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THE BUILDING NEWS

AND ENGINEERING JOURNAL.

THE ENGINEERING OF 1866.

RETROSPECTIVE glances are not always of a pleasant character, and there are probably many who look back upon the engineering schemes and works of the past year with no pleasurable feelings. As we, however, are neither engineers, directors, secretaries, nor contractors, there is no gall mingled with our reminiscences, and in our present review we can afford to look only upon the bright side of the picture, and to record with unalloyed satisfaction the progress and development of the different branches of engineering art and science. With the exception of the still unsolved problem of aërial navigation there are no means of communication remaining to be tried. The future of all those at present recognised lies in extension and application to examples on a scale hitherto unattempted. Thus a tunnel under the Channel would be but a gigantic instance of what has been successfully accomplished under the Thames, and what is in process of accomplishment under the Liffey, in Dublin, by the trunk connecting railway. Similarly, were a high-level bridge to be substituted for a tunnel, the precedents on a smaller scale are almost without number. It is seldom that a scheme is propounded, digested, the necessary funds provided, and the work carried out within the short space of one year, notwithstanding the present rapid manner of executing works; but an instance of this description is furnished by the history of the latest Atlantic cable, together with its fraternal predecessor, restored to life at the same time.

Of all the results of chemical investigations and analysis, the most conducive to the general welfare and utility is undoubtedly that of gas, and we are rejoiced to perceive that during the past year the use of it has penetrated to Nizam, a remote annexation to our vast Indian possessions. It is viewed with great favour, and with no little delight, by the majority of the native princes and rajahs, and we trust that it may really prove a light of civilisation into whatever realms its illuminating rays may extend. Old Father Thames has had another shadow thrown across his metropolitan course by the Cannon-street Bridge; the Victoria Bridge has been widened to take eight lines of rails; the new Blackfriars Bridge is rising into view, and if these structures continue to multiply, he may soon have to bid adieu to warmth and light while rolling his waters from Westminster to London Bridge. His banks will be confined by granite walls, although at the rate they are progressing it will be long ere that task is accomplished; or his bed disturbed by the Pneumatic Railway, which at present is at a standstill, the finances being, like the tube itself, considerably below low water. Last autumn witnessed the commencement of the Holborn Valley Viaduct, which will soon surmount the surrounding palisades; of its effect with respect to appearance we cannot at present speak, but there is not the slightest question of its utility and necessity, and, when completed, the untimely death of numberless unfortunate omnibus and cab horses will no longer lie at our doors. As the greatest commercial nation in the world, it has been incumbent upon us to provide adequate accommodation for our shipping, and London and Liverpool can boast of docks unequalled in size, security, and facility of ingress and egress. A new addition has been made to the London Victoria Docks by an hydraulic lifting dock, which has proved deservedly a success, and a new tidal basin at Glasgow is on the point of completion. Had iron attained, in the days of Smeaton, the notoriety which it now enjoys, it is more than probable that he would have built the Eddystone Lighthouse of that material instead of stone. In one recently erected by Mr. Stephenson, at Buddoness, a new description of illuminating apparatus has been employed, in which what are known as conoidal prisms have been applied for the first time to that purpose. Although various schemes have been put forward for supplying the metropolis with pure and wholesome water, yet nothing has been actually accomplished, and it will require another and more violent outbreak of the national epidemic before any efforts will be made to effectually remove the cause of the evil.

Those accustomed to attend railway committees had imagined that the severe and costly contests between rival bills so frequent in the palmy days of railroads had passed away for ever, but the contest which attended the passing of the bill for a new line to Brighton was worthy in every sense, including that of expense, of the best days of the "battle of the gauges." The bill passed; the act was obtained, but—*præterea nihil*. The link line connecting the insolvent London, Chatham, and Dover Railway with the Metropolitan station at Farringdon-street was one of the last efforts of that company, even while it stood tottering on the verge of bankruptcy. It is, perhaps, one of the most useful junctions ever constructed, and would go far towards re-establishing that unfortunate undertaking were the contingency within the bounds of possibility. While the Metropolitan District line is disinterring by hundreds the bones of our ancestors, the works of the St. John's Wood Railway are in a state of abeyance. It was but yesterday that the North London Railway opened the saloons and refreshment rooms of its new station; and the ground is cleared for the erection of the terminus at St. Pancras, which will be covered by a roof of gigantic dimensions. The proposed bridge over the Forth was commenced, so far as the sinking of one cylinder can be classed under that head; but the works never proceeded any further, and are now, as is well understood, definitely abandoned. The East London Railway has shown the greatest vitality of any, and there is every prospect, before the expiration of the present year, of witnessing a locomotive traversing the Thames tunnel and making some real use of that important subaqueous construction. In India during the past year the line over 1,100 miles in length has been opened throughout from Calcutta to Delhi, and the Governor-General has availed himself for the first time to the full extent of its resources. The only completed railway in India is the Madras line, which stretches from shore to shore, uniting the town of Beypoor with Madras, a distance of 400 miles. The Indian Branch Railway and the Indian tramway companies have both made good progress towards supplying with traffic their great arterial neighbours. The Suez Canal is yet to be cut, but its two terminating seas have already mingled their waters, and, judging from what has been accomplished, the rest is but a matter of time. No portion of the earth, whether surface or interior, has suffered so much from the attacks of engineering science as the Alps. Mont Cenis, like a person suffering from acute rheumatic fever, has been racked from summit to base, and what is worse, there is no hope of the internal malady abating for some years to come. Within the last twelve months an expedition has been undertaken which is rich in sacred, historic, and exciting associations. It carries back the imagination to the days when the Saracen and the Crusader met in battle array, when the war cries of "Allah" and "St. George" were shouted forth defiantly by contending squadrons, when the Grand Masters of the Knights of St. John were kings of Jerusalem, and when the ceaseless tread of pilgrims' feet, like the irresistible dropping of water, wore away the thresholds of the sacred buildings. The return of the party of Royal Engineers now employed upon the survey of a portion of the Holy Land will be welcomed by everyone interested in so important a measure, for before any engineering works of importance can be undertaken with a chance of success, an accurate survey of the country is indispensable.

In spite of the utter prostration of trade, a few most important chasms have been filled up during 1866 in the main railway routes on the continent. In Spain, the line crossing the passes of the Sierra Modena, the scene of many a ruthless guerilla conflict, was recently opened, and establishes communication between Paris and Madrid *viâ* Cordova, Seville, and Cadiz. The opening of the Badajos line placed Madrid *en rapport* with Lisbon, and thus the capitals of our ancient enemy and our ancient ally are united by the closest ties of civilisation. In Russia, the route from St. Petersburg to Warsaw and to Moscow is completed, and the Russian system will soon be united with that of Cracovia. The works have also been commenced to join the port of Poti, on the Black Sea, with that of Bakan, on the shores of the Caspian, and this connection would undoubtedly give to the trans-Caucasian lines the whole of the traffic between Europe and Asia. In Italy, Rome has been connected with Florence and Naples, and the Italian lines, over 3,000 miles in length, stretch to the confines of Illyria. We have now brought to the notice of our readers the principal works and the general progress made by professional skill and ability during the past year. It would be to no purpose, nor have we the space, to multiply individual examples. That we have many things

yet to learn, many difficulties yet to overcome, will be sufficiently demonstrated by two instances. One is, that it took three attempts to launch the huge "Northumberland;" the other evidence of our lamentable shortcomings is recorded in ineffaceable characters by the hand of Death at the bottom of the Barnsley pit.

WORKS IN THE PROVINCES, 1866.

IN our last number we endeavoured to give a synopsis of the principal works erected in London and its suburbs during 1866. It is our present intention to notice some of the improvements which have been effected in the country during the same period. Our observations on buildings last week were the result of personal inspection, which it would be simply impossible to extend to several hundreds of buildings of more or less merit scattered over the provinces. This impossibility is most noticeable in the case of churches, either building or in course of restoration. Indeed, the restorations are so numerous that the lightest chronicle of the fact would fill a small volume. We have, therefore, been guided in our selection chiefly by the reputation of the architects, the opinion of friends on whose judgment we are accustomed to rely, and, in many cases, by our own knowledge of the works in question. We have taken no note of restorations.

Of public buildings in course of construction there can be no question that the Exchange, Liverpool, is by far the most important. The west wing is fast advancing to completion. It will contain, besides other apartments, a news-room second to none in Europe. In point of size the proposed Manchester Exchange stands next. The competition did not give satisfaction to anyone, and may be recorded as the most unpleasant event which has occurred in the architectural world during the year. The *Punica fides* of committees is becoming a by-word. At Bradford an Exchange has been commenced, which promises well, and will be worthy of so important a town. The Exchange at Hull (Mr. Botterill, of Hull, architect) was opened early in April. It stands on the site of the ancient Suffolk Palace, the residence of the De la Pole family during the fourteenth century. The general effect is good, but we must repeat what we have often said—that an arched opening should never be used when the plan is circular. Unless the diameter of the circle be very large, or the arched opening ridiculously small—a mere slit, as in a Gothic castellated building—the arch will not stand, and instead of supporting a load must itself be supported by artificial means. Next in importance to exchanges, which can only be looked for in large and busy marts of commerce, we may place the Townhall. Few collections of dwellings too numerous to constitute a mere village but boast of some sort of public hall. The number of townhalls and market houses combined which have been this year in progress is prodigious. Many of them are of very humble pretensions, but some, on the contrary, are imposing and costly. Of the latter, the new Townhall of Hull is the chief. It is Italian in style, the ornament being good and sufficient rather than profuse. Mr. Cuthbert Brodrick was the architect. Ipswich has commenced a new Townhall, Messrs. Bellamy and Hardy being the architects. It is in the Italian style, but by no means so important a work as the first-named. At Hexham, a Townhall, which includes a corn exchange and a bank, has been completed. Report speaks favourably of it. The architect is Mr. Johnston, of Newcastle. At Congleton, a fine Townhall, in the Venetian Gothic, has been erected, the basement of which forms a convenient market. Mr. E. W. Godwin is the architect. In Wolverhampton a Townhall of some size has been commenced, and from the well-known public spirit of that town we are certain that money will not be spared to make it a handsome building. Chester is erecting a Townhall from excellent designs by the Messrs. Lanyon. It was in connection with this building that a ridiculous strike of a few days took place among the masons. It seems they wanted the dismissal of the clerk of the works. As far as the business of a contractor is concerned, they might as well have demanded the dismissal of the contractors themselves. The authorities of the union were appealed to, who decided the strike to be frivolous, whereupon it ceased. We have a great liking to Chester, because the townspeople regard their ancient city with more than usual affection, as witnessed by the care taken to preserve its ancient character when any alteration or new building is necessary. In most other towns, when it is necessary to rebuild a house the greatest care seems to be taken to make it of the new fashion, whatever that may be. In Chester, on the contrary, they endeavour to put up something similar in style to the former building, but with improvements suggested by modern experience. At Pendleton, Mr. A. Darbishire is the architect for a Townhall, and his name is sufficient guarantee that it will be of good design and sound construction. Mr. Habershon is superintending a plain and unpretending Townhall at Westerham, the cost of which we believe to be very moderate. The ancient town of Romsey is not behindhand, for a new Townhall will shortly be completed. It is Italian in design, which is under the circumstances to be regretted, though perhaps the townsfolks are the best judges. For our own part we should be guided in our choice of style by the character of the town in which the structure would be placed. There are certain towns—Oxford, Tewkesbury, Chester, Exeter, Gloucester, York, Bristol, and others, *quos referre mora est*—strongly marked by mediæval character, in which we should desire to see all improvements conducted with special reference to the preservation of that character. There are new towns in abundance having no mediæval claims, to which the Renaissance style seems better adapted. Of these, Brighton, Hastings, Liverpool, Manchester, Birmingham, and many others are examples. In watering places, which are for the most part of modern growth, and in towns like Liverpool, where the classical element has taken so strong a root that the town promises eventually to rival perhaps imperial Rome, the introduction of isolated mediæval buildings is particularly unfortunate, as in discord with the surroundings. A Markethall of considerable size and costly character has been recently opened at Derby. At Burnley a Markethall is in course of construction, the architect being Mr. J. Green, of Todmorden. It is a handsome Palladian building of one story, with a clock tower of very good design. There is no ornament whatever about this building, unless a free but judicious use of rustication may be so termed. A new Markethall has been very recently commenced at Staleybridge, but we have not the particulars at hand. Early in the year Mr. Bright laid the chief stone of a new Townhall at Rochdale. The architect is Mr. Crossland, of Leeds, who has, in spite of the prevailing rage for French Gothic, adopted the Late Decorated English style. While we must acknowledge the necessity for going abroad for Classical models, we cannot see the reason why architects should go so far a-field when they design a Gothic structure. Independently of its national claims, we absolutely deny the inferiority of the English school. A well-known writer of plays commented on the passion for things foreign in terms something like these—"Disable all the benefits of your own country, or I will scarce believe you have swum in a gondola."

Compared with the number of banks recently opened in London the provinces cannot be said to have done much in this kind of building, and perhaps it is all the more fortunate for them. Several handsome banks have, however, been erected during the past year. In Southampton, the Hampshire Banking Company have rebuilt their bank from designs by Mr. R. Critchlow, of Southampton. By the use of light iron columns in the ground and first-floor window openings, abundance of light is obtained, while the intervening stone piers give sufficient solidity to the appearance of the building. There is much in this façade that we like, but we shall never cease to protest against the use of circular or even segmental-headed windows in the upper story. Barry never fell into this error, knowing well that a cornice demands a square-headed aperture immediately beneath it. To a ground-floor opening a semi-circular arch is always appropriate, as it indicates the power of bearing great weight. For the openings on the first-floor no rule can apply, though a segmental head is a gentle transition, but for the uppermost openings, whose heads carry little weight, the lintel is the only thing which can satisfy the reason. Mr. Waterhouse has in hand a bank at Leighton Buzzard for Messrs. Bassett and Co., an illustration of which appeared in the BUILDING NEWS of December 21. It is decidedly French Gothic in style, but very well treated, and is an example of the principles relative to arches and lintels, to which we have just called attention. The ground-floor openings form a handsome arcade, but the openings on the upper floor—there are only two stories—are square-headed. The details of this bank, which we also gave, are well worthy of notice. At Darlington, Mr. Waterhouse is architect for a bank in somewhat similar style. The London and County Bank at Cambridge, by Messrs. F. and H. Francis, is a pleasing Gothic building, not overladen with ornament. The style is Gothic and Late Decorated. The porch is somewhat heavy, but as a whole this bank will be an ornament to the University town. Very early in the year the Consolidated Bank was opened at Norwich, Mr. R. M. Phipson, of Norwich and Ipswich, having been the architect. The style is Northern Italian of a late date.

We fear that the storms which have wrecked so many hotel companies in the metropolis have not passed over the counties without leaving traces in the form of vast unfinished undertakings. The storms, however, are not wholly to blame; the natural laws of demand and supply are as fixed as are those of cause and effect. There is no absolute certainty for supposing that a supply of any article will produce a demand, but experience has proved that a want which has a real existence is supplied in every case where it is possible, and in many cases where it would seem impossible. It is, however, less our business to examine the causes of the disasters which have befallen so many hotels than to give a list of the principal ones, with a brief description where we are able to do so. A very handsome hotel, the Cavendish, is in course of construction at Eastbourne, Sussex. About two-thirds is finished; the architect is Mr. Knightley, of London. Fronting on the sea, and having a fine road on each side, the situation of this hotel is very advantageous, and we hope soon to see it completed. It is in the style of the Renaissance, with high-pitched roofs, having a central pavilion, and two smaller ones at the angles. The fenestration is very well designed, and the whole effect exceedingly good. The coffee-room is of great merit. The Castle Hotel, Aberystwith, of which we gave an illustration in our last number, is one of the unfortunate hotels which are at present unfinished for want of funds. Mr. J. R. Seddon is the architect, and the building is in the French Gothic style, of which he is one of the principal exponents. Those portions which are completed show, beyond doubt, great picturesqueness of treatment, but we have strong doubts if the contemplated lofty central tower is an improvement. It is for four stories, entirely without variety, and the same may be said of the turret attached to it, which contains the staircase, with the addition that it is nine stories high. The coffee-room, overlooking

the sea, is completed, and is a handsome room 130ft. long and 30ft. wide. As much as £80,000 has been already spent. We hope some day to record its completion. The Queen's Hotel, in the same town, was opened on the 1st of May, Messrs. C. F. Hayward and H. O. Davis architects. A full description will be found in the BUILDING NEWS of May the 11th. At Leeds, the Great Northern Railway Hotel is, we believe, progressing on the site of the Wellington Hotel. The contract was for £31,500. The London and North-Western Railway Company have selected Mr. Waterhouse's design for an hotel in Lime-street, Liverpool, in a limited competition. This work is of considerable importance, and we regret that we were unable to inspect the drawings during the short time they were at Euston-square. The great hotel at Scarborough was not finished last year, and there is not much promise of its completion during the present. If, however, there be a place in England where, above all others, an hotel on a large scale might hope to succeed, it is certainly Scarborough. The Royal Hotel, Cardiff, Mr. C. E. Bernard, architect, has been completed. The style is Northern Italian. The Grosvenor Hotel, Chester, built almost entirely at the cost of the Marquis of Westminster, was opened in the early part of last year. It is built in the style of the old houses of Chester, and harmonises perfectly with the prevailing character of the old town. The first story is supported by pillars of Anglesea marble, forming a continuation of the "Row," so dear to the townspeople. The upper stories above the first floor are in the usual half-timbered style, having on each front two gables. At the angles are turrets surmounted by iron finials of very good pattern. In the interior a large open court is placed. We regard the whole arrangement of exterior and interior as a very successful reproduction of a most comfortable and effective style of building, a style which we desire to see extended to every ancient town in the country, to the extermination of the showy stucco railway hotel style at present so prevalent. In this brief review we must of necessity omit many works well worthy of notice.

Several provincial theatres have been recently opened in different places. Report speaks highly of the Prince of Wales's Theatre, Liverpool, of which Mr. Salomons, of Manchester, was architect. It is arranged in a somewhat novel manner, the pit being devoted to the dress circle company, and *vice versâ*. Its acoustic properties are said to be remarkably good. It is rumoured that Mr. Mapleson, lessee of Her Majesty's Theatre, is about to employ Mr. Salomons to design a new theatre in London in the neighbourhood of Leicester-square. At Stockton, a theatre, to seat about 1,700 persons, has been erected from the designs of Messrs. Potts and Son. At South Shields, at Nottingham, and at Brighton, Mr. C. Phipps has been architect for theatres of great merit. At Hull, a new theatre has been built on the site of the old Theatre Royal, burnt in 1859, seating upwards of 2,500 persons. Mr. R. G. Smith was the architect. At Holborn a new theatre has been built, after designs by Messrs. Finch, Hill, and Paraire. One fault in this theatre is the wide, wilderness look of the back part of the pit, and the difficulty of hearing, which arises partly from the clatter going on at the refreshment bar.

Educational buildings, such as schools, colleges, orphanages, and the like, have arisen in considerable numbers. The most important of these is the Glasgow University, which, after many delays, owing to the want of funds, has at length been commenced. Mr. G. G. Scott is the architect. The splendid site of Gilmore Hill has been obtained, and we trust that the scheme of the architect will be carried out in a manner worthy of the importance in which Glasgow stands with regard to the United Kingdom. The estimated cost of this edifice is about £200,000. Mr. Welby Pugin is architect for two orphanages, for boys and girls respectively, one at Hellingley (see BUILDING NEWS, March 9), the other at Bletchingly (illustrated in the BUILDING NEWS of May 11). It will be seen from the plates that they bear a strong resemblance to each other, and that they are worthy of the architect. The Duchess of Leeds generously provided the funds for the erection of both of these institutions. Mr. Pugin is also architect for the new schools, the foundation stone of which was laid in July last.

Extensive additions are being made to Dulwich College, in accordance with the act of reconstruction of 1858. Accommodation is provided for 600 boys, equally divided between the upper and lower schools. The buildings are of the Northern Italian style of architecture, and are designed by Mr. E. M. Barry. The probable cost will be about £62,000. In July, Her Royal Highness the Princess of Wales laid the foundation stone of the Home for Little Boys, at Horton Kirby, Farmingham, Kent, Mr. T. C. Clark being architect. These schools, which will probably be completed by midsummer, will cost about £7,000. The new college at Hull, to be called the "Hull and West Riding College," has been progressing; it is in the Gothic style of the nineteenth century. The architect is Mr. R. G. Smith. As the cost is not supposed to be above £3,000, while the frontage of the building is 130ft., the depth 117ft., and the greatest height 70ft., and as we understand that there are to be columns of red Mansfield stone and that the hall is to be flanked by flying buttresses crowned with pinnacles, we conceive that the architect must have exercised uncommon ingenuity. The Warehousemen and Clerks' School, Russell Hill, Caterham Junction (by Mr. J. G. Bland, of Birmingham), were completed early in the year, the foundation having been laid by Her Royal Highness the Princess of Wales, in 1863. This building, which accommodates 135 boys and 60 girls, cost about £20,000. It has no special merit beyond answering its purpose and presenting a picturesque appearance, two qualities not always combined in the same building. The style is Gothic, treated in a horizontal manner. Early in the autumn the foundation stone of the International College, Spring Grove, Middlesex, was laid by the Prince of Wales. Messrs. John Norton and P. E. Massey are the architects. Considerable additions have been made to St. Nicholas' College, Lancing, Sussex, and its kindred institutions at Hurstpierpoint and Ardingly. The architects are Messrs. Slater and Carpenter. With this brief notice of works of some importance we must close this portion of our remarks.

Although we do not profess to go into the subject of church restoration, which would open an almost boundless field, we must not let the most prominent works of Mr. G. G. Scott pass without notice. His principal external restoration of Salisbury Cathedral is completed, that is to say, the necessary repairs have been effected, and the work of restoring the west front has been commenced. It is proposed to replace as many as forty statues on this front alone. We have seen the model for one of the principal, and are assured that the work is in good hands. Mr. Scott has also undertaken the restoration of Bath Abbey, a church which, with the exception of Chester Cathedral, perhaps needed it more than any other in England. The restoration, or rather rebuilding, of the spire of Chichester Cathedral was brought to a close in June last, the ancient vane being then placed in position with much ceremony. The repairs of Gloucester Cathedral have been commenced, at an estimated cost of £70,000. Ely Cathedral is still in hand. It seems hard that the present generation should have to pay for the neglect of their ancestors; but, unless we are willing to let these noble monuments fall to pieces, there is no help for it. Mr. Scott has also superintended St. Mary's Church, Shakleford, Surrey; St. Andrew's Church, Derby; and a number of others. Mr. B. Ferrey was architect for a small church at Somerton, Somersetshire, a memorial, we believe; and also a church at Lufton, Yeovil. This last is small, but of excellent design, as is everything that Mr. Ferrey produces. This architect has undertaken a large number of restorations during the last year. Mr. Street has also been fully employed with restorations and new churches; amongst the latter, may be reckoned St. Peter's, Malton, Worcestershire, a small but skilfully designed church; St. John's, Warminster, also small, costing about £3,500; St. Peter and St. Paul, Teddington, of brick. At Fawley, Berkshire, the same architect has designed a church of which report speaks well; another at Cowleigh, North Malvern; and one at Wansford, near Driffield. The last is a village church, erected at the expense of Sir Tatton Sykes.

Mr. Bassett Keeling has exhibited his usual predilection for particoloured architecture in St. Paul's Church, Norwood. This church is of brick, with dressings of stones of various colours. Mr. Keeling has also commenced a church at Killingworth, Northumberland, and another at Greenhill, Harrow. Mr. Buckeridge, of Oxford, has been engaged on a small but handsome church at Wellingborough, Northamptonshire, a description of which appeared in the BUILDING NEWS of June 15th. He has designed a small church at Rudway, Warwickshire, to seat 250 persons; and also the church of St. Mary, Blackmore End, Whethersfield, Essex, a plain but well-treated brick structure. Mr. Buckeridge has been very busy in works of restoration. Mr. Blomfield has also been largely employed in similar works, and amongst other new churches has produced one of more than usual merit at Great Holland, Essex, on the site of a former church. Mr. Blomfield's works are always marked by good taste, without which originality is worthless. Mr. Paley's church of St. James, Poolstock, Wigan, is considered to be very fine. It was the noble gift of Mr. Eckersby, M.P. Mr. Paley was also architect for a small church, dedicated to St. John, at Woodland, Durham. Mr. Butterfield was employed on St. Anne's, Dropmore, a small church built of flint, brick, and timber. At Strathfieldsaye he has designed a larger and more costly church, considered to be remarkably good. Penarth Church, Glamorganshire, the gift of the Baroness Windsor, and a small church dedicated to St. Mary the Virgin, at Reading, are also among the works of this architect. At Newcastle-on-Tyne, the church of St. Ives', Leadgate, was commenced in September. It is in the prevalent French Gothic style. Mr. H. C. Fowler is the architect for this church, and for that of the Holy Innocents, Brancepeth, Durham. Mr. Roumieu was architect for St. Mark's, Broadwater Down, Tunbridge Wells. A full description of this church will be found in the BUILDING NEWS of August 24th. At St. Leonards, the church of St. Thomas of Canterbury, by Mr. C. A. Buchler, was opened in June. The BUILDING NEWS of June 8th contains a description. The church of St. Gregory, Stratford-on-Avon, has recently been opened. It is in the First Pointed style. Mr. Pugin was the architect. He is also the architect of churches building at Preston, and was associated with Mr. Ashley in the superintendence of erecting St. Peter's and St. Paul's, Cork.

Mr. Norman Shaw is proceeding with a church at Bingley in the First Pointed style. The internal walls are unplastered, the roof is underdrawn, and the plaster will be decorated. Mr. R. J. Withers has commenced a small church at Ivegill. It is very small, having only 120 seats; the style is Early Decorated. Mr. S. S. Teulon was architect for the new parish church at Hopton, in the First Pointed style. Mr. Teulon is not fortunate in his towers, as may be seen in Southwark and Camden Town. Messrs. Mallinson and Healey, of Bradford, were the architects for a church which has very recently been erected at Tockwith. The style is Second Pointed, and, as in Mr. Norman Shaw's church at Bingley, the internal and external faces of the walls are alike of stone. The cost was about £4,000. Mr. E. E. Scott, of Brighton, was architect for

a small church at Burgess Hill, Reymer, Sussex, the spire of which is well proportioned. As the cost of the entire building has been very little, the architecture has been of a plain character. Mr. J. Medland Taylor, of Manchester, has been largely employed. St. John's Church, Strand Lane, was built from his design. The church of St. Helen, Liverpool, is by him; also St. Chad's, Romiley, near Stockport, opened in April; St. Gabriel's, Hull; a church at Irlam, near Eccles, Lancashire; St. Matthew's, Ardwick, and several others in different parts of the country, are by the same architect. In the BUILDING NEWS of January 26th will be found an illustration of a cheap though characteristic brick church by Mr. J. Ladds, of London—St. John's Church, Lawley, Salop. It contains about 200 seats, and cost £1,250; notwithstanding which it presents both externally and internally an ecclesiastical appearance. Sir G. Bowyer has again employed Mr. Goldie, and on this occasion on a Gothic church, St. Mary's and St. Edmund's, Abingdon; the style is Second Pointed. Mr. Goldie has shown, in his elegant little church in Great Ormond-street, what he can do in the Classical style. Messrs. Stevens and Robinson, Derby, are architects for the church of St. Michael and All Angels, Blackburn; the style is thirteenth century English Gothic. A memorial church has been erected at Appleton-le-Moors, Malton, Yorkshire; which, although small, accommodating only 200 persons, is acknowledged to be of excessively good design; the style is First French Pointed. The architect was Mr. J. L. Pearson.

PAINTED DECORATIONS.

No. IX.

BESIDES the conventional treatment I have already described, we find that the painted decorations of old times included painted curtains or imitation hangings. The usual place for the painted curtain was that which in rich houses would have been occupied by real hangings—viz., between the floor and the first stringcourse, but there are instances of imitation hangings being painted in detached strips, as in the decorations of the clerestory at West Walton Church. When the curtain is continuous, it is generally painted as if looped up in itself to pegs at intervals of from two to four feet, and from these suspending points, where the curtain appears tied up in a knot, hang the folds which give such relief to the plain colour. Sometimes the curtain is covered with a rich diaper, or with bands of ornament with fringe at the border; and then it is not uncommon to find the folds dispensed with in order to show forth the pattern of the diaper, as at the church of St. Francis of Assisi. The diagrams figs. 1, 2, 3, 4, are merely to show how the painter usually arranged the hanging of the curtain.*

It is quite unnecessary to point out the numerous varieties of this decoration. It may be of the simplest form and colour, as in the Swedish churches, or it may be raised to the dignity to which the painter of St. Stephen's Chapel, Westminster, raised it when he suspended his curtains, richly diapered with gold, from the hands of angels. Wherever curtain decoration may have been adopted it seems to me quite clear that it is eminently unsuited for small chambers or irregular or broken wall surfaces, or, in other words, for chambers where there are many openings and projections. So, too, it seems contrary to common sense and mediæval practice to paint a continuous curtain in a raised position. The bottom of the curtain should never be raised above the floor higher than the height of a seat.

Division of wall space by means of medallions is another system of decoration planning which the young architect may well study to

* The King's treasurer is ordered to paint Henry III.'s great Chamber, at Westminster, of a good green colour, in the fashion of a curtain, as also the small wardrobe.—Close roll to Henry III.

FIG. 1.

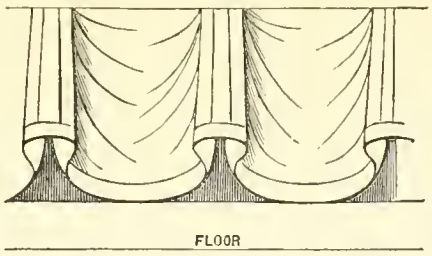


FIG. 2.

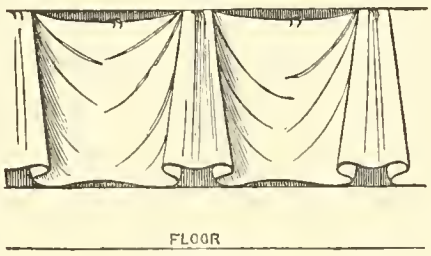


FIG. 3.

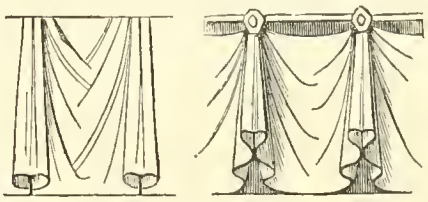
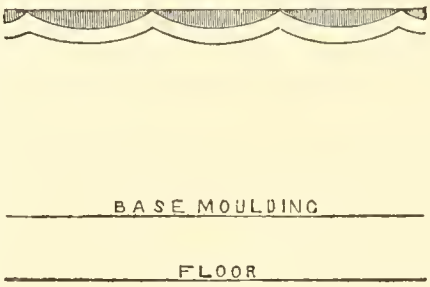


FIG. 4. (DIAPERED CURTAIN.)



advantage. When medallions are adopted the ground or space between them is either filled up by scrollwork diapers, including the masonry pattern, or by ornament issuing from the border of the medallion. One of the earliest and most interesting examples of medallion decoration in this country is that on the vaulting of St. John's Chapel, St. Mary's Church, Guildford, where subjects of three or four figures enclosed in circles are arranged symmetrically on the vault, and connected by scrollwork filling up the spandrels. Of plain geometrical medallion work without figures, West Walton presents us with a very good example of twelfth century work; and of later medallions enclosing symbols and emblems we have fine illustrations on the groining of the choir of St. Albans Abbey Church. In some of the Swedish churches the roofs are crammed full of circular medallions containing subjects, but there is nothing in Sweden to equal the splendid range of compound quatrefoil medallions which I have already described as occupying the crown of the vault of the chancel at Bjeresjoe. The arrangement of coloured medallions is quite a study in itself We find them arranged in friezes in the Romanesque churches of St. Apollinare in Classe, Ravenna, and Sti. Angeli, Perugia, and in the nave at Monreale. In England the medallion system *per se* was not often adopted, but we find many instances of a combination of the medallion with other systems, as at Winchester and Bristol Cathedrals; and in the groining of our northern churches it was always a favourite way of dividing the spandrels from the thirteenth down to the fifteenth century. In figs. 5, 6,

FIG. 5.

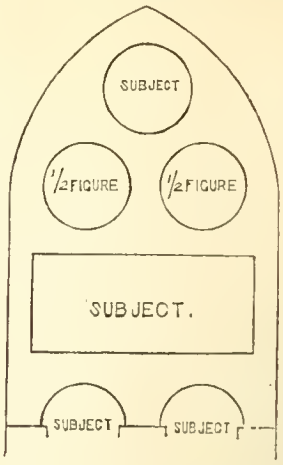


FIG. 6. (VAULTING.)

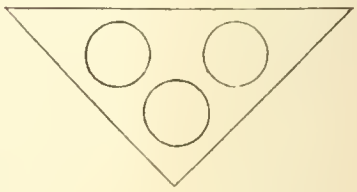


FIG. 7. (VAULTING.)

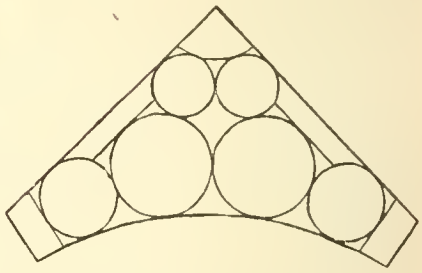
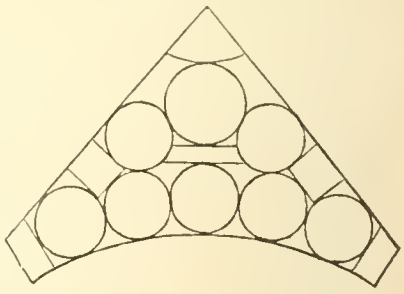


FIG. 8. (VAULTING.)



7, 8, I have shown a few examples of this method of separating or dividing the wall and roof space.

In the Liberati rolls mention is made of medallion decoration, the form of the medallions being always described as circles. Thus the Sheriff of Southampton, in the year 1238, is commanded to see to certain repairs of the King's Hall at Winchester, "to repair the dais of the same hall, as well with colours, where it shall be necessary or otherwise; and to cause the wainscot of the chamber there to be painted a green colour and stained with gold; and circles to be made on the same wainscote in which are to be painted 'histories' of the Old and New Testament."

Between the continuous and the medallion systems we have the arrangement which may be described as the panel system. The church of St. Francis, at Assisi, at once occurs as the great mediæval example of this system, where curtain, panel, and medallion all assist in the one object which every wall painter should keep constantly in view—the decoration of the architecture. In its general scheme of division and subdivision the painting of the Upper Church of St. Francis is grandly monumental,

and by the side of the monotonous division of Giotto's Chapel, at Padua, shows what an important work is the planning or spacing of decoration. That this part of an architect's duty was not lost sight of in England is clear from documentary evidence, but, unfortunately, we possess no works to compare with the examples which I have mentioned. What Henry's "great chamber" at Westminster was like it is impossible accurately to determine, but the orders concerning its decorations give us a very fair idea of how they were planned, and show that at Westminster, as at Assisi, the painted curtain was highly esteemed as a base to the pictorial or chief decoration. These orders are in themselves such curious illustrations of how they managed these things in the thirteenth century that I make no apology for quoting two of those relating to this great chamber. The first is from the Close roll of the 20th Henry III., wherein the king's treasurer "is ordered to cause the king's great chamber at Westminster to be painted of a good green colour, in the fashion of a curtain, and to paint in the great gable of the same chamber that verse—

"Ke ne dune ke ne tune, ne prent ke desire."

This order was given at Merewell, May 30th. About a year and a quarter later the king orders Odo, the goldsmith, "to displace without delay the painting which was commenced in the king's great chamber at Westminster, under the great history of the same chamber, with panels containing the species and figures of lions, birds, and other beasts; and to paint it of a green colour in the fashion of a curtain, so that that great history may be preserved unhurt." We may here, I think, learn if we like a very valuable lesson—namely, that "the species and figures of lions, birds, and other beasts," placed in juxtaposition with an important figure subject or "history," have a decided tendency (at least in the eyes of thirteenth century critics) to hurt the more important work, and that the quiet or repose of a green curtain is needed to preserve what the Americans would call the "go" of the painting above. E. W. G.

THE LOSSES OF THE YEAR.

IT is the old, old story that the great reaper Death has been busy in the ranks of the living. The losses during the past year have been both numerous and heavy—not so heavy, perhaps, as in some former years, but still great, and in many cases irreparable. If we have not had to regret the demise of a Macaulay, a Thackeray, a Lincoln, a Palmerston, or a Cobden, of men whose names were household words, and who enjoyed a world-wide reputation as master spirits of the time, the list of deaths nevertheless includes many men of real genius, occupying the front ranks in their respective walks, besides others of lesser note. Religion, politics, literature, science, and art, have each lost some of their brightest ornaments since last the earth made the circuit of the sun. It does not fall within our province to chronicle the names of all the noteworthy men and women who "have gone over to the majority" in the course of the year which has just closed. Leaving that task to others, we shall confine our record to those losses which science and art have sustained. The deaths of Sir Charles Eastlake, the late President of the Royal Academy, of Captain Fowke, the engineer and architect, of Nicholas Wood and Alan Stephenson, the well-known engineers, and of Richard Golding, the historical engraver, closed the obituary of 1865. These all passed away in December of that year, and their names and fames have been duly recorded. In art, our first loss in 1866 was Mrs. Newton, whose premature death, at the early age of 33, occurred on the 1st of January. On the 13th of the same month followed William Harvey, the apprentice of Thomas Bewick, and the pupil of Haydon. The illustrations to Northcote's "Fables," White's "Selborne," and Lane's "Arabian Nights," and Charles Knight's "Pictorial Shakspeare" establish Harvey's reputation as an engraver and designer on wood. He was 69 years of age. On the 19th died another lady artist of repute, Harriet Ludlow Clarke. John Gibson also passed from among us this month. He died at that favourite home of sculptors—Rome, where he had resided for well nigh half a century—on the 27th of January, at the ripe age of 75. Of John Gibson it will be sufficient to say that, the son of a Conway market gardener, he became the pupil of Canova and Thorwaldsen, and the greatest English sculptor of his time. His works, of which, happily, England possesses not a few, are well known. His first important work, "Mars and Cupid," was much admired by his great master Canova; it was afterwards reproduced in marble for the Duke of Devonshire, and is now at Chatsworth. His latest was the exquisite "Venus," so familiar to every visitor of the Great International Exhibition of 1862. The death in February of Godfrey Sykes was a great loss to the Government School of Design at South Kensington, in whose interest he had laboured so unremittingly, and, it is to be feared, at the sacrifice of his own health. This talented artist had just completed his fortieth year. Alfred Newman died in March, one year younger; Thomas Musgrave in April, aged 54; and within a month of each other, in June and July, John Hayes and William Hookham Carpenter, at the respective ages of 80 and 74. In August died David Dunbar, the eminent sculptor; in September, Edward Train, the landscape painter, very suddenly, at his easel, and Henry Chawnor Shenton, the historical line engraver; in November, at Leghorn, E. B. Spence, a pupil of John Gibson, and a sculptor of considerable merit. More recently we have had to mourn Thomas Morten and Paul Gray, two young and very promising draughtsmen, both of whom died a few weeks ago. Of Gray, who was but 24 years of age, it may truly be said that few artists have so rapidly achieved fame; few have had so brilliant a career so early closed.

Oh! why has worth so short a date,
While villains ripen grey with time?

France, too, has lost her Gavarni, the humble mechanic who rose to be the greatest caricaturist, beyond all comparison, of his country—the John Leech of France—a man of brilliant wit, and the most accomplished of Frenchmen; also Joseph Thierry, one of the most distinguished French decorative painters. Of antiquaries and archæologists, Dr. George Petrie, the Irish antiquarian, "departed this life" on January 18, aged 76, and Frederick William Fairholt on April 2. Both were also artists. Fairholt, a Londoner, born in 1816, is best known by his "Costume in England," published in 1846, and his "Dictionary of Terms in Art," published in 1854. He was the author of numerous other works on literary and archæological subjects. His latest work, "Up the Nile," was written and illustrated by himself, and is descriptive of a voyage he made in Egypt in 1851. The death of the Marquis Camden, President of the Kent Archæological Society, occurred in August. Mr. S. Stone died on September 10, in the prime of life; Charles Halliday, a well-known Irish antiquarian, on the 14th of the same month; and on the 13th of last month, Joseph Robertson, LL.D., the most learned antiquarian in Scotland, the author of "The Book of Bon-Accord," and the best account of the ecclesiastical architecture of his country that we possess. Dr. Robertson, who held the office of Curator of the Historical Department of her Majesty's Register House, Edinburgh, was a native of Aberdeen, where he was born in 1810. The engineers have lost a number of members from their ranks, the more eminent being George Rennie, who died on the 30th of March, at the age of 75, and Charles Wye Williams, only three days afterwards, at the patriarchal age of 87. To Rennie, in conjunction with his late father and his brother, the present Sir John Rennie, we are indebted for many important public improvements. The docks of London, Sheerness, Dublin, Leith, Woolwich, Pembroke, and other places, were constructed by them. They were the engineers employed in the construction of the breakwater at Plymouth, and in the formation of Plymouth, Howth, Kingston, Ramsgate, Portpatrick, and other harbours. George Rennie made the first surveys for the Liverpool and Manchester line of railway, including the tunnels, cuttings, viaducts, and the famed Chat Moss. He was the surveyor of several other lines in England and in Belgium, and the beautiful bridge which spans the River Meuse in the latter country was constructed by him. Mr. Rennie was a member of many learned societies, and to the "Transactions" of the Royal Society he contributed a number of able papers. Mr. Williams was equally distinguished, though in a different path. At a very early date he applied water-tight bulkheads to divide ships into separate compartments. In the great competition of makers of marine steam boilers at Newcastle a model boiler and furnace for the complete combustion of coal, invented by Mr. Williams, obtained the £500 prize, Sir William Armstrong being one of the adjudicators. His able treatise on the same subject, first published in 1839, is familiar to all scientific men, as is also his essay on "The Prevention of the Smoke Nuisance," for which Mr. Williams received, in 1856, the Society of Arts' £25 gold medal. How heroically Mr. Parkin Jeffcock, the mining engineer, sacrificed his life in attempting to aid the unfortunate miners at Barnsley our readers have already been told. In other branches of science the losses during the year have been neither few nor far between. Mr. Brande, the veteran chemist, the contemporary of Sir Humphry Davy, died in February. That wonderful man, Dr. Whewell, the most encyclopædiac mind of his time, expired on the 6th of March. He was successively Professor of Mineralogy at Cambridge (1828-32), Professor of Moral Philosophy, Vice-Chancellor of the University, and Master of Trinity College. Dr. Whewell presided at the meeting of the British Association held at Plymouth in 1842. The *Mechanics' Magazine*, in a notice of his death, said of him:—

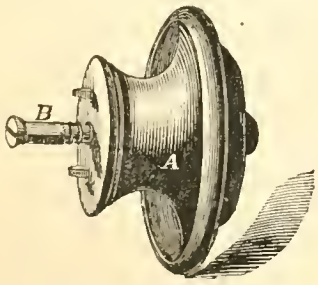
In 1838 he accepted the Professorship of Moral Philosophy, which he retained until the year 1855. To this period of his life we owe the most valuable of his works, and that, probably, upon which his lasting fame will be constructed "The History of the Inductive Sciences," with its sequel, "The Philosophy of the Inductive Sciences." It was upon these subjects that the pen of Dr. Whewell was frequently exercised in the *Mechanics' Magazine* some years since, he having been at one period a contributor to our columns, in conjunction with the late Dr. Ure, Sir James South, Dr. Woolley, and other men of great scientific attainments. Dr. Whewell wrote also upon Gothic architecture, and an example of his skill as an architect is to be seen in the memorial chapel in Cambridge Cemetery, which he erected to the memory of his first wife. The architect has now gone to his rest full of honours, but not so full of years as seemed probable before the untimely accident which has robbed science of one of her best friends.

Dr. Whewell's father was a humble carpenter at Lancaster, at which town the great mathematician was born in 1795. He was an extraordinary instance of success, but he worked hard for it, and his career offers a bright example to those especially who have been born in adverse circumstances. Charles Maclaren, the geologist, closed a long life of usefulness on the 10th of September. Another Edinburgh celebrity—Alexander Bryson, late President of the Royal Scottish Society of Arts, and other learned bodies—died on the 7th of December. Colonel Sir George Everest, C.B., F.R.S., an officer of great scientific attainments, died this month, at the age of 76; and the Rev. John Hinde, M.A., the eminent mathematician, also in December. In medical science the list is a long and mournful one. It is particularly painful to reflect on

the number of young rising medical men who have been suddenly cut off by epidemic at a time when they could ill be spared. Dr. W. A. Patrick Stuart, of the University College Hospital, caught a fatal fever while labouring to succour others. He had just attained his majority. Dr. John Wyber, one of the resident medical officers at the London Fever Hospital, and Dr. Southey Warter, similarly fell victims to typhus, both at the age of twenty-six. Dr. Ansell, the medical officer of Bow, and Dr. H. Jeaffreson, the distinguished physician of St. Bartholomew's, died suddenly—the one of cholera, the other of typhus. Their deaths were a great blow to the profession, and a serious loss to the community. The past year has not been signalised by the death of any great architect, though the usual complement of architects and builders of local note has been taken from among us. Mr. Henry Melsom, an extensive builder and decorator at Bristol, died in March; Mr. Hugh Byrne, the city architect of Dublin, in the autumn; Mr. Howell, the district surveyor of St. Margaret and St. John, Westminster, in August, in which month the death from apoplexy was recorded of M. Gisors, the architect of the Palace of the Senate; Mr. Shennan, Dean of the Guild of Edinburgh, and an extensive builder, dropped down dead at a public meeting in November; Mr. George Phillips Manners, who had been City Architect of Bath for the long period of forty years, died on the 29th of November; Mr. Charles Reeves, the architect, in conjunction with his partner, Mr. Butcher, of many of the County Courts in London and the chief towns of England, on the 6th of December. Mr. Reeves is succeeded in the surveyorships of police buildings in the metropolitan districts and of county courts by Mr. Thomas Charles Sorby. A fortnight ago we had to announce the demise of Mr. John Tolmie, the sculptor, of Belvedere-road, Southwark, which event took place on the 12th ult. We find that we have to add to our list the names of George Hillier, the archæologist; William Bewick, the historical painter; E. G. Papworth, the sculptor; and Nicholas Jaley, the French sculptor; all of whom belong to the necrology of 1866.

MYERS'S DRAWER KNOB.

THIS is a recent American invention. In old-fashioned times the ornaments of a chest of drawers or bureau were of metal and of the most elegant and solid description. Knobs for opening drawers were unknown, but swing handles, solidly secured to the wood, were for that use as well as for ornament. The convenience of knobs, the modern device, suffers some detraction, from their liability to break off or unscrew and become loose. To prevent this latter occurrence is the object of the improvement illustrated in the annexed cut.



A is a knob of the usual form, having, instead of the wooden screw on its inner face, a plane surface. The common wood screw B is used to attach it to the drawer or door, while the two sharp pins, one on either side of the screw, secure it in position. It is easy enough to see that these pins effectually prevent the removal of the knob from the outside by unscrewing. The inventor is Dr. L. B. Myers, of Elmore, Ohio, U.S.

Four new drinking fountains are about to be laced in the streets of Bournemouth, Hants.

LLANDAFF PROBATE REGISTRY.

THIS building has a recessed porch communicating with a vestibule, to the right of which is a spacious lofty clerk's office, well lighted, having a strong vaulted muniment-room attached to it. On the left is a waiting-room, &c., and over it and the vestibule a private room for the registrar. A residence, with a distinct entrance, for the chief clerk, was formed out of an existing cottage, which was readapted and incorporated.

The dressings are of the best Combe Down Bath stone, intermixed with bands of Bridgend green sandstone, and the body of the walls consists of Newbridge Pennant stone in thin flat courses. The roofs are covered with small green Carnarvon slates. The whole was substantially built in 1861 by Mr. Thomas Williams, builder, for £1,000, from designs and under the superintendence of John Prichard, Esq., Llandaff.

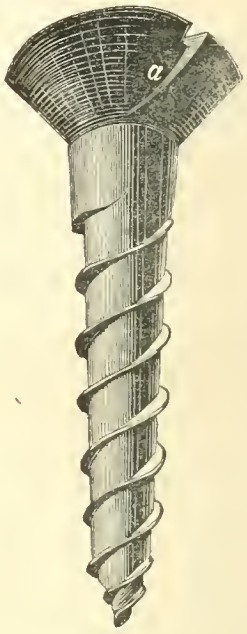
DRURIES, HARROW.

THE building of which we give a plan and part of detail this week is one of a class of buildings peculiar to our public school system, being, in fact, a master's residence, with accommodation also for about thirty-six to forty boarders. A house of this size is called at Harrow a large house, and it is evident the general requirements are different from those in what are called small houses, where special accommodation for only a few resident pupils is wanted. The chief architectural peculiarities of this building, however, arise rather from its position than its special requirements, for, although one of the oldest and largest houses at Harrow occupied the site of this building, the only access was and is now the narrow passage way shown on the plan, covered overhead by the first-floor of the adjoining house. There is, therefore, no frontage whatever to the street, and no chance of this interesting bit of architecture being found out by anyone merely passing through the town. In this respect the forecourt of this building represents as near as possible the position of many houses in Venice, and perchance this view may bring to the recollection of the traveller many a charming bit of architectural detail suddenly discovered in his rambles through that glorious old city—at any rate, the existence of this picturesque front will be a surprise, we venture to say, to many who fancy they know Harrow well. But, although there is no frontage towards the street, the garden front is indeed enough to compensate for any disadvantage at the entrance. The fine steep western side of the Harrow hill slopes from the terrace level, and, falling away towards the west, opens out a magnificent view over the plain as far as Windsor and beyond, while, of course, from the drawing-room floor and floor above the view is more extensive still.

The plan shows itself at once as adapted to the spot, and the difficulty of obtaining internal light and air is well overcome, while not an inch of space seems lost. The house which stood on this spot was a mere agglomeration of tumble-down wooden buildings—except the rooms facing the garden—which have been retained as far as possible in the new design. In order to obtain sufficient space for kitchens, &c., it was necessary to excavate deeply, and thus a rearrangement of levels enabled the architect to keep all the ground-floor rooms on a level with each other (except about two steps in the garden front) and by setting back the walls of the building in two or three spaces to avoid dark passages and useless rooms. The part of the house devoted to the pupils is divided by their staircase (which is of stone, and is built between walls without any well-hole), and the rooms occupied by them are right and left of this staircase, which being carried up as a sort of turret forms an important feature on another elevation of the building. The pupil-room—for personal instruction by the master—and the boys' dining-hall will be seen on the plan, as also the position of lift, &c., which adjunct to the working of a large house has now become almost a *sine qua non*. Gas is fitted to every room, and hot and cold water laid on to every floor. The porch is lighted from above, and the hall by the recessed windows. The latter is rather a fine feature, being decorated with Plymouth marble columns, and it would be evident from the upper plan, if we were to show it, how it grew into this special picturesque form, and how the arrangement of columns and arches work in with the entrance and pupils' dining-room on the one side, and the principal staircase with ante-rooms, &c., on the other. Mr. Chas. Forster Hayward (the honorary secretary to the Institute) was the architect engaged by the owner, C. F. Holmes, Esq., and Mr. R. E. Roberts, the builder.

IMPROVED WOOD SCREW.

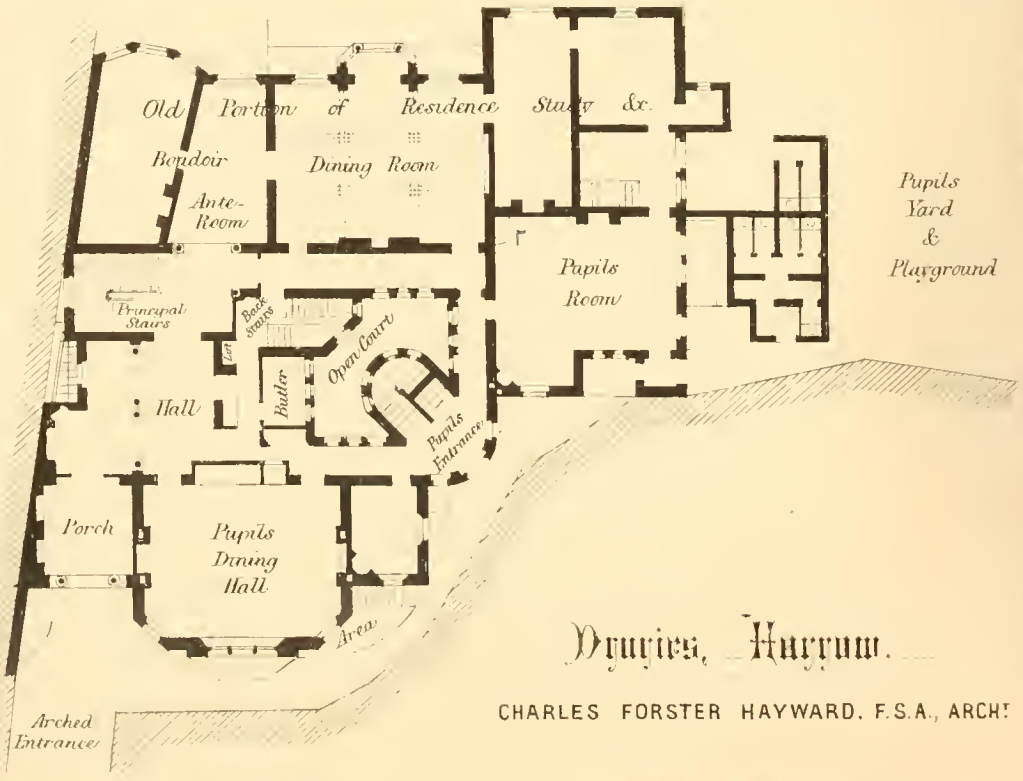
WE give below a drawing of an improved wood screw invented by Mr. Henry Titus, of New York, and patented in this country by Mr. J. C. E. Brooman, of Messrs. Robertson, Brooman, and Co., patent agents, 166, Fleet-street. The improvement consists in so forming the bevelled under side of the head of the screw that it shall act as a countersink, so that the screw may be used even in hard woods without the necessity of using a gouge or other tool to cut away around the hole, as is the present practice.



It will be seen that from each end of the nick on the head is a cut upon the under side (*a*), being of the form common to the counter-sink bit used by carpenters. This gives a ready exit for the chips and does not disfigure the edge of the head.

CHIMNEY SWEEPING.

IT is stated that our present system, in which the machine heads or brushes are formed of woody fibre, is very imperfect for thoroughly cleansing the chimneys, especially in removing the hard lumps of soot which accumulate in them. A new brush has been invented, in which the woody fibre of the brush or head is replaced by steel. The brush itself is a hollow tube of iron, on to which is loosely put four boxwood collars about half an inch thick, each having a circular groove in it, for the insertion of numerous finely-tempered steel bars, which radiate from the centre of each collar; the four being firmly bolted together by suitable brasswork; this forms an elastic brush, closely resembling those in common use, but with this essential difference, the steel bars, being very elastic, penetrate the whole and every part of the aperture of the chimney in their ascent, no matter how awkwardly built, and allow the light soot to fall through them, and do not put it on the roof; and in their descent thoroughly remove all the hard, so that there is none left in the chimney to take fire. The inventor, Mr. Thomas Welton, urges this as a manifest advantage over the usual machine, and, in addition, enumerates the following advantages:—It will promptly extinguish a fire in the chimney without damage to the brush. It will core a new chimney without climbing. It can be easily taken to pieces and repaired at a trifling expense by almost any person. It can have a ball and chain attached, so that it may be used from the roof. It fits the brass joints and canes at present in use. It will in many cases cheaply cure a smoky chimney by simply keeping it clean. It will, at once, by its use, arrest the accumulation of the hard, tarry masses of soot in kitchen chimneys, builders' workshops, and other buildings where wood, refuse of vegetables, spillings of fat, bones, cuttings of leather, and bituminous coal are burned.



Drawing Hall.

CHARLES FORSTER HAYWARD, F.S.A., ARCH^T

Whiteman & Bass Lithographers Holborn.

Llandaff · Probate · Registry. — JOHN PRICHARD ESQ., ARCHITECT.

NEW NATIONAL GALLERY.

WE are requested to state that foreign ministers, members of the two Houses of Parliament, Royal Academicians, and the competing architects will, on presentation of their cards at the entrance door by the Victoria Tower, in the New Palace at Westminster, be admitted on Monday and Tuesday, the 7th and 8th inst., between ten and four, to view the designs for the New National Gallery, in the Royal Gallery; and that the public will be admitted on Wednesday, the 9th inst., and three following days; and also on the four last days of the two succeeding weeks.

PARLIAMENTARY LEGISLATION FOR THE METROPOLIS DURING 1866.

DURING the last session of Parliament the Metropolitan Board of Works promoted several bills for improvements in London—namely, for the improvement of High-street, Kensington, and its vicinity, for the widening of Park-lane, for the formation of approaches for the northern embankment, and for the embankment of a portion of the Thames between Chelsea Hospital and Battersea Bridge. The first bill came into operation in October last; it proposes to widen High-street, Kensington, on the southern side, between Young-street and the Metropolitan Railway, and to form a new street in substitution of part of King-street. The nett cost of this improvement is estimated at about £77,000. The Board during the last session renewed their efforts to effect the desired improvement in Park-lane by submitting a plan to Parliament for widening the south end of the lane, on its western side, near Piccadilly, at a cost of about £105,000. The Chelsea Embankment Bill authorised the Metropolitan Board to extend the embankment of the Middlesex shore of the river from the termination of the present embankment to Battersea Bridge, and to form a public roadway between those points behind the embankment wall, so as to complete the thoroughfare along the river side. The length of the proposed embankment is a little more than three-quarters of a mile, and the cost is estimated at about £206,000. The nett cost of the approaches to the northern embankment were estimated to be about £454,700. The estimated nett cost of the last three proposed improvements amounted to about £765,000, and the Board proposed to Parliament to extend the period of levying the coal and wine duties to provide for such outlay. The Government intimated their consent, provided a proposition for levying an improvement rate on property in the metropolis were combined with it. To this course the Board consented, but owing to the press of business and the change of government the bills were not introduced. There was a bill making provision for the improvement of commons in the neighbourhood of the metropolis, and the protection thereof from nuisances. It was to apply to commons within the metropolitan police district, and to be carried out by a body of five unpaid commissioners. Another bill introduced by the Government related to artisans' and labourers' dwellings. This bill, however, applied to the United Kingdom. Two gas bills were considered by Parliament. The Gaslight and Coke Company's Bill proposed to raise further capital and to acquire land at Hackney Wick for the erection of works. The land proposed to be taken was adjacent to Victoria Park. This bill, though it passed the Commons, was rejected on its second reading by the House of Lords. The Imperial Gas Company's Bill also proposed to erect works in the vicinity of Victoria Park. This scheme met with a great deal of popular opposition, and was lost on a motion for the second reading. The Metropolis Sewage and Essex Reclamation Bill proposed alterations in the culverts sanctioned by the company's act of the previous session of Parliament. The bill also provided for the compulsory purchase of property. After some modification it became law. Railways bills too numerous to mention by name were introduced, and, if they all became law, and were acted on, London would soon become known as the City of Railways, as Rome is known as the City of Monuments. Happily almost all these bills were swept away with other "slaughtered innocents," and we hope that no bill that aims at cutting up London will become law without the maturest consideration.

NATURAL SYSTEMS OF ARCHITECTURE.

To the Editor of the BUILDING NEWS.

ONE of your correspondents having opened for discussion Mr. Griffith's remarks, just read before the Liverpool Architectural Society, on a "Natural System of Architecture," I may be excused for troubling you with the following considerations on the same subject.

Mr. Griffith, in his paper, a full report of which appeared in your journal, displays at least an amount of study and ingenuity only to be expected from an author who has devoted much time and labour to a very congenial view of architecture. Whether that view can be accepted as a rational one or not, I will briefly endeavour to show. Starting with a very undeniable fact, that architecture as now practised is in a very unsettled state, and is governed more by individual caprice than by any understood principles, such a system as Mr. Griffith proposes, inapplicable to practical requirements as it may be proved to be, is a step in the right direction. A more logical and scientific mode of designing than now generally adopted is an unquestionable want; and architects would do well, at least, to study the geometric beauty and admirable harmony found and preserved in the works of nature, and especially in the varied domain of plant-form. But to go further than to study the forms and structures of plants as accessorial to design—to make such study the fundamental basis of architectural arrangement and disposition, or even of architectural proportion, is to go beyond the legitimate province of nature, and is, I conceive, to confound its conditions and laws with those of art. Nature can teach us much: the crystalline forms of the mineral world, the geometrical beauty of flowers, and the structural adaptability of the stems of numerous plants are all valuable lessons; but they must not be mistaken in their purpose or meaning, or be pressed into the service of an art because certain laws of nature have given them symmetrical forms and relations of structure. The geometry of architecture is not, I take it, necessarily the geometry of nature, for we can proportion our halls and rooms in the beautiful manner described by Mr. Griffith, by taking either the equilateral triangle or the square as the primary element or key-note of our design, without having recourse to the flowers of three petals or the cruciferæ order of plants. These latter may be valuable in our floral and other decoration—natural as well as conventional, as shown in the valuable series of "Art Foliage," given in the BUILDING NEWS; and for this purpose chiefly do I conceive them applicable. While, then, we can go a great way with Mr. Griffith, admire his zeal for natural beauty, and value no less than he the three primary elements of form, with their compounds, the hexagon, octagon, and decagon, and the regular solids derivable from these; while we can thank him for his interesting work on the geometrical proportions of our churches, I do not think we can follow him so far as to believe our architecture can be so easily and entirely developed from a geometrical system as laid down by him upon certain invariable laws of nature.

These are considerations not dreamt of in these natural and harmonic systems of design. Geometrical proportion, though forming a very reliable basis for architectural design, is only one of that mass of elements generally accepted, though, as yet, unsystematised. Requirements, materials, construction, have all to be dealt with, as every practical architect knows, in various ways, and generally quite irrespective of any definite rules of design; besides these, there are other considerations belonging primarily to and having for their end the object and purpose of a structure, and which depend for their expression on the æsthetic qualities of the mind and the expressional power of form, and not upon any arbitrary principles founded upon nature or upon any system of numerical harmony, and applicable to all buildings alike. Here, indeed, is the mistake made by Mr. Griffith, Mr. Hay, and their school of thinkers; geometry and harmonic ratios are pleasant studies, but we have yet to be convinced that they constitute solely the groundwork of architecture, for if they did, it would no longer rank as a fine art in which the conceptive faculties of man were predominant.

That we shall eventually systematise our materials and construct therefrom a less erring standard of taste I firmly believe, and to this end the interesting investigations of earnest geometricians and naturalists, however untenable their hypotheses may be, are auxiliary. Awaiting such result we must still go on in the same way as we have heretofore, extending our studies as much as we please, but only adopting those features which common sense can sanction and discriminative taste appropriate to the purposes of our buildings.—I am, &c.,

G. HUSKISSON GUILLAUME.

NOTICES OF PUBLICATIONS.

A BATCH of publications wait for acknowledgment. *Facts Respecting Street Railways* (P. S. King, 34, Parliament-street). A series of official reports from the surveyors and mayors of the principal cities in the United States and Canada in favour of street railways, with a view to their adoption in this country. The evidence certainly proves that street railways work well on the other side of the Atlantic. *The Naturalists' Note Book*, No. 1 (1, Racquet-court, Fleet-street). This is a collection of extracts on natural history subjects, gathered from all sources. Some of the information is very old indeed, and, considering the very small amount of original matter which the Note Book contains, it is extravagantly dear at fourpence. Of almanacs, the number at this season of the year is unlimited. Mr. Charles Knight's *British Almanac and Companion for* 1867 is in many respects one of the very best publications of its class. The present volume is not a whit behind its predecessors in point of interest. Among the papers which form the chief feature of the *Companion*, we note as particularly good the *resumé* of architecture and public improvements for the year. The great popularity of *Letts's Diaries* has long proved their merit. The No. 9 Diary, or Bills Due Book and Almanac, is specially intended for men in business. A number of our contemporaries are in the habit of issuing once a year a useful calendar and reference-sheet—a gift to subscribers. We have received in this way the *City Press Almanac*, the *Preston Guardian Desk Almanac*, with a pictorial illustration of Liverpool Free Library; the *Hereford Journal Almanac*, bearing an engraving of the New Gloucestershire Bank in that city, and others. Messrs. Merritt and Hatcher, lithographers, Poultry, send a very pretty ornamentally printed calendar. *British America* (F. Algar, 11, Clement's-lane, Lombard-street) is a pamphlet reviewing arguments against a Union of the Provinces, with further reasons for Confederation, by the Hon. J. M'Cully, Q.C., Member of the Legislative Council of Nova Scotia. We have also received a Prospectus and Report of the Hot-air Engine Company (Limited), and Mr. Edward Stanford's (6, Charing Cross) New Map of the Metropolitan Railways and Miscellaneous Improvements, deposited at the Private Bill Office for the session 1867.

The strike among the operative masons in Glasgow continues.

DWELLINGS FOR THE POOR.

MR. A. G. R. HEINE, in a series of four short letters published for one penny, at 317, Strand, has given some additional information on the habitations of the poor in the metropolis, and also some suggestions well worthy of attention. If anyone wish to know how a large number of the poor of London are housed, let him listen to the following:—"The state of the block of buildings," says Mr. Heine, "between Cow Cross and Peter's Lane, in the East Central District, which I visited during November last, and of which I give the following report, is a specimen of the condition of the places now inhabited by the most poor and neglected:—In Broad Yard, which consists of 17 houses, inhabited by 45 families, eight persons sleeping within a yard of the only closet in the court were attacked by cholera; of these eight, but one recovered. No. 3 has not been lime-washed for five years. No. 14, top room front, contains six inhabitants, dimensions 892·6 cubic feet, overcrowded, scarcely habitable for three. No. 17, bedding in front parlour of the foulest description. In Rose Alley, where 32 families dwelt in 14 small houses, having again but one closet for the common use, Nos. 8, 9, 10, 11, and 12, are full of fever—five cases were taken in one week to St. Bartholomew's Hospital. Fryingpan Alley, containing 14 houses, with but one closet for the whole, is inhabited by 28 families. Bit Alley, having 13 houses, and, as usual, but one closet for the whole, shelters 26 families Horses and donkeys, being tied to the bed-posts at night, share the shelter of the families. Lamb-square, 4 houses, 67 inhabitants. No. 2, next a school-room, has no closet, most dangerous. The water in all these tenements is supplied through a hole in the wall for one half-hour daily. There is one house where the water has been entirely cut off for the past two years. There is only one really efficient dust-bin for the whole of the alleys." Mr. Heine is for rebuilding a great part of London, by new houses six, seven, and eight stories high, and this he would do, not for the better class of artisans, who can pay 4s., 5s., or 6s. a week rent, but for the poor, who can only afford to pay 8d., 9d., or 1s. a week. In order to do this he considers two questions, namely:—

"1. By what means can ground be economised?

"2. Which is the best and cheapest material for building?

"In answer to the first, I should reply that the principle of action should be—the dearer the ground, the higher the building. This, of course, is to be taken in a practical, common-sense view. I do not advocate building new Towers of Babel, but in stating that houses can be safely built eight stories high, I give utterance to the judgment of sound experience. Then, as such large buildings will necessarily contain a greater number of inhabitants, and consequently consumers, the ground-floors, to be devoted to shops and places of business, &c., will be of greater value, and their rent may tend to a further proportionate reduction of the rents for the uppermost tenements. Then, secondly, 20 per cent. ground can be saved by reducing the thickness of the present stone and brick walls, through their replacement by iron. And this leads to the second question—Which is the best and cheapest material for building? and I unhesitatingly answer, iron. As stone and brick replaced wood, so, it is my firm belief, will iron replace stone and brick in any reconstruction of London on a grand scale. It is scarcely necessary to point out the fact that iron is recognised as the best material for ship-building, more especially by those who pass the greater part of their lives on sea. These, subjected to every variety of climate, unhesitatingly pronounce the super-excellence of iron.

"It would be out of place here to enter minutely into all the advantages iron possesses as a building material over stone and brick; its utility has been proved by practice. The fact that, in place of thick walls of porous and absorbent material, a thin sheet of iron will answer all and every purpose, and by its use produce a saving of 20 per cent. of ground, is so great and valuable that, considering the enormous prices asked for land in the heart of London, iron recommends itself on that ground alone to the most serious consideration of all men. But houses of iron can be so constructed as to be removable to another site at a trifling expense of time and money. In case of the removal of a six-roomed house becoming necessary, the people living in it might, so to say, rise in the morning in one locality and retire to rest in the evening in another in the same house—it being actually taken down and re-erected in that time. The iron immovability of the great water-towers of the Crystal Palace, at Sydenham, during the heavy gales which visited the Surrey side of the metropolis some years since, grandly illustrated the stability of the material. Another great advantage is, that houses of iron are not liable to become infectious. The metal, being a natural tonic and disinfectant, recommends itself as the very best material for habitation. So, again, in an iron house the air is softer and milder, even in winter, and can be kept so by a reduced ratio of firing; and by painting the outer surface white or light grey, the air is cooler in summer than in ordinary houses. There are other important reasons why iron houses would materially improve the general health of the people. Moreover, iron houses are waterproof, and require little foundation. They can be secured by an admirable scientific mode of fixing them to the ground; they are in themselves lightning conductors; they will be cheaper as regards insurance; and they can be constructed so as to exactly resemble those built of brick or stone. Paint will give the external imitation, and any decoration can be so applied as to render an iron house equal in appearance to the most elegant and tasteful of modern edifices. Lastly, houses of iron can be built about 25 per cent. cheaper than houses of stone or brick; a strong, good six-roomed house can be had for £160.

"Therefore, if we can by the introduction of iron as our future material for building save, firstly, 20 per cent. in ground, and secondly, 25 per cent. in material, and adding to this another 20 per cent. profit arising from the altitude of such new buildings, and all the secondary profits and savings accruing from durability, repairs, &c., I think it needs not much calculation to arrive at this certainty, that under those conditions the rents of the highest stories could, with a fair profit, be reduced to Lord Shaftesbury's standard of 8d. per room."

It will be seen that Mr. Heine in one respect resembles Mr. Kerr. He quotes Lord Shaftesbury as an authority, but in a very different way and with a very different spirit. Lord Shaftesbury is for giving the poor house accommodation with three rooms for 2s. a week. This was characterised as "the three-room dogma." Mr. Kerr's wonderful panacea is to supply "not a room in a house, but a house in a room," or *one room with three beds in it for 3s. a week.* But his plan was so completely snuffed out at the second meeting at Conduit-street that we should hear no more of it, had the discussion of the question not been adjourned. Assuming the accuracy of Mr. Heine's statement, with regard to the capacities of iron for building purposes to be correct, his contribution "towards the solution of the problem" will produce a useful and a lasting effect.

CHAPEL-BUILDING—THE THEATRE MODEL.

AN interesting article in the *Freeman* on Chapel-building, contains the following suggestions as to the choice of style. Having passed in review the various styles of architecture, the Gothic, the Norman, the Classic, and the Eclectic, the writer says:—"In these suggestions as to choice of style we have refrained until now from considering the claims of the *theatre model.* Of course the fastidious taste that can find cold comfort in Gothic, whether pure or not, but disdains the 'Eclectic' which, like a Scotch haggis, contains a little of all sorts, and finds, with Jaques, 'good in everything,'—this fastidious taste will be shocked at once at the bare mention of the theatre as a possible teacher to the tabernacle. But as John Wesley didn't believe that the devil ought to have all the good tunes, and succeeded in consecrating some of the best to hymns that will never die, so we may fairly ask why only the player is to speak in a building in which he is perfectly heard without exerting his voice, which never flings back taunting echoes, or admits on all sides cold draughts. More than all may we ask this when we find that the theatre may be erected at as little a cost as a chapel, and that it is quite capable of adaptation to all our purposes. The advantages of the theatre can soon be enumerated. Its shape assimilates to the horse-shoe, and in the flat of the horse-shoe, of course the speaker stands. Its walls, instead of being bare and cold, are all alive with people; galleries, boxes, stalls, and pit succeeding each other from ceiling to floor. On some such model let one of our architects, untrammelled by precedent, and daring enough to strike out a new idea, design his chapel; let it be capable of containing not less than a thousand people; the platform will occupy the place of the stage, and there will be found the reading-desk, the baptistery, and the table on which the bread and wine are placed for the communion. At the end nearest the platform the ground will be only two or three feet below this level, but it must rise gradually to the back; and side galleries of no great height could probably be planned to run round from the platform until the rising floor stopped them. The space beneath, which could be gained by elevating the floor, could be adapted to a school-room—the vestries and class-room must be behind. Broad entries and passages must be provided at the two sides. The organ could either crown the far end of the chapel, or be placed behind the minister, where it would be heard to perfection. We can do no more now than roughly indicate the sort of building which we refer to, in the hope that there may be one at least amongst our many and skilful chapel architects who will work out the idea on paper, and give it a fair trial. Untrammelled by precedent, unburdened by traditional fallacies, untroubled by hoary superstitions, the art of designing a chapel to fulfil all our requirements demands only careful thought and common sense.

THE REMAINS OF ANCIENT ART.

WE can abandon with comparative indifference any small remains of faith we may have cherished in the traditional likenesses of barbaric kings or popes, but it is a very different matter when we are required to believe that no trustworthy images of the heroes, statesmen, poets, orators, and philosophers of classical antiquity have descended to us; that the busts of Alexander, Cæsar, Pompey, Hannibal, Pericles, Homer, Virgil, Horace, Demosthenes, Cicero, Plato, Socrates, and Aristotle, with a host of others which we have been wont to admire or venerate, are apocryphal. The *prima facie* argument is rather favourable to many of them. Fame is more lasting than brass, *ære perennius*, but brass, bronze, and marble are lasting enough to have endured to our time, and retain a faithful reflex of form and features, of character and mind. We know that the ancients were never tired of multiplying statues of their great men, and that the highest genius was employed on the greatest—Phidias, on Pericles, Socrates, and Alcibiades; Praxiteles, on Demosthenes; Lysippus, on Alexander and Aristotle, and so on. Alexander issued a decree reserving the right of reproducing his image to three artists—Apelles, for painting; Pyrgoteles, for stone engraving; Lysippus, for statuary in bronze. The more statues the more honour, and the number erected to the popular favourites was immense. Unluckily they were knocked down as eagerly as they had been set up when the tide turned. No sooner had the news of the battle of Pharsalia reached the capital than all Pompey's statues were thrown down and mutilated. Augustus began his reign by destroying all the busts and images of the assassins of Cæsar. At the same time he set about forming a collection of the triumphal statues of the great men who had contributed to the power of Rome; and the imperial city at that time boasted many private galleries rich with the spoils of Greece. If Mummius burnt Corinth with most of its inestimable treasures of art—that same Mummius who gave the well-known caution to the carriers of what he saved—Sylla thanked the gods for having granted him two signal favours—the friendship of Metellus Pius, and the good fortune of having taken Athens without destroying it. But, independently of the risks of removal, and the increased difficulty of identification, the accumulation of all the finest productions of art in one place, and that place the capital of the world, which ambition or sedition periodically converted into a battle-field, was one main cause of their being wholly lost, or of their descending in an unsatisfactory condition to posterity. *Furor arma ministrat:* anything or everything, sacred or profane, becomes a weapon in a deadly conflict when the blood is up. "I expect little aid from their hand," said Front de Bœuf, alluding to the stone images in his chapel, "unless we were to hurl them from the battlements on the heads of the villains. There is a huge lumbering Saint Christopher yonder, sufficient to bear a whole company to the earth." The Roman warriors thought and acted like the rude Norman baron. When Titus Flavius Sabinus, the brother of

Vespasian, was besieged in the burning capitol by the troops of Vitellius, he repaired breaches and formed barricades with the statues of the Temple of Jupiter. Fire and earthquake co-operated with civil war and barbaric conquest to complete the work of devastation; whatever was left unbroken or distinguishable lay buried under heaps of ruin; and when the superincumbent mass of rubbish was cleared away after the lapse of ages, the grand difficulty arose of appropriating the proper names to the best preserved images, and of duly assorting the arms, legs, heads, and noses of the mutilated. This difficulty was aggravated by a known practice of the ancients, which may have suggested to Sir Roger de Coverley the notion of transforming by a few touches of the brush the sign of "The Knight's Head," set up in his honour, into "The Saracen's Head!" When the Rhodians decreed the honour of a statue to a general, he was desired to choose which he liked amongst the existing votive statues, and the dedication was altered by the insertion of his name. The prevalence and antiquity of this method of substitution are proved by Plato's proposed law for compelling the statuary to form each statue out of a single block; and instances abound of the change of heads from vanity, caprice, or accident. A striking passage in Statius charges Cæsar with the incredible folly of cutting off the head of an equestrian statue of Alexander by Lysippus, and replacing it by a gilded effigy of himself. Tacitus states that Tiberius decapitated a statue of Augustus to make room for his own head; and the gods of Greece, including the Jupiter Olympus of Phidias, were similarly treated by Caligula with a view to his own deification. There is a statue of Pompey at Rome reputed to be the very one at whose base, "which all the time ran blood, great Cæsar fell." But, objects M. Feuillet de Conches, we must have recourse to some anecdote, suspicious as ingenious, to be persuaded that the head, very badly restored, is really the original head. Rome is full of antiquity-mongers, who will supply any number of consuls' or emperors' heads and noses to order. Napoleon was a great admirer of Hannibal, and one day during a visit to the Louvre, he stopped before the bust which bears the name of his hero, and inquired of M. Visconti, the distinguished antiquary, whether it was authentic. "It is possible," was the reply; "the Romans erected his statue in three public places of a city within the bounds of which, alone among the enemies of Rome, he had cast a javelin. Caracalla, who ranked him among the great captains, also raised several statues to him; but all this is much posterior to Hannibal." "This effigy," rejoined Napoleon, "has nothing African about it. Besides, Hannibal was blind of one eye, and this is not. Are there any medals of the time confirmatory of this bust?" "There are medals, also long posterior." Then it has been done *apres coup*. I do not believe in it." Although the inference from the eye may not be deemed conclusive by connoisseurs, that drawn from the want of contemporary medals carries weight. When medals and gems fail, the deficiency is not unfrequently supplied by inscriptions or books. The fine bust of Cicero at the Vatican is authenticated by a passage in Livy as well as by medals. There are no well-authenticated busts, medals, or gems of Virgil or Horace; although the biographers of Virgil do not hesitate to describe him as tall and dark, with long, flowing hair, whilst the personal peculiarities of Horace may be collected from his writings. The best bust of Plato is apocryphal, which is probably the reason why Mr. Grote's last great work, "Plato and the other Companions of Socrates," appears without a frontispiece.—*The Edinburgh Review.*

FIRE AT THE CRYSTAL PALACE.

DESTRUCTION OF MODELS.

AMONG the many works of art consumed by the late fire at the Crystal Palace, were the extensive and valuable collections of naval and engineering models placed in the galleries of the tropical department. Conspicuous among these was the model of the great suspension bridge, half a mile in length, over the River Dnieper, at Kieff, in Russia, erected about fifteen years ago by Mr. Vigneles, F.R.S., for the then emperor, at a cost of nearly half a million sterling. This model was first shown in London at the Exhibition of 1851, and was subsequently placed, on loan, in the Crystal Palace, where it had remained many years. It was considered a remarkable work of mechanical skill, and was constructed at an expense of several thousand pounds. The loss to Mr. Vigneles is irreparable, though a duplicate model remains in the engineering gallery at St. Petersburg, placed there by the Emperor Nicholas I., to whom it had been presented, with the imperial permission. Attached to the model was a printed descriptive account, from which the above particulars are extracted, by way of putting on record some recollection of this beautiful and singular work, destroyed, with so many other most precious and interesting objects of nature and of science, exhibited in the Crystal Palace.

PERSONAL.

MR. THORNEYCROFT has received a commission for an equestrian statue of her Majesty the Queen, as companion to that of the late Prince Consort, at Liverpool. The cost is to be £5,000.

Mr. Leather, C.E., the Contractor of Public Works, to whom the Admiralty and the War Department consigned the execution of the Portland breakwater and forts, and who is now engaged, under a similar contract, in the construction of the foundations for the marine forts at Spithead, has joined Mr. George Smith, of Pimlico, in his contract with the Admiralty for the execution of the works for the extension of Portsmouth Dockyard, which, according to the terms of the agreement with the Admiralty, will occupy fully four years, and involve a first expenditure of upwards of a million and a half sterling.

Mr. Thomas Charles Sorby has been appointed to the surveyorship of police buildings in the metropolitan district, and of county courts, in room of the late Mr. Charles Reeves, the architect. Mr. Reeves, who died on the 6th ult., in conjunction with his partner, Mr. Butcher, designed many of the county courts in London, and the chief towns in England.

WAGES AND SHORT TIME

The carpenters and joiners of Cardiff have given notice of a rise of wages of 3s. per week, to take effect from March next.

By the stoppage of a shipbuilder in Greenock, 2,000 men have been thrown idle. There are now 2,500 men unemployed in the town.

At ten o'clock on Monday morning, all the non-society joiners, with the exception of a small number, including apprentices, left their employment on the "Great Eastern," owing to a difference with their employers about wages.

IMPORTATION OF JOINERS' WORK.—An importation of joiners' work has lately been made into this country from Stockholm, consisting of panelled doors, jamb-linings, architraves and skirtings, machine-made and well put together, of excellent workmanship and of first-rate material. They are made to English sizes, and have been offered for sale at prices considerably below those which are given for English work and material of the same quality. It is understood that the machines which have been employed in making them are of English manufacture, imported into Sweden.

MALVERN.—The masons have given notice for reduction of the hours of labour to 55½ hours per week from the 1st of May next. The reduction is proposed to be made by commencing work at 7 a.m. on Monday, and by leaving off at 1 p.m. on Saturday.

THE BELGIAN IRON DISTRICTS.—The wages earned in the Belgian iron districts are:—Furnace-keepers, 2s. 1d. to 2s. 11d. per day; fillers, 1s. 8d. to 2s. 1d.; box fillers, 1s. 4d. to 1s. 8d.; labourers, 1s. 5d. to 1s. 8d. In the foundries, moulders get 2s. to 2s. 11d.; dressers, 2s. to 2s. 6d.; labourers, 1s. 5d. to 2s. 1d. In the forges, puddlers get 4s. 2d. to 5s.; under hands, 2s. 3d. to 3s. 1d.; rollers, 4s. 2d. to 5s. 10d.; helpers, 3s. 4d. to 4s. 2d.; shearers, 1s. 10d. to 2s. 6d.; labourers, 1s. 5d. to 2s. 1d.

WATER SUPPLY AND SANITARY MATTERS.

The Philadelphians are about to erect a mammoth reservoir, which it is proposed shall furnish the city with 8,000,000 gallons per day. It seems that during the past summer, a majority of cholera cases occurred in the north-western part of the city, where the water is very poor.

HUNTLY.—The ceremony of cutting the first turf in connection with the construction of the Huntly Waterworks took place last week. For several years the want of a sufficient supply of water has been much felt at Huntly, and several schemes have from time to time been suggested. Ultimately the scheme proposed by Mr. Robert Anderson, C.E., Aberdeen, was the one selected.

SUPPLY OF WATER TO LARGE TOWNS.—The Duke of Richmond, Sir John Thwaites, Colonel Henry Drury Harness, R.E., Alderman Phillips, Mr. Thomas Elliot Harrison, and Mr. Joseph Prestwich, have been appointed commissioners for the purpose of ascertaining what supply of unpolluted and wholesome water can be obtained by collecting and storing water in the high grounds of England and Wales, either by the aid of natural lakes or artificial reservoirs, at a sufficient elevation for the supply of the large towns, and to report, firstly, which of such sources are best suited for the supply of the metropolis and its suburbs. Secondly, how the supply from the remaining sources may be most beneficially distributed among the principal towns.

LEGAL INTELLIGENCE.

CAUTION TO BUILDERS.—Abraham Harris, a brickmaker at Reading, was summoned for having, on the 12th inst., in Upper Crown-street, caused a drain to communicate with the public drain, contrary to the Local Government Act. Defendant said he was out in the country, and knew nothing of the matter till he received the summons.—Mr. Woodman said that he received an application from Mr. Brown, on behalf of Mr. Harris, of Southampton-street, to allow a water and sink drain to communicate with the sewer. Permission was given, and on examination shortly afterwards the drain from the watercloset was also connected, and the closet had been used.—Mr. Carter, assistant surveyor, gave similar testimony.—Defendant said: The connection has been cut off, and the complainants asked me this morning to admit the charge, but I will never admit what I never did.—Mr. Rogers said that the magistrates had no discretion in fixing the fine. The amount, according to the act, was £5, costs 12s.

TO ARCHITECTS.—At the Portsmouth County-court a few days ago, the case of Rawlinson and Son *v.* Whenham was heard. This was an action to recover for professional services alleged to have been rendered by the plaintiffs, architects and surveyors. One point of interest only arose, and that had reference to an item for preparing an "agreement." His Honour remarked that he questioned very much whether an architect could prepare an agreement. The senior plaintiff said it was customary. He was frequently in the habit of preparing agreements.—His Honour: If that be so, you may as well say that any person can prepare a deed of conveyance. The plaintiffs were nonsuited.

THE LAW OF DISTRAINT FOR RENT.—A correspondent writes:—Permit me, through the medium of your columns, to place before your readers a point connected with the law of distraint for rent, which I think the public in general are ignorant of. On the 10th of last September a broker levied for rent, amounting to £32 10s., at some premises in Millbank-street, where property of mine (of trifling value) was. The goods were condemned on the 17th, and on the same day I gave the broker notice that a particular piece of property (describing it) was mine, and not the tenant's. The notice was disregarded, and the sale by auction fixed for the 25th, on the premises. I attended it, and when the auctioneer arrived at the lot which represented my property, I called upon him to ascertain if he had not sold, of the tenant's goods, for a sufficient amount to satisfy the rent and expenses. He cast his book, and told me he had not. My lot was then put up, and I had to buy back and pay for my own property. The next day I requested the broker to furnish me with an account of the sale, and how the proceeds were applied. He repudiated me *in toto*, and would give me no information whatever. Finding I could get no redress, and believing, as I still do, that more than sufficient was realised from the tenant's goods to satisfy everything, I took out a summons in the Westminster County-court against the broker for the amount I gave for my own property. The summons was heard last Thursday, and I was nonsuited by the judge on the ground that at law I had no claim against the broker whatever, that he was not bound to show me any account or give me any reason why he had sold my property to pay

another man's rent, and that my only remedy was against the tenant. Now, sir, if this is the law, look in what a position a lodger may be, and I have no doubt often is, placed; his goods may be seized and sold to pay his landlord's rent by an arrangement (at the cost of a guinea or two) made between him and the broker, although there may be ample property belonging to the tenant of the house to pay the rent without touching the lodger's goods at all; and the only remedy the unfortunate lodger has is to bring an action at law against his landlord, when if he gains a verdict it is probably obtained against an insolvent, whose goods are protected from execution by a colourable bill of sale, whilst the broker who committed this act of villany escapes scot free.

NOTICE.

*** The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at One Shilling for the first Twenty-four Words.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and to the ordinary business of the paper should be addressed to the EDITOR, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursdays.

RECEIVED.—S. R.—R. P.—R. S. J. B.—J. H.—P. and K.—M. R. and Co.—W. S. R.—W. T.—E. B. and J.—T. and A.—J. S.—H. C.—C. F. H.—C. B.—W. S.—R. W. H.—G. H. P.—E. W. L.—C. L. E.—T. C. S.—J. H.—B. and M. W.—J. A.—H. G.—M. and Co.—H. F.—C. C. and Co.

E. B., Norwich, asks for additional information on "Deodorisation by Dry Earth." We have written to our "special correspondent," who reported the Leamington Congress, for the same.

W. H. T., J. H., &c.—There are several questions and answers which must remain over till next week.

Correspondence.

MODERN ARCHITECTURE.

To the Editor of the BUILDING NEWS.

SIR,—In proportion as an architect is a great artist he will produce good work in any style. It is not style that makes the architect either great or small. The architecture of Greece was remarkable for its exquisitely refined sense of form and proportion. After the decline of the Roman Empire, however, all the countries of Western Europe commenced to develope a new architecture; it started upon the Roman, but gradually developed a new character, the different branches of the Teutonic and Celtic races giving to their own works their respective national traits, the various developments in Europe being also much affected by the different climates in which they were each completed. This architecture attained its perfection of constructive form in the thirteenth century; up to that date it had gone on improving in method of construction. All nationalities when young produce good construction. The savage of the present day constructs well, because he constructs upon first principles. Construction having attained its full development in the thirteenth century, the architectural mind turned towards refinement and delicacy of form; it saw very well that, although the thirteenth century had produced perfect constructive form, that form was often rude; consequently, in the fourteenth and fifteenth centuries we find the forms of architecture and general objects assuming much greater beauty and delicacy of outline, with a marked aspect of more complete civilisation. All ornamentation was more elaborate, as well as more refined, in form. The gradual advance of civilisation, however, had the effect of leading the Italian mind back to the old Classic authors, and art was also conducted into the same channels until in Italy it became wholly based on the work of ancient Greece and Rome. The marvellous intellect of such men as Michael Angelo, their complete sense of the beauties of ancient art, the admirable way in which they adapted it to their own times, the fact of its being Roman, all tended to make the movement European as well as Italian, and we know how in this country in the times of Elizabeth the intellect, literary and artistic, was influenced by Italy. In England there were no models left; this, added to our barbarian origin, tended to keep the national architecture alive. The Elizabethan architects only adopted a certain amount of classicism, and which, in many instances, gave great charm to their decorative forms. Our national architecture was all this time developing itself in the direction of domestic building; the mansions of the period were admirable in every important principle. Still later, at the time of Queen Anne, although in all great buildings the Classic style of Italy had been introduced, the brick houses retained their national character, the high roof remained, but, as a more convenient form of glazing in sash frames had been introduced, the windows assumed the well-known segmental form of the period.

Although the revived style of Italy was well represented in this country at a somewhat later period, and although our architects knew well its distinctive merits, the style can hardly be said to suit our climate. Still, we could not afford to be without the admirable examples we have of it. They are examples of a development of beauty that all true artists must admire. We should be thankful for beauty of any kind. The Romans must have built beautiful buildings, and Inigo Jones built beautiful houses, although not perfectly in accordance with our climate; still, the beautiful is so attractive that we easily slip over this little difficulty. Any real artist would be very glad to see a Classic church built now, if it were only good architecture of its kind. In like manner, we should be equally glad to see a building in the style of the thirteenth century of Perigord, if it were only good, and not a mere copy of the old. And this brings one to consider the position of modern architecture. It is not so much the question of style, but the unfortunate fact remains that modern architecture is without invention and without beauty. It would matter little about style if there were only merit and beauty of any kind. But yet the principle upon which modern architecture is to proceed is one of great importance, and one which architects seem little likely to be agreed about. You may go back to the thirteenth century, or to the Greeks, but your architecture will remain a copy, and a piece of antiquarianism. You may be eclectic, but you will only copy the forms of various places and times. You may bring your architecture from the South of France, or from Hindustan, but that will not make it English; it will only be a copy of French or Indian architecture, it will belong to a different race and a different climate. Considering the admitted want of artistic invention in our times when compared with the great ages of art, a little modesty would be wise, if we could only learn to study old art, not to copy its forms, but to acquire the spirit of beauty running through it, remembering that each country has developed a form of beauty and a practical character which answer fully to its wants and to its national feeling. An Englishman of the nineteenth century will never feel as a Greek, or a man of Perigord of the thirteenth century. It is usely to try, and can be of no advantage; the age is gone, and we are in another. If you can learn the spirit of construction of the thirteenth century without copying its forms, you will learn something worth knowing; and there is as much to be learnt in every other period of art. Each has its distinct merits; only in the present time we unfortunately do not learn the spirit, but only make bad copies of the forms.

To a young architect of the present day one can only say study, study everywhere—in the wilds of Siberia, if so inclined; but only, my friend, spare us the eclecticism when you come home. Unfortunately, travelling does not make genius. Florence and Rome were sufficient for Michael Angelo. It may seem odd to a young architect of 1866 that it is possible for a man of genius to learn all he requires of his art in his own country, that it is possible to develope an architecture suited to his time out of that which his country affords him for study. If he could only forget centuries and learn common sense, if he could only learn the spirit and forget the date, he might also learn that, with common sense, there particular form. But one sees that he has no notion fore good construction, as a basis, he may easily continue in the spirit and traditions of his country without being slavishly tied down to one of the spirit except by copying its forms. Let him consider how the brick architecture of Queen Anne's time was distinctly English in character, just as the fourteenth century was; the same spirit pervaded both, yet they are widely different in form. Let us pray for modesty and simplicity in architecture.—I am, &c.,

A. B. C.

THE GENERAL CREDIT COMPANY.

SIR,—As, in a former number of the BUILDING NEWS, you were pleased to review the Building of the General Credit Company, at the corner of Lothbury, and alluded to the so-called clever treatment of the waterpipes, from the roof at the angle of the building in question, and, further, as in your number of last week the allusion is repeated, permit me to state that the spiral-shafted angles conceal nothing whatever; the down pipes are carried down in the interior of the premises to the drains in chases for the purpose. The decoration in question is simply a decoration, and one very common in domestic buildings in North Italy. Had I wished to place the down pipes externally I should have shown them in their proper material, viz., lead, and not at the angle of the buildings, as in this case. I would also remark that the bas-relief does not represent Commerce. The female figure represents Enterprise assisting with capital the development of industrial works generally, such as mining, steam navigation, agricultural works, &c. The bas-relief was modelled from my suggestions and under my supervision most excellently by Mr. Redfern.—I am, &c., THE ARCHITECT.

20, Cockspur-street, Pall Mall, S.W.

Intercommunication.

QUESTIONS.

FIRE DAMP.

[170.]—I shall feel obliged if you or any of your readers interested in the prevention of colliery accidents would favour me, through the medium of your valuable journal, with a description of Ansell's indicator for the purpose of ascertaining the presence of fire-damp in mines; and whether any inquiry be made at the forthcoming session by a commission to be instituted to investigate the real advantages of the invention, in order that its adoption in mines be made compulsory. S. M.

BIRKENHEAD PUBLIC BATHS' COMPETITION.

[171.]—Can you or any of your readers inform the competitors what has been done in this matter? The designs were sent in on September 1 last, and I think the committee should either return the drawings, &c., or give some information, seeing that they have had four months for deliberation. A COMPETITOR.

DURABILITY OF ZINC.

[172.]—Will you or any of your numerous readers inform me, through your paper, of the durability of zinc for roofs, its cost per square, timber and all included, for spans of about 45ft.? Does the steam arising from farmyards injure the metal? W. SANDS.

TANKS FOR CONSERVATORIES.

[173.]—I take the liberty of requesting some of the subscribers of your journal to kindly answer the following question for me. I am about to put up a tank to supply a conservatory, and I want it to hold about 7,000 gallons. As the supports are already built conveniently, I wish to make the tank to suit them. It must not be longer than 13ft. 6in. nor wider than 7ft. 6in. I want to know what depth it ought to be to hold the above quantity of water. M. G.

THE PITCH AND SPAN OF ROOFS.

[174.]—The late gale having nearly stripped the roof of a house which was a very high one, I am engaged to lower the pitch of the roof to about 2 to 1. The span of the roof is 24ft. 6in., and, as the owner does not intend to use the old rafters, which, indeed, are not fit to be used, I have to provide new ones, and also new slates instead of the old tiles. Would you be so good as to let me know what scantlings my rafters ought to be for a kingpost truss. The slates will weigh about 5½ cwt. per square, and I want to put the principals about 10ft. apart. A. C.

WATER THROUGH PIPES.

[175.]—Would any of your readers be good enough to inform me how to make the following calculation:—I have put a 9in. pipe into a stream to bring water close to my house. The depth of water over the pipe is 2ft. and 2ft. 6in., according to circumstances. How many gallons may I expect to get per hour for the smallest depth of 2ft.? HOUSEKEEPER.

FOUNDATION FOR A CRANE.

[176.]—Could you let me know in your next number what sort of a foundation I ought to put in for a 3-ton crane? The ground is chalk at a depth of 17ft. under the surface, and gravel at a depth of 8ft. under the surface, so that I have 9ft. of gravel before coming to the chalk. Can I build upon the gravel with safety? WHARF.

THE BRITISH MUSEUM.

[177.]—I beg to ask, through the medium of your valuable journal, what are the necessary qualifications for a young person to obtain admission to the library or reading room of the British Museum, and whether books can be got out or not? STUDENT.

SIDE DRAINS.

[178.]—Would you let me ask in your paper what is the usual depth to put in side drains along a road, under the surface, and how to prevent the edges of open drains in marshy ground from falling in? ROAD METALLER.

[The side drains may be put in about 3ft. below the surface of the road. The best plan to prevent the edges of open drains from breaking and falling into and choking up the channel, is to give the slopes a very flat batter and dress them well with the back of the spade or shovel used in cutting them.]

THE RESISTANCE OF ROADS.

[179.]—I beg to trespass on your space a little with your permission. What is the resistance in pounds per ton, neglecting gravity, on a macadamised road, a paved road, a railroad, and on a gravel road rather soft?

QUESTIONER.

FRENCH METRES AND ENGLISH FEET.

[180.]—Could any of your numerous contributors give me a short rule for converting French metres into English feet and decimals? I should be much obliged to anyone giving me the information.

METRE.

THE INSTITUTE OF ARCHITECTS.—CONDITIONS OF MEMBERSHIP.

[181.]—Will you kindly inform me how I can become a member of the Institute of British Architects? I have had about eighteen years' good experience as draftsman, clerk of works, and as an architect and surveyor for a period of about seven years out of that time; and carried out about £30,000 to £40,000 worth of first-rate work on my own account, and still enjoy a good practice. But I should like to join a set of men who, like myself, do not work under £5 per cent., &c. I must add that I am not acquainted with any member of the Institute. Is it a costly and a difficult matter?

OLD YEAR.

[We fear that if "Old Year" combines the business of clerk of works with the profession of an architect he would not be eligible for membership of the Institute. He had better address a letter to the assistant secretary of that society, Mr. Charles L. Eastlake, at 9, Conduit-street, Hanover-square, when, no doubt, he will be furnished with the particulars which he requires. The amount of subscription for members depends on whether they enter as "associates" or "fellows," and whether they practise in town or country. In any case it is very moderate.]

REPLIES.

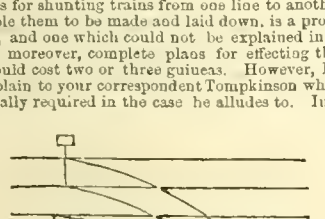
MEASURING EXCAVATIONS.

[167.]—In answer to your correspondent "Excavator," I beg to send the following answers:—1, 565 cubic yards 7½ cubic feet; 2, 910 cubic yards 1½ cubic feet; 3, 940 cubic yards 12 cubic feet; 4, 279½ cubic yards. I am not fully sure about the last two being very correct, as the "sloping of the sides" is not very explicit; but I shall be happy to furnish him with anything further if he will be kind enough to more fully explain his last two questions.

G. MOSS.

SHUNTING OF RAILWAY LINES.

[169.]—To give details of the points, crossings, and switches for shunting trains from one line to another, so as to enable them to be made and laid down, is a professional matter, and one which could not be explained in your columns; moreover, complete plans for effecting the operation would cost two or three guineas. However, I think I can explain to your correspondent Tompkinson what would be actually required in the case he alludes to. In the cut



is shown what is wanted, viz., six crossings and three switch boxes and levers. In reality seven crossings would be required, as it would be impossible to bring the lines in, as represented in the cut, the curves being much too sharp. Any good country smith can make the V for the crossings, cut the rails longitudinally to form the points, and make the rod or lever, which is worked by a counter weight, and the switch box. I have had many so made; although, if they are intended to be permanent, I much prefer cast-iron crossings, as they are heavier, quite as cheap, and keep the waggons on the rails infinitely better than the others. I have had some of these made from designs of my own, which have answered very successfully on small mineral lines. Every engineer knows that it is nearly always at the crossings where waggons and often the engine gets off, and the cause may be invariably traced to the crossings being either of an inferior description or not properly laid down with respect to bedding, fastening, gauge, or curve.

L. P. D.

Building Intelligence.

CHURCHES AND CHAPELS.

The district church of St. Simon, Southsea, was opened last week. It has been erected from the designs of Mr. Thomas Hellyer, architect, Ryde, by Mr. H. Laurence, of Southsea. The cost of the church was about £4,000.

A new church, to cost £10,000, is about to be erected by Mrs. Reade, of West Derby, at Liverpool.

The foundation stone of a wayside chapel of ease has been laid at Swimbridge, Devon. The building, which is to be dedicated to St. Thomas, is from designs by Messrs. Gould and Son, of Barnstaple. It will consist of a nave, 45ft. by 18ft., chancel, 21ft. by 18ft., and vestry, and will be in the First Pointed style. The contractor is Mr. John Cock, of Southmolton. The total cost of the chapel will be about £900.

A new Wesleyan Chapel in Whitefield-road, Liverpool, has just been opened. The building, erected from designs by Mr. C. O. Ellison, is in the Gothic style, and will seat 800 persons. The contractors are Messrs. Nicholson and Eyre.

AUGHTON.—A new church, costing about £5,000, is to be built in this parish, on a site given by Colonel Tempest, of Tong Hall, Yorkshire.

ST. PAUL'S CHURCH, BEDFORD.—This so-called "Metropolitan" of this small county is undergoing considerable reparation, and is again being re-established as a cruciform church. Late in Perpendicular times this edifice must have been remodelled, if not almost rebuilt, though there are considerable remains of Early English in the nave, and some Late Decorated in the chancel. The ground plan, however, was reduced to a parallelogram, measuring 45ft. by about 165ft., excepting the porches to nave and the vestry attached to the north side of the chancel. The nave, about half the whole length, has two noble perpendicular windows, of five lights each, for its west front (end). It is considered interesting, if not singular, in having its aisle, on the south, exactly of the same dimensions as itself in width, length, and height, so that it is sometimes described as a double nave, with its arcade of columns and arches in the midst. There is a good oak roof, renewed about twenty years ago. The new works at present comprise the steeple and its abutting transept north and south. The steeple will be in every way superior to the old one, though the general outline of it has been preserved. The chief stone was laid last May, as noticed in the BUILDING NEWS at the time. It stands upon four fine Early English piers of Portland stone, the foundation being laid on the solid rock, much below that of the old one. It has now reached a height of 70ft., and the spire, when finished, by Midsummer next, will make the whole about 170ft. from the floor. There is a clock with four dials; also a peal of eight bells, tenor 28 cwt. The transept, as rebuilt, connects in one mass that which before resembled two small churches joined together. Mr. Palgrave, of Westminster Chambers, is the architect; Myers and Son, the contractors, for nearly £5,000. There is a new north aisle all through in the contemplated additions, and is much needed; but the committee will have to appeal again to the liberal and wealthy of the neighbourhood for that help which the parish itself cannot afford.

BUILDINGS.

It has been resolved to erect another hospital at Liverpool at a cost of £40,000. Of that sum, upwards of £24,000 has been subscribed.

A new Independent College is to be erected at Nottingham, and a large piece of ground has just been purchased of the Nottingham Corporation for that purpose.

DARWEN.—On Saturday last Mr. Thomas Hughes, M.P., laid the foundation stone of a new Co-operative Store here. Mr. James Maxwell, of Bury, is the architect. The building will be built of Darwen stone, by Darwen contractors, viz., Mr. John Knowles, mason's work; Mr. William Kay, joiner's work; Mr. John Watson, plasterer; and Mr. W. Sutcliffe, plumber. The cost of the new store will be from £6,000 to £7,000.

HEREFORD. — The new Gloucestershire Bank, erected in this city, which is now near its completion, is located at the junction of High-street and Broad-street. The style of architecture is Italian, and the building is constructed of Bath stone, with occasional courses of red Forest stone. The carving is by Forsyth, the sculptor. Messrs. Medland, Maberly, and Medland, of London and Gloucester, are the architects, from whose design the building has been erected by Messrs. King and Godwin, of Gloucester.

NEW UNIVERSITY COLLEGE, GLASGOW.—By direction of the Building Committee of the New University College, of which Mr. G. G Scott, R.A., is the architect, plans were submitted by several engineers for the ventilation and warming of the building. After due consideration, those of Mr. W. W. Phipson, C.E., London, were accepted, as combining all the requirements of this important application. The cost of the building will be about £200,000. Mr. Thompson, of Peterborough, is the contractor.

WALSALL.—THE NEW GUILDHALL.—The opening of this building, which is all but finished, was celebrated by a public banquet on New Year's Day, his Worship the Mayor presiding. The hall, which is the third structure of the kind which has stood on the same site, is in the Italian style. The building has been put up by Mr. Charles Burkett, of Wolverhampton, the amount of whose contract price was £5,083. The erection has been superintended by the architect, Mr. G. B. Nichols, of West Bromwich and London, and will be completed within that gentleman's estimate. The fittings have been supplied chiefly by Messrs. Lambert Brothers, of Walsall, and Messrs. Brown, Westhead, and Co., of Hanley. Mr. Barton acted as clerk of the works.

STAINED GLASS.

SELBY.—Several stained glass windows have been placed in the venerable Abbey Church. One window, presented by Mrs. John Webster (late widow of Captain Frank, mariner), and executed by Messrs. Wailes, of Newcastle, contains representations of Christ stilling the tempest, Peter walking on the sea, and the draught of many fishes, and is placed on the north side of the choir, to the memory of Captain Frank and his two children. Another is given by Mr. John Underwood, of Selby, and designed by himself in ornamental cathedral quarry glass, with the Selby coat of arms executed in stained glass in the centre. This is placed in the west front. The churchwardens have also placed several additional windows in the church this Christmas.

STATUES, MEMORIALS, &c.

A bust of Lord Macaulay has, with the permission of the Dean and Chapter, been placed in Westminster Abbey by his sister, Lady Trevelyan. It rests upon a handsome bracket, designed by Mr. Scott, in the immediate neighbourhood of the grave, and of Addison's statue in Poets' Corner.

THE POET MIEKIEWICZ.—A monument has just been erected to the poet Adam Miekiewicz, in the cemetery of Montmorency, which the Polish exiles have selected as their Campo Santa. It is the work of M. Préault, a well-known French sculptor. A bronze medallion, enchased in a small stone pyramid, represents the poet dying, the expression of features in great repose, and the likeness perfect.

THE FREEDMEN'S MONUMENT TO ABRAHAM LINCOLN.—The model of this monument was successfully unpacked and set up for exhibition in the art gallery of the Boston Museum on the 11th ult. It recently arrived from Italy, and is the last work and the masterpiece of Harriet Hosmer. She regards it as her greatest achievement, and confesses that she cannot improve it. Reserving the right to modify or alter a few minor details, she offers it as her highest conception of what a monument to the martyred President ought to be. The model will be exhibited in Boston, New York, and Washington. Then an effort will be made to raise the money necessary to complete it in the massive proportions which the artist contemplates. It will be 60ft. in height; the base will be 60ft. square. The architectural work will be of New England granite; the figures, the ornaments, and the bas-reliefs, of bronze. It will cost a quarter of a million of dollars.

General Items.

Her Majesty has signified her intention to publicly open the Albert Orphan Asylum, at Collingwood-court, Bagshot, in June next, and at the same time to lay the foundation stone of a dining-hall and chapel.

The Mersey Dock Board have abolished the restriction hitherto existing of not permitting their chief engineers to take articled pupils. The subject was discussed at a meeting of the Board last week, when a letter was read from the Engineer-in-Chief of the London and North-Western Railway, stating that all engineers-in-chief enjoyed the privilege of taking articled pupils, and nowhere was there a better school for such pupils than the office of Mr. Lyster, the present engineer to the Board.

FALL OF A LIGHTHOUSE.—The old lighthouse at Cromer, which had for so many years been a conspicuous object on the edge of the lofty hill, has at last succumbed to the voracious assaults of the sea. It toppled down the other day, and was immediately buried by a great fall from the cliff which followed it.

SEPULCHRAL TUMULI IN WESTMORELAND.—During the last few weeks the Rev. W. Greenwell, of Durham, accompanied by the Rev. James Simp-

son, vicar of Kirkby Stephen; the Rev. Charles M. Preston, vicar of Warcop; the Rev. T. Tasker, of Carlisle; the Rev. Charles Pixell, of Skirwith; and Mr. R. Hewitson, of Ellergill, have made investigations in five sepulchral tumuli, situate in the mountainous country in the vicinity of Appleby, Brough, and Kirkby Stephen. The researches have been of the most interesting description, the excavations yielding the remains of the ancient Britons, both burnt and unburnt, and in two cases showing the practice of the Anglo-Saxon adoption of older barrows for their burials, one of which was discovered as recorded just 100 years ago, and another important illustration recently, in a barrow slightly to the south of Kirkby Stephen, a British burial having been disturbed to insert the rough log coffin and body of, as shown by the funeral accompaniments, an Anglo-Saxon, of which the details were of no value.

"PAVED WITH GOLD."—In a letter to the *Times*, Mr. J. J. Mechi says:—"The great City of Loudon is comprised in an area of only 632 acres and a few poles—in fact, the size of a farm which in the country could be had for a rent of £600 to £1000 per annum. My country friends will be astonished when I tell them that the last cheap thing I heard of as purchased land in Lombard-street was over two millions sterling per acre, or nearly £70 per square foot of area. A friend of mine thought himself lucky in obtaining a site a few years ago at only £1,660,000 per acre. At this rate the good old City is getting really 'paved with gold.' What an amount of generalship is effected by the people themselves when some 600,000 persons can be got safely into and out of this limited area each twenty-four hours! Our brave departed Duke would have been puzzled to have accomplished such a wonder."

FORD'S THEATRE, WASHINGTON.—The theatre in which President Lincoln was assassinated, and which was purchased by the Government, is being rapidly filled with interesting relics of the war. The archives of the Southern Confederacy are deposited there already. There are to be seen there all the latest inventions of artificial limbs, and also in jars nearly all portions of the human body attacked by diseases or wounds incidental to war.

THE VICTORIA BUILDING, INVESTMENT, AND FREEHOLD LAND SOCIETY, BIRMINGHAM.—The eighteenth annual meeting of this society was held at the Public Office, Moor-street, last week. The Chairman (Mr. Timothy Jones) said that notwithstanding the very trying times of the past year a considerable business had been transacted; and, although it might be truly said that less building had been erected in the town during the year than usual, still there was a greater demand for suitable dwellings for the industrious classes. The report was then read, showing the receipts from all sources to be £24,631 18s. 1d., and the disbursements £24,281 10s. 6d.; this with a balance of £350 7s. 7d. in the hands of the secretary, making the total sum of £24,631 18s. 1d. The report referred to the high rate of bank interest during the year, and to the state of the commercial world, and expressed a strong hope that the coming year would be more successful to all. The total receipts of the society had amounted to upwards of £313,000.

MEETINGS FOR THE WEEK.

TUES.—Royal Institution.—"On the Chemistry of Gases" (Juvenile Lectures), by Professor Frankland, 3.

Institution of Civil Engineers.—Discussion on Mr. Preece's paper, "Intercommunication in Trains in Motion," 8.

WED.—Geological Society.—The following papers will be read:—1, "On the Age of the Lower Brickearths of the Thames Valley," by Mr. W. Boyd Dawkins. 2, "On the Occurrence of Consolidated Blocks in the Drift of Suffolk," by Mr. George Maw. 3, "On the Jurassic Fauna and Flora of South Africa," by Mr. Ralph Tate, 8.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

1435 P. J. MESSENT. *Improvements in apparatus for mixing concrete and other materials.* Dated May 21, 1866

The novelty in this mixer consists in the configuration, disposition, and operation of the vessel in which the materials for making the concrete or mortar or other materials to be mixed are enclosed. The mixing is accomplished by the revolution of the said vessel on a spindle, the rotating motion being communicated by hand, horse, steam, or any other motive power. The vessel may be made of cast or wrought iron, of timber, or any suitable material, with six, ten, or a larger number of sides, so arranged in angular position to each other that, in turning the mixer the materials are turned over from side to side, as well as in the direction of the rotation of the vessel. It may have one or two doors or openings, which are securely closed during the mixing and opened for receiving and discharging the materials to be mixed, and the concrete or mortar or other result of the materials mixed. The vessel should not be more than half filled with the materials to be mixed when the door being closed and secured by the fastenings concrete will be thoroughly mixed by from eight to fifteen revolutions of the vessel, which, however, should not be at a greater rate than fifteen revolutions per minute, twelve rotations per minute being the preferable rate of speed. *Patent completed.*

1454 W. HEATHFIELD. *Improvements in the construction of iron girders and joists.* Dated May 24, 1866

This invention consists in forming the top and bottom flanges, or either of them, of iron girders and joists of a curved or convex shape in their cross section. *Patent abandoned.*

1465 J. W. HOFFMAN. *An improved hanging centre or centre stop for doors, gates, swing sashes, blinds, and other similar uses.* Dated May 25, 1866

In performing this invention the inventor employs two cones, the one a male and the other a female, both toothed or ribbed to fit the one into the other. As applied to a door the invention is carried out as follows:—The female cone is fitted with lugs by which it may be screwed on to the edge of the door. The male cone is furnished with a coiled or other spring, and is attached to the sill, both cones being ribbed; the spring keeps the convexities of the one in the concavities of the other, and thus a door so fitted may be placed and will remain open at any required distance. For swing sashes, toilet glasses, blinds, and many other purposes of a similar nature, the same appliance may be employed as a centre and stop, and either horizontally or vertically. *Patent abandoned.*

Trade News.

TENDERS.

BEDFORD.—Accepted for Mr. Jarvis's brewhouse, Bedford. Mr. James Horsford, architect. Quantities supplied:—

Harrison, bricklayer	£712 12 6
Joy, carpenter	424 14 0
Kilpin, smith and founder	115 9 6
Carling, plumber, painter, &c.	110 12 0

BROUGHTON PARK.—For building a house in Broughton Park, for Mr. John Lowcock. Mr. Thomas Tulley, architect:—

Ledger	£1,870
Southern and Son	1,817
Clay	1,780
Neill and Son (accepted)	1,777

ENFIELD.—For a detached villa, to be built in the Ridgeway road, Enfield, for Mr. H. W. Draper. Mr. Thomas J. Hill, architect. Quantities supplied by Mr. R. L. Curtis:—

Moreland and Burton	£2,159
Field and Sons	2,100
Fairhead	1,876
Cushing	1,875
Anley	1,850
Patman Brothers	1,849
Webb and Sons	1,757

HADLOW.—For a row of four labourers' cottages, at Hadlow, for Mr W. Crundwell. Mr. Henry Stapley, architect, Tunbridge Wells:—

Hammond	£508 10

HOLBORN.—For new amphitheatre, Holborn. Messrs. Smith and Sons, architects:—

Macey	£4,679
Piper	4,500
Henshaw	4,390
Bracher and Son	4,300
Ennor	4,080

PARK-LANE.—For new front, &c., to a shop, in Brick-street, Park-lane. Mr. S. Dyball, architect:—

Terrey (accepted)	£578 10

ROMFORD.—For a pair of semi-detached villas, at Romford, for Mr. T. Champness. Mr. C. Pertwee, architect, Chelmsford:—

J. Whithers, Romford	£1,048
A. Davey, Romford	1,037
W. Roper, Chelmsford	1,040
J. Hammond, Romford	1,025

WESTMINSTER.—For a new dwelling house, in Frederick-street, Westminster, for Mr. Eason. Mr. H. W. Budd, architect:—

Clemence	£565
Hemmings	508
King and Son	490
Pemberton	475
Mills and Son	475

BATH STONE OF BEST QUALITY.

RANDELL AND SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depôts, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Thos. Chapman, jun., New North-road, Hoxton, cutler, Jan. 23, at 1—Thomas Cook, late of Arbour-square, Stepney, mechanical engineer, Jan. 23, at 1—William Dockett, Winchester-street, Kentish New Town, journeyman keymaker, Jan. 16, at 1—Howard Ashton Holden, Queen-street, Cheapside, and Clifton-gardens, Maida-vale, contractor for public works, Jan. 9, at 1—Robert Jolly, late of Chatham, cabinet manufacturer, Jan. 23, at 1—George H. Manning, Bridport-place, Hoxton, ironmonger, Jan. 14, at 12—James Worms, Ireland-yard, Doctor's Commons, builder, Jan. 14, at 12—David Hales, Forest-hill, Kent, builder, Jan. 16, at 11—William George Horncastle, High-street, Poplar, auctioneer, Jan. 23, at 12—Henry Richard Snow, Whitstable, builder, Jan. 14, at 1—John Julian Thompson, Rotherhithe-street, boat-builder, Jan. 14, at 1—John James Ward, Woodford, journeyman coach builder, Jan. 15, at 1.

TO SURRENDER IN THE COUNTRY.

Thomas Bartlett, Yately, Southampton, builder, Jan. 11—J. Furnifull, Southport, Lancashire, painter, Jan. 11—Peter Gray, South Hilton, contractor, Jan. 8—J. Hopkinson, late of Rochdale, contractor, Jan. 17—Phillip B. Scott, Cardiff, civil engineer, Jan. 9—William Barnes, Crich, Derbyshire, quarryman, Jan. 15, at 12—William Davies, Liverpool, joiner, Jan. 15, at 3—Robert Danby, Burwell, Cambridgeshire, plumber, Jan. 15, at 11—William Davies, Liverpool, joiner, Jan. 15, at 3—Richard Dodd, Manchester, screw bolt manufacturer, Jan. 11, at 11—John Foster, Doncaster, cabinet maker, Jan. 19, at 12—Thomas Fraser, Harrington, Cumberland, builder, Jan. 11, at 10—William M'Donald, Keswick, blacksmith, Jan. 10, at 11—James Culliford Miller, Sunderland, block and mast maker, Jan. 18, at 12—George James Westcott, Bournemouth, builder, Jan. 22, at 11—Hugh Williams, Bryntirion, near Langefni, joiner, Jan. 11 at 12.

NOTICE OF SITTINGS FOR LAST EXAMINATION.

Jan. 18, G. Wood, Sunderland, shipbuilder—Jan. 18, A. Tait, Newcastle-upon-Tyne, iron merchant—Jan. 23, T. Pound, Kingswinford, Staffordshire, blacksmith—Feb. 21, S. M. Gammage, Hampstead, painter—Feb. 26, T. B. Smith, King's-road, Victoria-road, builder—March 1, T. Garrett, Farnborough, journeyman bricklayer—Jan. 28. E. and L. Powell, Hereford, builders—Jan. 21, D. Esau, Abertillery, Monmouthshire, contractor—Jan. 15, T. D. Perrott, Bristol, coachbuilder—Jan. 11, G. Wilson, Oldham, journeyman millwright—Jan. 19, S. J. Tozer, Horsley Heath, Staffordshire, journeyman painter—Jan. 25, C. Wilby, Masbrough, joiner—March 1, M. K. Trott, Walthamstow, plumber.

PARTNERSHIPS DISSOLVED.

Hartop and Howroyd, Bradford, Yorkshire, plumbers—Rownson and Drew, Upper Thames-street, ironmongers—Thompson and Co., Hunslet, engineers—Cunliffe and Co., Westleigh, Lancashire, brickmakers—Kitto and Jackson, Compton-street, Clerkenwell, engineers—Bairstow and Co., Ovenden, machine makers

DECLARATIONS OF DIVIDEND.

S. Berrisford, Stockport, ironfounder, 3s. 5d.—J. Collier, Liverpool, joiner, 2s. 9d.—J. Hunter Burscough, boat-builder, 6½d.—W. Johnson, Leigh, Lancashire, ironfounder, 20s.—Johnson and Whitaker, Leigh, Lancashire, ironfounders, 4s. 7d.

DIVIDEND.

Jan. 14, G. Weston, Quemerford, Calne, Wilts, builder.

SCOTCH SEQUESTRATION.

Robert WILSON, Glasgow, bellhanger, Jan. 5, at 12, at Glasgow.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9	0	£10	10	Archangel, yellow ..	£12	0 £13 0
Quebec, red pine	3	6	4	15	St. Petersburg, yel..	10	10 11 10
" yellow pine..	2	15	3	10	Finland	8	0 9 10
St. John N.B. yellow	0	0	0	0	Memel.....	0	0 0 0
Quebec Oak, white ..	0	10	6	0	Gothenburg, yellow	9	0 10 10
" birch.....	3	10	4	10	" white	6	0 8 10
" elm	3	10	8	0	Gefle, yellow.....	9	0 11 0
Dantzic oak	3	10	6	0	Soderhamn	9	0 10 10
" fir	2	0	3	10	Christiania, per C.,		
Memel fir	2	0	3	10	12 ft. by 3 by 9 in.		
Riga.....	2	0	3	0	yellow	18	0 23 0
Swedish	1	16	2	5	Deck Plank, Dantzic,		
Masts, Quebec red pine	6	0	8	0	per 40 ft. 3 in.	0	14 1 4
" yellow pine..	3	0	6	0	PUMICE STONE pr ton	5	0 6 0
Lathwood, Dantzic, fm	4	10	5	10	OILS, &c.		
" St. Petersburg	6	10	7	10	Seal, pale....per tun	46	0 47 0
Deals, pr C., 12 ft. by 3					Sperm body 125	0	0 0
by 9 in., duty 2s per					Cod	39	0 0 0
load, drawback 2s.					Whale, Sth. Sea, pale	45	0 0 0
Quebec, white spruce	13	10	21	10	Olive, Gallipoli.....	61	0 65 0
St. John, white spruce	13	0	16	0	Cocoanut, Cochin, ton	61	0 61 10
Yellow pine, per reduced C.					Palm, fine	42	10 43 0
Canada, 1st quality.	17	0	19	10	Linseed	37	10 0 0
2nd do.....	13	0	14	0	Rapeseed, Eng. pale..	41	10 42 0
					Cottonseed.....	32	0 39 0

METALS.

IRON:—						
Welsh Bars in London .....per ton	7	0	0	to 6	6	0 3
Nail Rod ..... do	8	5	0	8	15	0 2½
Hoops ..... do	9	10	0	10	0	0
Sheets, Single ..... do	10	10	0	10	15	0
Staffordshire Bars ..... do	8	7	6	8	15	0
Bars, in Wales ..... do	6	5	0	6	10	0 2
Rails ..... do	6	5	0	6	10	0 nett
Foundry Pigs, at Glasg. No. 1 .. do	2	14	0	3	7	0
Swedish Bars ..... do	10	10	0	12	10	0 2½
STEEL:—						
Swedish Keg, hammered .....per ton	16	15	0	16	0	0
Swedish Faggot ..... do	10	10	0	12	10	0
COPPER:—						
Sheet & Sheathing, & Bolts ....per ton	86	0	0	0	0	0 3
Hammered Bottoms ..... do	96	0	0	0	0	0
Flat Bottoms, not Hammered .. do	91	0	0	0	0	0
Cake and Tough Ingot ..... do	76	0	0	0	0	0
Best Selected ..... do	81	0	0	84	0	0
Fine Foreign ..... do	90	0	0	92	0	0
Yel. Metal Sheathing & Rods ....per lb	0	0	7½	0	0	8
LEAD:—						
Pig, English .....per ton	22	10	0	22	15	0 2½
" Spanish Soft ..... do	19	10	0	0	0	0
Shot, Patent ..... do	23	10	0	24	0	0
Sheet ..... do	21	5	0	0	0	0
White ..... do	30	0	0	31	10	0 6½
SPELTER:—						
On the spot .....per ton	21	5	0	0		net
TIN:—						
English Block .....per ton	83	0	0	85	0	0 2½
do Bar ..... do	84		0	86	0	0
do Refined ..... do	85	0	0	88	0	
Banca ..... do	82	10	0	83	0	0 nett
Strait ..... do	81	10	0	0	0	0
ZINC:—						
English Sheet .....per ton	28	0	0	0	0	0 2
Devaux's V. M. Roofing Zinc .... do	27	0	0	0	0	0

* And 6 per cent. discount if laid upon the new system.

QUICKSILVER .....per btl.	6	18	0	7	0	0
REGULUS OF ANTIMONY.						
French .....per ton	34	0	0	0	0	0

THE BUILDING NEWS.

LONDON, FRIDAY, JANUARY 11, 1867.

THE NATIONAL GALLERY COMPETITION.

TO design a picture gallery in these days, with the experience of continental architects before us, is not a very difficult task. Picture galleries, like churches, have worked into a certain groove, and it will take something more than one original architect to get them out of it. We know no more unhealthy sign in art, as in everything else, than when things get into that stereotyped condition which finds expression in the motto "rest and be thankful." *Satisfaction* in any condition of art, Greek or Gothic, or in any supposed perfection of plan or proportion, means inaction, and consequently death. Not very long ago the art world included a respectable number of old gentlemen who held tenaciously to the belief that the ultimate possible limit of man's art power was attained when, in the midst of one exquisite harmony of clime, colour, costume, sculpture, and architecture, the Athenians unveiled the cryselephantine statue of their great Goddess of Wisdom. That this absurd belief has not quite died out is evident from the way in which almost everyone we meet assumes that the new National Gallery must, as a matter of course, be what is called Classical. The first result of this unreasonable assumption is now before the public in the shape of designs for a new gallery in Trafalgar-square. Out of the fourteen views submitted two only are Gothic, and the author of one of these was so doubtful of the strength of his Gothic venture that he has followed it up by a design founded upon the Venetian Classic Renaissance.

Like the law courts' competition, this is what is called a limited one. Twelve architects were selected, including Mr. Scott, Mr. Street, and Mr. E. Barry, who are what may be called double firsts, having been selected in both groups. Mr. Scott has declined the National Gallery, and we think wisely, as it was simply impossible for any man to do himself common justice in two such works within such a short period. Moreover, Mr. Scott may have been warned by the foregone conclusion as to style to which we have already referred, and may not care to become the St. Paul of modern architects, to be subjected to any more perils or stripes than those he has already received anent the Foreign Office. It will be well if others follow his example. Nay, it might even be desirable for the sake of English art, supposing any such thing to exist, if some were to retire altogether.

Elsewhere we have animadverted on the narrow limits of the selection of architects for the law courts' competition. All that we have said thereon may be applied with even additional force to the case of the National Gallery. We have no wish to be personal, but, at the same time, our respect for English architects obliges us to say that a gross injustice has been done them in this competition, which no amount of argument, standing as it must side by side with such designs and drawings as those of Messrs. Penrose, Jones, Cockerill, and Street, can, under any condition of things, excuse or palliate. The error, however, has been committed, and the result, as everyone who knows anything of architecture expected, is a disgraceful failure. We had intended, before visiting the Exhibition, to have devoted at least two articles to the drawings submitted, but we must candidly confess that a walk round the room was sufficient to convince us that, unless we sank the office of critic in that of advertiser, and became merely the mouthpiece of the ten several gentlemen who have competed, there was not sufficient material for more than one article.

The designs are arranged as follows :—

1. Mr. Owen Jones.
2. Mr. Brodrick.
3. Mr. Street.
4. Mr. Cockerill.
5. Mr. James Murray.
6. Mr. E. M. Barry.
7. Mr Penrose.
8. Mr. G. Somers Clarke.
9. Mr. M. Digby Wyatt.
10. Messrs. Banks and Barry.

1. Mr. Owen Jones has taken his inspiration from the new buildings at South Kensington Museum. There is, it is true, a delicate compliment in this, paid to the art authorities of the Brompton clique, which may certainly enlist the sympathies of those art-critics who sit at the feet of Cole, C.B. Mr. Jones, however, would appear to be considerably in advance of the authorities as touching the Christian virtue of modesty or humility, since otherwise we are at a loss to account for the large number of views of his chief façade which this gentleman has thought fit to exhibit. In his plan Mr. Jones is in the small minority of placing his several buildings, not according to the shape of the ground, but at right angles to one another, by which much ground is lost, and, as it happens, great irregularity is the result. There is nothing particular to learn from the plans, and less than nothing from the elevations.

2. Mr. Brodrick is, as usual, great in pillars. There are some thirty-six Corinthian shafts in the front elevation alone, and when we have said this we have said nearly all that can be said of the design. Everyone who knows Mr. Brodrick's works at Leeds and elsewhere need scarcely be told that the composition is severe to a fault. Its great mistake is in the monotony which results from an excess of Corinthian pillars. The projecting portico shows no less than fourteen in a row, supporting a level entablature. The wings have each six shafts, and over the centre in line with the wings ten pillars appear, supporting the pediment which crowns the design. The plan follows the irregular form of the ground, and nearly the whole of the space is covered with buildings, so that neither light nor air worth mention is admitted into the interior of the site. This plan of nearly covering the ground, which has been followed by Mr. E. M. Barry, is, we think, most objectionable.

3. Mr. Street's design is an exception to all the others in more than one particular. In plan he confines himself to the ground which has already been set aside for the enlargement of the present building, whereas all the other competitors have made their designs for the new gallery on the assumption that the whole plot behind the frontage will be available. So far, Mr. Street is at a considerable disadvantage, and cannot be brought into comparison with his co-competitors. The style in which he has worked out the problem to be solved will, of course, be called in general terms Gothic, but then it is Mr. Street's Gothic, and that, too, after visiting Spain, and this we submit makes all the difference. For it would be monstrous to accept this design as any, even the faintest, index of what really might be done by our Gothic school of architects had they had the chance of designing a National Gallery. For the sake of Gothic art, and because of the hasty conclusions people are apt to draw from one man's work in a given style, especially when that man happens to be a well-known one, we cannot but be sorry that Mr. Street should have been tempted to send this design out of his office. The composition is slight and not even picturesque. The front shows a long uninteresting straight building of two stories, divided on each side into five arched compartments, with a single doorway in the centre, supported on each side by circular, dome-covered turrets, and crowned by a circular, dome-covered tower. The whole design is singularly devoid of anything like dignity, and, until Mr. Street has made himself capable of grasping the idea of a large building—for grandeur and largeness of mass are by no means inconsistent with true Gothic principles—he must fail in his endeavours to persuade the public that *his* style is better adapted to the large public buildings of the day than (say) that adopted by Mr. E. M. Barry.

4. Mr. Frederick Cockerill has disappointed us ; his perspectives are so dull and foggy in tone that they would have ruined a far better design. We cannot understand how it is that, with such artistic refinement and such tender feeling for the highest development of Classic art, this architect should be enticed by any of the false allurements of the Renaissance.

5. Mr. James Murray, in two of his designs, may be placed in comparison with Mr. Brodrick, and, although his perspectives are not quite such effective drawings as those of the last-mentioned gentleman, we think a comparison of the architecture must result in only one opinion, and that entirely in favour of Mr. Murray. The composition of the elevation is very much the same as that in Mr. Brodrick's design, but there is far less monotony in No. 2, and much more of Greek feeling in the treatment of detail, although, strange to say, the number of pillars is exactly the same, except in the wings, which have five instead of six. In plan, Mr. Murray is very much in advance of all the others. The buildings follow the shape of the ground; each of the four fronts has a central composition, and the back and front are united by a broad gallery, which consequently cuts the site in half, forming two large courts ; the main galleries run all round the building behind the narrow gallery, in compartments for cabinet pictures. The simplicity of this plan and the thorough adoption of the system which the German mind has thought out for us will, of course, commend it to the favourable consideration of the judges, and, if pillars and porticoes be the sort of things to be desired in a country where driving rains, and fogs, and frost and snow, and slush are but too common, why Mr. Murray may be congratulated for having produced a design worthy of the English nation.

6. Mr. E. M. Barry has evidently gone in to win, and, as a sure card with a London public, has played off Sir Christopher Wren and that much over-rated building, St. Paul's Cathedral. His plan B, if we omit some of the inner galleries which crowd up the site, is much the same practically as Mr. Murray's. The central dividing block of building Mr. Barry treats as a grand staircase, which may also be used as a sculpture gallery. This is all very well for the staircase, but we have a fancy—it may be only a fancy—that the works of sculptors deserve just as good and special a reception as the works of painters. The set of drawings which illustrate this design are really worth looking at. Mr. Barry's perspective is unquestionably *the* drawing of the whole exhibition ; he has chosen, too, his point of sight well, for we doubt whether the angle domes and the one over the centre of the front would group so well from any other point. By the way, why will architects continue that deplorable practice of drawing impossible interior perspectives, which not only distort the architecture, but mislead the public ? This question is suggested to us as we turn from the exterior to the interior views which Mr. Barry has exhibited ; the latter are as bad and ineffective as the former is good and effective.

7. Mr. Penrose has sent in a design, and we prefer to say no more about it.

8. Mr. G. Somers Clarke has given two designs—one Venetian Classic Renaissance, which we may at once pass over ; the other, Italian Gothic—very much so indeed—which we regret he had not more time to develop into something more homogeneous and complete. Had the Renaissance design never been thought of, and Mr. Clarke had had a little more faith in his Gothic design, the extravagances of the latter might possibly have been avoided by the extra time which would have been se-

cured for study. The plan adopted is much the same, generally speaking, as those of the more successful Classic designs. Its great feature is the central sculpture hall, admirably shown in a perspective, which only wants its top cut off to be a very true and pleasing drawing of a still more pleasing design, which, though it does savour strongly of St. Mark's, Venice, is none the worse for it; for, if architects must needs borrow, they had better borrow direct from the designs of such structures as St. Mark's, than second-hand from even the best revivalist.

9. Mr. M. Digby Wyatt sends no less than twenty-four drawings, illustrating a very original and somewhat picturesque design, so original that it is a very great pity it was not illustrated by half the number of drawings, really well drawn, instead of by a huge, dirty-looking view, and a large number of other unsatisfactory sketches. The general composition of the front consists of two triple-grouped masses of buildings at the angles over the entrances, circular in plan and domed; these are connected by a massive screen wall, in which are sunk seven quasi-apsidal recesses divided by single shafts. We need hardly point out that the great defect of such a design is the absence of any central feature, and the depression of the chief part of the façade by the emphasis given to the angles. These latter, too, although *planned* in a highly picturesque way, are exceedingly ill-proportioned in their subdivisions and detail. And how Mr. Wyatt could have brought himself to set up colossal tombstones each side of his doorways, for the purpose of inscribing names thereon, is altogether beyond us.

10. Messrs. Banks and Barry have sent in a careful set of drawings, but, as usual, their design, instead of looking like one for a great national monumental building, looks more like a row of "first class" houses, with here and there an extra story or so, which the most elastic conscience would scarcely dare to admit in the category of towers. The choice will no doubt eventually lie between Messrs. E. M. Barry and Mr. James Murray, although the very great merit of parts of Mr. G. Somers Clarke's Gothic design, especially the great hall and the central arcade, is enough to show that there is no reason why a national picture gallery should not be designed upon Gothic principles.

THE NEW LAW COURTS' COMPETITION.

JUSTICE is said to be blind, and certainly so far as this competition is concerned that seems to be her chief characteristic. Since the selection of the twelve gentlemen who were thought to be the most fit and proper architects to design a palace of justice, we have more than once called attention to it, and we cannot but still regard it as a huge blunder. Raised upon such a foundation, it will not be very surprising if the superstructure should not prove such a success as anticipated. Of course, architects who really can gauge, so to speak, the commissioners who really can gauge, so to speak, and those power of the present day will not break, the art either by this competition or that taken in National Gallery, so as to suppose that either the one or the other, or both together, form a faithful index of that power. We are not sufficiently in the secret to state positively how many architects out of the dozen personally sought to be elected, or what amount of touting with portfolios filled with fancy designs took place. But of this we are quite sure, that without some such proceeding, some of the fortunate twelve would have remained in their original obscurity. When men to whose works we can point with pride are omitted from a national competition, and men who have no works to show are put in their place, there must be something wrong somewhere. However, the mistake, or rather we should say, the injustice, has been committed, and we suppose that the English Government, true to its traditions, is far too indifferent on the subject of art to attempt to rectify it. It may be that, with a foresight for which we can scarcely give them credit, they have reserved certain architects whose qualifications are far higher than many of those selected to act as professional advisers or assessors to the non-professional committee who are to deliver judgment in this competition.

Now with regard to the problem which the plans about to be exhibited pretend to solve we would offer a few preliminary remarks before entering upon the merits and demerits of the several designs. To begin with the site, it appears to us to have two great defects—first, a deficiency of area when compared with the requirements of the commissioners and with the amount of light necessary for the proper illumination of the internal courts; and second, an irregularity of the main line of frontage formed by the retention of Picket-street, which compels the architect either to abandon a portion of his already too small area or to break up the unity of his chief façade.

That interesting document familiar to competing architects by the term "Instructions" is generally the cause of much unpleasantness of feeling and not a little miscarriage of justice from being too reticent. The Courts of Justice "Instructions" err for exactly opposite reasons. Not only is the area of every room given, and the distribution of the various groups of rooms indicated, but the degrees of light and quiet are laid down with almost tyrannical precision, and in one case the exact point whence the light is to come is determined. How far the competitors have obeyed these regulations remains to be seen. As everyone, from the Lord Chancellor down to the taxing master's clerk, demands a full measure of quiet and light for his private room, we shall either behold some marvels of planning or be amused by no end of lively objections arising from a sense of neglect on the part of the various officers of the law. As to the general scheme or plan, it does not require much penetration to foresee that the competitors will adopt one or other of the following systems, or a combination of two or more of them. First, there is the Central Hall scheme, which was shown in Mr. Abraham's preliminary design; second, there is the Open Court plan; third, there is the Street plan; and, fourth, the Radiating plan.

First, the Central Hall scheme depends very much on the size of the central hall and the use to which it is devoted for its success. If it is very large, and is used by the general public, it is clear that there cannot be sufficient space left upon the site for internal areas, whilst, at the same time, instead of concentrating the machinery of the law, the *oi polloi* will be collected together in a way which is evidently contrary to the spirit of the instructions. If, on the other hand, the central hall is limited to reasonable proportions, and is devoted only to the use of those who are actually engaged in the proceedings of the various courts, it may possibly be found to be the most satisfactory arrangement. Second, the Open Court plan commends itself to favourable consideration because of the limited nature of the site and the strong necessity of securing as much light and air as possible for the internal areas. This necessity, it seems to us, is the one great difficulty of the problem, for even without any central hall we very much doubt whether anyone will produce a plan which fulfils what may reasonably be considered as the necessary requirements of the "Instructions" as regards the very important desiderata of light and quiet. We must be remembered, however, that the architect who ventures to sacrifice the grand internal architectural effect which a public hall at law suggests to the practical working of the right and the comfort of the workers, although considering so doing, will nevertheless stand at a drawing-room disadvantage in the show of economy, for, talk as we will about it, and all that sort of thing, everyone knows well enough by this time that fine feathers do make fine birds, and that pretty pictures do operate very considerably on those who adjudicate in these matters. The third or Street plan, if the streets are wide enough and the buildings not too high, may be made perhaps even more convenient than the Open Court plan; but then the streets must have through ventilation at the ends by means of openings in the main façade, as at Somerset House. The only objection to this would be that wherever air was admitted sound could not be kept out. On the other hand, one great advantage of this system would be the very great ease with which the various departments of the law could be kept distinct and, so to speak, in separate houses—an advantage which might also belong to the Radiating scheme. The chief drawback to this last-mentioned plan would be, we fear, a very serious one, inasmuch as from the shape of the site there must necessarily arise odd corners and inconvenient triangles, with the consequent result of much waste of space.

Whatever the general scheme may be, Picket-street is a crux common to all. We take it for granted that no one will be foolish enough to propose to give up any of the ground to the Strand, or have the daring to take in Picket-street. If we start, then, with these two very natural assumptions, it is clear that there must be a break somewhere about the centre of the main façade; or, in other words, the Strand front cannot be continuous. The treatment of this difficulty will form one of the most interesting features in the competition. The fact that this break in the site occurs at about the middle of its greatest length (700ft.), coupled with the consideration that the law is in the main divided into two great branches, viz., Chancery and Common Law, may possibly have suggested to some a division of the composition into two or more groups of buildings; or, in other words, to design a concentration of law courts rather than one large palace of justice. We rather hope this will prove to be the case, for it must be borne in mind that 700ft. against the Strand is a very different kind of thing to 700ft. against the River Thames. Again, considering that our only points of sight will be comparatively near—for it will only be the tops of the roofs and the towers which will be seen beyond the surrounding streets—we want diversity and minuteness of parts, and careful—even delicate—detail, rather than a hugely massed façade with colossal parts and bold, obtrusive detail. The distant view will be bold enough, for there need be no fear of lack of towers if the competitors have only followed the suggestions of the officers of the Record department. We do, therefore, earnestly hope that we may have something to look at in the streets just a little bit more interesting than blocks of granite or even base mouldings. For this reason we hope, too, that small perspectives of portions of the fronts may be found amongst the drawings, and that we shall not have merely to judge from impossible views taken at random from the other side of the water, or from balloons at various degrees of altitude. If we are to spend an enormous sum of money on 2,400ft. of street front, it is not too much to expect a drawing or two showing some of this enormous frontage as it will really appear to the people who go to and fro.

OUR HOSPITALS.

THERE are nowadays certain fixed canons as to hospital construction bearing chiefly on the importance of securing the greatest possible comfort and relief as well as speedy cure to their suffering inmates, and we think it might be worth while to ascertain how far our London hospitals agree with these conditions. One most important point is that a hospital should be in as free and airy a situation as possible, and, therefore, many hold that all should be built in the open country. With regard to London at least, this may at once be pronounced impracticable,

for it is obviously impossible to convey all cases of accident or disease a distance of several miles without, in some instances at least, inducing a fatal result, and in all lessening the chance of ultimate recovery. Convenience of access must therefore be the first consideration, an airy situation coming after, though, theoretically speaking, this should not be so. One illustration of the point just alluded to is King's College Hospital, which is built in almost as bad a situation as could well be chosen, but, being surrounded by the abodes of squalid poverty, is in the best possible position for benefiting the poor wretches who constitute a large proportion of the number of those admitted there. Site, however, has not so much to do with the strictly architectural portion of the subject as the arrangement and style of the building; yet that it may operate disadvantageously is seen in the case of Westminster Hospital, which being built in the Broad Sanctuary was adapted to the style of the surrounding buildings by the employment of a variety of architecture, probably the very worst which could have been had recourse to, viz., the castellated. Few of our readers may have examined all of these abodes of misery, so that we may give a brief description of the principal general hospitals of London. St. Bartholomew's, founded in 1123 by Rayhere, said to have been the minstrel of King Henry I., being the oldest, the largest, and the wealthiest, first invites attention. It is, as many of our readers are aware, situated on one side of the old Smithfield market, and extends thence backwards towards Aldersgate-street. The buildings were originally quite detached from each other, and the patients were located in small houses, a few in each, so that the whole constituted a little village or parish complete in every way. The present building was chiefly erected in 1730, but various additions have since been made to it, never, however, entirely departing from the original plan. The main part of the buildings consists of four detached pavilions, forming the four sides of a square, which last is planted with trees and traversed by walks. From a sanitary point of view, this style of erection is much superior to the other plan of conjoining the buildings at their angles so as to make the square perfectly enclosed, the free circulation of the air being greatly favoured by the former of these, and correspondingly impeded by the latter.

Guy's, again, which is situated in Southwark, has its principal entrance from St. Thomas-street. Here is a sort of court flanked right and left with buildings, chiefly occupied by those engaged in the management of the hospital, open towards the front, but shut in behind by the proper buildings of the hospital. These might be said to be arranged in the form of two hollow squares behind the open court fronting St. Thomas-street, the one being separated from the other by a vestibule. Behind—that is, farther away from St. Thomas-street—there are a number of buildings devoted to various purposes, and built more in accordance with recent scientific principles than the bulk of the hospital, which was erected so far back as 1724. The site of both these hospitals is bad, being surrounded with buildings on almost every side, and being situated in the centre of the city. St. Bartholomew's, which is the largest hospital in London, contains 650 beds, Guy's, which comes next, counting only 575.

St. George's, the London, University College, and Middlesex Hospitals are all built on a somewhat similar plan. This consists of a frontage to the street, with two wings stretching backwards from either extremity of the main building to a greater or less extent, and thus forming a partially enclosed courtyard, which is usually set apart as an airing ground for patients. Middlesex has, in addition to the two wings extending backward, two similar ones stretching forwards, so that it possesses a figure like the letter H, and forms two courtyards, one opening to the front, the other behind the main building. St. Mary's, at Paddington, consists of little more than an oblong building of simple outline, Charing Cross being of a somewhat similar figure. King's College Hospital, situated behind Lincoln's Inn Fields, was commenced in 1839, but has never been completed; as it stands, its shape is rather irregular. It consists essentially of a central building surrounding a square, and having at one end a wing, which, however, is unfinished. Having roughly sketched the external appearances of our London hospitals, we shall try to ascertain how far these are in accordance with the recognised canons. In the first place, it must be remembered that all such institutions originate in this country from private benevolence, and that consequently the means at the disposal of the projectors may be inadequate for the construction of a building perfect in all its details. Further, the price of land in London is so great that the extent necessary for the erection of an hospital on thoroughly scientific principles may be unattainable. These considerations must to a certain extent restrain us in our criticisms, as the poor will probably be more benefited by makeshifts than by waiting until a model erection can be obtained. As it is for the benefit of these classes that such asylums are instituted, the grand object must be the cure of disease as completely and speedily as possible. To this end, three great things are required—a sufficiency of pure air and water, and, as a corollary to the last, a proper and sufficient system of drainage. To secure plenty of pure air, a site open and exposed to healthy winds should be selected, as far removed from marshes or stagnant water as possible; the foundation should be on dry and firm soil, and should be well drained. Gravelly soil will consequently be better than a clayey bottom, but either is preferable to soft, oozy, marshy ground. One point of very great importance with regard to hygiene, but which unfortunately has not always been attended to, is, that the drains made to carry off the sewage of the building should never be permitted to pass under any part of the structure itself. The reason for this is obvious, viz., that should at any time the drains become choked, they are much more easily reached in the one case than in the other, to say nothing of the gaseous emanations which may be constantly escaping into that portion of the building beneath which they pass. Most frequently, however, the architect has not to select a site, but has rather to erect a building which will suit the space of ground assigned to it. Now there are certain general rules with regard to this also. In the first place, we think that their exterior should be as plain as is consistent with the absence of ugliness, for it is difficult to say how much florid ornamentation and irregular surface inside and out may have to do with keeping up that epidemic erysipelas which sometimes makes such fearful ravages among the inmates of our hospitals. So, also, the windows should be large and cheerful; anything which has a tendency to obstruct light or air should be carefully guarded against. But with regard to the disposition of the buildings themselves, various plans may be adopted. When the space of ground is limited and it is important to obtain as many wards as possible, this being generally the case in London, an arrangement similar to that of King's College Hospital, or, better still, of St. Bartholomew's Hospital, might be adopted. Some are of opinion that the shape of Middlesex Hospital is that best adapted for such erections, but this view is not generally entertained. The great end is to have a free circulation of air round the wards, and this can never be had where the windows or ventilators open on courtyards. Complete isolation is also a good thing, as one wing or building can then be set apart for any infectious diseases which may make their appearance.

In modern times two styles of hospital have been received with most favour. The one is known as the "corridor system," and may be aptly illustrated by the great military hospital at Netley; the other is known as the "pavilion system," and is seen in the Herbert Hospital, at Woolwich, or, better still, in the great Lariboisière Hospital, at Paris.

By the corridor system it is intended to separate as much as possible the patients who are able to get up from those who are not, and to this end a wide corridor is made to extend from one end of the building to the other along one of its sides or fronts. In this the convalescents may sit or lounge during the day, whilst opening off from the corridor and extending at right angles from it towards the opposite wall, are wards for those unable to move about, and for the accommodation of all at night. By this scheme it was supposed that the air would be warmed in the corridor before being admitted into the wards; but the air will not only be warmed, it will also be contaminated and rendered less fit for respiration than when admitted directly from the external atmosphere. There can be no thorough ventilation except from side to side, and, as windows can only be placed on one side of the ward, and one side of the corridor, it is evident that the air must pass through one to reach the other. The better of the two without doubt is the "pavilion system," which was recommended as far back as 1788, but only acted upon in very recent times. The intention is that each pavilion shall be surrounded on every side with air, except at the point where it joins a corridor which connects them all. This scheme in a sort of embryo condition may be seen in the fine Marine Hospital at Woolwich, but, better still, in the case of the Herbert Hospital there. In either case a central building extends from one end of the hospital to the other; from this at certain equal distances spring at right angles a given number of wings, varying of course with the space of ground covered. The central erection constitutes the connecting link between all the wings, and in these wings are situated the wards. It may be accepted as one of the grand rules in hospital architecture that none should rise above the ground to a greater height than two stories. Unfortunately, this cannot always be attended to for want of room and for want of funds, but supposing that it is, each pavilion would thus contain two wards, the one above the other, each wholly isolated from the rest of the building the moment its own door is shut. It will thus be seen that the corridor system agrees best with a long-extended frontage, whilst the pavilions will cover a greater area, but will present a much more compact appearance than the other, although the system is also applicable to a long and narrow site, as in the proposed erection for St. Thomas's Hospital.

But by far the finest type of this kind of hospital is to be found in the Lariboisière, at Paris. In fact, Paris far excels us in accommodation of this kind, but it must be remembered they are there Government institutions, under the enlightened direction of a M. Husson. The hospital referred to is situated near the Northern Railway, close to the boulevard and in the ancient Clos de St. Lazare. The building was begun in 1846, M. Gauthier being the architect: and was finished in 1854. The buildings, which are three stories high, alone cost 6,245,630f., the total cost of the hospital being 10,445,056f., and it is fitted up to contain 600 beds. It is composed of three pavilions on either side of a wide court planted with trees, the pavilions being arranged in three parallel lines with their ends opposite and directed inwards, so that the whole, when completed by one long range of buildings behind and one in front devoted to the "service" of the institution constitutes a parallelogram. The separate pavilions are connected by a series of buildings one story high, which intervene between the inner extremities of the pavilions. These are chiefly used as dining-rooms and libraries, whilst running all round the interior of the courtyard is a glazed gallery, which serves as a means of communication from one pavilion

to another, and also as a promenade for the patients in wet weather. When the weather is fine the plots of ground which intervene between the different buildings, and which are carefully laid out, serve as airing grounds. Each pavilion contains three wards of thirty-two beds each, but the number can easily be increased.

USEFUL INFORMATION FOR ENGINEERS.*

THERE is a certain class of books of which it is difficult to predict the nature of the reception they may meet with at the hands of the public, or at least of that portion of the public for whose benefit they are presumed to be written. At the same time there is also a class of works concerning the success of the advent of which no one feels any doubt, perhaps not even the author. The volume on our table belongs to this latter class, its reputation having been established beforehand by that acquired by its two predecessors, constituting the first and second series of "Useful Information for Engineers." It consists, like them, of a collection of the subject matter of various papers and lectures read and delivered from time to time by the author before different societies and institutes, and some of which have been published separately in the transactions and records of those bodies. The easy, practical style in which the work is written renders the contents, especially the lectures, exceedingly well adapted for fulfilling the object the author had in view, which, he remarks, was the moral and intellectual improvement of the engineer and artisan. There are six lectures altogether, the first four of which deal with general principles, and are calculated to be of great benefit to the student, apprentice, and younger members of the profession, in so much as broad rules are laid down for their guidance, and the means, and the means alone, by which a man can become eminent in after life are accurately and conscientiously defined. The remaining two, one upon "The Thickness of the Earth's Crust," and the other "On Iron and its Appliances," are, as their titles imply, more special in their character, and were both delivered to the members of the Literary and Philosophical Society of Newcastle-upon-Tyne. In the latter a valuable practical and theoretical example is given in the drawings and description of a wrought-iron tubular engine beam designed and constructed by Mr. Fairbairn for the purpose of replacing the cast-iron beam which by its failure occasioned the lamentable Hartley Colliery catastrophe some years ago. The strength of the wrought-iron beam is investigated by the well-known formula $W = \frac{adc}{l}$ and all information afforded likely to be of service to those engaged in designing similar structures. We cordially concur in the remark made by our author when investigating the strength of a crank; he observes, "for ordinary purposes these calculations will be found practically safe, but in all these constructions I must confess that much depends upon the experience and practical knowledge of the engineer, and that a keen eye to proportion and a sound judgment are frequently of much greater value than a whole volume of algebraical formulæ."

The first three papers are abstracts of Mr. Fairbairn's report to the Board of Trade upon the machinery department of the Paris Exhibition of 1855, and that of the International Exhibition of 1862, and contain a detailed description of nearly every machine possessing any especial features of novelty and interest. The papers on iron roofs contain some well-selected practical instances of the various forms on which roofs are constructed, including an elevation of the gigantic example of Mr. W. H. Barlow, intended to roof in the Midland Railway Station at St. Pancras-road, London. It surpasses in span and other dimensions every structure of a similar nature in being 240ft. wide in the clear and 690ft. in length; it will rise to a height of 125ft. about the level of the present roadway. In the first portion of the paper the question of the theoretical determination of the strains upon the rafters and various bars of trussed roofs is entered into rather fully, but not by any means more so than what the importance of the subject demands. Roofs of this description, like all trussed structures, require a careful and detailed calculation in order to arrive with any degree of accuracy at the correct proportions of the component parts. Since the whole of their economy consists in putting the metal just where it is wanted, and in no other place, it is evident that they cannot be designed, as some structures may, by "rule of thumb;" while on the one hand, they allow of a far closer economical approximation of practice to theory than any other form, on the other, they require considerably more skill and scientific knowledge in order to obtain that desirable result. Paper 5 is a brief history of the experiments undertaken by the author, at the request of the Atlantic Telegraph Company, upon the insulation and other properties of submarine telegraph cables. Tables are added giving the results obtained under different pressures and with different coatings. At the present time, when ocean telegraphy is upon its trial, these experiments are deserving all attention from electricians and those interested in the subject, as a host of valuable information is contained in the records of them. Paper 6 is of a similar character to the foregoing, and narrates the experiments which induced the company to select the cable now doing its silent duty at the bottom of the Atlantic. In paper 7, which together with a short appendix concludes the volume, we have a record of experiments made by the author, at the request of the Board of Trade, to determine the effect of impact, vibratory action, and long-continued changes of load on wrought-iron girders. The practical conclusions arrived at are, "that cast-iron bars or girders are not safe when subjected to a series of deflections due to one-half the load that would break them;" but that they are perfectly secure in sustaining a dead weight not exceeding one-third of the weight that would break them, and that these reiterated deflections appear to have no injurious effect upon the metal from which the bars were cast. With respect to the durability of wrought-iron girders and beams, we find that it is not safe to submit them to violent disturbances when loaded to one-third of their breaking weight, but that they may be perfectly safely subjected to the same shocks with a load equal to one-quarter of their breaking weight. According to Mr. Fairbairn, a wrought-iron girder will last, under the latter conditions, 328 years, but under the former, only for the term of eight years. On this hypothesis, then, we may assume that when our bridges last eight years, they will last until it is time to get new ones. Great and deserved as has been the success of the two first series of this work, we consider that the new comer will eclipse the fame they have acquired both at home and abroad. The name of the publishers is a guarantee for everything connected with that department.

* "Useful Information for Engineers." Third series. As comprised in a series of lectures on the applied sciences, and on other kindred subjects, together with treatises on the comparative merits of the Paris and London International Exhibitions, on roofs, on the Atlantic cable, and on the effect of impact on girders. By WILLIAM FAIRBAIRN, Esq., C.E., LL.D., F.R.S., F.G.S., &c., corresponding member of the National Institute of France and the Royal Academy of Turin, Chevalier of the Legion of Honour, &c. London: Longmans, Green, and Co. 1866. The right of translation is reserved.

PRESERVATION OF WOOD IN DAMP AND WET SITUATIONS.*

NO introductory apology for the theme of this paper is judged necessary. A few plain statements will show that the subject is one of vast though unheeded importance.

The annual drain which is exhausting our forests is startling when we remember the vast areas of our country utterly destitute of timber—when we learn, for instance, that upon the 55,000 square miles of Illinois, there grows not a single pine large enough from which to fashion a board. Statistics show that in 1865, above 5,000,000,000ft. of lumber, 2,000,000,000 of shingles, and 900,000,000 pieces of lath were sold in Chicago alone. Michigan and Wisconsin almost entirely supply that market. 6,000ft. of pine lumber per acre is an average yield. No formal calculation is necessary to show us that, with the present demand, a single generation will exhaust the supply those states can afford.

But the consumption increases in a rapid ratio. It has already raised the prices. Clear lumber sold for 18 dollars per thousand in 1855, for 24 dollars per thousand in 1860, and for 45 dollars per thousand in 1865. And following close on Chicago, in this trade, are Albany and Pittsburgh.

Improvidence will soon, we fear, make us as dependent on foreign supplies of timber as is England, who has already granted numerous patents for processes promoting the durability of the lumber every enlightened nation must have.

Shall we employ those processes whose utility experience has demonstrated? Self-interest returns but one answer. But in America railway management, self-interest seems to be disregarded. While the average life of English railway sleepers is fifteen years, that of American sleepers is only seven years. Allowing 2,112 sleepers per mile, at 50 cents each, 1,056 dollars per mile of American railroad decays every seven years. Thoroughly impregnate those sleepers with sulphate of copper, at a cost of 5 cents each, and they would last twice as long. Thus would be effected a saving of 880 dollars per mile in the seven years on sleepers alone. In the United States are 33,908·6 miles of railroad. The whole saving on these lines would be 29,839,568 dollars, or upwards of 4,262,795 dollars per annum.

Again, English engineers deride American wooden railway bridges. Eight years is their average duration. Creosote them and they are good for double or treble that time. For ordinary railroad purposes they cost 40 dollars per linear foot. The use of Bethell's process would effect a great saving on such a line as the Grand Trunk Railway, whose wooden bridges measure 9,355ft. upon the Montreal and Portland division alone. Further illustrations of the importance of preserving timber from decay seem unnecessary. Let us proceed to the discussion of this desirable object.

In situations so free from moisture that we may practically call them dry, the durability of timber is almost unlimited. The roof of Westminster Hall is more than 450 years old. In Stirling Castle are carvings in oak, well preserved, over 300 years of age. Scotch fir has been found in good condition after a known use of 300 years, and the trusses of the roof of the Basilica of St. Paul, Rome, were sound and good, after 1,000 years of service. After these well-attested examples of preservation, the further consideration of wood in this state seems unnecessary.

Wood constantly wet in fresh water is quite as durable. Piles were dug from the foundations of old Savoy Palace, in a perfectly sound state, after having been down 650 years. The piles of old London Bridge were found sound and perfect 800 years after they were driven.

While the acidity of bog-water retards decay, it seems to us that part of the preservative property attributed to the stagnant liquid should be ascribed to the salts of metals or alkaline earths held in solution, and deposited among the woody fibres.

In the above situations, the action of natural agents cannot be improved. But in certain other conditions, man must resort to preservative processes to secure permanence of structure. For convenience of discussion we have introduced the following classification:—

1. When wood is damp we have to guard against dry rot.

2. When wood is alternately wet and dry we have to guard against wet rot.

3. When wood is constantly wet in sea-water we have to guard against teredo navalis and limnoria terebrans.

1. Wood in Damp Situations.—When unseasoned wood is surrounded by dead air, it very rapidly decays, fine fungous growths extending through every part. After the rot has begun, the mere contact of decayed and sound wood seems sufficient to ensure, by a catalytic action, its spread through the latter. This has probably led some observers to their conclusions, that the accompany-

* From the "Journal of the Franklin Institute." By H. W. LEWIS, University of Michigan.

ing parasitic plants, Merulius lachrymans (or L. vastator) and Polyporus hydridus, cause the decay. But the highest authorities now regard these growths as accessory, and beginning only after a suitable habitat has been prepared for them. Thus the fungus acts the part of a scavenger and converts corrupt matter into new forms of life. The presence in the timber of the fungi spores is easily explained. The researches of Pasteur show that atmospheric dust is filled with minute germs of various species of animals and plants, ready to develope as soon as they fall into a congenial locality. He concludes that all fermentation is caused by the germination of such infinitesimal spores. That they elude observation, does not seem strange, when we consider that some infusoria are only 1-24000in. in length. Admitting that they are only ten times the linear dimensions of their germs, the latter will be 1-240000in. long. But with the best microscopes we cannot perceive objects measuring less than 1-80000in. These germs might find their way into the growing plant through both roots and leaves. The whole tree is thus filled with the seeds of decay, awaiting suitable conditions to spring into growing organisms. The prolonged vitality of spores, made necessary by this theory, cannot be a serious objection, when we remember the vigour of the "mummy wheat," and the unknown plants which start from the earth raised from deep excavations. Indeed, time, even when measured by centuries, seems hardly to affect the vitality of vegetable germs.

But what prepares timber for the germination of the fungi spores? Probably fermentation of the juices and semi-solids of the moist wood. For fermentation, five conditions are necessary, viz.: 1. Presence of water. 2. Temperature from 40 deg. to 110 deg. Fah. 3. Presence of a ferment. 4. Presence of a fermentable body. 5. Exposure to the atmosphere.

Three of these conditions almost always prevail. Very rarely, if ever, can we maintain the temperature of any timber construction below 40 deg. Fah., or above 110 deg. Fah. Probably countless numbers of ferment spores are annually absorbed into the fluids of the smallest sapling. Completely excluding any construction above earth and water, from the atmosphere, is practically impossible. The two remaining conditions we can generally prevent.

1. We can remove the water by thorough seasoning, and in damp situations we can practically prevent its return by ventilation or resinous coatings.

Examples of remarkable durability of wood have been cited. With equal care in selecting and preparing the lumber, modern constructions might last as long. But while the wood of those old edifices was drying through years of preparation, the timber of modern constructions is translated from the primitive forest into a painted and varnished city dwelling in less than a single year's time. No wonder that in a very few decades, the whole structure is unsafe, and that an odour of decay makes the mouldering rooms untenable.

Thorough ventilation is indispensable to the preservation of even well-seasoned naked wood in damp localities. The rapid decomposition of sills, sleepers, and lower floors is not surprising where neither wall gratings nor ventilating flues carry off the moisture rising from the earth, or foul gases evolved in the decay of the surface mould. In the close air of cellars, and beneath buildings, the experiments of Pasteur detected the largest percentage of fungi spores. Remove the earth to the foot of the foundation, and fill in the cavity with dry sand, plaster rubbish, &c., or lay down a thick stratum of cement to exclude the water, and provide for a complete circulation of air, and lower floors will last nearly as long as upper ones.

Various expedients have been resorted to, in order to hasten the seasoning process. Mr. P. W. Barlow's patent provided for exhausting the air from one end of the log, while one or more atmospheres press upon the other end. This artificial aërial circulation through the wood is prolonged at pleasure. However excellent in theory, this process is not practicable. By another method, the smoke and hot gases of a coal fire are conveyed among the lumber, placed in a strong draught. Some writers recommend the removal of the bark one season before felling the tree. All good authorities agree that the cutting should take place in the winter season.

An impervious covering upon undried timber is very detrimental, for by it all the elements of decay are retained and compelled to do their destroying work. The folly of oiling, painting, or charring the surface of unseasoned wood is therefore evident. Owing to this blunder alone, it is no unusual thing to find the painted woodwork of older buildings completely rotted away, while the contiguous naked parts are perfectly sound.

In concluding this part of the subject we may say, thoroughly season your lumber, afterwards cover it with varnish, paint, or pitch, or maintain around it a constant and thorough circulation of air.

2. We can remove the fermentable body, or chemically change its nature.

Woody fibre consists chiefly of cellulose and lignine. The former is very durable, and the latter moulders away but slowly, when exposed to air and moisture. But permeating through these, and increasing from the heart to the alburnum, are nitrogenous substances of the sap and immature wood, mostly vegetable albumen. These are the fermentable bodies we desire to remove or change. A patented process has been proposed to wash out the albumen by water flowing in at one end of the log while a vacuum was produced at the other. Theoretically sstisfactory, this method does not seem to have been adopted. Boiling and steaming partly remove the ferment spores, but may not destroy the vitality of those remaining. For, according to Milve-Edwards, he has seen tardigrades resist the prolonged action of a temperature of 248 deg. Fah., and has known them to survive a temperature of 284 deg. Fah. That low forms of vegetation are fully as tenacious of life cannot be doubted.

Boiling and steaming also coagulate the albumen at 140 deg. Fah. Although coagulated albumen is insoluble in water, the water of solution is, by this heating process, sealed up in the wood, and the cohesion of the latter is said to be diminished.

Albumen is also coagulated by sulphate of copper, pyrolignite of iron, chloride of mercury, chloride of zinc, &c. Some of the compounds thus formed are albuminates of the metallic oxides. Probably this is the reason why some of those salts are such excellent preservatives. But the researches of Kœnig show that, when blue vitriol is employed, a certain portion of basic sulphate of copper remains combined in the pores of the wood, so that water will not wash out. The most resinous woods retain the most of the basic salt. Impregnated woods also contained, he found, less nitrogen than natural. It is even possible, he states, to remove all the azotized compounds by long immersion in the sulphate solution. The albuminous substances first precipitated by the solution are redissolved by excess, as in case of concentrated sulphuric and muriatic acids. The operation of such solutions should, therefore, be one of lixiviation. Kœnig hopes similarly to explain the action of the chlorides. A recent experiment on animal albumen, by Professor Prescott, shows that its precipitate by the chloride of mercury, is also soluble in excess of the chloride solution. From this we may conclude that the antiseptic qualities of the chlorides depend, at least partly, on their dissolving out the albumen.

But could all the nitrogenous substances be removed, thereby preventing fermentation, the cellulose and lignine of unprotected wood would slowly decompose. Hence the salt used should act on those substances also. According to good authority, sulphate of copper has this action. M. Weltz maintains that, after a time, the sulphuric acid leaves the base, and, acting upon the timber, carbonises it. He has seen the props in a mine, opened 1800 years ago, charred by the free acid thus eliminated and in a perfect state of preservation, while their surfaces were covered with metallic copper in regulus.

The use of corrosive sublimate was patented by Mr. Kyan in 1832; that of chloride of zinc by Burnett in 1838. M. Boucherie has used solutions of blue vitriol and pyrolignite of iron. Easy impregnation of the wood is the great merit of his method.

Each process has in turn excited the most extravagant hopes, and neither has justified a tithe of the expectations formed. While "Kyanising," "Burnettising," or the use of any salt whatever, has not prevented the ravages of teredo navalis or limnoria terebrans, each of the processes named improves the durability of wood exposed to dampness. Each is, therefore, worthy of explanation here.

Kyan's specified solution was one pound of chloride of mercury to four gallons of water. Long immersion in the liquid in open vats, or great pressure upon both solution and wood, in large wrought-iron tanks, is necessary for the complete injection of the liquid. The durability of well-kyanised timber has been proved, but the expensiveness of the operation will long forbid its extensive adoption.

For "Burnettising," a solution of chloride of zinc—one pound of salt to ten gallons of water—is forced into the wood under a pressure of 150lb. per square inch.

Boucherie employs a solution of sulphate of copper one pound to water twelve and a half gallons, or pyrolignite of iron one gallon to water six gallons. He encloses one end of the green stick in a close-fitting collar, to which is attached an impervious bag communicating through a flexible tube with an elevated reservoir containing the salt liquid. Hydrostatic pressure soon expels the sap at the opposite end of the log. When the solution makes its appearance also, the process is completed.

He finds the fluid will pass along the grain—a distance of 12ft.—under a lower pressure than is required to force it across the grain—three-fourths of an inch. The operation is performed upon green timber with the greatest facility.*

EXETER DIOCESAN ARCHITECTURAL SOCIETY.

THE report of the committee of this society was read at the quarterly meeting, held recently at the College-hall, the Ven. Archdeacon of Exeter in the chair. The following are the principal passages of the report:—At our last quarterly meeting your committee referred with pleasure to the great increase of real practical work in which they had been engaged, and which could be traced at once most readily to the then recently adopted resolution of the society. It is with like pleasure that they have now to state that a considerable number of plans and drawings have since that time been reported on; and they think that in the future the real utility of the unanimously adopted resolution will be found most evident to all. It will be found that architects, as a rule, do not feel aggrieved because their designs are reported on—criticised if you like—by the committees of such societies as our own. They know that the reports of such committees will be taken only for what they are really worth. If they are fair criticisms, candid, outspoken reports, they will be duly weighed, and it may be will be acted upon. In either case no harm will be done, either to our common cause or to the architect. At the most it will only be another proof that even when all agree there are points wherein a difference of opinion can well exist. Yea, architects who have a great love for their art, and withal a greater love for the church of which they are members, will not care much whether the one common object be attained by their own individual exertions, or by the helping hands of architectural committees; will not care much whether they have to do the work unaided, or whether it be encouraged and promoted by the reports or the criticisms of non-professional opinion. Yea, more—architects, as a rule, know very well that they and your committee are in the main united, that in all chief points they will most likely agree; that, instead of being antagonists, they are the best of friends. The first plan, in order of time, is one by Messrs. Gould and Son, for the restoration, enlargement, and reseating of the very small, but in many points very interesting church of St. Thomas à Beeket, Newton Tracey. It may be well to remark that Newton Tracey and Bovey Tracey have both the same dedication. The church at present consists of a well-developed chancel, nave, and with tower of very early full pointed work. A great deal of mural painting is still to be found in the chancel; drawings of this have been kindly promised to be forwarded by Mr. Gould for the society's portfolio. In the north wall were found two early arches of unequal span, which had been for a long period walled up. These evidently formed the arcade of a short north aisle; portions of the foundation of the north wall have also been discovered. All the old features of the church will be carefully preserved; amongst which must be placed the use of different coloured stones in the construction of the arches. Ham Hill stone is somewhat freely used in them; and the employment of this material in such a locality as Newton Tracey proves how great must have been the zeal of these old builders, who must have met with many difficulties in supplying for this church a material on which they had set their hearts. The next in order of time were plans by Mr. St. Aubyn for the partial resto-

* To be continued.

ration, rearrangement, and reseating the church of St. Wenhear, near Bodmin. Then plans by Mr. Fenton, for the enlarging, rearranging, reseating, and restoring the church of St. Martin, Martinhoe. This church is another proof of the mistaken opinion, once very prevalent, that all our Devon churches were of Third Pointed or Perpendicular work. There can be no doubt that a vast amount of church work was carried on in Devonshire during the Third Pointed Period; and the probable reason or cause of this great activity would well supply a very profitable subject of inquiry; but there can be no doubt that whilst a great deal of Third Pointed work is to be found everywhere, there is nevertheless to be found a very considerable amount of very early work. It is no uncommon thing to find Third Pointed windows taking the place of earlier ones, whilst the walls themselves have remained untouched. The church at Martinhoe is wholly of First Pointed work. Old features will be preserved, the chancel will be lengthened, and the needed increased church room will be attained by the erection of a short west aisle. The plans by Messrs. Gould and Son for a chapel of ease at Traveller's Rest, in the parish of Swimbridge, have also been laid before us. It will be remembered that the first design for this chapel of ease (not by the Messrs. Gould) was sent by the Archdeacon of Barnstaple to your committee, that they might report thereon. A full report on these plans was forwarded to the Archdeacon; and there is but little doubt that one of the consequences of that report is to be seen in the very effective and striking design which is now to be carried out. No one who cares to compare the present design with the originally proposed one can hesitate about at any rate one of the reports of your committee having been of real service to the cause which we have in hand. Even without our report, it is not likely that the original plans would have been carried into execution; but without that report it is not likely that an entirely new design would have been thought necessary. Very rich, beautifully drawn, and most carefully prepared designs by Mr. E. S. Sedding, for the restoration of the chancel of St. Mary at Rewe, having also been reported on. This design, although expressive of the greatest care and thought, was freely criticised, and your committee think that it will be no betrayal of confidence if they add that that report of theirs has been acknowledged without any tokens of displeasure. The sixth was a design of one of the members of our own committee, Mr. Ashworth, for restoring and correctly fitting the chancel, and reseating with open benches the nave and north aisle of the church of St. Mary at Tedburn. This forms the third church in our present list which gives proof of the prevalence of First Pointed work in our churches. The chancel roof is probably First Pointed; there are also two-light lancets on the south side and one on the north of the chancel. These are the following adjoining churches where the like features are to be found:—St. Mary, Cheriton Bishop; St. Mary, Colebrook; St. Bartholomew, Bovey or Nymet Tracey. And the last a design by Mr. Street for a metal altar cross, a reredos, and an east wall enrichment for the church of St. Mary, Down. A work of restoration has for some time been in progress in the chapel of St. Saviour, the chantry of Bishop Odam in our cathedral. The cost of the restoration is borne by Corpus Christi, Oxford. The architect engaged is Mr. Hayward. But very few would hesitate about regarding the work done here as being in the main both a restoration in the proper meaning of the word and a needful restoration. There are some who have expressed doubt upon this point, and have lamented the loss of the old colouring on the sculptured figure of the Bishop. This supposed very valuable example of ancient figure colouring was indisputably not ancient at all. And the coarse way in which the colour was laid on looked more like a figure whereon to clean out paint brushes than anything else. The coarsest paint had been daubed on; the fingers were wholly obliterated; and when this miserable substitute for mediæval work was carefully removed, sufficient evidences of the original colouring in the main could be distinguished. Those tokens of ancient works have been carefully followed. Your committee do not appear here as defenders of Mr. Hayward—he is very well able to do that himself; but they do desire to express their opinion that though there may have been (as there are) cases where true principles have been lost sight of in the work proposed, yet there are other cases where the fault-finding with the work done has likewise been based, as it seems to your committee, upon a mistaken principle. To be conservative in matters connected with the works of other days is quite needful; to have a great care and regard for all the artistic features of the works of other days is undoubtedly ever to be encouraged; but to set a value upon the deed which mars the works of other days is surely "conservatism" run mad, when such a maxim is to be applied to the House of the living God. A ruin, by all means touch it not, but a church is no ruin; it may be venerated in age and feature, but it ought to be youthful and lively too. If our churches are to be mere museums for preserving the records of the past, if they are to be mere galleries of art, then indeed let nothing be touched that has once left the hands of the old master complete; but, if a church be, as it is, God's House, if it is to tell of the present, as well as the past, then the true conservative spirit, whilst it preserves with care all the works of the artist craftsman, which cannot be touched without losing its value, will at the same time endeavour to prevent, if it may be, the least sign and token of decay, every evidence of waste, every symptom of neglect.

THE SOCIETY OF ANTIQUARIES OF SCOTLAND.

A SPECIAL meeting of this society was held last week, Sir James Y. Simpson, Bart., vice-president, in the chair. Professor George Stephens, of Copenhagen, author of "Old English Runic Monuments," described the Runic inscriptions on thirty-five monuments in Great Britain, from which it appeared they had been found on crosses, coffin-lids, brooches, rings, and caskets. Among the crosses, Mr. Stephens directed particular attention to that at Ruthwell, in Annandale, which he regarded as the most sumptuous in ornament, and the most interesting, from its inscriptions, of any in the world; and he implored the society to take some interest in the preservation of a monument so precious. Mr. Stephens explained that the first part of his work contained the old northern Runic inscriptions in Scandinavia, and that the second, which was now well advanced, would contain all such inscriptions known in Britain, with careful and detailed drawings of the crosses, caskets, rings, and other objects on which the inscriptions were engraved. Some of the sheets of this part were exhibited, and excited general interest and admiration. Mr. Stuart trusted that Professor Stephens's interesting discourse might make his great work better known among them, and that it would lead themselves to prize the venerable monuments still remaining in the land, on which Mr. Stephens had lavished so much zeal and learning. With regard to the cross at Ruthwell, he had recently been corresponding with the minister of the parish on the subject of its better preservation, and he trusted that ere long a suitable plan would be devised for this purpose.

METAL WORK.

MESSRS. PEARD and JACKSON, 159, High Holborn, have issued a new and enlarged edition of their examples of metal work. The catalogue consists of several hundred illustrations of metal work "for ecclesiastical and domestic use, designed after the manner of mediæval works." Most of the designs are by Mr. Peard. Some of them, however, were designed by Mr. A. W. Blomfield and Mr. John Goldie. Due praise is awarded to Mr. W. G. Smith, the artist, who has drawn the examples on wood. We take the following, on iron, from the preface of the catalogue:—

"By some persons who profess themselves to be very learned in the peculiarities which should distinguish the construction of works in iron, is the use of malleable cast iron rigorously proscribed. These gentlemen cannot have endeavoured candidly and honestly to comprehend its capabilities, and in not seeking to utilise a material which modern science has produced, do but resist an economic law of commerce. It has its legitimate application, and this there is no difficulty in defining. To adopt it for designs in which the chief characteristic of construction suggested to the mind would be welding, is manifestly an absurdity, because for all practical purposes it is incapable of this mode of manipulation; and as absurd would be its use for those purposes in which ordinary cast iron is equally available. It should bear the impress of its mode of production, casting, and when used as the ornate parts of work constructed in frame of wrought iron, and secured thereto by means of rivets, screwed pins or bands—a quantity of each one or more parts being required—the manufacturer has at hand an exceedingly economical as well as durable and ductile material, capable of great variety in treatment, since it can with ease—after passing the annealing process—be hammered and variously shaped.

"Too often are crude and egotistic notions set forth as to the manner in which wrought work should be done. It is taken for granted that because welding is a very natural mode of making junctions, &c., it was almost universally adopted in ancient work, and that any departure therefrom must be disallowed as 'not legitimate.' It is forgotten that riveting is a process only largely attainable with wrought iron, and therefore a natural process, though to solely or mainly rely thereon in mediæval design is to descend, it may be, to 'metal joinery.' The introduction of rivets and bands will frequently produce pleasing variety in welded scroll and other work, providing they are made points in the design, while the proper tapering or diminishing of all the out-growths of scrolls furnishes the best evidence of hand labour having been bestowed on them; frequently, however, is the manufacturer restricted in developing to its proper extent the latter, by the necessity laid on him to 'keep down cost.' Complaints are sometimes made, not always without reason, that smiths will persist in filing their work, and obliterating the marks of the hammer: this will be rarely the case when a design is such as can be fairly executed with a smith's ordinary tools; but it is notoriously true that smiths are too often expected to forge that which neither hammer, cutter, nor punch can by any possibility produce on the anvil; hence complaints are unfairly made on grounds and for reasons insufficiently understood. A determined and careful 'study of the processes employed by the best artificers of all times,' especially of our own, in which mechanical contrivances have been so largely augmented, would enable artists as well as manufacturers to avoid prejudice, correct errors, and attain success."

ARCHÆOLOGICAL.

IN the Department of Eure-et-Loire, at Bazoches-les-Hautes, not far from an old Roman road which still bears the name of "Route de César,' and about half-way between Chartres and Orleans,' there is the farm called the Fauconière, which has been in the possession of the same family of farmers, of the name of Neveu, for the last three centuries. On the adjoining ground a considerable number of Roman and Gallic antiquities have been picked up from time to time, and the foundations of buildings, together with quantities of coins and medals of Nero, Faustina, the Antonines, and the Constantines, confirm the opinion that a Roman camp formerly existed there. The late M. Neveu had formed a tolerable collection of such antiquities, but was not sufficiently read in archæology to enable him to classify them. His son, now residing at Janville, has, however, made himself thoroughly master of the subject, and is not only an experienced farmer, but also a learned archæologist. Having taken great pains to classify and increase his father's collection, he has at length succeeded in forming a very valuable museum, which excites the admiration of visitors. Among the curiosities he possesses there are a Roman steelyard, two Roman chandeliers of bronze discovered at a depth of 13 metres, a Roman hatchet, two flint ones, three bronze keys, four iron ones, a bronze Mercury in perfect preservation, &c., and, above all, seventy Gallic medals, including three gold and three silver ones; the rest are bronze. These medals, which are in excellent condition comprise about fifty different types, five of which seem to be quite new to archæologists. One of the gold ones is among the latter. Besides these Gallic medals M. Neveu possesses forty Roman ones of a small size (sixteen of which are silver), and fifty of a much larger type and all of bronze. Lastly, his museum contains two gold pieces, one of Charles VII. and the other of the Black Prince.

Since the process of photographing upon silk and linen has been perfected in France, many persons have their portraits upon their linen instead of their names or initials. Washing, it is said, does not injure the portraits.

EARTH CLOSETS.

THE following observations have been communicated to the Sanitary Committee of Norwich. If earth closets are applicable to that city we see no reason why they may not be applied elsewhere :—

To the Sanitary Committee.

GENTLEMEN,—As I understand that the Board of Health, at their meeting held on Tuesday, the 18th inst., referred to the consideration of your committee the question of the applicability of the dry earth system for the purposes of deodorisation, and the feasibility of the substitution of that system for the proposed enormous expenditure in irrigation and the extension of the city sewerage, I take the liberty of asking your attention to the following considerations :—

EVILS OF THE PRESENT SYSTEM.

The best method of removing from large towns the excrementitious matter, sink washings, semi-liquid and other refuse from slaughter-houses, stables, factories, &c., is one of the most perplexing questions of the day.

Cesspools and common privies are acknowledged to be simple abominations.

About fifty years since waterclosets were introduced, and a system of drainage was organised which seemed to solve the vexed question. However, as the contents of hundreds and then thousands of these waterclosets, with sink washings, factory wastes, and other offensive matters, were indiscriminately conducted to the sewers, we now discover that in practically carrying out this system two gigantic evils are created.

First—The drainage which is necessary in every town to carry away the rainfall and other inoffensive liquids is converted from a sanitary blessing to a service for conveying noxious and pestilential gases into all our thoroughfares, yards, and houses, producing disease, fever, and death.

Second—It pollutes the river into which it discharges.

The first evil.—This, thoretically, can be obviated by trapping, but we know this is practically impossible in the extensive ramifications of highly charged pestilential gas drains.

The second evil.—This can be prevented by diverting it from the river and deodorising it by irrigation over land—a plan which appears to be most in favour with engineers, but it cannot be done without enormous expenditure, and with very questionable results.

THE DRY EARTH PROCESS.

A conference has been held at Leamington, which was attended by deputations from the governing bodies of Manchester, Glasgow, Oxford, Macclesfield, High Wycomb, and other places. Other towns were also represented by their engineers and other officials—in all about 300 gentleman. The report in the BUILDING NEWS * divides the papers read into three classes—first, those advocating the "dry earth" system; second, those in favour of irrigation; and lastly, those which had special schemes for converting sewage into manure easily transportable. The decision appears to have been decidedly in favour of the dry earth.

On carefully reading the report, the dry earth system appeared to me to be well worth further investigation. I therefore procured "National Health and Wealth," and other papers upon the subject, and also "Liebig's Natural Laws of Husbandry," and from a common sense point of view, it seemed to me that we must look to earth and not to water for the solution of the difficulty.

Mix water with excrementitious matter, and it causes fermentation and the production of noxious gases. Its influence decays wood, stone, iron, &c., and it is enormously expensive.

Get the next most abundant composition of nature, earth; dry it (not wet it) and on application it perfectly deodorises the most offensive matter, and makes it a rich manure for the growth of our grain, and it preserves what water destroys.

CAN THE DRY EARTH PROCESS BE APPLIED TO NORWICH?

If the earth system can be carried out in Norwich, it will be needless to expend £60,000, or it may be £100,000, upon a system of sewerage. The annual expense of pumping the millions of gallons of sewage and annual expense of maintenance will be saved, and the risk of failure avoided.

An injunction from the Court of Chancery will not be required to prevent our authorities polluting the river; and an injunction from the Court of Chancery will not be required to prevent our authorities polluting the atmosphere. One injunction is as reasonable as the other, for be it remembered pestilential gas is always being generated in our sewers and drains, is forcing its way out, not only in the close unhealthy November, but every day in the year, through thousands of apertures in our streets, passages, yards, and houses. But our rivers are not pestilential (except for drinking purposes) only on a few hot days in a very dry summer.

The question which the Government appears to have really gone into is "The best means of preventing the pollution of rivers," not "The serious evil of the pollution of the sewers," but the latter is a question whith must soon follow. The irrigation system only deals with the former, and its success appears to be uncertain.

HOW DRY EARTH MAY BE USED WITH PROFIT.

Upon the foregoing considerations the question arises—Can the earth principle be carried out with health, comfort, and cleanliness in Norwich?—With proper and systematic arrangements it seems to me that it can, and I have made the following calculations based upon the recommendations of Dr. Hawkesley, and the special convenience of the city.

Norwich, according to the census tables of 1861, contained 17,112 inhabited houses, with 74,891 inhabitants (on the average 4½ persons to each house).

Divide Norwich into twelve districts, each having a depôt for the earth, horses, &c., in convenient positions to attend the houses, &c., allotted to it; each district to comprise on the average 1,400 houses or 2,000 closets. These districts must be divided into two classes, according to the nature of the locality, viz.:—

1st Class.—Houses with closets—one-third requiring removal every day, one-third every two days, and one-third every three days; say four districts.

2nd Class.—Houses with closets downstairs, which can be constructed to contain a fortnight's accumulation; say eight districts.

Each depôt of the first class districts would employ five vans, ten horses, ten men. Each van would convey 200 clean pails and 18lb. of earth, and would remove from each area, yard, or door, the used pails placed there over night, or when called for between six and nine o'clock a.m. each day, second day, or third day. Each van when it left the depôt would convey 200 pails, weighing 9 cwt. and 3,600lb. of earth, representing a total of 2 tons 1 cwt. The additional weight on its return to the depôt would be 16 cwt. 102lb.

Each depôt of the second class would distribute 11¼ tons of dry earth, remove 17 tons of manure, and procure 3½ tons of fresh earth per day.

The annual cost of collection and management for each first class district would be £834, for second class districts £542, in the aggregate. The four first class districts and the eight second class districts, with cost of the earth required, would incur an expenditure of £8,438, and the sale of the manure to be disposed of at 20s. per ton or 6s. an individual, amounts to £22,986, being an annual profit of £14,548.

It should be particularly observed that I have only valued the manure at 6s. per individual per annum. Dr. Hawkesley's lowest estimate is 14s., and Mr. Moule gives a much higher value; and Norwich being in the centre of a rich agricultural district, with railway and water carriage, the maximum value will be eventually obtained, and the manure being in a solid and inoffensive form its transit is convenient.

As to the first outlay, I calculate that it will only be about £4,600, invested in horses, vans, pails, and drying kilns.

As to the treatment of the other refuse from towns, I quote the following from the report of "the Royal Commissioners for inquiry into the best means of remedying the pollution of rivers," whose public inquiries in the North closed last week: "Sewage, beyond all question or doubt, may be applied to irrigate land, or the earth closet may be introduced so as to prevent stream and river fouling. Solids of all sorts and kinds from manufactories and dyehouses may be intercepted, and in some instances, much of the colouring matter which is mechanically suspended in the water may be filtered out before wasting this pollution into the stream. Absolute purity of the water will be impossible and need not be looked for."

As a further proof of the recognition of the value of the dry earth system amongst scientific men, I may add that an international conference on cholera has recently been held at Constantinople, when the conference decided, amongst other things, in favour of the universal abolition of all sewers, and the adoption of earth closets.

QUANTITY OF EARTH REQUIRED.

The main difficulty which many people raise is the vast amount of earth that seems to be required. I quote Mr. Moule's words: "For the removal of excrementitious matter alone, an average of 4lb. a day for one person will be sufficient. This would be ½ cwt. a fortnight, or for a family of five persons 2½ cwt. a fortnight, or 1 ton for sixteen weeks, or 3¼ tons a year. What family thinks of the trouble of taking in so much coal every year? The removal need not be more frequent, nor would it require much more labour. But then this labour would not devolve on the family itself."

The following is an extract from a letter in the *Times*, signed George Faithorn, medical officer of the Chesham District of the Amersham Union:—"I inspected the earth sheds, and saw the process in every stage. I put my nostrils into close contact with soil which had been taken from the closets this morning, and I took up some which had been out no more than a fortnight without soiling my hands, and, lastly, I have come away with a small parcel of the dried soil in my pocket, having during the whole investigation met with nothing in the smallest degree disagreeable."

COST TO OCCUPIERS.

The cost to each occupier or owner to alter his existing seat and riser, and adapt it to the earth closet will be about £2 per closet; but this expense will be repaid back in four years by the saving of water rate of 10s. per annum, in addition to which there would be the important saving of the extra rating which the irrigating system would necessitate. And those whose waterclosets and privies are not attached to the sewers, but who will be compelled to use the new sewers, will save at least half that cost by the use of the earth closet.

I will close these remarks by stating that I have no interest in either scheme, directly or indirectly, except as a ratepayer, wishing health, wealth, and prosperity to my native city.

I am, Gentlemen, yours obediently,

EDWARD BOARDMAN,
Architect and Surveyor.

Queen-street, Norwich, December 19, 1866.

* The overwhelming weight of opinion at the meeting was in favour of dry earth, but a different opinion was expressed as to its applicability to large towns.

MONUMENT TO PRESIDENT LINCOLN.

IN our last number, under the head "Statues, Memorials, &c.," we gave a short notice of a proposed monument to the late President Lincoln, the model of which was designed by Harriet Hosmer, who sent it from Italy. The sculptor, in a letter to the President of the Freedman's Monument Association, writes:—"In designing a monument to record the life and services of Abraham Lincoln, I have endeavoured to express the idea that the Temple of Fame which we rear to his memory is based upon the two great acts of his administration, viz., the emancipation of the slave and the preservation of the American Union. Commencing, however, with his earlier history, I have represented other scenes of the President's life in the four bas-reliefs which surround the lower base. In the first, his birth, his journey through the woods to his new home in Indiana, and his occupations as builder of log cabins, rail-splitter, flat-boatman, and farmer; in the second, as stump-speaker, as member of the legislature, as bidding farewell to his constituents and friends at Springfield, and as taking the oath of office as President of the United States at Washington; in the third, four memorable events of the war—the bombardment of Sumter, the capture of Mobile and of Petersburg, and the surrender of Lee at Appomattox; and the fourth, the assassination, the funeral procession, and the final interment at Springfield. Upon the circular columns which enclose these bas-reliefs, and crowning the first base of the temple, are placed four statues, representing the condition of the negro as it actually existed at different periods of the President's four years of office—first, as ex-

posed in chains for sale; second, upon the plantation; third, as guide and assistant to our troops; and fourth, as a soldier and a freeman. Above these columns rises an octagonal base, four sides of which contain the inscriptions :—

"ABRAHAM LINCOLN;
"Martyr-President of the United States;
"Emancipator of Four Millions of Men;
"Preserver of the American Union.

"Upon this rests a circular base, forming the immediate base of the temple, upon which is represented a bas-relief composed of thirty-six female figures, hand in hand, symbolical of the union of the thirty-six States. Upon this rise the four columns of the temple, supporting a cornice, upon which are inscribed the concluding words of the Emancipation Proclamation :—'And upon this, sincerely believed to be an act of justice, I invoke the considerate judgment of mankind and the gracious favour of Almighty God.'

"Within the temple a statue of the dead President rests upon a sarcophagus, and the four mourning Victories, with trumpets reversed, which guard and surround the whole, record the sorrow of the nation, stricken down at the moment of proclaiming its triumphs.

"It is needless to say that in so small a space but little study could be given to details. Should opportunity be afforded me of completing the design upon a larger scale many improvements and accessories would be introduced; for instance, the historical bas-reliefs would contain careful portraits of individuals and places; in the circular bas-reliefs the characteristics of each separate State would be preserved, and the shields affixed as architectural ornaments would bear their appropriate coats of arms. The object thus far in my design has been merely to convey to you an idea of its general effect, and of the manner in which I should propose to illustrate the history of the great man whose life was so rich in events that it only remains for the artist to give prominence to its most brilliant passages."

HONOLULU CATHEDRAL, HAWAII.

THE proposed new cathedral at Honolulu, the capital of the Hawaiin Islands, is to be erected as a memorial to the late King Kamehama, and, for the purpose of raising the necessary funds for this object his widowed queen visited this country. He had taken very great interest in the growth of religion in his country, and to his exertions are due in a great measure the foundation of the See of Honolulu. The bishop was consecrated by the late Archbishop of Canterbury in December, 1861.

The plan of the church consists of a nave six bays in length and 24ft. wide, with north and south aisles, each 11ft. 6in. in width; north and south transepts, 24ft. wide; and choir, with a five-sided apse with processional path continued round it. The length of the choir, from the first step to the outside of the apse columns, is 45ft. The tower stands in the angle between the north transept and the north choir aisle, and the octagonal baptistery is placed in a corresponding situation on the south side. There are two rows of six stalls each on each side of the choir, the dean and precentor's stalls being respectively at the westernmost ends of the south and north upper stalls, and the chancellor's and treasurer's stalls at the eastern ends of the same rows of stalls. The bishop's throne is on the south side, eastward of the stalls (omitted on the accompanying plan by an oversight). The altar is raised seven steps above the nave level, and will have over it a lofty baldaquin of metalwork. A low iron screen divides the choir and nave, and it is also intended to place metal grilles in all the arches of the choir and apse, with gates opening into the processional path. The pulpit will be erected against the north-eastern pillar of the crossing, and the nave and transepts will be devoted to the congregation, using the aisles as passages. The font will stand at the western end of the nave, and in the centre of it.

It has been sought to convey the cathedral idea more by the general plan and arrangement of the building than by grandeur and magnitude of design, for to such a comparatively small place as Honolulu the English type would not be appropriate, even had it been possible, through the amount of funds available, to have contemplated a building on that scale. With regard to the building materials, there were only two courses to be adopted—either to send out the mason's work from England, or to build the whole of rough stone, plastered inside and outside. It has been resolved to adopt the former course, and the columns, arch-mouldings, strings, cornices, windows, doors, &c., will therefore be sent out. The whole of the island is volcanic, and there is no freestone of any kind. For ordinary walling, black basalt and reef-stone (cut from the reefs by the native prisoners) is used, quarried to any size, and 8in. thick. The natives thoroughly understand and do this sort of work well, but skilled mason's labour is very expensive, about five or six dollars a day being asked. Bricks, if used, have to be brought from California; the lime is good and cheap, and there is plenty of good Oregon timber at reasonable rates, and also American pine. Shingles are used for roof coverings.

The portion of the cathedral which it is now in contemplation to erect is the choir and processional path, and the tower. The choir is of three bays in length, with an apse of five arches; the columns are cylindrical, with sculptured capitals; the arch-mouldings are in two orders. The clerestory has in each bay two lancet windows (except in the apse, where there is one window in each bay), with moulded internal arches, resting on shafts with carved capitals; on a line with the springing of these windows rise the arched principals of the roof, resting on wall shafts, which are continued down to the caps of the arcade. Under the clerestory runs a string of ornamental terra-cotta, and of this material will be the labels of the arches. The aisle windows are coupled and have arch-mouldings and shafts inside and outside; they will have movable glazed sashes and wooden inside Venetian blinds. The tower is divided into four stages in its height, and has a circular stair turret on its east face. The west, north, and east sides of the second stage have a series of rich sculptured niches, with figures, the principal ones being—our Lord, the first Bishop of Honolulu, and the late King. The third stage is plain, and the fourth or belfry stage has on each side a deeply-recessed and moulded two-light traceried window. A timber and shingle spire will eventually be added to the tower. The nave and transepts will correspond in their general design with the choir. The four arches of the crossing are of lofty and massive proportions, and the walls above them, under the arched principals of the roofs are pierced with three open arches, resting on slender shafts. Over the crossing will be a rich flèche of timber and lead, surmounted by a figure of St. Michael. It is proposed to use Doulting stone for the masonry, together with Ketton and Bath stone for the ashlar internal lining. The external walls will be of basalt laid in regular courses, and not plastered. Terra-cotta will also be used for strings, plinths, &c. The tile flooring and all fittings will be sent out from England. The font, a gift of Lady Franklin, has already arrived at Honolulu. Separate funds are also being raised for the bells and stained glass.

The completion of the whole building is of course a matter of time, and depends on the raising of the requisite funds, but it is hoped that the actual erection of the choir will be begun at once, the plans for the foundations having been already sent out to the bishop by the architects to the cathedral, Mr. W. Slater and Mr. R. Herbert Carpenter. We intend giving a view of the interior of the cathedral in a future number of the BUILDING NEWS.

DESTRUCTION BY FIRE OF CROYDON CHURCH.

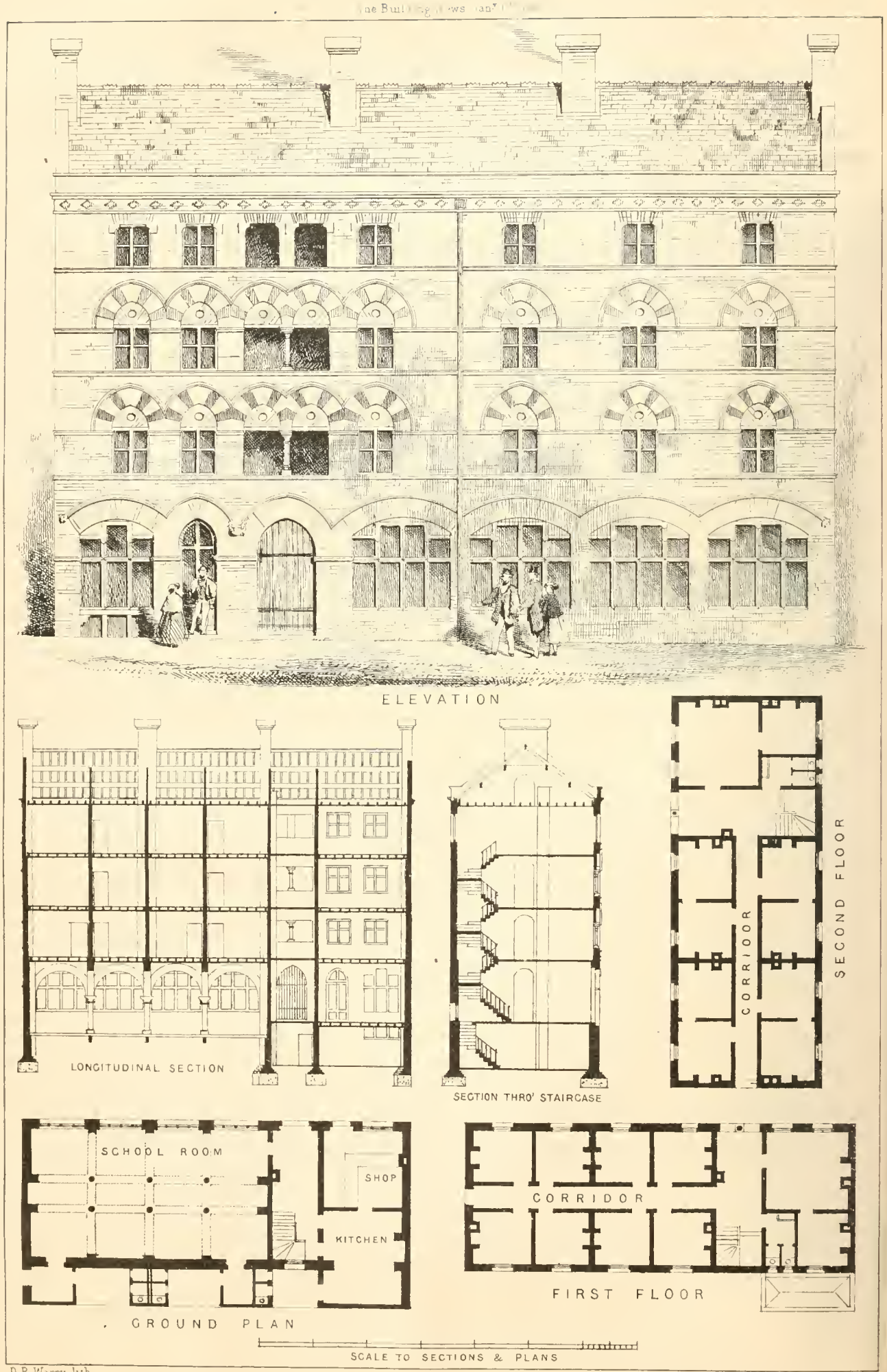
WE regret to have to state that the fine old parish church of St. John the Baptist, at Croydon, was on Saturday night almost totally destroyed by fire. The sacred edifice is situated in the lower portion of the town, at the end of Church-street, near to the old palace of the Archbishops of Canterbury, and was of great antiquity. It has always been regarded as one of the finest examples of ecclesiastic architecture in Surrey. The greater part of the fabric was erected in the beginning of the fifteenth century, but there are in and about it remains of work of an earlier date. It consisted of a massive square tower and belfry, with a nave, two aisles, and chancel; and a clock with chimes had proclaimed the flight of time for generations to the whole neighbourhood. The architecture was in the Perpendicular style of the fifteenth century. About seven years ago the whole interior of the church was re-fitted with oak, finely carved, under the supervision of Mr. George Gilbert Scott. The fire broke out in a part of the tower communicating with the roof, and is supposed to have been caused by the overheating of a flue used in warming the fabric. The roof of the side aisles was of old oak, as dry as tinder, and that of the nave of pitch pine, varnished, and when once materials so inflammable caught fire they burnt with inconceivable rapidity, fanned as the flames were by a strong wind. The fire was discovered about half-past ten on Saturday evening, and burnt, with more or less fury, during the whole succeeding night. On the fall of the roof in blazing masses the fire was communicated to the interior woodwork, and eventually the destruction was complete. Of the fabric itself nothing now remains except the tower, which, however, has been completely gutted, and the outside walls, some of which are in so dangerous a state that they may topple over at any moment. Fortunately, the registers, dating from 1533 down to the present time, were saved, with the Communion plate and an ancient lectern, much prized. But, unfortunately, the organ, built by Avery in 1794, with subsequent improvements by Messrs. Hill, and one of the finest instruments of the kind, has been completely destroyed. It was blown by hydraulic pressure. The chancel, or, rather, the chantries, contained monuments of no less than six archbishops, all more or less magnificent, viz., of Archbishop Grindall, who died in 1583; Archbishop Whitgift, who died in 1603; Archbishop Sheldon, 1677; Archbishop Wake, 1736; Archbishop Potter, 1747; and Archbishop Herring, 1774. The figures were mostly recumbent, and executed in marble and partly in alabaster, the monument of Archbishop Sheldon in particular, which has been sadly defaced by the fire, being considered one of the most perfect pieces of sculpture in the country. The whole of the fine peal of bells, except one, has been destroyed, and the hands of the clock in the belfry, pointing to a quarter to twelve, show the precise time when its mechanism was arrested by the conflagration. Mr. George Gilbert Scott, the architect, paid a visit to the ruins on Monday, and is understood to have expressed an opinion that the tower, which was erected in the time of Archbishop Chicheley, towards the end of the fourteenth or early in the fifteenth century, is capable of being restored, all or most of the exterior walls having been preserved. The fabric was insured to the amount of £10,800.

MODEL LODGING-HOUSES, ST. ANNE'S, SOHO.

ONE of our lithographic sheets contains an elevation and plans of model lodging-houses recently erected in St. Anne's, Soho. The dwellings were built for L. M. Rapi, Esq., from designs by Mr. Burges, of Buckingham-street, at a cost of £2,900. They consist of a school-room, shop, and kitchen, with scullery and cellar under, eight rooms let at 3s. each per week, one set of two rooms at 6s. per week on the first floor; four sets of two rooms at 5s. 6d. per week, and one set of two rooms at 6s. on second floor. The third floor is the same as second. There are dust shoot, sink with water, and two waterclosets on each floor. The building is substantially built, so that no structural repairs are likely to be required. They pay about £5 per cent.

GRANITE PIERS FOR BLACKFRIARS BRIDGE.

A SCOTCH paper says, a new industry has lately been introduced into Glasgow, that of polishing granite, an art for which Aberdeen has long been noted. The works established near Pollokshields by the Scottish Granite Company are presently employed in the preparation of eight polished granite columns for the piers of Blackfriars Bridge, London, now being rebuilt by the Corporation of the City. One of these immense monoliths is already in an advanced stage of its progress, and presents an object of great novelty and interest in this part of the country, if it be not also the largest block of granite that has ever been wrought into a polished column in Scotland. It is about 7ft. in diameter, and about 11ft. in length; and four of the number are to be about 8ft. in diameter and 12ft. high. The material is the beautiful red syenitic granite of Mull, which takes on the finest possible polish, and will no doubt rise into favour for ornamental and memorial purposes. Visitors of the works are shown various productions in the grey granite of the South of Scotland also; but the most remarkable sight of all is the stupendous granite cylinder for the bridge in London.



D R Warry lith

Whiteman & Bass Lithographers Holborn

Model · Lodgings, — St · Ann's · Court, · Soho.

MR W. BURGES, ARCHT.

The Building News Jany 11th 1867

Whiteman & Bass Lithographers, Holborn

Honolulu · Cathedral.

W. SLATER
R. H. CARPENTER } ARCH^TS

THE STREET-CLEANSING QUESTION.

THE past week has sufficiently proved that one of the greatest inconveniences we might almost say calamities—that could well happen to London is a protracted snowstorm. A great fall of snow, by blocking up and rendering the streets impassable, interrupts her gigantic traffic, than which no heavier calamity could befal the metropolis of the world. This will be admitted on all hands. Under the circumstances, therefore, the very favourable change which has taken place in the weather is far from unwelcome. The streets of London, which a week ago were "knee deep" in snow and slush, are once more open thoroughfares, and street traffic and individual locomotion, which were entirely suspended, or at best performed with wearisome effort, are again in full swing. With a lively recollection of what we Londoners have experienced and "passed through," we gratefully thank Providence! As was pointedly remarked by a West-End householder, who, on Monday, applied at the Marlborough-street Police-court for a summons against the Vestry of St. George's, Hanover-square, for neglecting to remove the snow from the streets in that parish, "had not Providence done what the Vestry neglected to do, the inconvenience to the public would have been unbearable." Let us hope that the experience of the past week will lead us to trust less to Providence in a matter like this at least, and more to ourselves for the future. At present we are enjoying a cessation of the storm, for which, for the reasons already stated, we are thankful; the question, however, is, Will we be better prepared to cope with another such storm when it comes—as there is every reason to expect it will come before "the winter is past and gone"—than we were to cope with the last? We fear it must be very generally admitted that Mr. Bumble did not manage matters in the most satisfactory manner on a recent occasion. Indignant complaints of the pig-headedness of that pompous and self-sufficient functionary have been rife in all quarters. He has been charged with a dereliction of his duty, of which a very principal portion, as is generally conceived, is to prevent the accumulation of snow in the streets. There could be no doubt as to the condition of the streets. It would appear, however, that the law of the case is not so clearly defined as it might be and ought to be. We can only say that the sooner the law is more clearly defined the better. While one local board considers itself legally bound to remove the snow from the streets within its district, another local board cannot see it. Thus during the late severe snowstorm, while the St. Pancras District Board set to work with commendable spirit, and cleared the main thoroughfares within its jurisdiction, other vestries were content to leave the work to Providence. The consequence was that the traffic suffered very little inconvenience in some parts of the metropolis, while in other parts there was no traffic at all. And it so happened that it was just those portions of the metropolis most needing relief, viz., the City, which were most neglected. As usual, "they manage these things better in France." In Paris, for example, they go to work in a thoroughly business-like and systematic style. That city is divided into small districts, to each of which a certain number of sweepers are always attached, and these not only clean the streets every day, but are liable to be called out at a moment's notice on extraordinary occasions, such as a fall of snow. So perfect is the organisation that the men begin work as the white flakes fall, their numbers being increased as the occasion may require, and the snow is swept to the sides of the streets in heaps, and then carted into the Seine or into open spaces with surprising rapidity. So it ought to be here, and so it would be under a better system of local government than we have at present. It is said that difficulties exist in London which do not exist in Paris. There need be no difficulty at all. What is possible in Paris, as regards street-cleansing at least, is surely possible in London. The vast extent of the metropolis presents no insurmountable difficulty. London, like the French capital, is divided into separate and distinct districts for the sake of public convenience, and idle labourers are as abundant here as there. It was estimated that between 5,000 and 6,000 persons connected with the building trade, of whom a large number were labourers, were thrown out of work by the late frost. Admitting that these men would be willing to turn public scavengers, how, it is asked, are you to get at them? The answer is easy enough. Let each parish issue placards announcing the offer of work, and hundreds of hands would be obtained at any moment's notice. Have not gangs of frozen-out labourers been parading every street in London in search of work? The St. Pancras Board experienced no such difficulty. It found labour in abundance, and readily availed itself of it, and the St. Pancras district was the only one in the metropolis which was not snowed-up. At all events, the main thoroughfares were kept comparatively clear, and, as a consequence, traffic suffered less interruption there than anywhere else. From a report by the Chief Surveyor of St. Pancras we learn that nearly ten miles of streets in this parish were cleared at an expense of £1,000—by no means a large sum, considering the object. It was not attempted to clear away the snow from the whole width of the roads, but mainly for a width of about 10ft. from the kerb, by which course was also removed all the snow that had been swept off the roofs of the houses, and the channels left open and free for the thaw when it came. As much as 7,000 loads of snow were carted away by means of 120 carts, with the assistance of nearly 300 men, working for three days and a half and three nights. Arrangements were made for taking the snow into the squares and shooting it round the enclosures. We observe that this Board has had a deal of abuse heaped upon it for the course it took. Some of its own members have charged the Board or its surveyor with gross extravagance. Had you waited for a time, say these wiseacres, there would have been no occasion to do what was done. It is all very well, though it is not very honest, to censure now that the thaw has accomplished all that was wanted. But supposing the storm had continued and increased it is very probable that we should have heard complaints of a very different kind. The cry would have been for action. The truth is that the law on this point is at fault. The Metropolitan Local Management Act, as far as it relates to the cleansing of the streets, must be amended. What is wanted is a special clause making it imperative on vestries to remove the snow from the streets within their respective parishes. According to the decision of Mr. Tyrwhitt, which will be found in our legal intelligence, the act, as it stands, does not empower a police magistrate to grant a summons against a vestry for neglecting to remove the snow or other refuse from the streets. The matter, therefore, is one with which the legislature must deal, and no doubt it will be brought before Parliament when it meets. Indeed, Mr. Bentinck, M.P., is almost pledged to ask that august body to consider the law with a view to its amendment.

EVICTED TENANTS.

ONE of the gravest—if not the gravest—question of modern times is, how are the poor of London to be lodged? It is of vastly more consequence than building a new National Gallery or new Law Courts. We give on another page some illustrations of new model lodgings recently built from designs by Mr. Wm. Burges. Though many such dwellings have been erected in London during the last few years, all that has been done is a mere drop in the bucket compared to what has to be accomplished. The question assumes larger proportions daily on account of the increase of London, the increasing demand for space for railways, &c., and the continual increase in the price of land. On Wednesday last the Evicted Tenants' Aid Association waited on Lord Derby, to whom they presented a memorial. The memorialists said: We "approach your lordship and the members of your Cabinet in the name of humanity and religion, as well as in the economic interests of the inhabitants of the metropolis at large, rich and poor; and with reference to the three points which embrace the scope of their labours, they venture very humbly to suggest:—1. That with regard to evictions, no further railway extension or public works should be sanctioned in the metropolis by the Legislature without compulsory provision or compensation for tenants liable to be evicted thereby. 2. That the question of overcrowding should be left for the present to the operation of the Sanitary Act of last session of Parliament. 3. That with reference to rebuilding, some public body or bodies should be charged with the duty of improving property now occupied and overcrowded by the poorer classes, by causing such property as may be judicially condemned to be unfit for occupation to be pulled down, and suitable other residences to be erected in their stead, when the owners of such property refuse to undertake the improvements required of them, and that the deficit, if any, be made a charge on the metropolitan rates; and that with this view the society urge the immediate acceptance of Mr. Torrens' bill of last session of Parliament as reported by the select committee, or some measure founded on similar principles by your lordship's Government."

A long and desultory conversation took place between the memorialists and the noble lord, but little practical good was the issue. The gentlemen forming the deputation were certainly unfruitful in useful suggestions, and Lord Derby did not treat the question with the gravity and thoughtfulness it demanded. We think it is desirable that Mr. Torrens' bill, which provides for the compulsory sale of fever-infested localities, should become law, but what then? Who are to build the new houses? We have wealth in London to meet all the modern exigencies. Dwellings for the people can be made to pay, and pay much better than Confederate or Peruvian bonds, or the many schemes in which millions sterling are annually lost. Resolution and honesty are the only things now required. There is plenty of sympathy afloat. Let that sympathy be combined with zeal and integrity, and this great problem will begin to be satisfactorily solved. There are scores of acres of land covered with two-story dwellings which might be replaced with five-story and six-story dwellings, and so more habitations may be provided.

ART EDUCATION.

THE Right Hon. Sir Stafford Northcote took the chair at the annual meeting of the Exeter School of Art, at Exeter, of which institution he is the President, on Monday evening. In the course of his address, he said—"There will be an interesting exhibition of the works of all nations at Paris this year; and, though we have had a great many international exhibitions, I think there is a general feeling that there never has been an exhibition since that of 1851 which possessed the interest which the Paris Exhibition of the present year is likely to possess. The Exhibition of 1851 was exceedingly interesting, because it was the first bringing together of the productions of all nations. The Exhibition of 1867 will be interesting because it is likely to be the greatest attempt at bringing together a fair representation of the works of all nations. I think, without jealousy or carping, we may admit that the French have a wonderful power of organisation, which probably exceeds this or any other nation; and we know well that they are on their mettle; that they are determined to make this one of the greatest Exhibitions that have ever

been seen. I think there is every promise that it will be, perhaps, more remarkable than any since that of 1851, to which it will be decidedly very superior in extent and scale of magnificence. It is important that England should show well at the Paris Exhibition, and I think very probably that England will do well and be very creditably represented in industry and art. I hope that those who take an interest in art will go over to Paris, and I hope the result of the Exhibition will be as remarkable in its way in advancing the cause of art education as the Exhibition of 1851 was in first promoting a movement which has now grown to so much. I think the French Exhibition will be extremely valuable, and will well repay the trouble and expense of a visit." In another part of his speech the right hon. baronet referred to the spread of art education. He said—"I am pleased to see that drawing is now becoming so completely a part of national education as it is. I was very much struck the other day in looking at a report of one of the assistant commissioners who are sent out by the commission upon middle-class education—of which I have the honour to be a member—to find that in going through the list of the various branches of education drawing stood higher than any other in the district which the assistant commissioner was appointed to survey. Drawing was taught in 95 per cent. of the schools which he visited, while in only about 87 per cent. was any one other subject taught. If you looked at the number of pupils learning different subjects, more boys were learning Latin and English grammar than were learning drawing; but drawing stood third on the list. I do not wish to place drawing above English grammar, history, and mathematics, or any other branches of instruction; but I do look upon it as a very important fact, and one exceedingly gratifying to those who are friends of schools of art, that drawing has taken such a place in the education of the country, because when this movement began we remember quite well people used to talk of drawing as a mere accomplishment, its acquirement waste of time to boys who ought to be learning something useful, and only to be taken up by those with a particular taste and genius for it. But I am happy to find this delusion is beginning to be dispelled, and we may hope that in course of time the English nation will throw aside altogether the delusion, which I believe was a very unfortunate one for this country. We are beginning to discover that drawing may be taught upon as strict principles as almost any other branch of education. It may be made a means of training the mind as well as the eye and the hand, and will enable the learners to appreciate much more fully the work they have got to do in other respects. We are beginning to see that it is not only useful in all branches of industrial life, but that the habit of working carefully truly to represent on paper actually what we see is good for the mind, because it induces a habit of clear observation."

RAPHAEL AND HIS WORKS.

THE lectures at the Institution, Park-street, Bristol, were resumed on Monday evening, when Mr. J. Beavington Atkinson read an able paper on the above subject, illustrating his remarks by numerous engravings from his portfolios, and also by photographs from the cartoons lent by the Bristol School of Art. Mr. Atkinson in his opening remarks observed that a single evening was far too short to devote to the express consideration of the genius and works of the greatest painter the world had yet known; the difficulty in treating the subject would be in concentration. In sketching biographically the life of Raphael at Urbino, it was remarked that he was certainly, in all that concerned his art, a favoured child of fortune. Perhaps as a first instructor few could be safer and sounder than his father, but as Raphael was only twelve years old when his parent died, it might be taken for granted that in those early lessons little more than the rudiments of the art were taught. His progress in the school of Perugino, to which he was sent by his uncle, was then glanced at, and in noticing his early death, at the age of 37, the lecturer observed that it was well, therefore, that he went early to work; his genius was not wasted, for from the hour when his hand could hold a pencil not a day passed without a line or from his father a lesson. In him they saw no silly reliance on genius, often the plea for indolence—no gaping for inspiration, no swoonings ecstacies of sentiment—all frailties incident to the smaller and weaker order of talent; but, instead of this, hard and resolute work. In Raphael's painting he was not aware of a single instance of bad, careless, or vague drawing. His earliest achievements showed qualities of perseverance and hard fag, and that practical common sense to seize clearly, and deal concisely with, the points of a subject, without which brilliant powers were of little avail. His youthful works indicated another pledge of future greatness, a remarkably clear and painstaking effort to approach the truth. There was something tentative and timid in the touch; there were signs of modesty and misgiving in his first attempts to follow after nature; his mind was recipient and expectant rather than productive and originative. As a pupil, he was content to be as his master. As Christian art at the close of the fifteenth century had well-nigh reached its culminating point, to say that Raphael when he left his master's studio was equal to him was to assert no less than that a novitiate in his twenty-first year was already a proficient, and that an ordinary term of apprenticeship had put the pupil in possession of an art which it had needed three centuries to mature. He had the advantage of being able to commence life at the point where old men were content to leave off. Raphael's second or Florentine period, which was next noticed, extended from 1504 to 1508, and these four years were full of great works. There was then, surely, in the Tuscan Athens sufficient noble thought, high art, intellectual converse, and refined luxury to stimulate and delight a sensitive and aspiring mind. The almost Christian character maintained by the artist during this time might in some measure be due to the friends he chose. Having elucidated the first and second styles of Raphael by alluding to the Madonnas and holy families, of which he painted no less than fifty—the best known were especially commended for the simplicity and purity of their Christian sentiments—Mr. Atkinson remarked with reverence that Christian art, if true and positive and of any worth, must follow in the footsteps of Him who was at once human and divine. He then proceeded to discuss the questions of genius, and inspiration, and beauty in art, remarking that the Christian art into which Raphael threw himself was the embodiment of Christian truth and beauty. Raphael joined physical and spiritual beauty, and so made that enduring and ideal humanity which reconciled as it represented two natures. Thus, laying aside all pretension to inspiration (the lecturer remarked) in any sense, he had endeavoured to show how from merely natural powers and materials Raphael matured Christian art. The genius he had ascribed to him infused into the manner of the period vigour, beauty—in short, nature. Of the painter's third or Roman period, it was remarked that it brought with it a vast development, and to it belonged the greatest pictures the world contained. When at the age of 26 Raphael travelled to Rome he did not get rid of his Florentine manner; the two periods overlapped each other; there was no break in continuity, no sudden revolution, but merely progress through development. Directing attention to the Roman school generally, of which Raphael was the founder and chief ornament, the lecturer, the better to illustrate his observations, glanced at the intellectual and religious condition of Rome at the time, and then went on to show what compensations and advantages came to the Roman school of paintings under the changes he had just traced. He denied the charge that Raphael owed the greatness of his Roman style to Michael Angelo, partly because, with the exception of one or two figures, such as Isaiah, there was nothing in common between the works of the two contemporaries, and also because there were other causes amply sufficient to effect the change from the Florentine to the Roman manner. Raphael had in style and mind grown into the man, and in Rome he entered a great and busy world which called forth his power. The support of patrons and the rivalry of the greatest artists of the age stimulated to utmost effort. He was also accustomed to take counsel of the learned men and leading intellects of the time, and thus they could in some measure understand how Raphael was called to the highest arguments, and as a painter representative of the times. Raphael, so far as he was not self-made, was fashioned by his age; in part he founded the Roman school, but that school had never been known had the city of Rome not existed. That city demanded a school; and it was not from Michael Angelo, but from sculptors of a prior age, that the school found patronage, whose works were then exhumed from the *debris* of the Roman empire. Indeed, no artist was removed from this world-wide influence. In the Roman style of Raphael this painting of many generations obtained its consummation. Raphael made the old art live and move; he saw nature through the classical, and from the classical he drew that which was eternally true. He made no dead transcripts from the Greek, but worked as the Greek artists would had they received from Julius and Leo commissions. They recognised in his lines the same grace, in his forms the same beauty, in his compositions the balance and the symmetry, in his humanity the ideal and transcendent types which brought Greek art so near perfection. This was the Roman school of which Raphael was the founder, or rather the reviver. The stern grandeur of the Greek was in his hands softened; it was in this blending of two schools, the Christian and spiritual of Florence with the grandeur and simple nature of the Greek, that the perfection of Raphael's Roman manner was reached. The close of the paper was devoted to a critical estimate of Raphael's genius as a whole. Raphael, as they had seen him, owed as much to others as to himself: he borrowed without robbery; he repaid and made the world rich. Genius was with him often the power of adaptation, the art of putting the right thing in the right place—that least "touch of nature that makes the whole world kin," and gives to the style called Raphaelesque a charm words could not well define. In considering the precise relations to nature and art in which his pictures stood, it was observed, he troubled himself little, let us hope, with metaphysical perplexities; intuition was his surest guide; that his first intuition led him to approach as near as might be to nature's truth and beauty his countless studies showed; and from this it would seem as if he never painted a figure till he had made careful studies from the life, even of the extremities, the draperies, and sometimes of the anatomies which draperies would conceal. Illustrating the naturalistic yet transcendental method of which Raphael's pictures were express examples, Mr. Atkinson remarked that while the Dutch school made itself at home in a beer cellar, and its utmost reach was the temptation of St. Anthony, the Roman school rose to argument, to philosophy, theology, and jurisprudence. This contrast resulted from the diverse view and interpretation of nature. Raphael so studied nature as to get at her central underlying idea—the original and perfect type, and in this he was not singular. They might be sure that the artist had greatness in him when he made them think more nobly of nature than they did before. Of Raphael it might be said that he added to man manliness, and, like Shakspeare, clothed womanhood in womanly grace and modesty. In his pictures lived characters which could not die; his genius sustained them in immortality. Were those figures annihilated, not only would art suffer loss, but nature herself would feel the void. The genius of Raphael was finally summed up by the lecturer in one word, dramatic, though he said he feared he should scarcely carry conviction to his audience. What writers accomplished in words, he reached by pictorial composition. His chief works were eminently dramatic. But he avoided the comic side of the dramatic. At some length it was argued that if a man was true to nature he must be dramatic; and several of Raphael's works were cited in proof of the assertion.

The lecture, of which the above is a brief abstract, showed that much time and thought had been bestowed upon its preparation. At its close a cordial vote of thanks was tendered to Mr. Atkinson.

STRIKES AND TRADE UNIONS.

AT a recent meeting of the Statistical Society, Col. Sykes, M.P., presiding, a paper was read on "Combinations and Strikes, with Reference to Wages and the Condition of Labour," by Mr. Jacob Waley, M.A.

The following is an outline of the essay, which was exhaustive in its treatment, and was attentively listened to by a crowded meeting of members. Mr. Waley first discussed the question whether strikes were, in any case, economically justifiable. He said that question must be answered in the negative if, in the nature of things and under the operation of irreversible, economical laws, the labourer was incapable of obtaining, by means of

a strike, any important advantages which could not more readily and beneficially be obtained by less violent means. This was a matter upon which the greatest possible differences of opinion still prevailed. So much of capital as was paid in wages was the fund to be divided amongst workmen. Its proportion to their number determined the rate of wages. Capital was attracted to a prosperous and repelled from a declining trade, and the interest of the workman was, therefore, bound up with that of his trade. Capital and labour at variance were like two heads on the same stem in perpetual conflict, notwithstanding their having common sensation. In a declining trade a strike, by augmenting its disadvantages, might cause its ruin. Notwithstanding strikes, there was prodigious activity in the London building trades, which could not be transferred to a foreign soil, and in spite of them the coal, iron, pottery, and cotton industries flourished. In fluctuating trades, where there must be a large margin of uncertainty in the division of returns between profits and wages, a strike may advance the latter, perhaps permanently. It was difficult to say how far wages rose naturally with prosperity, and it would be well if employers would prove by example that they did so. Reviewing certain strikes and deducing inferences, Mr. Waley questioned the received mode of computing the losses of the workmen during a strike by adding the amount actually expended to the loss of wages. The money expended took the place of part of the wages which would have been earned. The contributors took upon themselves the loss represented by their contributions; the balance of the loss of wages fell upon the workmen on strike, but the aggregate of the workmen's loss was equal to the amount of wages which would have been earned, and no more. Having shown that historians of the strikes of the engineers, the Preston operatives, and the London builders, considered that the balance of advantage, consequent as well as immediate, was on the side of the men, Mr. Waley remarked that there were more solid and cogent reasons for preserving the integrity of the standard working day than for abridging its duration. He saw no objection, but rather the reverse, to workmen directing their efforts to a reasonable and moderate reduction in the hours of labour instead of to a rise of wages. Referring to apprenticeship restrictions, he said that it must appear strange that, after legal requirements had been removed, others should be voluntarily imposed, and they must have a pernicious effect in preventing the transfer of labour and in hindering the workman from bettering himself. On the whole, although apprenticeship might be sound as a practice, it was questionable whether it could afford a reasonable ground for combined workmen to make a stand upon against the masters who, finding capital and running risk, must mainly control organisation and industry. Whilst conceding that the power which combination conferred upon the workmen was essential to his protection, it must be earnestly desired that that power should rarely be called into active exertion, that its effect should be felt rather in promoting peaceful solutions and averting contests than in provoking them or determining their issue. That in some districts strikes were so chronic, must arise from some serious unsoundness in the relations of employer and workman. Discussing remedies, he passed over courts of conciliation as inapplicable to a free bargain, and referred to the successful experiment at Methley Colliery, of dividing the profits above 10 per cent. with workmen, shareholders, and customers, which Messrs. Briggs found more profitable to themselves than their former plan of working. Messrs. Fox, Wood, and Co., of the Newport Rolling Mills, Middlesborough, had introduced a similar scheme without making a joint-stock company. These schemes did not go so far as ordinary co-operation, which might ultimately affect materially the organisation of labour. Meanwhile candour, good temper, and understanding of the relations must be relied upon. On the whole, he thought the following conclusions might be accepted as being in accordance with the facts:—The single workman is, when alone, no match for his employer. His weakness naturally leads to his combining with others having the same interest with himself. This combination may be legitimate though not confined to the workmen under one master, but much more extensive in its scope. The workmen of a trade may fairly combine for upholding common trade interests against a master or any number of masters. A strike, or the fear of a strike, is the last resort of workmen for enforcing a more favourable bargain with employers. Without the assistance of an extensive organisation by which funds could be collected from workmen in employment and applied for the maintenance of workmen on strike, it would hardly be possible that a strike could be conducted to a favourable issue. Hence the connection between trades' unions and strikes. A strike for a rise of wages or a reduction in the hours of labour, if made when the condition of trade renders such a demand reasonable, if not resorted to until peaceable means have failed, if carried on without violence or intimidation, is not necessarily to be condemned on economical or other grounds, but, as it is sure to inflict great loss and distress, and to impede the production of the wealth on which both employers and workmen must live, it should be regarded as a great calamity, and should not be undertaken without careful consideration of the circumstances of the trade, nor while there is a chance that the dispute may be amicably settled by peaceful means. Employers must consent to abandon the autocratic view of the position of the chiefs of industry; they must be forbearing and conciliatory in their relations with their workmen; they must recognise in the trades' union a power co-ordinate with themselves, and consent to regard it as representing the workman in those matters on which he has a right to be heard, such as his hours of labour and the salubrity of the factory in which he works. On the other hand, they are not bound to admit of the interposition of the society as to any matters not immediately connected with the remuneration, health, and comfort of the workman. Workmen, both individually and when connected in trade societies, must bear in mind that they have a common interest with their employers as well as a separate interest. Both are interested in the augmentation of the trade resources which form the fund to be shared between them, and it is only when the apportionment takes place that there is room for variance. Trade unions must avoid meddling and officious interference, as those whose means keep industry going and who run the risks attendant on industrial undertakings must be left to control and discipline industry. Unions must cease to assume that there is an antagonism between them and the masters, and must bear in mind that they are doing their constituents incalculable mischief when they hinder the growth and impair the prosperity of the trade to which they belong. They must keep to their own functions, that is, the protection of trade interests and the due administration of their common funds. Their action for political objects can only be fatal to their efficiency for the purposes for which they were formed. Above all, they must respect the freedom of others, whether masters or workmen. Only when they abstain from coercion, rely on the free and voluntary support of their members, and forbear to interfere with the liberty of others, can they expect to win respect or support from enlightened opinion. In the ensuing discussion the views of Mr. Waley were generally endorsed.

THE BIRMINGHAM ARCHITECTURAL SOCIETY.—ANNUAL MEETING.

THE annual dinner of this society took place at the Hen and Chickens Hotel, New-street, on Friday evening last. The chair was occupied by Mr. J. H. Chamberlain, president of the society; and the vice-chair by Mr. W. Harris, the Vice-President. The following members of the society were present:—Messrs. J. R. Botham (treasurer), F. B. Osborn (honorary secretary), J. J. Bateman, Thomson Plevins, J. G. Bland, F. Empson, H. Yeoville Thomason, T. Naden, G. Bidlake (Wolverhampton), J. A. Chatwin, E. Holmes, James Veall (Wolverhampton), A. B. Phipson, Nichols (West Bromwich), Corser, J. H. Hawkes; and Messrs. P. Hollins, S. Timmins, Allen E. Everitt, and J. T. Bunce, honorary members of the society.

After dinner the President gave the health of "The Queen," which was duly honoured.—Mr. Naden then proposed, and Mr. A. B. Phipson replied to, the toast of "The Royal Institute of British Architects."

The next and principal toast, "Success to the Birmingham Architectural Society," was given by the President (Mr. Chamberlain), who said:—In the two years that have elapsed since we last dined together nothing of very great importance has occurred in the history of our national art and architecture; and with regard to our own little society, we have been content to follow our ordinary custom, taking up such subjects as were presented to us for discussion, and assisting one another with advice and counsel whenever that advice or counsel was required. But we have to congratulate ourselves upon the additions that have been made to our numbers; and we are most glad to welcome here to-night those gentlemen who, practising our art in neighbouring towns, have joined our society, and those honorary members whose talents and attainments have so often proved of advantage to us. There is surely no need to dwell upon the use of a society like this, or upon the advantages of association. All of us must constantly have felt how comparatively weak, helpless, and useless we are without the assistance of our fellows, and how impossible it is for nearly all men to achieve much that is good or great if they cut themselves off from intercourse with those who, by similarity of mental habit and study, are naturally able to assist and help them. In professional questions it is often a matter of necessity that we should consult together, and decide upon a common course of action. And there are now being presented to us, day after day, questions relating to matters of custom and practice, which it is almost impossible for any one architect to decide upon rightly by himself. Take, for instance, those questions which are now being persistently raised by the Builders' Association. There is one change in particular which is called for, and which, if it should by any means be brought about, would entirely subvert the present position of the architect and the builder, and would be most entirely, thoroughly, and completely disadvantageous to the latter. The change that the Association wants to bring about is this: that in future the architect shall cease to care for the interests of the builder, and shall regard himself as only and solely the agent of the client. In fact, the Association considers it an impertinence on the part of the architect that he should profess to be anything else. Now all of us know, from our own experience, that, although we are "paid by the employer, and can be dismissed by the employer," yet that in the numberless questions that arise during the continuance of all building operations our influence is exerted over and over again to the advantage of the builder, and that he does derive from us continual assistance and support. We have hitherto regarded it as our duty to see that our clients or employers have their work properly performed, and the stipulations of the contract fully carried out. But at the same time it has been and it is a tradition amongst us, that the builders' interests are also to be considered by us, and that our position is constantly and of necessity that of an unbiassed arbitrator, and that we do not take the narrow, the exclusive, the one-sided view of a mere paid agent or partisan. From this position the builders would depose us. But they will have cause to be sorry if the change they desire is really carried out. They ask the architects, deliberately and with emphasis, to take from them the help which is now constantly given, and to transform themselves as far as they can, if not actually into the builders' enemies, at least into their stern and severe judges; always on the watch for faults and defects, always looking to the letter and never to the spirit of the law, and always prepared to visit every shortcoming and every deviation from the letter of a contract with the narrowest, the severest, and the most bitter judgment which it is possible for one class of men to mete out to another class, for whom it feels no sympathy and towards whose well-being it has no care. But there are other subjects, momentous ones, which, as a society, we ought to study. For instance, there is the study of archæology and of art. Nothing much need now be said about the study of archæology, as that will be specially dealt with in the course of the evening; but it is a matter of much importance, and with which we are greatly concerned. The town is gradually changing; one by one the old buildings are removed; old streets are widened, new ones are made, and unfortunately, in the majority of instances, without any record being kept of the nature of the change. Now, each architect ought to consider himself as in duty bound, whenever he is called upon to replace an old building with a new one, whether that old building is good, bad, or indifferent, to make or to have made careful drawings of the work he is about to destroy. Then, if such drawings were deposited in our own library, we should have, in time, a most valuable series of historical records, which, alike to the antiquarian, the archæologist, or the historian, would possess great and undying interest. Then, with regard to the study of art, in past times architects have done great things. Take, for instance, four names only, those of Stuart, Chambers, Rickman, and Pugin. The first of these was

the great delineator and historian of Grecian art. He it was who revealed to the European world for the first time the unsurpassed glories of the greatest triumphs of ancient art. Sir William Chambers, also, was the historian of Palladian architecture, and the chief English exponent of that school, the Italian Renaissance. Again, Rickman, a native of this town, directed the growing taste for Gothic architecture, and, for the first time, classified those monuments which so many had learned to admire; and after him, Pugin revealed to us the inner life of that glorious school, and by patient and minute investigation, aided by the fire of his great genius, discovered the roots from which that glory had sprung, and revealed his knowledge to us. But of late years architects have not appeared in the foremost ranks of art literature. The work of investigation has been carried on by archæological and architectural societies, but no English architect has distinguished himself greatly (unless we except Mr. James Fergusson) as an author. Yet the field is a wide one, and one subject that demands our most earnest consideration is that of the unity of art. Indeed, it is owing to this unity of art being so little felt or acknowledged that, comparatively with our hope, so little actual progress is made. Artists work alone, and neither feel nor see, nor seem to care to know, that all art is one; that it is literature, painting, sculpture, architecture, music, and the minor arts that together make up decorative art; that these are really and rightly one and indivisible. The painter thinks only of pictures—the sculptor only of the statue, the author only of his book; but the architect who knows anything at all knows well that, to produce a great result—that to erect a building for which men shall care, and towards which they shall look—these separate excellences must be united together. Those who have studied both art and literature know that the history of the one is almost the exact counterpart of the history of the other, and that no man can have a perfect knowledge of ancient art without a knowledge of ancient literature, or can understand that literature without an insight into the meaning of its contemporary art. Yet, however keenly we may study art, however diligently, however honestly, we shall find that the result of our studies will be that we shall be divided into two classes, each representing a distinct line of thought. Throughout the history of many long years these two separate trains of thought have been recognised, and have been called by different names. They have been called Calvinistic and Arminian, Tory and Radical, Catholic and Protestant, Classic and Gothic, and by many other names, all tending to point out those two great schools of thought under whose banners all great thinkers have enrolled themselves, and will probably continue to be enrolled. But as far as we are concerned there seems to be no cause for regret, as, indeed, there is no use in regretting that which is inevitable. On the contrary, we may, whilst we grieve that there are truths which we can never fully appreciate, be glad that there are others to whom these truths are made clear. Also, in pursuing the study of art, we shall see more and more clearly how all that is good in ornament and beautiful in design arises out of "use;" that from the commonest wants of mankind the most beautiful forms have been originated; that if we are to excel in our art at all, or understand its history at all, we must look below the surface of all form to find the causes which eventually determined it; and that we shall not find those causes in the fancy or imagination of the designer, but, in the first place, in some commonplace want or necessity, honestly and thoroughly met. It is our knowledge of these things, and our practice of them, that gives us that influence which we now possess. It is an advantage that we cannot well be too proud of, that, generally speaking, we are so attentively listened to in matters of our art, and our opinions deemed worthy of consideration. In the great revival of art which we have happily lived to see, the influence of architects has effected much. It has already well nigh banished the apparently cheap, but really costly shabbiness, which at one time threatened to leave our towns a wilderness only of rotting and rotten laths and crumbling stucco. But every year better and sounder materials are being employed, and every year more and more of beauty is introduced into our work. Therefore, in proposing this, the toast of the evening, "Success to the Birmingham Architectural Society," what we are really desiring is increase in knowledge amongst ourselves, increase our mutual reliance and support, and for our town a gradual and constant change, from meanness into nobleness, from shabbiness to greatness, and from ugliness to beauty, until at last it may become, as indeed there is no reason that it should not become, as full of all grace and loveliness and beauty as those old Italian cities in which it is impossible to walk without rejoicing, and of which the memories are imperishably and unspeakably dear.

The address of the president was frequently interrupted by applause, which was warmly renewed at its close.

LIVERPOOL ARCHITECTURAL SOCIETY.

THE seventh meeting of the members of this society, this session, was held on Wednesday evening, Mr. T. J. Kilpin, the president, in the chair. The President said before they proceeded to the transaction of the ordinary business it was his painful duty to announce to the meeting the death of one of the most valued members of the society, Mr. Stirling, the sculptor, who expired on Sunday, after a long illness. He had been connected with the society from its commencement, and there were few members who took a greater interest in it and devoted more attention to it than he did. The society was particularly indebted to him for the trouble he took in forming and instructing the students' modelling class, to which he gave the use of his premises and devoted his services, his time, and his talents gratuitously. In the particular branch of his profession to which he devoted himself Mr. Stirling had few equals.

Mr. Boult moved "that the secretary be requested to convey to Mrs. Stirling the expression of the deep feelings of regret which the society experiences on the occasion, and of their sincere condolence with her in the heavy affliction which has befallen her." Mr. Bradley seconded the motion, which was unanimously adopted.

Mr. Gibbs gave a brief description, illustrated by a diagram, of a plan for improving the ventilation of sitting rooms. The plan consists in leaving the jambs on each side of the fireplace hollow, carrying up the flues instead of building them solid, the flue on one side being for the ventilation of the rooms on the upper story, and that on the other for the rooms on the ground floor. The cold air is admitted through a grating in the plinths of the building, and in ascending the flues passes through cast-iron chambers in close proximity to the fireplace, thus getting slightly warmed before entering the room through a perforated zinc panel near the ceiling, or through an open ornamental cornice.

Mr. Boult exhibited some beautiful specimens of polished madrepore marble, from Devonshire, remarking that in the rough block the stone was used in the construction of the Plymouth breakwater.

The subject of building contracts, which was discussed at the last meeting of the Architectural Alliance in London, and by this society last session, was again introduced by Mr. Boult. It will be remembered that at the last meeting of the Architectural Alliance a form of contract was submitted by Mr. Plevins, of Birmingham, and that considerable discussion took place with regard to the last clause, which provided that in certain cases matters in difference between the contractor and the proprietor, instead of being arbitrated by the architect, should be referred to an independent party. It was ultimately resolved that the draft contract be referred to the different societies in the Alliance for their consideration and report. Mr. Boult now expressed his opinion that, although he believed it would be very seldom enforced, the insertion of such a clause in the contract would tend to promote harmony and confidence between all the parties to the contract. A circular from the General Builders' Association, submitting four suggestions on the subject of building contracts, was read, and, after some conversation, it was resolved that the form of contract prepared by Mr. Plevins and the suggestions of the Builders' Association be circulated amongst the members, and that the farther consideration of the subject be adjourned to a future evening in the current session to be appointed by the council.

NORTHERN ARCHITECTURAL ASSOCIATION.—ANNUAL MEETING.

THE eighth annual meeting of the members of the Northern Architectural Association was held at the Old Castle, Newcastle-on-Tyne, on Tuesday, the 8th inst. In the absence of the president (Mr. Thos. Moore, of Sunderland), Mr. J. Johnstone, vice-president, took the chair.

In the absence of the honorary secretary (Mr. T. Oliver), Mr. Dunn, Newcastle, read the annual report, which detailed the business done during the year, and congratulated the members on the increase to their numbers which had taken place during the past as during previous twelvemonths.

On the motion of Mr. John Ross (Darlington), seconded by Mr. G. G. Hoskins (Darlington), the report was adopted.

On a ballot being taken, Mr. J. G. Sullivan was elected an associate of the association.

The Vice-President afterwards delivered an interesting address to the meeting, in the course of which he said:—I have to congratulate you, gentlemen, on the continued and increasing prosperity of this society, as you have heard from the secretary's report. Many new members and associates have been enrolled, and the state of our finances is healthy. We now number amongst our members, with very few exceptions, the names of all in the three counties who are noteworthy in the architectural profession. The consequent influence of this society is great, and is being yearly more and more felt, to the advancement of art and the elevation of the profession in the public mind. This picture of our position is certainly very gratifying; but that future presidents may be able to paint it in still more glowing colours, does it not behove us in the present to make strenuous efforts by every means in our power to increase even further the influence and utility of our association? In the first place, I hold it to this end highly essential that we should, if possible, obtain and hold our meetings in premises of our own. I would advocate the formation of a collection of local building materials, and appliances and patents connected with the building trades; the introduction of classes for assistants, pupils, outworkmen, and operatives, in which projective instruction—art principles applied to building—the use of materials and kindred subjects might be taught; and the institution of a library where a few costly books of reference (such as are not to be found in general libraries) might be lodged. And I would earnestly entreat every member to make great individual effort to popularise our general meetings, and induce a larger attendance—such small audiences as we generally have being little encouragement to gentlemen to expend the thought and labour necessary to the preparation of a creditable paper. One of the great disadvantages we labour under, as at present lodged, is the want of accommodation for the safe keeping of drawings, books, photographs, models, &c., that might be sent down for exhibition, after and during the time intervening between general meetings. I do not doubt but many members and friends would come forward with donations of books, photographs, sketches, and the like, were we but once out of lodgings and comfortably settled down into a habitation of our own. I cannot leave this part of my subject without remarking on the great good such societies as ours work among their members. Intercourse to a great extent swamps petty jealousies and rivalry, and engenders a gentlemanly and considerate line of conduct towards each other; much mutual improvement is the natural result of the interchange of opinion. I have now to draw your attention to the working of the Town Improvement and Sanitary Acts in this borough, for I cannot but think that the strict enforcement of the letter of the bye-laws is, in many instances, prejudicial to the improvement of the town, and, in exceptional cases, antagonistic even to sanitary reform. What is requisite is discriminating and intelligent interpretation of the bye-laws by those in authority. After lengthy reference to sanitary matters and labourers' dwellings, he said:—My own experience in the management of tenement property in the metropolis, in Glasgow, and in our town, teaches me that a great deal may be done towards the provision of working class dwellings, by the judicious renovation of old and dilapidated properties. Did time permit, I could point out in our town many properties and localities to which the principle might be advantageously applied. To all lovers of mediæval art, it must be most gratifying to learn that at length steps are about to be taken to restore, and place beyond chance of destruction, that noble monument of the middle ages, the St. Nicholas' tower and spire, which has so long been an ornament to our town, and the pride of our country. The committee of management, I think, have displayed

great discretion in their selection of an architect to whom to depute this important undertaking. Mr. Scott's acknowledged ability and great experience are sufficient guarantees that the restoration will be effected in a conscientious and painstaking spirit. After alluding to St. Andrew's, which had been restored by Mr. Oliver, the chairman said:—Conspicuous among the Dissenting places of worship in our town is that in Rye-hill, designed by Mr. Cabitt, of London, displaying as it does great artistic merit, and much original yet pleasing detail. Schools by Mr. R. I. Johnson, and Messrs. Johnson, Hogg, and Son, are erecting in our town, while the important commercial buildings, mostly by Mr. Parnell, lately finished, and at present completing, give interest and form characteristic additions to the street architecture, for which our borough is so justly celebrated. It must have been distressing to our honorary secretary to see his building in New Bridge-street (the new Mechanics' Institute) standing through so many months partially built, in consequence of the masons' strike, which has so seriously impeded building operations in the town. May the time not be far distant when the universal adoption of a few judicious measures, such as payment by the hour and the recognition of the individuality of the workmen, shall put a stop to strikes, with all their inconveniences and impoverishing effects, for ever! A great opportunity for the exhibition of some good architecture now presents itself in our borough. I refer to the St. John's Lane improvement, and beg to submit that the new street, when finished, ought to be second to nothing of the kind in the kingdom. It should be handsome and capacious, for it will be a leading thoroughfare from the central station to the heart of the town. It is, happily, placed in the hands of our able engineer and architect, Mr. Lamb; and I look forward with great hope to the result. What is being done in the matter of the new police-courts? and can anyone explain how it is that the Newcastle public, generally so excitable, and the magistrates, lawyers, and officials put up so patiently with their present accommodation, or rather the want of it? Our neighbours on the opposite bank of the Tyne seem to make but little progress towards the realisation of their new Town-hall scheme. Can it be that by this time they have discovered that the course pursued by them in procuring a design, and in the preparation of the necessary drawings, was as injudicious and extravagant as it was insulting to the local architects. This increasing practice, on the part of public boards and committees, to depute important architectural works to officials ignorant of the very elements of the art, and whose real duties are consequently neglected, cannot be sufficiently deprecated. In noticing the new lunatic asylum for the borough at Coxlodge, I cannot but reflect on the conduct of the magistrates in their selection of an architect, evincing, as it did, great inconsideration, not to say injustice, towards us of the profession in this town; as ratepayers we severally had a claim, and none will dispute but that we include in our body many gentlemen quite capable of carrying out such a building in accordance with the most advanced and enlightened views. It is with great pleasure I notice, after much talk, a practical and determined effort is being made to perpetuate the memory of Newcastle's greatest builder, Richard Grainger, whose enterprise and indomitable energy, I may say, almost created our town. I cannot conclude without a passing word of tribute to the memories of the late Mr. G. T. Gibson and Mr. Ralph Walters—men who worked, although not long, yet successfully, to improve their native town. The great architectural events of the coming year will be the competition for the new Law Courts, and for the rebuilding of the National Gallery. Twelve competitors have been named in each instance, but this number is much too limited to embrace anything like a fair proportion of the talent of the country, while a glance at the names of the competitors will make it apparent to every unprejudiced mind that the selection has been made in many cases with more favouritism than discrimination, many gentlemen being included whose *forte* does not lie in this direction. I cannot bring my mind to think that the steps taken by the Government in this matter are those best calculated to procure the best design the country is capable of producing; but, nevertheless, we may reasonably expect a fine exhibition of designs, for some of the ablest heads and hands are, no doubt, at this moment busy on the drawings. I would say a word or two on competitions generally, and, like most other architects, could cite many instances, within my own experience, of ill-usage and want of consideration received at the hands of committees. Competition I consider a great principle, and well calculated to encourage genius, and could it only be in some way systematised, and weeded of the many abuses that characterise its application at the present time. Attempts in this direction have been made by the Royal Institute of British Architects and the Association in London, and by some provincial societies, our own amongst the number. It is of the first importance, in the conducting of a competition to a successful issue, that the conditions and instructions be well defined and explicit, and the selection be made by some properly qualified and thoroughly disinterested tribunal. I am decidedly opposed to the method, so much in vogue latterly, of leaving the selection to the arbitrament of some professional man, however pure his motives and intentions; for it must be quite impossible for any mind to divest itself of the prejudices arising from education, study, or, it may be, a long practice in a certain school; and deal justice alike to all comers in different styles. You will no doubt all of you have remarked that a new system is likely to be inaugurated by the forthcoming competition for the Manchester New Town-hall, as described in the building papers; it seems sufficiently remunerative and promises well. I shall watch its progress with much interest, and in the meantime let us give all credit to the committees for their readiness to receive and profit by suggestions from without. Very many important works have been undertaken and finished during the past year throughout the kingdom, and I think I may say, generally, in a manner creditable to the architectural taste of the day. I believe that the architectural taste during the last few years has made great strides, and that the buildings at the present are not so utterly devoid of vitality and expression as some of the critics would seem to think. We have no predominating style, but I fancy there are few styles that ever existed, and contained the germs of a living art, but have been cleverly adapted and reproduced in our own time in our own land. I am no partisan of either side in the battle of the styles, for I hold that bad buildings are more frequently due to the want of art in their designers than to any insurmountable peculiarities of the style they affect. As a noteworthy example of this, I beg to mention the entirely successful designs of Mr. Thomson, of Glasgow, in that, perhaps, least plastic of all styles—the Greek. I cannot pass Mr. Thomson's name without a reference to a paper by him, in vindication of his favourite style, read before the Glasgow Association a short time ago. I consider it one of the ablest papers of the year in connection with our art.

Mr. Dunn moved and Mr. Hopkins seconded a vote of thanks to the Vice-president for the interesting address he had just read.

JERUSALEM.

SIR MOSES MONTEFIORE, Bart., has determined since his return last spring from the Holy Land, to erect another Hospice at Jerusalem, for the residence of several poor Israelitish families. This building will be on a large scale, and built near to that which was erected in the year 1859, under the superintendence of Mr. William Edward Smith, architect, of 45, Upper Bedford-place. The contemplated works, we are informed, are entrusted to the professional skill of the same gentleman.

ELECTION OF A SURVEYOR FOR COVENTRY.

A SHORT time since the authorities of Coventry advertised for a surveyor, and sixty-one candidates applied for the situation. At a meeting of the council on the 26th ult., twenty-one were selected, viz.—Mr. C. H. Lowe, London; Mr. C. H. Cope, Birmingham; Mr. Alfred Morris, Rasholme, near Manchester; Mr. Arthur Jacob, Croydon; Mr J. E. Palmer, Rugby; Mr. E. J. Purnell, Wolverhampton; Mr. G. Taylor, Coventry; Mr. C. Slagg, Manchester; Mr. William Beaumont, Elland; Mr. James Lund, Sheerness; Mr. James Richardson, Leeds; Mr. John Wood, Nuneaton; Mr. W. W. Fereday, Burton-on-Trent; Mr. Robert Vawser, Belfast; Mr. William Ground, Durham; Mr. Thomas Hewson, Salford; Mr. J. Jowett, Dorchester; Mr. John Laing, London; Mr. Edwin Whineman, Crewe; Mr. E. W. Shaw, Torquay; Mr. Michael Creamb, Brighton.

After some investigation the number was reduced to nine, and the following are the particulars of the names, residences, occupation, and experience of the candidates from whom the choice is to be made:—

J. E. Palmer, Rugby, surveyor to local board, was at Cardiff and Swansea, carrying on the drainage and other improvement works six years. Has extended the drainage works at Rugby, and carried out new waterworks, laid out new streets, and is thoroughly conversant with sewage irrigation schemes. Testimonials from Rugby Local Board of Health; inhabitants of Rugby; several engineers and others at Swansea and Cardiff.

E. J. Purnell, Wolverhampton, surveyor at Wolverhampton from 1857 to 1864; prepared a scheme of sewage, sanctioned by Council and approved by Mr. Rawlinson, the Government Inspector; superintended the formation of 79 streets there, at a cost of £20,000. Testimonials from Sir J. Morris, several eminent civil engineers, and members of Local Board, Wolverhampton. Could commence forthwith.

Chas. H. Lowe, London, assistant surveyor to parish of St. Mary-le-bone, has been concerned in every class of work required at that place, including paving, cleansing, lighting, watering, and drainage; was acting surveyor twelve months, during illness of surveyor, for which he received a gratuity of £50; prepared plans and estimates for the workhouse and infirmary there, to hold 1,900 inmates, which were approved by the architect to Metropolitan Board of Works. Testimonials from Vestry Clerk, Mary-le-bone; Dr. Whitmore, Mary-le-bone; Mary-le-bone Guardians, Dr. Randall, Surveyor of St. Pancras, Engineer to West Middlesex Waterworks Company, Rev. S. H. Widdrington, and others.

Alfred Morris, Rasholme, near Manchester, surveyor to local board, was articled for six years to corporation of Bolton, afterwards was engaged by them as assistant; his present employers have recently advanced his salary. Testimonials from several mayors, ex-mayors, and members of council, and civil engineers, at Bolton.

Arthur Jacob, Croydon, assistant engineer of the public works, had sole charge of twenty miles of the Great Indian Peninsula Railway to construct, under directions from the Indian Government; he prepared schemes for supplying water to two towns; on his return to England was chief assistant to Mr. Addison, Westminster. Testimonials from Lieut.-Col. Kennedy, Major-General Scott, Lieut.-Col. Lisle, C. B. Lane, Esq., Baldwin Latham, Esq., C.E., Chairman of Croydon Local Board of Health.

Wm. Ground, Durham, surveyor to local board, has held his present office since 1856; has been engaged on the Middle Level Drainage Works, in Cambridge; was Superintendent for the Lords Commissioners of the Admiralty, in repairing breach at the mouth of the Humber; was on the Ordnance Survey of England, at Durham, two years. Testimonials bear date from 1851 to April in the present year, and refer to applicant's ability as a surveyor, &c.; they have been used for similar occasions.

George Taylor, Coventry, architect and surveyor, has had considerable experience in every branch of his profession; is thoroughly acquainted with the construction of the waterworks and baths; furnishes list of twenty-eight public buildings erected under his superintendence. Testimonials from Charles Hanson, Esq., Rev. D. H. Haigh, Edington; H. Woodyer, Esq., Rev. G. F. Fessey.

Charles Slagg, Greenhays, Manchester, was surveyor at Leek from 1858 to 1862, during which time he thoroughly drained the town, and delivered the sewage on land; has been assisting the surveyor at Manchester the last four years, in extending the waterworks, and improvement of river and drainage; has assisted in the erection of several pumping engines. Testimonials from surveyor to local board, Norwich; City surveyor, Manchester; T. Curley, Esq., C.E.; Dr. Ritchie, and others.

James Lund, Sheerness, engineer and surveyor to the local board, has been engaged for many years on sewage and waterworks; had considerable experience in tunnelling, bridge building, and town improvements. Testimonial from R. Rawlinson, Esq., certifies as to the ability of applicant while employed under him at Lancaster

and Wigan. On the 2nd of January a special meeting of the Board of Health was convened, when the nine selected candidates had a personal interview with the Board. It was decided to reduce the number from nine to three, when Purnell secured 29 votes, Lowe 18, and Palmer 7. The third and final voting was—Purnell 28, and Lowe 10. The Mayor then formally announced that Mr. Purnell, of Wolverhampton, had been duly elected the surveyor for the city.

PERSONAL.

MR. SERJEANT BURKE has been elected for 1866-7 *Directeur* or chief honorary officer of the well-known Society of Antiquaries of Normandy. This is the first time the compliment has been paid to an Englishman.

Mr. W. C. Robson, the honorary secretary of the Master Builders' Association of Newcastle, has been presented with a handsome gold watch and appendages by the members of the association.

Mr. Thomas Purnell is succeeded as assistant secretary of the Grand Archæological Institute by Mr. A. R. Lodge.

Mr. E. J. Purnell has been elected surveyor for the city of Coventry, after a contest with sixty-one candidates.

Mr. Thomas Wheatley, locomotive superintendent to the London and North-Western Railway Company, at Wolverton, has been appointed locomotive superintendent to the North British Railway Company.

The death is announced of Mr. Robert Lemon, F.S.A., late of her Majesty's State Paper Office. He contributed many valuable papers of an antiquarian nature applicable to history and archæology to the *Gentleman's Magazine* and other periodicals of the kind. Mr. Lemon was 67 years of age.

If John Dyble, who was in business about 27 years ago, near Kingsland Gate, as marble mason, will apply to Mr. Peirse, 2, Cobourg Villas, Cobourg-road, Old Kent-road, he will hear something to his advantage.—Second column of *Times*.

Mr. Joseph Newton, of the Mint, has been reappointed president of the Association of Foremen Engineers. We believe that this is the ninth time he has had this distinction conferred upon him. Mr. Keyte has been chosen vice-president.

The following are the names of the judges appointed to decide on the merits of the New National Gallery designs:—Viscount Hardinge; Lord Elcho, M.P.; A. J. Beresford Hope, Esq. M.P., president of the Royal Institute of British Architects; W. Tite, Esq. M.P., F.R.S., F.S.A.; W. Russell, Esq., trustee of the National Gallery; W. Boxall, Esq., R.A., director of the National Gallery; D. Brandon Esq., F.S.A.; T. Gambier Parry Esq.; and R. Redgrave, Esq., R.A., Inspector General, Science and Art Department. A preliminary meeting was held on Wednesday last.

At the last meeting of the Institution of Civil Engineers, on the 8th inst., Mr. C. H. Gregory, vice-president, in the chair, six candidates were balloted for, and declared duly elected, including five members, viz.:—Mr. John Clark, engineer to the Municipal Council of Shanghae; Mr. Lewis Henry Moorsom, resident engineer in charge of the works at the London-road Station, Manchester, of the London and North-Western, and Manchester, Sheffield, and Lincolnshire Railway Companies; Mr. James Long Parker, executive engineer of the 1st grade in the service of the Government of India, Meerut; Mr. Charles Sacré, chief engineer to the Manchester, Sheffield, and Lincolnshire Railway Company; and Mr. Edwin Thomas, engineer to the Regent's Canal Company, and one Associate, viz.:—Mr. Adam Fettiplace Blandy, resident engineer, Millwall Docks.

WATER SUPPLY OF THE METROPOLIS.

THE following account is taken from the annual report on the health of the parish of St. Marylebone for 1865, and dated November, 1866. It is from the pen of Dr. John Whitmore, the medical officer of health for the parish. He says that he is indebted to the courtesy and kindness of W. H. Whiffin, Esq., the secretary of the West Middlesex Water Company, for most of the facts and statistics here given, and for the privilege of personally inspecting the works at the different stations of the company.

The water supply of the metropolis has of late occupied so large a share of public attention, and the effects of its impurities on the health of the population has formed the subject of so much discussion amongst men eminent in science, that I need offer no apology for describing somewhat in detail the method by which the water supplied to this parish by the West Middlesex Company is brought from its source to the dwelling of every householder, and the process it undergoes in its transit to deprive it of its organic and other impurities; but, apart from these considerations, the magnitude of the operations of this one company—which it must be remembered supplies only one-eleventh part of the population of London—cannot fail to be a subject of interest, inasmuch as it shows very forcibly what human skill and enterprise can accomplish, and the beneficent effects they are calculated to produce when wisely and properly directed.

The company's source of supply is the River Thames at Hampton, Middlesex, above the village, and six miles above the tidal influence, whence the water is pumped direct to Barnes, Surrey, through a 36in. main, $8\frac{3}{4}$ miles in length, passing through Twickenham and under the River Thames (through duplicate pipes) near Richmond Bridge and through Richmond and Mortlake. There are two engines at Hampton of 105-horse power each. At Barnes the company have three subsiding reservoirs* of about $20\frac{1}{2}$ acres area, containing about 55,161,768 gallons, available for filtering, and five filter-beds of eight acres area, the storage of the beds being 9,501,233 gallons. A small engine of 6-horse power is used for the purpose of washing the fine sand through which the water is filtered. This process of cleansing the sand I have seen in operation, and must pronounce it to be very effective. I may add that the filter-beds require cleansing out at intervals varying from one to three weeks, depending principally upon the state of the weather. From the filter-beds at Barnes, the water is conveyed by means of a 36in. conduct pipe under the bed of the river to the pumping establishment at Hammersmith, whence it is propelled to the high-level reservoirs and districts by means of five pumping engines of an aggregate amount of 900-horse power. The company have a covered reservoir at Notting-hill, which is 112ft. above Trinity high-water mark; it is about $1\frac{1}{4}$ acres in area, and will contain 3,672,000 gallons. They have also another covered reservoir at Barrow-hill, near Primrose-hill, which is 177ft. 6in. above Trinity high-water mark; this has an area of about $1\frac{3}{4}$ acres, and will hold 4,750,000 gallons. At Barrow-hill there are two pumping engines, one of 40-horse power, and the other of 45-horse power, for the supply of the higher parts of the district about St. John's Wood, the New Finchley-road, Hendon, &c., which places the reservoir cannot serve by gravitation. For the future permanent supply of this high locality the company have purchased land at the back of Kidderpore Hall, near Child's-hill, Finchley-road, where they are constructing another covered reservoir which will be 310ft. above Trinity high-water mark, and will contain about 2,500,000 gallons. The average daily supply of water to each person is thirty gallons. As regards the purity, the results of analyses made by Dr. Letheby and Dr. Frankland, and of those which I have conducted, show that its saline constituents amount to from 15 grains to 17 grains per imperial gallon, and its organic and other volatile matters to an average of from half a grain to three-quarters of a grain per imperial gallon. Compare this with the quantity of organic matter contained in the water derived from the surface wells of London, and which in many instances amounts to 3 grains, 4 grains, and even 6 grains per gallon, and we can then form an estimate of the great superiority of Thames water for all drinking purposes. It would not be possible in this brief summary to describe the arrangements of the filter-beds, but I may state generally that the bottom of them is covered over with a concrete bed, upon which is first placed a layer of course gravel 12in. thick; above this are four other layers of gravel of gradually increasing fineness, the thickness of these layers varying successively 6in., 3in, 2in., and 4in. Above the gravel is a layer of Barnes sand 12in. thick, and again above this is a layer of Harwich sand 21in. thick. Thus we have a bed of filtering material 5ft. thick, and through this all the water is made to pass before it is distributed for our use. I ought not to omit mentioning that since the year 1852, when the company obtained an Act of Parliament enabling them to change their source of supply from the Thames at Barnes to Hampton, £268,000 have been spent by them in the construction of new works. At the present time five water companies obtain their supply from the River Thames, viz., the West Middlesex, the Grand Junction, the Southwark and Vauxhall, the Chelsea, and the Lambeth, the three first at Hampton, and the two last at Thames Ditton. The quantity of water taken from the river by these companies amounts to an average of about 50 millions of gallons daily, or upwards of 18,000 millions of gallons annually. The inexhaustibility of the source from whence this enormous quantity of water is derived may be estimated by two facts, first, that in seasons of the greatest drought the fall of the river at Hampton does not exceed from 3in. to 4in, and next that the water which flows over Teddington weir in 24 hours is calculated at an average of 500 millions of gallons.

* In these reservoirs a considerable portion of the solid matter held in suspension is allowed to subside before the water passes into the filtering-beds.

MACHINERY FOR LIFTING WATER.

THE mechanical or motive power derived from the employment of water as a prime agent, says the *Mechanics' Magazine*, is due to the non-equilibration of the pressure it exercises in any given direction. The pressure may assume the condition of simple weight or the action of gravity, or of impact, or, as frequently occurs, of the two combined; it may likewise present itself as a force centrifugally developed. As air and water were the only mechanical powers available before the introduction of steam, many machines, as might be anticipated, were invented at various times for economising and utilising their force. The preference appears, however, to have been given on the whole to water wheels, of which there are three different descriptions generally recognized—viz., the undershot, overshot, and breast wheel. The turbine and Barker's mill are both well calculated to do good service in situations where the others could not be made use of; but they act not so much by the direct force of the water applied as by its reactive agency, and are consequently rather more complicated in their mechanism. The undershot wheel affords the simplest method of utilising the impactive force of water. It may be briefly described as a vertical wheel, turning upon a horizontal axis and carrying paddles upon its periphery which are perpendicular to the plane of the wheel, and are, in fact, in a line with the prolongation of any radius. All these wheels are so well known to engineers that we shall not describe them, except generally. In fixing an undershot wheel, there is one important practical detail to be borne in mind, and that is to so erect it that the current of the stream or river should be as nearly as possible in the direction of a tangent to the circumference of the wheel when the paddles dip into the water. On the supposition that only one paddle was in the water at the same moment, it would be possible to arrive at an accurate result of the work done by the wheel by a mathematical investigation; but as this is never the case, as two or three paddles always dip at the same moment, the problem becomes so exceedingly complicated, owing to the fact that each paddle produces an alteration in the angle and the velocity of the water when striking the next, that its solution has defied all theoretical attempts to reduce it to calculation. Although no accurate calculation can be made, except upon facts deduced from actual experiments, yet some general conclusions may be arrived. Confining the theoretical inquiry to the first assumption—viz., that only one paddle is acted upon at a time—it has been found that the work done by an undershot wheel never, except in rare instances, exceeds a quarter of that due to the water. The greatest amount of work is got out of the wheel when its velocity is equal to about half that of the water. It has been assumed, in deducing these conclusions, that there is no escape of water, and that the paddles are sufficiently broad to fill the entire breadth of the channel—an impossibility in practice. The undershot wheel is not, however, a good machine to employ where it is necessary to economise the power; for it wastes half the water when constructed in the most perfect manner, as suggested by theory. All machines set in motion by water impinging upon a succession of flat surfaces are open to the same objection, and the remedy is to curve the surfaces. This improvement is carried out in Poncelet's wheel, which has concave paddles, and which has been found by experience to do nearly twice as much work as any wheel with flat paddles. In 1825, the Institute of France awarded a prize to M. Poncelet

for his improved form of paddle, after satisfying itself that it produced the practical advantages claimed for it by the inventor. Theoretically this wheel is perfect in its construction, but in practice it only utilises about three-fifths of the motive power; its maximum effect is produced when the velocity of the wheel is rather more than half that of the stream.

In the overshot wheel, the water is above instead of underneath, and runs into buckets, which replace the paddles in the undershot, and are so constructed that they should retain the water until the wheel has nearly made a semi-revolution. Theoretically the water should not leave the buckets until a semi-revolution is accomplished, but this condition cannot be fulfilled in practice, and hence arises the chief defect of the wheel. It has been endeavoured to overcome this defect by a peculiar shape of bucket, but it was found to lead to a more serious evil—viz., that of retaining some of the water in the buckets during their ascent, and so adding considerably to the dead weight to be moved. We have alluded to the breast wheel, but it is in reality a modification of the overshot wheel, and differing from it principally in the direction at which the water enters the buckets. In the overshot the water falls into one of the top buckets and impels it in the direction of the stream. In the breast wheel it enters a bucket on a level with the centre of the wheel and impels it downwards, causing the lower part of the wheel to move in the direction of the stream, and also enabling the water to act with effect upon it, which cannot be done in the case of the overshot wheel. The relative advantages of these two wheels may be summed up as follows:—With a good fall, but small quantity and velocity, use the overshot wheel; with a small fall but large quantity, use the breast wheel; the latter should always be employed when the tail race is intended to be utilised.

It is clear, continues the *Mechanics' Magazine*, that these three wheels can only act under particular conditions of fall, quantity, and velocity, and to do so advantageously demands a combination of circumstances that cannot be always attained. Recently a description of wheel has been patented by M. de la Fontaine, with the object of combining the several advantages of the different systems.* This new wheel has flat paddles so arranged as to act whether partially or totally immersed in water, and capable of revolving in both directions. The inventor remarks that this would be a valuable detail where the motive power was that of the tides. The principle of the invention consists in fixing the paddles upon pivots, upon which they can move freely, and which allows them to assume a pendent position, when the force of the current

FIG. 1.

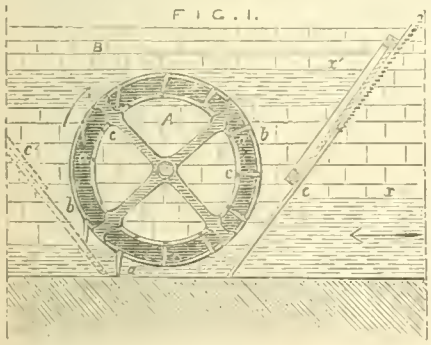
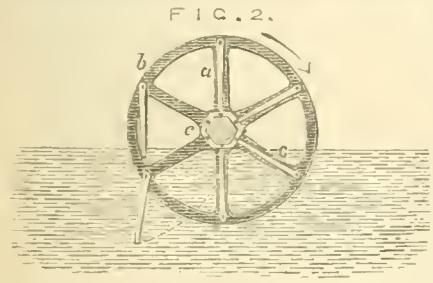


FIG. 2.



ceases to act upon them and to revolve completely round when the direction of the current is reversed. In fig. 1, the paddles *a a* are represented mounted upon the circumference of the wheel, and resting partly upon the short bars and stops *c c*, and partly in a pendent position. Supposing the water to be at the level *x*, and the sluice *c* opened to allow the proper amount of head, directly the water touches the paddles they at once bear upon the points of support or stops *c* fixed upon the frame of the wheel, and it commences to rotate. As the wheel emerges from the water they assume a pendent position until again acted upon by the force of gravity, and finally bear again upon the stops. The paddles in their ascent evidently present no resistance to the water, as they drop at once to the necessary angle of inclination. In fig. 2 a somewhat similar wheel is represented, but, instead of the paddles bearing upon stops, they base their points of support upon the axis of the wheel, which allows it to act under all conditions of partial or total immersion. This principle of wheel, therefore, is founded upon that of articulated or suspended and movable paddles, so arranged as to yield to the current when opposed to it in direction, but to resist it rigidly when acting favourably for the development of the motive power. It also possesses the other advantages with respect to immersion already mentioned, but the pith of the patent lies in the novelty of the paddles.

* We are indebted for the particulars of this invention to our contemporary *Le Genie Industriel*.

WAGES AND SHORT TIME.

STAFFORDSHIRE.—The ironmasters of South Staffordshire and East Worcestershire gave notice on Saturday of their intention to reduce the wages of the men in their employment. It is stated that among the millmen and puddlers, some opposition will be offered to the reduction; but the masters appear confident that a strike will not be resorted to. At a meeting of the London Working Men's Association, held on Tuesday, the following resolution was passed:—"That in the present circumstances of the iron trade, not only in North England, but in Staffordshire, it is desirable that the existing efforts on behalf of the ironworkers be continued."

LEGAL INTELLIGENCE.

INFRINGEMENT OF THE CHIMNEY-SWEEPERS' ACT.—At the Hammersmith Police court on Monday, Thomas Liley, a chimney-sweeper, was summoned for allowing a boy under sixteen years of age to enter the house No. 17, Addison-road North, Kensington, for the purpose of sweeping a chimney. The proceedings were instituted by a master chimney-sweeper named Stromeger, who saw the boy with the defendant at the house. He said to the defendant, "Thomas, you are violating the act in taking the boy into the house," when he replied that he did not care for him or the act so long as he had a shot in the locker to pay. Fined 20s., and 2s. costs. The defendant, who refused to pay the fine, was then ordered to be imprisoned for fourteen days, with hard labour.

TENANTS' RIGHTS IN MINERALS.—A case of some public interest, as affecting the right of tenants for life under settlements to work minerals, was the other day decided by Vice-Chancellor Wood. Tenants for life may work mines already opened, but if not empowered to commit waste, may not open new mines for their own benefit, and the question has often been raised, What amount of previous working renders a mine open, so that tenants for life may work it for themselves? The plaintiffs in this case were Colonel Stepney and his two sons, who are the present owners of the Stepney estate in South Wales; and the defendant is Mr. William Chambers, who is the executor of a late tenant for life of the estate, who was not by the terms of the will of the settler authorised to commit waste. On coming into possession of the estate, however, he granted a lease of all the coal under certain farms forming part of the estate, and the suit in question was instituted for the purpose of recovering the amount of royalties received under this lease. The defendant contended that the mines were open ones at the date of the settlement, and that it was consequently not waste in a tenant for life to work them; and in support of his view he proved the existence on the farms of an old trial pit, and a very considerable amount of superficial working at the outcrop of the various seams of coal on the side of the mountain. The Vice-Chancellor, however, held that workings of this description did not amount to an opening of the mine, and gave the plaintiffs a decree with costs.

THE SNOW CLEARING QUESTION.—Mr. Bentinck, M.P., and Mr. Percy Doyle attended at the Marlborough-street Police-court, on Wednesday, to learn the decision of Mr. Tyrwhitt on the application for a summons against the vestry of St. George, Hanover-square, for neglecting to remove the snow in their parish. Mr. Tyrwhitt said—I have attentively considered the Local Management Act, 18 and 19 Vic., cap. 120, sec. 125 and 231, with 25 and 26 Vic., cap. 102, sec. 65. The question for the magistrate is whether he has summary jurisdiction to inflict a penalty on the vestry of St. George's for not sweeping the streets in their parish during the late snow fall. It is well settled that, without express words inflicting a penalty, and making it recoverable before a magistrate, he has no such power, and I find no such words. Section 125 of the Local Management Act is the only section bearing on the subject; it requires the vestry to appoint and employ a sufficient number of persons, or to contract with any company or person, for such sweeping, but no penalty is attached on the vestry for not so doing, but a penalty of £5 is inflicted on the scavenger who after such contract shall fail properly to perform the work. Supposing the vestry not to have employed a sufficient number of persons to sweep the streets, or not to have contracted for doing that work, the remedy against the vestry would be by indictment for disobedience to the statute, or had the snow lasted, by mandamus. It may be that the legislature was content with requiring vestries to employ scavengers, and took it for granted that they would do so; but with that the magistrate has nothing to do. I am, therefore, of opinion that I should do wrong in issuing a summons against the vestry.—Mr. Bentinck wished to assure the magistrate that in bringing books to the court it was from no feeling of disrespect; his only view in coming forward was that the public question might be raised. He quite agreed with the decision just given, and was pleased to find that the ratepayers had no remedy against the vestry, as the legislature must be called upon next session to provide a remedy.

NOTICE.

*** The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at One Shilling for the first Twenty-four Words.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and to the ordinary business of the paper should be addressed to the EDITOR, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursdays.

RECEIVED.—D. N.—H. D. L.—A. C. P.—A. and R. D.—J. E.—M. and Co.—M. T. S.—J. B.—J. C. F. K.—J. W.—J. P.—T. G.—B. and D.—C. W. L.—E. B. and J.—M. H. and Co.—R. P. S.—M. and M.—T. O.—W. B. and Son.—J. C. and Co.—J. A. F.—E. B. F.—H. S. P.—T. M.

Several questions and answers for the intercommunication must remain over another week.

. H. T.—We can't advise you; apply to a patent agent.

J. H. R.—It is contrary to our rule to give the price of books.

W. H.—Write to the Secretary of the Architectural Association, 9, Conduit-street.

J. L.—Sun-dials next week.

Correspondence.

THE NATIONAL GALLERY COMPETITION.

To the Editor of the BUILDING NEWS.

SIR,—I was never more disappointed—I had almost said disgusted—on paying a visit to these designs yesterday. What can our architects have been about? A majority of the plans would disgrace an architect's pupil. We have been told again and again that the National Gallery site is "the finest site in Europe." But the competitors appear to have looked at it as one of the worst sites in the world. All I can say is, that if these drawings are the best fruits our architects can show, Lord have mercy on our future architecture! I heard but one opinion during my two hours' stay in the Victoria Tower, and that was that the competition was a monstrous failure. Would an unlimited competition have produced more melancholy results than this? I trow not. Let us hope that the law courts' designs will efface the memory brought away from the Victoria Gallery. I, for one, look forward to them as a child who longs for a piece of sugar after taking his physic.—I am, &c.,

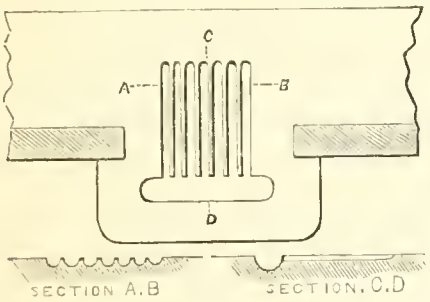
ARCHITECT'S PUPIL.

A GOOD ARRANGEMENT.

SIR,—Since reading your notice of Murray's cash pad I have seen an arrangement at the Portland-road station on the Metropolitan, which seems to me much more practical, and one which possesses every quality of durability.

The counter in front of the money taker, from which the passengers take their change is delicately fluted, and most effectually gets over that bite which the coin always takes upon a counter with an even surface.

The annexed sketch will make the arrangement



better understood. It will be seen that the fluted form is well adapted for the fingers, and on account of the concavity of its surface prevents the coin from lying flat.—I am, &c.,

Broad-street Station, Jan. 7. E. H. HORNE.

STRIKE IN CHESTER.

SIR,—You state, when referring to the town-hall, in your last number, that a strike of a "few days" took place on that job, and that "the authorities of the union on being appealed to declared the strike to be frivolous, whereupon it ceased." This is incorrect. The works have been at a complete stand since the strike took place and are so still; the contract has been transferred to another contractor, but the masons (the only trade which struck) have not yet recommenced work, nor do they appear likely to do so. It is much to be regretted, as the building trade here is very slack, and the money which the job would put in circulation would be acceptable to many. Asking pardon for thus trespassing upon your time.—I am, Sir, F.

Chester, January 8.

BIRKENHEAD PUBLIC BATHS' COMPETITION.

SIR,—I see in your columns a letter signed "Competitor," asking for information respecting the above competition, and complaining very justly of the unusual and unnecessary time taken by the committee for deliberating upon the same, viz., since September 1 last. Will you allow me, through your columns, to endorse the complaint of your correspondent, and to repeat his inquiries as to whether anything has yet been done in the matter? and thus oblige, ANOTHER COMPETITOR.

Intercommunication.

QUESTIONS.

MANUFACTURE OF SALT.

[182.]—Will you allow me to ask if any of your readers will kindly inform me what average quantity of coal is consumed in producing a ton of salt by the usual method of boiling sea water? ENQUIRER.

IRON IN CESSPOOLS.

[183.]—Would you or any of your readers inform me of the utility of putting iron (small pieces to obtain as much surface as possible) into a cesspool one-fifth in depth, the contents of which have to be pumped out on to a kitchen garden? CONSTANT READER.

MEASUREMENT OF LATHS.

[184.]—Will you kindly inform me, through the medium of your widely circulated paper, what number of feet run there should be in a bundle of laths, and how many bundles there should be in a load, and if there is any standard measurement, the same as timber and other materials? A person agreed to supply me with laths at a certain price per load. On measuring the same I found them considerably short of the usual quantity, viz., 400ft. run. I want to know if I can demand the full complement.

A COUNTRYMAN.

HOW TO USE SPARE TIME.

[185.]—Would you or some of your numerous readers favour me with the benefit of their experience on the following, and I have no doubt it will prove of great assistance to many others:—A fellow student and myself have been respectively five and four years in the architectural profession. Now, Sir, being anxious to employ our spare time in the most useful manner possible, we are at a loss to know whether we should enter a school of art to learn free-hand drawing or whether we should turn our attention to water-colour drawing, or whether it would be better to join the Class of Design of the Architectural Association?

A WOULD-BE GOTH.

WAREHOUSE AND GRANARY FLOORS.

[186.]—May I be allowed to use the medium of your valuable journal for deriving the information required as follows?—A warehouse is proposed to be erected, one story high, the upper floor to be used for the stowage of grain, and to be carried on columns and girders as under:—Proposed columns, cast iron, circular, 10ft. from centre to centre, 9ft. high, 4½in. diameter at bottom, 3¾in. at top, ¾in. metal; proposed girders, yellow timber, 13in. by 9in., 9ft. 6in. from centre to centre; proposed joists, 9in. by 3in.; floor-boards 1¼in. yellow battens. Would the above scantlings be sufficient for such a purpose? and if so, what weight per square would it carry? If any of your readers could oblige me with scantling of timber and ironwork for a similar purpose and the tested weight they would carry, one, two, or three stories high (each floor separately), they would greatly oblige, A PROVINCIAL SUBSCRIBER.

N.B.—The requisite thickness of external walls would also oblige.

THE WEIGHT OF LIME.

[187.]—Could any of your subscribers inform me what, if any, is the difference in weight per bushel of ordinary stone lime and blue lias? H. M.

TRANSIT THEODOLITES FOR LARGE SURVEYS.

[188.]—I should take it as a favour if you would insert the enclosed question in the next number of your excellent periodical. Is there any advantage to be gained by using a transit theodolite for large surveys in preference to the older form where the telescope has to be taken out of its Y's to prolong the same line in the opposite direction. I should be very much obliged if some of your practical engineering or surveying subscribers would let me have their opinion on the matter, as I have an excellent 5-inch Troughton of the older form, and I do not wish to be put to the expense of purchasing a new instrument unless there is a necessity for it. Many of my professional friends are similarly situated to myself. A SURVEYOR OF THE OLD SCHOOL.

CEMENT FLOORS.

[189.]—I shall feel obliged to any of your readers informing me how to mix and work a cement concrete floor, the proportions, &c. BIRTLEY.

GALTON'S VENTILATING STOVES.

[190.]—Could any of your readers inform me where I can get Galton's ventilating stoves? Is his the best in use?

TOM.

REPLIES.

DURABILITY OF ZINC.

[172.]—Zinc does not form a very durable covering for roofs in comparison with many other substances. Its chief advantage consists in its lightness; it only weighs 1½cwt. per square of 100 superficial feet, whereas corrugated iron, which is infinitely its superior in point of durability and strength, weighs 3 cwt. per square, and slates and tiles more than double that of iron. Neither iron nor zinc would be sensibly affected by the cause W. Sands alludes to. With respect to that portion of his question relating to the total cost of a roof per square, it is impossible to give an approximate reply, because in a span of 45ft. there is considerable latitude in the choice of the design of the principals. A good economical design might be got out, and, on the other hand, a very bad and expensive one. Roofs having metallic coverings require a different treatment of principal to those covered in the ordinary way with slates or tiles. Our correspondent may, however, calculate the cost upon the following dimensions:—Principal rafters, 6in. by 4in.; tie beam, 12in by 6in.; queenposts, 6in. by 4in.; struts, 4in by 4in.; straining piece, 6in. by 6in. The scantlings of the purlings will depend upon the distance apart of the principals, and will be from 5in. by 4in. to 7in. by 4in. The small or secondary rafters may be taken as 4in. by 2in. No accurate estimate could be made without a preliminary rough design being got out.

[172.]—I should like to inform W. Sands that, though I cannot say how steam would act upon zinc, I can say, after a long experience in buildings, &c., that where there is no steam it will only last a few years. I have taken down a zinc spout 20ft. long that would not weigh more than 2lb. or 3lb., and in the house I now live in, the spouts, which had only been up eight years, had to be replaced with other material. J. RATTRAY.

TANKS FOR CONSERVATORIES.

[173.]—Your correspondent's question may be solved as follows:—Let D = the depth required. Now it is clear that the cubical contents of the tank must just equal the cubical contents of 7,000 gallons, the quantity of water required to be contained in it. As a cubic foot of water weighs practically 62½lb., and one gallon of water 10lb., it is evident that a cubic foot will contain 6¼ gallons of water. The cubical contents of the tank are equal to D × 13·5ft. × 7·5ft., and that of the water $= \frac{7000}{6{\cdot}25}$, equating therefore $D \times 13{\cdot}5\text{ft.} \times 7{\cdot}5\text{f.} = \frac{7000}{6{\cdot}25}$, and solving for D, we find the depth to exactly equal 11ft. In constructing the tank, which may be either of cast-iron plates bolted together, and the joints well caulked, or of very thin riveted boiler plates, stiffened along the sides and edges by angle-irons or strips, it would, of course, be necessary to make the total depth of the tank from 4in. to 6in. more than the actual theoretical dimensions required. L. L. D

[173.]—One cubic foot of water = 6·2355 gallons, which although nearer 6¼, is generally reckoned for practical purposes 6½; therefore for 7,000 gallons 1,143 cubic feet are required. The depth of "M. O.'s" cistern must be 11ft. 4in. without allowing for the working of the ball under the lid. E. T.

[173.]—I beg your permission to answer "M. G.'s" question in your last week's number. If the inside tank for the conservatory be 13ft. 9in. × 7ft. 6in. he will require it to be 11ft 1in. deep. This capacity will hold the required 7,000 gallons. For all practical purposes he must take 6¼ gallons to equal one cubic foot.—WILLIAM WATTS, Inspector Ashton and Staleybridge Waterworks.

THE PITCH AND SPAN OF ROOFS.

[174.]—I think "A. C." may safely make his rafters for a kingpost truss of the span and pitch he mentions to be 5in. by 4in.; the tiebeam should not be less than 9in by 6in.; the kingpost should be 4in. by 4in. For a 10ft. bearing between the principals the purlins will have to be at least 7in. by 6in., and the common rafters 5in. by 3in. With so large a bearing as 10ft. I should be inclined to dispense with the common rafters altogether, and make the purlins about 3½in. by 2in., placing them to suit the slates. J. X.

[174.]—In answer to "A. C." on "The Pitch and Span of Roofs," I should say that scantling required for rafters would be about 6in. by 2½in. The span of roof being about 25ft the rest of the roof should be in the following proportions, viz.:—Principal, 5in. by 4in.; tie beam, 10in. by 5in.; kingpost, 5in. by 5in.; struts, 5in. by 3in.

T. L. COLLEY.

WATER THROUGH PIPES.

[175.]—Our correspondent may work from the following formula:—$G = \sqrt{\frac{(15 \times d)\ 5 \times h}{l}}$, where G = number of gallons delivered in one hour, d = the diameter of the pipe in inches, h = the head or depth of water above the pipe in feet, and l = the length of the pipe in yards. As "Housekeeper" has not given us the value of l we cannot solve the equation for him, which otherwise we should have been glad to do.

FOUNDATION FOR A CRANE.

[176.]—Would you allow me to answer the query of "Wharf" in the last issue of your able journal, more especially as I have had some experience in getting in crane foundations? If the gravel is of a hard and sound quality, it is quite as safe to build upon as the rock. The kind of foundation I should put in would be of common concrete, with a small proportion of Portland cement mixed with it, if the ground be damp. I should carry up the concrete to about 3ft. of the surface, and then put in the bed for the crane post, either in stone or brick in cement, but I should prefer large heavy blocks if I could get them at a reasonable price. E. A. A.

[176.]—I beg to state, in answer to "Wharf's" question that he may make the foundation for the crane with perfect safety upon the gravel. I would advise him to bed a piece of ashlar 4ft. square by 2ft. thick in concrete. This will be a cheap and good foundation. By screening the gravel it can be used for the concrete. The iron step for the crane to work in must be let into the centre of the ashlar, and set level with the surface.—WILLIAM WATTS, Inspector Ashton and Staleybridge Waterworks.

THE BRITISH MUSEUM.

[177.]—In order to be admitted a reader at the British Museum, the applicant must apply in writing, and accompany his application by a recommendation from a respectable householder, who will be required to certify that the applicant is over 21 years of age, and seeks admission for literary purposes, the application to be addressed to the principal librarian. On no account are books permitted to be taken out of the reading room.

SIDE DRAINS.

[178.]—The plan mentioned in your last number in answer to "Road Metaller" to prevent the edges of open drains from breaking and falling into and choking up the channel is undoubtedly a good one, but it is not always efficacious. I have known instances where the soil was so unstable as to require the sides to be pitched with thin slabs and flat pieces of stone and slate, which alone kept the drains in proper order. BOROUGH SURVEYOR.

THE RESISTANCE OF ROADS.

[179.]—In answer to "Questioner," who desires some information respecting the frictional resistance of various surfaces, I would, with your permission give him the following reply:—The resistance in pounds per ton, neglecting gravity upon a macadamised road is about 55lb. on an average, but varies according to the exact nature of the surface. That of a paved road is 33½lb.; on a gravel road about 155lb., and on a railroad from 7lb. to 8lb. It need scarcely be mentioned that the state of the weather has a great deal to do with the practical truth of these results. F. B.

[179.]—In answer to your correspondent "Questioner" on the subject of "Resistance of Roads," I beg to state the following for his information:—The resistance in pounds per ton of load (neglecting gravity) on a macadamised road = about 56lb.; paved road, 33lb; soft gravel, 210lb. The resistance on a railroad, with train moving at usual velocity, say 30 miles per hour, the track being straight and level, would be 13½lb. per ton of load. On a sharp curve 20lb. per ton, or 50 per cent. added to its resistance on a straight line. T. L. COLLEY.

FRENCH METRES AND ENGLISH FEET.

[180.]—To convert French metres into English feet and decimals of a foot multiply by 3·2809, or for all practical purposes, where only approximate accuracy is required, by 3·281. R. W. D.

[180.]—In answer to "Metre" respecting conversion of French metres into English feet and decimals, I would inform him that 1 metre = 39·371 English inch, and multiplying English feet by ·30479 will give him length in metres. Thus—100ft. × ·30479 = 30·47 metres. T. L. COLLEY.

The town of Coburg, Canada West, was on the 1st ult. lighted with a new gas, made from pine wood, bones, and refuse vegetable and animal matter. The light was brilliant, surpassing that manufactured from coal, which had been formerly used, while it will be more economic.

Building Intelligence.

CHURCHES AND CHAPELS.

A Roman Catholic Cathedral has been erected at Tetuan, in Morocco.

Spitalfields Church was last week reopened after having undergone restoration and repairs which have cost nearly £7,000.

ABERDEEN—OLD MACHAR CATHEDRAL.—This interesting structure, of which we recently gave an account, has been carefully examined by Mr. Daniel Macandrew, architect, Aberdeen, with a view to its restoration. In noticing the architect's detailed report, the *Aberdeen Free Press* says the report shows that the movement for restoration has not been made a day too soon.

ALTRINCHAM (MANCHESTER.)—A new church has just been opened. It is of the Early Decorated style, and consists of a broad nave of five bays, with north and south aisles, and north and south transepts. There is a western porch, and adjoining it on the north side is the baptistery which is marked off from the north aisle by a small triple arcade; on the south of the porch is the steeple, which rises to a height of 140ft. The chancel aisles open by arches into the chancel and transepts, and these arches are filled to the height of 7ft. with arcaded wooden screens. The material is stone of three or four kinds. Accommodation is provided for 950 persons. Mr. J. M. Taylor was the architect, and Mr. J. Thompson the builder, Manchester. The builder's contract was £5,330.

LIVERPOOL.—A new Wesleyan Chapel has just been opened. It is in the Italian style, and consists of two square towers surmounted by a mansard roof 65ft. high from the level of the road. The front and sidesare facedwith red bricks, with dressings of Stourton stone. The chapel will accommodate 500 in the body, and 350 persons in the gallery. The work has been carried out, from the designs of Mr. J. Brattan, architect, by Mr. J. Hogarth, builder, at a cost, including the land, of £5,500.

LINDLEY.—The memorial stone of a new Wesleyan Chapel at Lindley, near Huddersfield, was laid on Saturday last. It is to be built of stone in the Gothic style, and, with galleries, will accommodate 650 persons. Mr. George Woodhouse, of Bolton, is the architect. The cost of the chapel will be £2,500.

LIVESEY.—The foundation stone of a new church was laid here a few days since. The church is after the type of the twelfth century architecture, consisting of a nave 85ft. in length, transepts 25ft. wide and 64ft. across; to the east of the nave is the chancel, 35ft. long and 24ft. wide. The tower is 22ft. square externally, and rises to a height of 160ft. The church will be built of Darwen pier points, the spire being built of ashlar. The church is from the designs of E. G. Paley Esq. architect, Lancaster; Messrs. Swain and Co. being the builders.

NEWCASTLE.—The ancient church of St. Andrew was reopened on Sunday last. In addition to a thorough renovation and remodelling of the interior by the removal of the galleries and unsightly pews, and their substitution by open benches in keeping with the ecclesiastical character of the building, the east end of the chancel has been rebuilt, and the great east window is now fitted with a stained glass representation, in mediæval character, of the Ascension, from the manufactory of Mr. Wailes, of Newcastle. The alterations have been carried out by Messrs. John Burnup and Sons, of West Clayton-street, under the supervision of Mr. Thomas Oliver, F.I.B.A., architect. The cost of the entire work will be about £2,500.

RIPON.—RESTORATION OF THE CATHEDRAL.—A meeting of the restoration committee was held the other day in the Townhall. Mr. Clarke, Mr. G. Gilbert Scott's clerk of the works, was present, and received instructions to take down the papier mache ceilings of the north and south transepts, and to put up new ones more accordant with the style of the architecture. The papier mache ceilings, erected about 1842, now being demolished, are bad imitation of a style at least fifty years before the date of the transepts, which were built between A.D. 1154 and 1180. On commencing the demolition of the south transept ceiling, the old beams and springs of a Perpendicular ceiling, A.D. 1490, were seen yet intact above the curve of the sham groining. It was also decided that a new pulpit and lectern should be erected, and the bishop's throne, contracted to its old and proper limit, thoroughly restored; the seat belonging to the throne has been long preserved in the vestry. The under part represents the "Two Spies returning with the Bunch of Grapes" from the Promised Land. A couple of burlesque figures—all heads and limbs—face and follow the spies with quarter staffs. An interesting discovery connected with fresco painting of an early date (certainly before A.D. 1190) has just been made in the chapel dedicated to St. Andrew.

SHEFFIELD.—A new chapel is to be erected in Sutherland-road for the Primitive Methodists. The trustees invited designs for the chapel to seat 1,200, vestries and schools, &c., from four gentlemen in a limited competition; and after meeting several times adopted the design submitted by Messrs. C. J. Innocent and Brown, of Sheffield, and appointed them the architects.

WINDSOR.—THE CHAPEL ROYAL.—This chapel, in Great Windsor Park, near Cumberland Lodge, has been reopened for divine service. The new edifice, the chancel of which was consecrated some time back by the Bishop of Oxford, has been erected in the Early English style of architecture by the Commissioners of Woods and Forests from designs by Messrs. Salvin and Teulon, the architects, the works having been superintended by Mr. Morris. The exterior of the chapel is composed of Princes Risborough stone, with Bath stone facings, and the west end is provided with a belfry furnished with a couple of bells. The plan includes a nave, an aisle, chancel, and transept, while the open pointed oak roof is carried partly by the north wall, some finely-carved stone pillars separating the nave from the south aisle. In the chancel is a fine memorial window to the memory of the late Duchess of Kent. The subjects of the memorial include the principal events in the life of the Saviour, and at the bottom of the window the arms of the Duchess and her husband are emblazoned. Separated from the chancel by an open handrail, and on its south side, is the Royal closet, which has a stone screen dividing it from the end of the aisle. About 200 sittings are provided for the congregation, which consists of the families of the members of the Court and the *employés* on the Crown estate of Windsor Park.

BUILDINGS.

It is in contemplation at the Poor Law Board to supply three fever hospitals for the reception of pauper patients. One would be erected in the east, and one in the south of London.

Boston, in Massachusetts, is to have an art building which will cost £200,000. Land worth £50,000 has been already set apart for the purpose.

A few days ago the new Catholic schools attached to St. Alban's Church, Blackburn, were opened. They are of Gothic architecture and have been constructed to accommodate about 400 scholars, and are from the designs of Messrs. Bintley and M'Call, architects, of Kendal, at a cost of £1,950.

CLAPHAM—NEW ORPHANAGE.—Mr. Spurgeon has just concluded the purchase of 2½ acres of land, adjacent to Clapham Common, upon which the buildings for his new orphanage will be erected. It is correct, as stated some time since, that a lady has placed a sum of £20,000 at Mr. Spurgeon's command for the purposes of the orphanage; but it is accompanied by a condition that only £8,000 out of it shall be spent, the remaining £12,000 to go to capital account for the permanent benefit of the institution.

HALIFAX.—Mr. John Crossley has just erected a five-story substantial stone building, in the Italian style of architecture, for a new model lodging house. It will provide sixty beds in separate rooms, and has cost £2,811. Mr. Paull, of Manchester, was the architect. This model lodging house Mr. Crossley proposes to transfer to the Halifax Corporation on very liberal terms.

LIVERPOOL.—At their meeting last week, the Liverpool Town Council resolved to rent some land near Liverpool, and to erect on it buildings suitable for a Juvenile Reformatory, at a cost of £3,000, and also to pay 1s. per head for each boy committed by the local magistrates to the reformatory. The Juvenile Reformatory Association are to manage the institution, and pay the Corporation 4½ per cent. on the above outlay, the corporate officials having at all times access to the establishment.

LONDON.—The new vagrant wards for the Holborn Union are now completed and occupied. The building is situate in Vine-street, Liquorpond-street, the ground on which it stands having been cleared of buildings for the purpose. The architect engaged was Mr. L. H. Isaacs, of Verulam-buildings, Gray's Inn; the builders were Messrs. Simpson and Son, of Baker-street, Portman-square. The contract price for the whole was £2,662.

STATUES, MEMORIALS, &c.

Arrangements are being made for the erection of a monument to the memory of the late Sir W. W. Wynn, Bart., at Rhosymedre.

It is proposed to erect at Dublin, by subscription, a statue of Mr. Guinness, the restorer of St. Patrick's Cathedral. Mr. Foley has undertaken to carve the work. Well does Mr. Guinness deserve the honour!

MEMORIAL OF NOVEL DESIGN.—A tomb has just been erected in the Brompton Cemetery to the memory of a gentleman many years member for an important borough in the West of England. It has been designed by Mr. Ashpitel, in the style of those of the early Christians, as found in the catacombs at Rome. The body is of Portland stone, the frieze and plinth are of Green Forest of Dean, and the pilasters of polished Peterhead granite. The most novel features of all are the statues of the four Evangelists, in bronze, by Messrs. Potts, of the Art Works, at Handsworth, near Birmingham, which are cast by their new process, and are undercut and chased up by hand in a very satisfactory manner. They are modelled by Signor Brucciani. On the top is a plain cross; on one side the monogram of Constantine; and on the other an interlaced Alpha and Omega.

MONUMENT TO CARDINAL WISEMAN.—We understand that a magnificent monument is about to be erected over the vault which contains the body of the late Cardinal Wiseman at Kensal Green, where it will remain until the intended metropolitan cathedral is built. It will be then removed, and occupy a conspicuous position in that edifice. The work has been entrusted to Mr. Welby Pugin.

THE PROPOSED MEMORIAL TO LORD PALMERSTON.—A young architect in a letter says:—Observing, in your impression of December 28, a notice of the National Exhibition of Architecture at South Kensington, in which criticism is made on the drawing of the proposed memorial to the late Lord Palmerston in Romsey Abbey Church, and a touch of incredulity expressed about the correct restoration of the low-pitched roof to the proposed Lady Chapel, I write to inform you that authority is found for the same by the fact of the ancient weather moulding still remaining, showing precisely the original position of the roof, which was obviously kept down to prevent the obscuration of the unrivalled geometric windows in the east end of the choir. Similar roofs as regards flatness of pitch exist over the east end of New Shoreham Church, and over the great north porch, Christ Church, and other examples if necessary might be referred to.

STAINED GLASS.

The east window of Bulphan Church has been filled in with stained glass, by Messrs. Cox and Son, of London. The centre light has for its subject the Crucifixion. The window was given by Mrs. Mark Gotts, of Bulphan, as a memorial of her deceased husband.

CHERITON.—A stained glass window has been placed at the east end of the south aisle of Cheriton Church, near Hythe, by James Pilcher, Esq. Messrs. Clayton and Bell furnished the glass, under the direction of Messrs. Pownall and Young, architects. The subject is taken from the early life of Christ—the Nativity in the centre, and on either side the Annunciation, the Salutation, the presentation in the Temple, and Christ among the doctors.

KNARESBOROUGH.—A memorial window has just been placed in the east end of the south aisle of Trinity Church. It consists of two lights, the subjects being the raising of Lazarus, and Mary at the feet of Jesus. The artists were Messrs. Ward and Hughes, of London.

NORTH BERWICK.—A stained glass window has been erected in the Episcopal Church, by Colonel Denoy, to the memory of the officers and soldiers of the 71st Royal Highland Light Infantry, who died in Canada, the West Indies, and other places, and who served with him from 1842 to 1857. The subject is Christ raising the widow's son. Messrs. Ballantine and Son, of Edinburgh, were the artists

The Sand Patch Tunnel on the Pittsburgh and Connelsville Railroad is at last cut through. Its total length is 4,750ft., being 1,000ft. more than the long tunnel on the Pennsylvania Central Railroad through the Alleghanies between Altoona and Cresson. It is intended for a double track, and is 22ft. wide by 19ft. in height.

General Items.

The harp has been introduced in association with the organ in the service at St. Andrew's Church, Wells-street.

A correspondent suggests, as a preventive of frozen water taps, that the water should be allowed to "drop" constantly, not, however, to run.

A furious gale occurred at Portland on Saturday morning, and a large portion of the breakwater staging was swept away.

The freehold of No. 9, St. James's-square, has been sold for £35,000, three times the sum it cost a few years ago.

The election of Associates of the Royal Academy takes place on the 31st of this month. There are two vacancies only.

Sir Isaac Newton is said to have worn in his finger ring a loadstone weighing three grains, and capable of sustaining over 250 times its own weight.

The nineteenth annual ball in aid of the funds of the Builders' Benevolent Institution will take place at Willis's Rooms on Thursday, the 31st inst.

The long-talked-of Finsbury Park, as well as the Southwark Park, are to be formed. The lands for both have been purchased, and the residents of south and north London may expect shortly to be in possession of these places of recreation.

It is not generally known that a sheet of paper laid on a bed, under the counterpane or blanket, by retaining the warmth, is equal to an additional blanket; old newspapers stitched together answer well.

The Common Council have agreed to purchase Southwark Bridge for £200,000; and in the meantime, in order that the public may be allowed its free use, the Bridge Company is to be compensated at the rate of £5,500 per annum.

THE CULTIVATION OF TIMBER IN DESERTS.—A modern writer of eminence, says an American paper, ventures the assertion that, with proper care and protection, even inarable territory and sandy deserts, as in Arabia and Africa, might in places be covered with forests, the theory not being inconsistent either with experience or the deductions of science. In fact, many acres in the Sciota and Miami valleys, in Ohio, are to-day covered with a thrifty timber growth sufficient for fuel and fencing, which thirty years ago were entirely destitute. It is stated that timber is becoming sufficiently abundant for domestic use in that State, where the land at the period of first settlements was without trees, and, in the ordinary parlance of the times, was known as the "barrens;" the process of timber cultivation being now, in fact, silently going on in the States of the west as well as those in middle latitudes.

NEWCASTLE SOCIETY OF ANTIQUARIES.—This society held its usual monthly meeting in the Museum, in the Old Castle, last week, Mr. John Clayton presiding. Mr. Thompson laid on the table an engraving of two portraits, supposed to be those of the Emperor Severus and the Empress Julia. The engraving was taken from a bas-relief found in front of a house in the High-street of Edinburgh. The museum is possessed of casts of these portraits. Mr. Thompson read an interesting paper on the subject. There was no business of public importance before the meeting.

ANCIENT SILVER COINS.—A man, while ploughing up a headland on Chanton Farm, between Washington and Ashinton, Sussex, felt his plough come against something which caused it to be thrown out of its course. It proved to be an old crock, or earthenware pot, containing a number of old coins, chiefly of the time of Edward the Confessor and Harold. They were all packed in the crock on their edges, as closely as possible, and had evidently remained undisturbed since first hidden. The Government authorities have been communicated with on the subject of the treasure.

THE METROPOLITAN MAIN DRAINAGE WORKS.—The latest statistics of the new Metropolitan Main Drainage works are very curious. The total length of new sewers at present completed is 82 miles, and the works, when finished, will have cost £4,200,000. The drainage intercepted and carried off by these sewers is derived from an area of about 117 square miles and a population of 2,809,000. The amount of sewage carried off on the north side of the Thames amounts to 10,000,000, and on the south to 4,000,000 cubic feet. In the construction of the works 318,000,000 bricks and 880,000 cubic yards of concrete have been used, and about 3,500,000 cubic yards of earth excavated This grand system of sewerage has been constructed under buildings, and over and under canals, rivers, and roadways, from 25ft. above, to 75ft. below the surface, without any important casualty or interference with the public convenience or traffic. The constructural arrangements of the metropolis would appear to be more wonderful and successful below the surface than above.

FLOWERS IN POTS.—It is a common fault to put plants kept in rooms into too large pots. This has always a bad effect. If the soil be good and not over watered the plant will indeed grow rapidly, but it will produce leaves and branches instead of flowers; and if the soil be over watered the mass of sodden soil around the roots has the same effect upon them as stagnant water in a saucer. The soil should always be in such a state as to admit air with the water to the roots; but this it cannot do when it becomes blackened paste by being saturated with water. At the same time frequent repotting is often absolutely necessary to keep the plants in a dwarf compact habit of growth, and to prevent them from being drawn up. The way in which practical gardeners ascertain when repotting is necessary, is by turning the plant out of the pot, with the ball of earth attached, and if they find they look white round the outside of the mould, then the plant should be transferred to a larger pot. but only one size larger; afterwards it may be repotted again if necessary, but always to a pot only a little larger than the one it was taken from. By persevering in this mode of treatment for some time, and never advancing more than one size at each change, a plant may be grown to a large size, and made to produce abundant of flowers; while by the contrary treatment, that is, suffering it to remain in a very small pot or shifting it suddenly into a very large one, the stem will become weakened and elongated, and the flowers will be few and very poor.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

1544 G HENDERSON. *Improvements in girders manufactured in iron, steel, or otherwise combined with timber.* Dated June 4, 1866

These improvements relate to constructing girders on the principle described in the specification of a former patent granted to the present patentee dated 7th of February, 1865 (No. 335), consist in the employment of a web or webs (with or without flanges) and abutments or skewbacks used in conjunction with an arch or arches of brick, stone, tile, timber, or other material, the arch or arches being formed between the abutments or skewbacks forming part of the girder. The webs of the girders are generally constructed of metal, cast or otherwise manufactured, but in some cases the webs may be in part formed of iron bands or rods and timber or other suitable materials combined. The abutments or skewbacks herein mentioned are either cast or otherwise manufactured in metal; in some instances, however, the abutments may be formed of timber or of timber and metal together, and may be solid or hollow. The inner side of the abutments or skewbacks are formed to the particular angle to suit the radius of the intended arch or arches that are constructed within the span or space between the two abutments, and in the centre, or sometimes in other parts of the said skewbacks or abutments, he forms a tenon or slot to receive the ends of the webs, as hereinbefore mentioned. In some instances he forms the abutment, in cast or otherwise manufactured metal in the shape of a shoe or plate, the lower side being horizontal to the wall or foundation, and the inner side is made to incline to an angle suitable to the arch or arches which abut on to the face of this shoe. The web of the girder may be of rolled or cast metal and may sometimes be made in timber in conjunction with hoop iron bands, or otherwise strengthened by braces running parallel therewith, but in common the web will be of metal, the form thereof usually being that of a longitudinal flitch or plank, and the ends thereof are either dovetailed or turned up to fit the tenons or slots in the before-mentioned abutments or skewbacks, or they are formed to suit such other mode of fixing as the occasion may require. He then places the skewbacks or other abutments in position, and securely fixes the web to the skewbacks by dropping or placing the dovetailed or turned-up ends of the web into the tenons or slots of the skewbacks, or secures them together by such other means as may appear best suited to the particular occasion. The arch or arches is then connected within the span or space or between the abutments, and built up clear of the top of the web, which is never subject to vertical pressure, but the weight or pressure is firmly supported or carried by the arches on either side. In order to obtain the necessary length of the web where the spans are of considerable length, as will frequently be the case in bridge building, the web will be formed by one or more plates or pieces of iron, steel, or other materials placed together, bolted and screwed together in the usual way, or connected in some other manner. *Patent completed.*

MEETINGS FOR THE WEEK.

MON.—Royal Geographical Society.—The following papers will be read:—1. "A Journey to Kano from the Niger," by the late Dr. W. B. Baikie. 2. "On the North-East Province of Madagascar," by the Bishop of Mauritius. 3. "Diary of a Hill Trip in Burmah," by Lieutenant T. H. Lewin, 8.30.

TUES.—Institution of Civil Engineers.—"Ships of War," by Mr. J. Bourne, 8.
Royal Institution.—"On the Ancien Régime, as it Existed on the Continent before the French Revolution," by Rev. C. Kingsley, 3.

THURS.—Royal Institution.—"On the Ancien Regime, as it Existed on the Continent before the French Revolution," by Rev. C. Kingsley, 3.
Linnean Society, 8.
Chemical Society, 8.

FRI.—Royal Institution.—"On Sounding and Sensitive Flames," by Professor Tyndall, 8.
Architectural Association.—"Notes on Shop Fronts," by Mr. T. Blashill, 7.30

SAT.—Royal Institution.—"On the Ancien Régime, as it Existed on the Continent before the French Revolution," by Rev. C. Kingsley, 3

Trade News.

TENDERS.

BATLEY.—For five woollen warehouses, in Station-road, Batley, for Mr. Isaac Colbeck. Mr. M. Shean, architect:—

Masons and bricklayers.			
W. Copley and Co.	£3,150	0	0
J. Brier	3,055	0	0
J. Booth	2,650	0	0
Preston and Webster	2,550	0	0
Carpenters and joiners.			
R. Ibberson	£2,305	0	0
M. S. Butler	2,200	0	0
J. Fozard	2,145	0	0
J. Willans	2,050	0	0
Plumbing, glazing, and gasfitting.			
T. Armitage	£289	5	6
J. Wright	270	0	0
J. M. Hart	265	6	6
J. H. Senior	245	2	6
Plastering.			
J. W. Hey	£247	10	0
R. Howroyd	185	0	0
J. Broadhead	165	0	0
Slating.			
R. Denton	£146	0	0
J. and W. Atkinson	127	10	0
J. and J. Hills	110	0	0

ISLINGTON.—For two houses with shops, in Rotherfield-street, Islington, for Messrs. Tubbs, Lewis, and Co. Mr. W. Smith, architect. Noquantity given:—

Taylor	£2,079
Madgin	1,700
Johnson	1,485
King	1,478
Saby	1,396
Crabb	1,386
Hunt	1,362
Grover	1,346
Cubitt	1,021

KENBY.—For a small country house, at Kenby, Surrey, for Mr. T. Davis. Quantities not supplied. Mr. H. Wiber Webster, architect:—

Shield	£1,200
Calow	1,112
Graham	1,030
Danby	970

LIVERPOOL.—For seven shops, Hardman-street, Liverpool, for Mr. H. C. Beloe. Mr. T. Cook, architect. Quantities supplied:—

Witter	£4,875	
Bamber	4,605	0
Wiley	4,600	0
Henshaw	4,497	0
Urmson	4,429	0
Callie	4,424	10
Nicholson and Ayre (accepted)	4,299	0

LIVERPOOL.—For three houses, Rupert-lane, Liverpool, for Messrs. W. and D. Busly. Mr. T. Cook, architect. Quantities supplied:—

Urmson	£1,361	0
Westmorland	1,348	0
Wiley	1,340	0
Nicholson and Ayre	1,289	15
Wilson	1,274	0
Callie (accepted)	1,230	0

OXFORD.—For building a branch bank, at Oxford, for the London and County Bank. Messrs. Francis, architects. Quantities by Mr. J. Robson:—

Castle	£9 840
Symm	8 994
Hill and Son	8,970
Dove Brothers	8,895
Dovor	8,598
Jones and Son	8,250

RIVERLEIGH.—For billiard room, conservatory, forcing-house, &c., Riverleigh, near Liverpool, for Mr. J. M'Ardle Mr. T. Cook, architect. Quantities supplied:—

	Section No. 1.	Section No. 2.
Urmson	£502 0	£410 0
M'Gerron	—	394 0
Lamb (accepted)	461 10	346 10

BATH STONE OF BEST QUALITY.

RANDELL AND SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depôts, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

THE BUILDING NEWS.

LONDON, FRIDAY, JANUARY 18, 1867.

ART WORKMANSHIP AT THE SOCIETY OF ARTS.

THE works sent in competition for the prizes offered this session, a list of which will be found elsewhere, are now on public view in the great room of the Society of Arts, Adam-street, Adelphi. They are divided into two classes, namely, works to be executed from prescribed designs, and works to be executed without prescribed designs, the latter including works executed and finished by machine. These divisions embrace carving in stone, modelling in plaster, carving in wood, *repoussé* work in metal, hammered work in metal, carving in ivory, chasing in bronze, engraving on metal, enamel painting on copper, painting on porcelain, decorative wall painting, wall mosaics, die-sinking, glass blowing, bookbinding, and illuminations. The entire number of articles on exhibition, only 102, strikes the visitor as rather small, and were it not for the general excellence of the majority the Society would not have grounds for the satisfaction with which, we understand, they regard this exhibition. The prizes are already awarded by the judges, but at the time we write the awards have not been made known. We give, therefore, the result of our own examination of the various objects. With regard to some of the subjects exhibited we must call attention to the fact that this is supposed to be an exhibition of the works of art workmen, not of art masters. Comparatively few are aware of the width of the gulf which lies between these two classes, though its existence seems generally recognised. We should define an art workman as one who could produce from a pattern an artistic work, and we should call an art master one who could produce the pattern, or, in other words, an original work of excellence. There are many art workmen who work almost without model or pattern, and these are, to a very great extent, art masters, but it must be confessed that there is a large number who mistake the bent of their talents, and who would be better employed in copying good designs than in originating bad ones. This is especially remarked in sculpture and carving. Carving in stone, for instance, is not sculpture. The distinction is subtle, but nevertheless clear, and is as thoroughly received in art circles as an axiom in Euclid, or, what is at present of almost equal authority, the dictum of Mr. Ruskin. Now as a means of testing the proficiency of an art workman an exhibition like this is invaluable. It is not of the overgrown dimensions of an industrial exhibition, which is an *omnium gatherum* of objects of every conceivable nature, nor does it bear the exclusive character of the Royal Academy. The judges are men who understand their offices, and we believe that the rewards are distributed with equal impartiality and discrimination. Having said thus much about the exhibition, we will proceed to notice those works which struck us as most interesting, taking the objects as they appear in the catalogue, under their several headings.

No. 1 (Carving in Stone), "Panel, after Chimneypiece by Donatello." This is a work in low relief, Cupids and arabesques. It is very fairly carved. This subject, in the original, may be called a sculpture rather than a carving. No. 2 is purely a stone carving, being, like Nos. 3 and 4, a Gothic bracket or corbel. These corbels are of almost the same size, and there is about the same quantity of work in each, but the prices differ widely. No. 2 is valued at £5, and Nos. 3 and 4 at £15 and £12 respectively. The face which appears in No. 2 is too naturalistic in treatment, and in this respect it is not equal to No. 3; but, notwithstanding its low price, it is better than the others. No. 4 is remarkable for two birds, whose legs are most delicately carved, though not in a way desirable for the treatment of stone. It also has a good grotesque head. No. 5 (Flowers, in Caen stone), is boldly and well-carved. No. 6 is well-executed, but, in our opinion, marble is an unsuitable material for small subjects. With some of the Greek marbles, which seem to have the grain and colour of ivory, the case is different; but, with the best Italian marble, the shining luminous particles destroy the repose of any but a large composition. It is for this reason that the plaster cast invariably looks better than the marble, and in the opinion of many the clay model bears the palm from either. Mr. Jones is also exhibitor of an unfinished basso-relievo, in marble, representing the Arts and Sciences, the price, when finished, to be £20. Judging from the model in plaster, we think very highly of this work, which is original, and we consider the price extremely low. No. 9 (original), a basso-relievo in marble, subject "Christ Blessing little Children," we do not think very highly of as a work of art, and the material is most unsuited to the subject. No. 12 (original), a plaster model of national emblems—rose, shamrock, and thistle—struck us as very good.

We next come to the carving. Under this head there is only one work executed after a prescribed design; it is No. 14, a sort of covered cup with figures for handles, after a design by Holbein. Some of this carving is good, but the figures, which demand the most care, are the least pleasing portions of the work. All the following wood carvings are original:—No. 79, a statuette of "Egeria," though it might be anyone else for aught we can see, as it is particularly badly placed. No. 80, "Cynthia," by the same hand, is a very pleasing work. No. 81, a female head in satinwood, is in our opinion of great merit; the material is almost equal to ivory in texture. No. 83, an original group in walnut, something like a race plate, and represents "Wallace at the Battle of Stirling." This work has considerable merit, but we regret that so much labour has been expended on such a material. With a few emendations, such as giving a better proportion to the upper body to one of Wallace's antagonists, the subject is worthy to be executed in silver. No. 84, a dog's head, is very clever, as is also No. 85, "Bird and Flowers," by the same hand. No. 88, vase of flowers, &c., is very elaborate and delicately carved, but the design is inappropriate. Mr. Bull should exercise his talents in copying until he has gained more knowledge of composition—he must see that the vase is very much too small for the bracket; but the carving is excellent. This closes the list of wood carving. We next come to metalwork, which forms the principal portion of the exhibition. There is so much *repoussé* work that our limits will not allow us to mention each specimen; we may say, however, that of the five copies of "Raphael's three Graces," we should be puzzled to select the best. There is a beautiful piece of leafage in copper, No. 23A (original) and a portrait of the late Viscount Palmerston in copper, which is a good likeness. Nos. 24, 25, and 26 are specimens of hammered brass work. Nos. 25 and 26 are hammered brass brackets, displaying workmanship of a high order. Of hammered iron work there are some good specimens. Nos. 27, 28, and 29, brackets, are much to our liking; and No. 30A, a panel for a screen, and 32, a bread-basket, designed by Mr. A. W. Blomfield and executed by T. Winstanley, will, we imagine, find favour in the eyes of the judges. Some ivory carving is to be found in the glass cases, but there is very little of it, and that little principally interesting as having been executed by the machine. These are Nos. 96, 97, 98, and 99, the latter the head of her Majesty. The chasings in bronze, of which there are several examples, do not appear to possess unusual claims to notice. There are three busts of "Clytie," of about equal merit, by different exhibitors; and two statuettes of "Caractacus" and "Jacob Wrestling with the Angel," which attracted our attention; but the two "Miniature frames raised and chased," by the same hand, appeared to us not particularly happy in design. The engravings on metal after arabesques, of which there were 6 or 7, pleased us as much as anything we saw. The "Ornamental plateau in blue," No. 60, after a design by Maestro Ludovico, we consider very good. A pair of door finger-plates in majolica style, by Miss L. Leila Hawkins, must please the admirers of that style, and, with all the surroundings to match, their somewhat powerful colour would not be inappropriate. Nos. 62 and 63, circular plates, subjects from the "Signatura" ceiling, are of great merit. Of decorative painting, that is to say, wall painting, there are four specimens, and we are sorry that we cannot speak in terms of praise of any of them. Dr. Salviati sends a single specimen of glass blowing of more than usual merit, inasmuch as the vessel stands straight, and Samuel Cooper sends the only wall mosaic. Of bookbinding there are only four specimens, but they appear to us to be very good. There are only two illuminations, Nos. 77 and 78, which appear to possess about equal merit. Two specimens of enamel painting on copper are exhibited, and some painting on porcelain, all of which are worthy of praise. The awards of the judges will be made public in a day or two, and we hope they will be as satisfactory to the exhibitors as beneficial to the general progress of art.

HORTICULTURE AT THE PARIS EXHIBITION.

THE year which is to witness the crowning attempt of the Emperor Napoleon in behalf of peace and concord has already commenced. We begin to reckon the weeks that must elapse before the inauguration of his magnificent project, while time—*inexorabile tempus!*—rapidly diminishes the fleeting hours. Among the many novelties connected with this gigantic undertaking, not the least important is the Exhibition of International Horticulture. This interesting department has been partially developed on numerous other occasions, and, in fact, there is not a park, public or private, which does not contain many specimens of rare and valuable exotics. But a brief description of the prominent part it plays in the forthcoming Exhibition will demonstrate that it has at last obtained that degree of attention and consideration which it unquestionably merits. The display of international horticulture will take place in a reserved or special garden separated from the rest of the park by an iron railing. Those who are familiar with the position of the Botanical Society's Gardens in Regent's Park will be at no loss to form an accurate idea of the case in question. It is bounded by the avenues of Labourdonnaye and Piquet, by the principal walk of the Park, and by the circular railway. Its area is rather over 70,000 square yards, and the main entrance faces the junction of the two avenues alluded to. The price of admission will be half a franc, and no further payment will be required in any part of the garden. There is a point connected with the arrangement of the admission into this garden which, unless it is altered, visitors will do well to bear in mind. Suppose a person already in the park wishes to view the garden, he pays his half franc, and passes in; but if he does not care about seeing the garden, he pays no more than the sum he has already paid for entrance into the park. Now a person entering the garden from the exterior, that is, by an entrance which does not open on the park, will be obliged to pay not only the half franc for admission into the garden, but also the sum for admission to the rest of the Exhibition, whether he wishes to go there or not. Thus if a visitor had seen

the Exhibition and wished to pay a visit specially to the Horticultural Garden he would have to pay over again for what he had already seen and might not wish to see again. This unwise arrangement, which we hope never to witness carried into effect, will cut two ways; in the first place, it is manifestly unjust, and secondly, it is a trap to catch the unwary, as many will probably enter by the garden entrance, and have to pay their half-francs without caring to see the garden at all.

Entering by the avenue of Tourville a splendid panorama bursts on the view. Not a vestige of the Exhibition building or its numerous appendages is visible, but the limpid surface of a vast lake relieves the verdant hue of the expansive sward. From the centre of the former rises a lofty mass of superincumbent rocks, surmounted by a cascade, which, in its never-ceasing flow, restores to the lake the waters to which it owes its life. The sward is crowned by a small crystal edifice constituting the Winter Garden, and appropriated to the reception of exotics. On each side of this building are formed two artificial gorges or ravines, at the end of which the ground rises, and on the level spaces are a couple of greenhouses, surrounded by ponds filled with aquatic plants. The entrance to these gorges is guarded by masses of rockwork, and embellished with lakes and cascades, while through the falling spray can be dimly seen the gloomy mouths of grottoes and caves, alike inviting the curiosity of the visitor, and, by their sombre appearance, forbidding him to gratify it. Towards the right of the house devoted to the orchids stands a large semi-circular building with an elegant colonnade and portico. It is the diorama, and is a peculiar feature of the Exhibition, and was invented by M. Rouzzi. As it was impossible to collect all the known plants of the world in one spot, a number of photographs, amounting to 4,000, of the most interesting specimens, were obtained in different lands and forwarded to Paris. In order that these might be viewed of the natural size, fifty magnifying glasses are provided for the purpose, to each of which is attached a handle. By turning this handle the visitor causes to pass in review before him about eighty different specimens of foreign plants. A natural fac-simile of the photograph is appended to each where it has been possible to procure it. Passing the collections of fruits and vegetables we find ourselves under the palm trees, by the banks of a river. Following its sinuosities, they lead to a lake filled with rare and curious fish, while its banks are bordered with plants of a nature seldom seen in our northern climates. In the large lake previously mentioned are the famous carp which were brought from the ornamental water of Fontainebleau by permission of the Empress. They are of an enormous size, and are said to be two or three hundred years old. The submarine chamber, although not strictly connected with our subject, deserves notice. It is about 60ft. in length, and the first impressions created by entering it are those of mingled astonishment, fear, and admiration. The sea is above, below, on all sides; the finny inhabitants congregate in myriads to gaze upon their unknown visitors, and sea-horses and dolphins sport and gambol above their heads. A large oyster-bed, and marine plants of every hue and shape, serve to increase the illusion. Near the marine aquarium is the building devoted to the reception of Brazilian orchids; an elegant kiosk for *bouquets à la main*; a hothouse for large forced vegetables; and a beautiful little crystal palace, where, surrounded by the fruits and flowers indigenous to their tropical climate, the humming-birds pass the live-long day, flitting from one flower to another with never-tiring wing.

Situated in the avenue parallel with l'Ecole Militaire, is the conservatory appropriated to the reproduction and growth of plants, and which, of all others, claims the first attention of the horticulturist. Let those who are sceptical on the subject of rapid growth enter and observe how the flower is born, grown, and multiplied, not by a process contrary and inimical to the laws of nature, but by forcing her to proceed at full gallop, by compelling her to accomplish her results in the shortest possible space of time. It is not too much to assert that the present is a forcing age, no matter in what light it may be viewed. Men never forced their brains to so injurious an extent as they do now. The minimum speed of the race of life has changed from the post-horse to the locomotive, and a man lives now in twenty years more than his great-grandfather did in fifty. It is especially a fast age—fast for the mind, fast for the body. We not only force ourselves, but everybody and everything connected with us. We force all our mechanical means to the utmost, we strain the steel and stretch the iron until they can bear it no longer, and lamentable catastrophes bear witness to the truth. Discovery and invention were never so rife as now, and man's intellectual faculties are ever on the rack to keep pace with the strides of scientific investigation and research. To take relaxation and repose is to be idle, to lose time; and thus the only chance for a man to attain to the "three-score and ten years" is destroyed by the restless system of life of the present century.

WATER SUPPLY OF LONDON.*

It is not necessary that we should trace and demonstrate the direct influence which the water supply has upon the physical and moral health of the inhabitants of a great city. Evidence, vast in extent and irresistible in its force, has proved the thesis that wherever water is not, disease and vice will flourish, and the converse holds good. Those, therefore, who may assist in solving the problem how to increase the water supply of a town in proportion to the wants of its increasing population "deserve well of the State," and are especially entitled to respectful consideration when they bring to bear on the subject experience and scientific knowledge. Many propositions have been made during the last few years for supplementing the acknowledged deficiency of the metropolitan water supply, and several of them have from time to time received attention in these pages. It is not essential that they should now be recapitulated, and some of them certainly are placed beyond the pale of practicability, from the enormous cost which would attend their institution as realised plans. The most recent attempt to accomplish the desideratum—and which certainly has some claims to attention—is that which is explained in the pamphlet under notice, and of which Mr. Telford Macneill, C.E., is the author. This gentleman insists that nature has so adapted the topographical and geological position of some of the environs of London to the purpose, as that a system of natural filtration of the waters of the Thames might readily and inexpensively be inaugurated for the abundant supply of the metropolis. The statement and the deduction are alike bold, but they appear to have been based on carefully prepared data. The geological position of London itself is peculiar, and it may be briefly depicted before proceeding with a further elucidation of Mr. Macneill's scheme. London is situated upon the lower tertiary formation. The upper stratum is a tenacious clay; the next is known as plastic clay, and is really composed of argillaceous deposit and beds of sand. These latter rest upon the chalk, a formation varying from 300ft. to 500ft. in thickness, and not lying horizontally, but rising up all round like the sides of a basin, and coming to the surface at the Surrey and Chiltern Hills. The water which falls upon and percolates through the edges of the porous chalk is arrested at the bottom of the basin by a layer of gault or impermeable clay, where it accumulates until the whole stratum becomes charged with water. The rim of the basin (to carry out the simile) being higher than the strata it contains, the water, whenever the opportunity is given by a sufficiently deep well, has a tendency, resulting from hydrostatic pressure, to rise to its natural level above the surface of the ground. The wells usually sunk within the area of the London basin are, as a general rule, of three classes. The first, and most numerous, are shallow, and in many instances yield a positively poisonous water, impregnated with the drainage from graveyards, the soakage from cesspools, the leakage of carburetted hydrogen, &c., by diffusion through gas pipes, and other impurities. The second reach the sandy, water-bearing beds of the plastic clay, and generally produce water full of ferruginous-like contaminations. The third class—and of these there are many in London—are sunk into the chalk, and supply clear and good, though generally very hard, water. The idea of obtaining an inexhaustible quantity of water by means of innumerable wells of the last-named kind prevailed very largely some years since. Experiences of later date have, however, demonstrated the fallacy of the notion, and it is a matter of notoriety now that in a few years hence that source of supply must fail. At present, many of the large breweries of the metropolis, in spite of the existence of their artesian wells, are compelled to become customers of the water companies; whilst the gradual subsidence of the water level of the chalk springs involves continual expenditure in lowering pumps, driving adits, and remodelling lifting appliances.

Thus, then, it may be said that London will have eventually to depend for its increased supply of water from rivers in its own neighbourhood, or, water must be brought into the mighty city by aqueducts communicating with more distant sources. Mr. Macneill argues that there is no necessity for travelling far from home in order to achieve what is required. His project, as described by himself, "contemplates conducting to the Bagshot Sands (Bagshot Heath) and spreading over them a supplemental quantity of the water of the Thames—taken from an unobjectionable place and in a proper manner—together with the water from the Greensand Hills, south of Guildford; gathering the water again, by means of catch-water canals or cuts, after its perfect filtration through these purifying sands, and reconducting it, in a covered conduit, to a service reservoir at Norwood, from whence it may be supplied to the centres of distribution of the existing companies." . . . "Five years from the present time would be sufficient for the completion of the work, and that would bring us to the census year, 1871."

By that date Mr. Macneill assumes that the consumption of water in London will have reached 250 millions of gallons per day. The river companies have now power to take 100 millions of gallons per day without providing any water compensation for the loss. The abstraction takes place some miles above Teddington, and Mr. Macneill suggests taking his own supply from a point immediately above the weir at Teddington, to the foot of which the tide flows. That portion which would be taken direct from the Thames "would be conveyed by an open canal as far as Chertsey, a distance of eight miles. A pumping station to lift 30ft. would be required at the west side of Bushy Park. The conduit through the park might be covered if thought necessary. The water would then be passed under the Thames to another pumping station one mile to the south of the river, where a lift of 85ft. would take place, and then would be delivered through pipes into the existing Basingstoke Canal, at a level of 102ft. above the Ordnance datum. The next four miles of its course would be along the Basingstoke Canal, which

* "Water Supply of London, by Means of Natural Filtration of the Waters of the River Thames." By TELFORD MACNEILL. London: Edward Stanford, 6, Charing Cross. 1867.

can, by slight alteration, be made to convey this water to the Bagshot Sands."

Mr. Macneill calculates that by such means a daily supply equal to 125 millions of gallons might be obtained. The water to be obtained from the Guildford districts the same gentleman estimates at 50 millions of gallons per diem, and, owing to the favourable nature of the gathering grounds, extensive reservoirs will not be required—as he states, and appears successfully to show. Both streams, being at length united in the Basingstoke Canal, are proposed to be taken to the filtering districts in the following way :—"A vertical lift of 40ft. will deliver the water into another reach of the canal two miles long, whence it will be put into the lowest distributing conduit on the sands by a lift of 68ft." Over the Bagshot district there would be three main distributing conduits at the respective levels of 360ft., 300ft., and 200ft. over Ordnance datum, and thus 22½ square miles would be irrigated. The surface of this vast filtering ground would be so treated as to improve to the utmost the quality of the water. In the pamphlet under notice valuable appendices are subjoined, containing the results of analyses of the Thames and Greensand Hills waters, together with scientific opinions favourable to the mode of filtration as suggested by the author. For the conveyance of the water to Norwood, Mr. Macneill proposes the construction of a brick culvert 18ft. in diameter, with a fall of 1ft. per mile, and which would be sufficiently capacious for the passage of 400 million gallons every twenty-four hours. At Norwood a reservoir "at the 210ft. level" must be constructed, and from this the water would have to be conducted to the existing centres of supply in the metropolis, "which would then have," enthusiastically remarks Mr. Macneill, "an unlimited command of water of the purest character, except in softness, ever provided for any town in the world." So much for the mode of operation proposed, and now for the cost of realising the very comprehensive plan. This is set down in round numbers at £5,000,000 sterling, supposing that 200 millions of gallons per day only were required, and an additional expenditure of £1,700,000 would be necessary to make the works yield 400 millions of gallons. Such are the propositions, briefly summarised, of the ingenious author of the "Water Supply of London by Natural Filtration." That they are eminently practical there is no doubt, and assuredly they are worthy the consideration of all who take an interest in the great question of obtaining for London an unfailing fountain whence may flow and permeate among its three or four millions of inhabitants pure streams of that fluid so essential to the health and well-being of humanity.

There will, no doubt, be much discussion during the ensuing session of Parliament upon this and other plans for supplying London with a largely increased quantity of water, and in one way or another the work will have to be done. Many of the principal towns of this and other countries are in advance of the metropolis in this respect, but we have the advantage of their example, and may hope to profit by their experience. Such contributions to the subject of metropolitan water supply as that of Mr. Macneill are of great value, as directing public notice to it, and we recommend those who would learn further of his plans to obtain and study the pamphlet, which is illustrated by a map of the various districts to which we have referred.

THE GATES OF OLD LONDON.

IN earlier times the boundaries of "the ancient and most famous cittie of London" were limited, and a wall was not at first deemed necessary for its defence. It was bounded on the south by old Father Thames, on the west by the River Fleet, on the north by a deep morass in Moorfields, and on the east by a stream called the River of Wells, now Walbrook. These were the natural fortifications of the city at the date of Cæsar's first visit to our shores in the year 55 B.C. We have no correct data as to when London was first walled in. That the original wall and gates were the work of the Romans is undisputed; the exact period of their erection cannot be fixed with certainty. Maitland assigns the building of the wall to the era of Theodosius, 368 A.D.; other writers to that of Helena, mother of Constantine, about sixty years earlier; and Stow fixes upon the year 434. This of course refers to the wall built by the Saxons; of the Roman wall no traces are to be discovered above ground, and very few have been discovered underground, for it is well known that the surface of the present city is several feet higher than the Colonia Augusta, or Londinium of the Romans. At various periods of its existence the wall met with very rough usage. Thus in 839 it was completely demolished, and not rebuilt until forty years afterwards; in the years 994 and 1016 it was destroyed by our powerful enemies the Danes. Accepting what would appear to be the most reliable account, the wall began at the Tower, went along the Minories to Aldgate, by the back of Houndsditch to Bishopsgate, thence in a straight line by London Wall to Cripplegate, Aldersgate, and Newgate, thence to the Thames by the River Fleet. It was about 20ft. high and 9ft. thick, and defended by towers and bastions. The circuit of the city within the walls was little more than three miles, and we are further informed by Fitz-Stephen, who wrote in Henry the Second's reign, that the wall on the north was in the form of a bow, and on the south like the string of it. In the neighbourhood of the Minories the remains of a portion of the walls may still be seen. The original gates of the city, of which we have any mention, were Ludgate, Doorgate, Aldgate, and Aldersgate, all purely Saxon names. Four were subsequently added, Cripplegate, Bishopsgate, Moorgate, and Newgate. Besides these, there were the postern on Tower Hill, and the bridge-gate at London Bridge, both of which were of great antiquity. The former was erected shortly after the Conquest, and it either fell down or was taken down while certain additions were being made to the Tower in the reign of Henry VI., about the year 1440. It was never rebuilt, but we are told that "a plaine cottage of timber, lath, and loame, with a narrow passage" was erected in its stead. This also passed away some time after the year 1611. A woodcut of the bridge-gate of Queen Elizabeth's time—a strongly embattled structure, abundantly garnished with traitors' heads—may be seen in Visscher's View, published in 1579. Doorgate, or the Watergate, answering to the modern Dowgate, has left no traces behind it. Aldgate stood about 500 yards to the north of the postern on Tower Hill. It is mentioned in a charter of Edgar, A.D. 967, and was undoubtedly one of the original and principal gates. During the bitter war between King John and his barons, the latter entered the city through this gate, and their leader afterwards rebuilt it in the Norman style, and made it a place of great strength. In 1606, being then in a very ruinous condition, Aldgate was taken down and restored, on which occasion a number of Roman coins was discovered at the foundation. Two of these coins Mr. Bond, the surveyor, had copied on a stone tablet, and placed on the east front of the new building, which also bore the inscription, "*Senatus populsque Londinensis fecit*," 1609: Sir Humphrey Wild, Mayor. And the northern postern bore the words "This foot postern was made at the care and charge of the Honourable City of London, in the mayoralty of Sir Anthony Bateman, Knt., ANNO DOM. 1660." In 1602 one of the quarters of Sir Thomas Armstrong, who suffered for his complicity in the Rye House Plot, was spiked on the gate; and in 1694 the head of Sir John Friend was similarly exhibited, as a reward for the part which the unlucky brewer-knight was supposed to have taken in the Jacobite conspiracy against William III. Aldgate remained until 1760, when it was sold by the City Lands' Committee to Mr. Blagden, a well-known carpenter in Coleman-street, for £177 10s. Mr. Blagden, the same year, purchased Cripplegate for £91, and Ludgate for £148, and the following year he contracted with the Committee for the ground from Cripplegate to Moorgate for building purposes. The ground, 1,000ft. in length, brought £350, being at the rate of 7s. per foot. Such was the value of land in the city a century ago; how value it now, except by naming the most fabulous sums? A piece of ground purchased in Lombard-street recently cost over £2,000,000 sterling per acre, or nearly £70 per square foot of area. Bishopsgate was situated about the same distance north-west from Aldgate as the latter was from the postern. The conjecture is that Bishopsgate took its name from its founder, a bishop of London in the eleventh century, and old chroniclers tell us that Henry III. confirmed to the Hanse merchants certain privileges, in return for which they were bound to keep the gate in repair, and to defend it in times of danger. However this may have been, we read that the City Corporation restored the gate in 1551, and in 1731, when it had again become dilapidated, they rebuilt it. It was finally pulled down during the general demolition in 1761, and the materials sold. Moorgate, again, was 550 yards westward of Bishopsgate, and was erected in 1414-15 by Thomas Faulconer, mayor, who drained the tract of ground now called Moorfields, then a swamp or marsh. Moorfields was for a long the favourite place of recreation with Londoners, and this gate, which gave the people access to the fields, was a very stately structure. "Its arch was much higher than the other gates, and than the common rules of proportion, for the convenience of the city trained bands marching thro' it to exercise in the fields with their spikes erect." It had two side posterns for pedestrians, and apartments over the main archway for the accommodation of the Lord Mayor's carvers. The gate was sold in 1761 for £166. Cripplegate owes its name to having been the common resort of cripples, who loitered about the gate soliciting alms of passers-by. It spanned the old Roman military way called Ermine-street, which led from London by Hornsey northward, and is mentioned as early as the year 1070. It would seem to have been rebuilt by the brewers of London in 1244, and again, in 1491, by the executors of Edmund Shaw, goldsmith and Lord Mayor, who bequeathed 400 marks for that purpose. Cripplegate was used as a prison for common trespassers, but afterwards became the official residence of the water bailiff. It was repaired, and a new postern added, by the Corporation in 1633, rebuilt after the great fire in 1666, and finally done away with, as already stated, in 1760. London chroniclers are at variance as to the origin of the word Aldersgate. Some will have it that the founder of the gate was one Aldrich, a Saxon; others say that it took its name from a group of elder trees which at one time flourished hard by. On the other hand, Stow, a very trustworthy authority, is of opinion that the gate was called Aldergate, or Oldergate, simply to mark its antiquity. The last of the gates of this name was built in 1617. It was a heavy Gothic structure, and a special monument to James I., who had passed through the old gate on coming to take possession of the English throne fourteen years previously. On the north front, over the archway, it bore a figure of the king on horseback, and above, the arms of England, Scotland, and Ireland, quartered; on the same side (east) was an effigy of the prophet Jeremiah, with the text, "Then shall enter into the gates of this city kings and princes, sitting upon the throne of David, riding in chariots and on horses," &c., Jer. xvii., 25. On the west a companion effigy of Samuel, and these words, "Behold, I have hearkened unto your voice in all that ye said unto me, and have made

a king over you," 1 Sam. xii., 1. His Majesty was also represented on the south front, sitting in his chair of state in royal robes. In 1670 the gate was repaired, having been much defaced by the great fire. It was restored in 1739, and the circumstance has given us some notion of the state in which one of the principal streets of London was kept, even in that late day. The word "beautified" having been stuck upon the gate after its restoration, the Lord Mayor received a letter signed "Civicus," reminding his lordship that the word "safety" had been forgotten. The writer stated that "a deep channel for the current of much water being in the middle of the gateway, just where the cart-horses must go, it had happened that a horse, choosing better footing on one side of the channel, had unexpectedly drawn the wheel against the stonework and crushed a person to death." "Civicus" therefore suggested that the channel "should be turned to one side, as at Newgate." This was accordingly done. One of the quarters of the unfortunate Sir Thomas Armstrong was placed on Aldersgate, and at one period of its existence the Common Crier resided in it. The first of the city gates that was pulled down to make room for modern improvements was Ludgate. Leland discards the notion that this gate was originally erected by King Lud, as Geoffry of Monmouth says, about the year of Christ 66. The name is derived, according to Leland, from the Saxon word flud, floete, or fleet, a small water-course, namely, the River Fleet, which ran close to the gate. In the year 1379, Sir Nicholas Brewer being Mayor, the Common Council ordained that all freemen of the city should, "for debt, trespasses, accounts, and contempts," be imprisoned in Ludgate, and thereby hangs a very pleasant tale, with a moral to it. One Stephen Foster was a prisoner here, and one day being at the "begging grate," a rich widow, who happened to be passing, stopped and asked the unhappy debtor what sum would purchase his release. Foster replied, £20, which the compassionate widow paid, and afterwards took him into her service. In the language of the penny novelist, "need the sequel be told?" Stephen gained the affection of his benefactress, and married the widow. By indefatigable application to business, he acquired great wealth, and became Sir Stephen Foster, Lord Mayor of London. Sir Stephen was possessed of a grateful heart and a kindly disposition. He did not forget the miserable condition of the poor prisoners in his old quarters at Ludgate. He contributed greatly to their comfort and welfare by enlarging the prison and rendering it more commodious. He also added to it a chapel, on the wall of which was placed a brass plate bearing this quaint inscription:—

Devout souls that pass this way
For Stephen Foster, late maior, heartily pray,
And Dame Agnes, his spouse, to God consecrate,
That for pity this house made for Londoners in Ludgate,
So that for lodgings and water prisoners here nought pay,
As their keepers shall all answer at dreadful domes-day.

These good acts Sir Stephen Foster performed in 1454, the very year in which he was elected Lord Mayor, and it is gratifying to know that by none was his conduct more warmly applauded than by the worthy widow who became Lady Foster. At Ludgate ended the rebellion of Sir Thomas Wyatt in 1554. Having marched his forces along the Strand and Fleet-street he found the gate shut against him and strongly manned. Wyatt was summoned by the herald to surrender, and he had enough good sense left to comply with the request. But he lost his head all the same. The last gate—that which was pulled down in 1760—was erected in 1586, and was adorned on the west front with a statue of Queen Elizabeth, and on the east with statues of King Lud and his two sons. Newgate was situated about a thousand feet north-west of Aldersgate, and was the newest or latest erected of the city gates. It was also considered "the fairest of all the gates." The original structure dates from the time of Henry I. or of Stephen, and, as Ludgate was the prison for civil trespassers, this was the gaol for criminal offences, and had been so used since the reign of King John. In 1422 the executors of the famous Dick Whittington "re-edified" Newgate in accordance with his last will and testament. It was rebuilt "more stately than ever" after the great fire. The present Newgate prison of course takes its name from this gate, which occupied a portion of the site of Dance's edifice, begun in 1770, completed in 1783. During the Lord George Gordon riots in 1780, old Newgate had been pretty well demolished, a fate that entirely befel the King's Bench prison, to which the rioters set fire, releasing seven hundred prisoners. And so passed away the ancient city gates. They were interesting as relics, but having served their end and purpose they were no longer necessary. They met with universal fate, and are now numbered among the things that were.

SOCIETY OF ARTS.—PRIZES TO ART WORKMEN.

THE works sent in competition for the prizes offered this session are placed in the Great Room, for the inspection of members and their friends.

The following is a catalogue of the works received:—

FIRST DIVISION.

Works to be Executed from Prescribed Designs.*

1. Carving in Stone.—Panel, after chimneypiece by Donatello, by J. Daymond, jun., 4, Edward street, Vauxhall bridge road, S. Price £8.
2. Ditto, Gothic bracket, by E. J. Price £5.
3. Ditto, by John Edward Daly, 33, Medway street, Westminster, S.W. Price £15.
4. Ditto, by John Barker, 4, John street, Marlborough road, Chelsea, S.W. Price £12.
*5. Flowers carved in Caen stone, by W. H. Holmes, 101, Dean street, Soho, W.
*6. Head, in marble, "Ecce Homo," by J. P. F. Jones, 4, Surrey villas, Nunhead green, Peckham Rye, S.E. Copies made for £5.
*7. Basso relievo, in marble, representing the Arts and Sciences, by the above. Price when finished £20.
*8. Ditto, in marble, by the above.
*9. Carving in Stone.—"Christ blessing little Children," by H. Francis, Reigate heath, Surrey.
*10. Ditto, "First Steps in Life," by the above.
*11. Ditto, specimens of letter-cutting in stone, by the above
*12. Modelling in Plaster.—National emblems, arranged by J. Daymond, jun., 4, Edward street, Vauxhall bridge road, S. Price £8.
*13. Head in Caen Stone.—"Winter," by T. Herne, 22, Werrington street, Oakley square, N.W.
14. Carving in Wood, after design by Holbein, by T. E. Mayle, 33, James street, Stockwell, S.
*14a. Carving and Gilding.—A Glass Frame, designed and carved by W. M. Holmes, principal part of the flowers by Mouatt (deceased), gilt in double mat and burnished by Messrs. Buchholtz, Venning, Chowne, sen., Ettershank, Connor, and Allen, exhibited by J. H. Wyatt, 101, Dean street, W.
15. Repoussé Work in Metal.—Executed in iron, after the Martelli bronze mirror case at South Kensington, by G. Page, 39, Duglas street, Northampton-road, Clerkenwell, E.C. Price £20.
16. Ditto, by J. S. Nicholls, 4, Everilda street, Hemingford road, Islington, N. Price £5.
16a. Ditto, on silver cup, by X. Y. Z. Price £30.
17. Ditto, on silver, by V. U. (Unfinished.)
18. Ditto, "Raphael's Three Graces," in silver, by Joseph Hakowski, 59, Frith street, Soho square, W. Price £20. Copies at £15.
18a. Ditto, "Three Graces," in silver, by X. Y. Z. Price £12.
19. Ditto, "Three Graces," in copper, silvered, by Charles Yerman, 14, Gerrard street, Islington, N.
20. Ditto, "Three Graces," in copper, by Alexander Dufour, 36, Cleveland street, Fitzroy square, W.
21. Ditto, "Three Graces," in copper, by W. Holliday, 14, Nailour street, Islington, N. Price £15.
*22. Ditto, Portrait of the late Viscount Palmerston, by the above. (Sold.)
*23. Ditto, Gronp, in copper, "Abundance," after J. Van Eycken, by Thomas James Bowman, 3, Rheidol terrace, St. Peter's, Islington, N. Price £7 10s.
*23a. Ditto, "Raffle-leafage." Price £5.
24. Hammered Work in Brass.—Adapted for use as a bracket, by W. Mansfield, 72, Bishop's road, Camberwell New road, S.
25. Ditto, by E. Millward, 35, Little Clarendon street, Somer s town, N.W.
26. Ditto, by Albert Edward Millward, 13, New Compton street, Soho, W.
27. Hammered Work in Iron.—Ditto, by Alfred Millward, 35, Little Clarendon street, Somers town, N.W.
28. Ditto, by G. H. Price £5 10s.
29. Ditto, by James Gwillim, 19, Sidney square, Mile End, E. Price £15.
*30. Ditto, by the above. Price £20.
30a. Panel for a Screen, by W. Letheren, Lansdown Iron Works, Cheltenham.
*31. Ditto, by William Cunliffe, St. Peter's street, Burnley. Price £5 5s.
*32. Ditto, Bread-basket, designed by A. W. Blomfield, Esq., architect, for East Sheen Church; executed by T. Winstanley, 7, Stanhope street, Clare market, W.C. Price £12.
33. Carving in Ivory.—Medallion Portrait of Flaxman, by J. W. Beutley, 22, Sherwood street, Golden square, W. Price £10.
34. Chasing in Bronze.—Bust of "Clytie," by Frederick Beech, 52, Great Colmore street, Birmingham. Price £16 16s.
35. Ditto, by H. R. Batchelor, jun., 149, St. John street road, E.C. Price £14
36. Ditto, by T. Nichols, 4, Everilda street, Hemingford road, Islington, N. Price £15.
37. Ditto, Ornament, after Goutier, by R. Reynolds, 15, Oak village, Kentish town, N.W. Price £15.
38. Ditto, Ornament, after Goutier, by G.
39. Ditto, Ornament, after Goutier, by H. J. Hatfield, 16, Alfred street, Tottenham court road, W.C. Price £15.
*40. Ditto, Statuette of "Caractacus," by the above.
*41. Ditto, Gronp, "Jacob Wrestling with the Angel," by the above.
*42. Two Miniature frames, raised and chased by the above.
43. Engraving on metal, after arabesques, by G. S. B. Price £3 10s.
44. Ditto, by G. Berry, 31, Brewer street, Golden square, W. Price £4 4s.
45. Ditto, by William Rowe, 4, Larkhall lane, Clapham, S. Price £3.
*46. Ditto, by Gilles M'Kenzie, Tudor street, Sheffield.
*47. Ditto, by the above.
*48. Ditto, by the above.
*49. Ditto, on silver cup, by the above.
*50. Enamel Painting on Copper.—"Madonna and Fish," after Raphael, by Frederick Lowe, 13, Wilderness row, E.C.
*51. Ditto, "Boy and Doves," after Raphael, by Walter J. W. Nunn, 10, Gardour street, Bromehead street, Commercial road, E. Price £5.
52. Painting on Porcelain.—"Two Children," in Raphael's cartoon of "Lystra," painted on a vase, by Edwin Saunders, Messrs. Battam and Son, Gough's square, E.C.
53. Ditto, "Two Children," painted on a vase, by W. J. W. Nunn, Messrs. Battam and Son, Gough square, E.C.
54. Ditto, "Two Children," by F. D. Bradley, West Parade, Mount Pleasant, Stoke upon Trent. Price £4 4s.
55. Ditto, "Two Children," by John Slater, Field place, Stoke upon Trent. Price £3 3s.
56. Ditto, "Two Children," by William Slater, Field place, Stoke upon Trent. Price £3 10s.
57. Ditto, "Two Children," by William H. Slater, Oakhill cottages, Stoke upon Trent. £5 10s.
58. Ditto, ornament, by F. D. Bradley, West Parade, Mount Pleasant, Stoke upon Trent. £5 5s.
59. Ditto, ornament, by Alexander Fisher, 5, Clyde street, Stoke upon Trent.
*60. Ditto, ornament, plateau in blue, after design by Maestro Ludovico, by the above.
*61. Ditto, pair of door finger plates, majolica style, by Miss L. Leila Hawkins. Price £5 5s.
*62 & 63. Ditto, Circular plates, subjects from the "Signatura" ceiling, by W. P. Rhodes, School of Arts, Stoke upon Trent.
64. Decorative painting, Ornament, by John Slater, Field place, Stoke upon Trent. Price £3 3s.
65. Ditto, by Δ.
66. Ditto, by Charles Pfinder, 28, Bayham street, Camden town, N.W. Price £6 5s.
67. Ditto, after a picture frame in the South Kensington Museum, by the above. Price £13 10s.
68. Wall Mosaics, after Bertini, of Milan, by Samuel Cooper, 2, Waterford terrace north, Walham green, W.
69. Die Sinking, after Wyon's "Head of Prince Consort," by W. E. Bartelle, 4, Chichester place, Wandsworth road, S. Price £15.
70. Ditto, by J. W. Minton, 9, Royal Mint, E.C. Price £20.
71. Ditto, by Albert Heness, 3, Egbert street, St. George's road, N.W. Price £10 10s.
72. Glass Blowing.—Exhibited by Dr. Salviati, 431, Oxford street, W. Produced by Marco Seguso, of Murano.
73. Bookbinding.—After an Italian specimen "Quintus Curtius," by John Jeffrey, 23, Upper Marylebone street, W. Price £7
*74. Ditto, Early Florentine style, "Histoire de la Porcelaine," by Louis Geuth, 30, Brydges street, Covent Garden, W.C. Price £35.
*75. Ditto, "Œuvres de Lorize Labe," by the above. Price £8 8s.
*76. Ditto, case specimen of mosaic, by the above. Price £10 10s.
77. Illuminations.—Specimen by Charles Pfinder, 28, Bayham street, Camden town, N.W. Price £5 10s.
78. Ditto, by Miss Mary R. David, 4, Anderson street, Chelsea, S.W. Price £5 5s.

SECOND DIVISION.

Works to be Executed without Prescribed Designs.

Wood Carving.—(a.) Human figure in the round, in alto or in bas-relief. Animals or natural foliage may be used as accessories.

79. "Egeria," by J. W. Gould, 33, Bayham-place, Camden town, N.W. Price £15.
80. "Cynthia, by the above. Price £10.
81. "Autumn," Female head in satin wood, by G. F. Bridge, 3, Vincent square, S.W. Price £5 10s.
82. A Finial carved in oak, by R. Davison, 28, Winchester street, South Belgravia, S.W.

* Those marked with an asterisk (*) are not after the prescribed designs.

83. Original Group in walnut, "Wallace at the Battle of Stirling," by John Lucas, 82, Long Acre, W.C. Price £31 10s.

(b.) Animal or still life. Fruit, flowers, or natural foliage may be used as accessories.

84. "Dog's Head," by E. Dujardin, 46, Camberwell grove, S. Price £2.

(c.) Natural foliage, fruit, or flowers, or conventional ornament, in which grotesque figures or animals may form accessories, preference being given where the work is of an applied character for ordinary decorative purposes, as representing commercial value.

85. Panel, "Bird and Flowers," by E. Dujardin, 46, Camberwell grove, S. Price £10.

86. Panel in Lime Wood, by J. S. Booth, 19, Malden road, Kentish Town, N.W. Price £10 10s.

87. Chemera Truss Leg, by R. Baker, Messrs. Holland and Sons, Gillingham street, Pimlico, S.W.

88. Vase of Flowers and Conventional Bracket, by G. H. Bull, 16, Millman mews, Millman street, W.C. Price £23.

89 & 90. Design for Damask Table Linen, by Miss A. Kemp, 27, Hereford square, Brompton, S.W. Price of No. 89, 15s., No. 90, 10s.

91. Design for a book Cover, by Miss Mary R. David. Price £1 10s.

92 & 93. Designs for Damask Table Linen, by the above. Price 10s. each.

94 & 95. Works in Oil, by Charles Maiben, 40, West Hill street, Brighton.

Works Executed and Finished by Machine.

Exhibited by Charles J. Hill, 6, Albany street, Regent's Park, N.W.:—

96—98. Three Groups in Ivory. Price £15.

99. "Head of H. M. the Queen," in Ivory. Price £5.

100. "Greek Head" in Steel. Price £8.

101. Ditto, in malachite. Price £5.

102. Case with Two Proofs from Engravings on Steel for Surface Printing, and two "Medusa's Heads." Engravings and dies in hand. Price £4 each.

DOMESTIC FIRES.

IT is not easy to overrate the importance of what is now looked upon as "the great coal question." Whether our supply of coals will be sufficient for the coming centuries, or whether England will by-and-bye be beaten in the race of nations, either for the want of coals or from the difficulty of getting at them, we will not now consider. We, however, welcome any suggestion which may tend in any way to preserve our national wealth, and therefore have pleasure in giving currency to the useful hint given by Mr. Recorder Warren to the people of Hull. In a letter to the Mayor of that town, dated the 6th inst., he says:—"Wishing you and all the town and corporation a happy and prosperous new year, and many of them, I cannot leave for town without offering a practical suggestion to yourself and every householder in Hull, which may at least show my goodwill. On that suggestion I have profitably acted for seven years, and it relates to coal. Do you wish to have the full benefit—that is, without waste—of every ounce of coal you pay for; to save nearly one-third of your ordinary consumption; to have a fire lit in the morning, which, with a little care, will last nearly the whole of the day, with possibly a single replenishing, and so save trouble as well as coal, and have warmth equally distributed through your apartment, great or small?—then attend to the following practical suggestion, upon which I have acted at home with complete success, for, as I have said, seven years, and have, with a like result, recommended to very many friends. The suggestion is not my own; I met with it seven years ago in a London journal. Ordinary fire-grates have open bars at the bottom, the result of which, of course, is to place the coal between the two draughts, one from below and the other from above, up the chimney, and ensure two things, rapid consumption and diminished heat in the apartment. When I arrived at my hotel last Wednesday afternoon—a bitter cold day—I found a large fire, which was twice replenished before I went to bed. The coal was excellent, but I could scarcely get warm. I prevailed on my worthy landlord to try my experiment on my fire-grate here. He has done so, and with what result? Ask him. But I will tell you that to-day my fire was made up at ten a.m. It is now five p.m. I have enjoyed, and am enjoying, a most comfortable warmth, without having to sit within a yard of the fire. Not an ounce of additional coal has been placed on it, nothing having been required but now and then, at long intervals, a poke from beneath and a pressing down from above. Now, how is this brought about? I will tell you. Send for an ironmonger or blacksmith, and order him to take the measure of the bottom of your grate and make you a sheet-iron plate of about the 1-6th of an inch in thickness, or even less, which, if your grate be large, will cost you 2s. Simply lay this on the bottom of the grate, then let your servant lay and light your fire as usual. It will soon burn up, but you must keep pretty open the lowest bar, so as to secure a slight draught. When the fire has begun to burn, poke it gently from beneath, and the flame will gradually get through the entire mass of coal, the iron plate beneath gets red hot, and so keeps up a constant combustion, at the same time dispersing the heat through the room, instead of its being sent up the chimney, thus entirely consuming the coal, instead of filling the hearth with ashes. In my own house I tried the experiment for a week in the breakfast-room, then in the dining-room, then in the kitchen, with uniform and complete success; and then I had the sheet iron plate put into every fireplace—and there are many throughout the house—with equal success. So I do with the fireplace in my official residence. When the fire is once made up, say about ten a.m., for the day, an occasional poke, and possibly a single replenishment, suffices for the day. In my own case, and also at my hotel here, where three scuttles were required, one now suffices."

NEW YORK UNDERGROUND.

A CORRESPONDENT of an American paper writes:—Several years ago, a little German Jew, named Schwartz, believing that in the sewers of New York might be found many articles of value which had been lost, entered them, and for three days wandered through the labyrinth. He was very successful, picking up some 27,000 dollars' worth of jewellery, spoons, forks, &c.; but having lost his way the first day, he believed that he might have found much more could he have carried out the original plan, which was to visit Fifth and Madison Avenues, Broadway, and the wealthy portions of the city. So great, however, were the difficulties and dangers which he encountered that nothing could induce him again to visit "New York underground." His adventure for a time created quite a little sensation, but there were none venturous enough to attempt a second until Wednesday of last week, when an adventurous party of three entered the sewer of Houston-street, at the ferry on East River, intending to remain one week, during which time they proposed visiting every portion of the city where there seemed to be any chance of finding treasure trove. The party consisted of Mary Walker, a young girl of 18, her brother James, aged 16, and Michael Grady, an old man of about 50. Miss Walker, some months ago, in an old paper wrapped around a parcel which she was taking home from a "slop-shop," saw an account of Schwartz's undertaking, and resolved to imitate it. Maps were obtained, and the city studied carefully. Each day's work for herself, her brother, and Grady, who was formerly in her father's employ, was carefully marked out. Every preparation which limited knowledge could prepare for was made, and the adventurers started. Each day they rendezvoused several times in the chambers at the street corners. On Sunday they had filled all the bags they had taken with them, some fifteen in number, and Miss Walker returned. James Walker and Grady continued their search, emptying six of their bags at the corner of Twenty-second-street and Fifth Avenue. On Wednesday morning, at a very early hour, and before people were stirring, Miss Walker was at the place with a waggon. On removing the iron plate which at each street corner leads into a small chamber connecting with the sewer, she found her brother, but not Grady. He had started off on another trip, although the six bags had been filled in Madison Avenue. The loose treasure was placed in extra bags, and the whole driven to a Broadway jeweller's. The rest were taken from the place on Thursday morning. A watch was set for Grady, but up to this time of writing nothing has been heard from him, and it is feared that he has perished. The result of the week's search is roughly estimated at 1,500,000 dollars. I saw the treasures yesterday, piled in three heaps on the floor, and the jeweller informed me that it must have cost over 3,000,000 dollars, but in consequence of the old-fashioned style of setting, its bruised, battered, and corroded condition, its value was reduced to about one-half. A little over a bushel (how queer it sounds to talk of jewellery by the bushel!) has been sorted, and among it has been found one diamond ring valued at 16,000 dollars, two more valued at 5,000 dollars, and half a dozen valued at 3,000 dollars and upwards. The most curious is a plain gold ring, inscribed on the inside, in Dutch, "Peter Stuyvesant to wife." It is an heirloom of the Stuyvesants, and was stolen, with other jewellery, last March, by burglars. How it came into the sewer is a problem for philosophers to speculate about. Miss Walker and her brother, who find themselves thus lifted suddenly from penury to great wealth, intend to proceed to England, where they have relatives. This adventure is talked of everywhere, and already there are others preparing to follow in their footsteps.

A TEA PARTY AND A TESTIMONIAL.

ON the evening of Friday, the 11th inst., a trade union meeting of a somewhat remarkable character, if taken in connection with the general attitude assumed between masters and men in the building trade, took place at Crown Works, the new and extensive premises of Mr. William Higgs, the well-known builder of the Metropolitan Tabernacle, the Guards' Barracks, Chelsea, &c. At six o'clock the whole of the workpeople of Mr. Higgs, with their wives and families, sat down in the large joiners' shop (which was tastefully decorated for the occasion) to a hearty and substantial tea, provided at the expense of their employer. The meeting was one of the merriest of its kind, men, women, and children enjoying the excellent cheer and the roaring fun that a lot of workpeople at home in their own workshop are sure to create upon such an occasion as this. Strong expressions of satisfaction and pleasure beamed on the countenances of everyone, whilst Mr. Higgs went about the place seeing that all the folk enjoyed themselves. There were about 600 men, women, and children present. After tea the company adjourned to the other wing of the shop, which had been fitted up as a lecture-hall. Amongst the gentlemen on the platform were William Higgs, Caleb Higgs, George Higgs, Joseph East (Mayor of Kingston-on-Thames), G. Charlton, W. Cheshire, T. Olney, W. Olney, and C. Blackshaw, Esqs., and the Revs. C. H. Spurgeon and Frank White. The interesting ceremony of presenting a testimonial to Mr. Higgs, as a mark of respect and esteem from his clerks and foremen, was the first proceeding of the evening. The testimonial (which was one of Benson's best timepieces) was a beautiful black marble pedestal, inlaid with malachite panels, surmounted by an urn hung with festoons of gilt flowers, and bearing the simple inscription, "Presented to William Higgs, Esq., by his *employes*; 11th January, 1867." Amidst loud applause Mr. Higgs thanked his people for this token of their respect (which had been kept secret from him until the moment of presentation), and trusted that meetings such as these would strengthen the bonds of union between employers and employed, assuring them that in everything that laid in his power he should be only too glad to conduce to their happiness. The enthusiastic applause that followed showed that there was a bond of union between master and men, far different and much stronger than any trade compact, viz., the bond of sympathy. He has already given them most substantial proofs of his care for them, having, amongst other things, gone to some considerable expense in fitting a large and comfortable dining-room on the premises. Mr. Spurgeon afterwards delivered his famous lecture, "Sermons in Candles." Unanimous votes of thanks were passed to Mr. Spurgeon and to Mr. Higgs, and the highly delighted meeting broke up.

STAMFORD CHURCH EMBELLISHMENT.

THE decorative painting in the chancel of St. John's Church, Stamford, is now completed. The colouring of the roof is a restoration, all the old work being accurately reproduced. Though little of it was visible before, yet, when the scaffolding was erected, it was not difficult to make out the whole of the work on the timbers and carved figures. All the principals and tracery are grounded vellum colour, the pattern work and picking out being principally chocolate, black and red. A very quaint cinquefoil in red, with gold centre, is frequently introduced. The carved bosses are gilded, also the coronæ of the angels and the emblematic shields they hold. The panels of the roof are a blue, which has the peculiarity of lighting up well, and showing its blue colour as well by artificial light as by day. This effect is produced by some peculiar preparation of the ground colour. Upon the panels is a powdering of stars, a very large one being in the centre of

each. The wall above the altar is painted as a reredos in three compartments. That in the centre contains a large gilt cross on a richly diapered ground, with an Agnus Dei on a medallion at the intersection of the arms of the cross. This is divided from the side panels by passion flower ornament. In the outer panels are four demi-figures of angels bearing inscribed scrolls. These are on gold grounds, and have gilt coronæ and jewelled clasps. The wall below these figures is diapered all round the chancel with a very effective block diaper, on a dull red ground, in black, white, green, and buff. The walls above, to the height of eight feet, are painted dull red with white lines, one inch broad, and about six inches apart, at an angle of 60 deg. Upon these lines are black pellets, and the spaces between are filled with a sprig of hawthorn in green, and rosettes in white and buff alternately.

The upper part of walls to the cornice is divided into three spaces and filled with diaper work of different patterns, separated by bold and effective borders. The pattern that intersects the points of the arches is particularly good, being a sort of brick pattern, in white, on a dark olive ground. The white squares bear a red quatrefoil, and the dark spaces, herring-bone work, in fine lines of russet colour. The moulded arches to the north and south chapels stand out from this work with very fine effect. The space under the window, on the north side, is divided into three panels. The centre one contains a medallion of St. John the Baptist, girt with a camel's hair girdle. The side panels are filled with geometrical devices. The splays to east window have a vine scroll on the sides and square panelling on the soffit. The splays to side windows are very successfully treated, with an arrangement of lines forming enriched panel work of alternate squares and diamonds. The elegantly moulded arches are carefully and judiciously coloured, and, though all the patterns differ, all are equally good. The artist is Mr. J. C. Lea, Lutterworth, who has recently decorated the interior of St. Michael's Church, Stamford.

THE NEW COURTS OF JUSTICE.

WE are authoritatively informed that when the article on the designs for the New Courts of Justice which appeared in one of the daily papers, and will be found in another part of the BUILDING NEWS, was penned, none of the drawings were hung, and a large part of them were unpacked. It will be seen that the article referred to is so expressed as to imply that it was written after an inspection of the exhibition. We are informed that the delay in exhibiting the drawings arises from the necessity of multiplying all the floor plans by photozincography, their intricacy, and the number of persons whose minute examination of them is necessary, being such as to compel this course. At a recent meeting of the Exhibition Committee a series of resolutions were come to as regards the opening and management of the exhibition. It was resolved that the exhibition shall open on Friday, February 8, and that and the following day shall be reserved for a private view by members of Government, peers, members of the House of Commons, judges of superior courts, foreign ambassadors, and other distinguished persons. After the first two days the exhibition will be open for four weeks, that is, to Saturday, March 9. On Mondays, Tuesdays, and Wednesdays, the Commissioners and their officers, members of the law, architects, and artists will be admitted, Thursdays being set apart to the public. Admission on these four days will be by card, to be obtained at the office of the commission, 33, Lincoln's Inn-fields. Fridays are to be reserved for the special work of the commission, and Saturdays to members of the Government, &c., as on the first two days. The invitations to the private views on these days will be under the direction of the Board of Works. The hours of admittance will be from eleven a.m. to four p.m. daily. The following noblemen and gentlemen form the Exhibition Committee:—The Right Hon. the Lord Chancellor (chairman), the Right Hon. the First Commissioner of Works, Hugh C. E. Childers, Esq., M.P., J. C. Lawrence, Esq. (Alderman), the President of the Law Society (A. Bell, Esq.), W. H. Walton, Esq., H. A. Hunt, Esq., J. Greenwood, Esq., Q.C., R. P. Amphlett, Esq., Q.C.

IMPROVED COMBINATION TOOL.

THE term "Yankee notions" has been applied to many simple but very effective devices, designed to lighten labour and conduce to the comfort of the race. These "notions" are often very valuable. The engraving herewith pre-

sented shows one of these handy combination implements, simple in construction, cheap in price, and effective in operation. It is a combination of hammer, pincers, nail-drawer, tongs, and hooks, and can be applied to varied uses about the house. The jaws A are intended to pull tacks and nails, to grasp covers of stoves, handle cooking utensils, &c. The hammer B is for driving tacks, and the hooks C for lifting pots, kettles, sad-irons, and other household appliances. The working part is of iron, and the handle of wood. It was patented through the *Scientific American* Patent Agency, and is manufactured by Messrs. J. C. Longshore and Brother, Mansfield, Ohio.

ST. GEORGE'S CHURCH, TUFNELL PARK, HOLLOWAY.

THE church, as illustrated on another page, is being erected from the designs of Mr. George Truefitt, architect, of 5, Bloomsbury-square. We are glad to lay it before our readers because it is so entirely different to the many churches erected, and which are all so very much alike. The difficulty the architect had to deal with was to get the building at all on such a sharp triangular piece of ground, but the way he has done it shows he does not believe that a church must of necessity be of the usual nave, aisle, and chancel type, about which there is perhaps really no design whatever. In this church the interior effect has been principally thought of, and as a building partaking of the circular plan always looks externally smaller than it really is, so the interior, which in this case is very spacious, surprises all who enter, as it seems so much larger than it appears from the outside view. There will be sittings for 1,020 adults, without galleries, the cost £5,400, being without the tower and spire, which it is hoped the heir to the estate will build when he comes of age. The site is presented by the Tufnell Park estate, the subscriptions coming principally from the seatholders of the temporary church, but, as only about half of the money has been collected, the building is now stopped for want of funds. The indefatigable treasurers are at work, however, and hope to see the building finished before long. At present the roofs are all on and slated. The materials are Kentish rag and Bath dressings; the columns, of cast-iron, ten inches in diameter. The roofs, which are open, are all rough from the saw, without stain or varnish, and are boarded and tongued with iron. The pewing will be varnished, the seats being all open. The chancel and passages will be all laid with cement or concrete, ready for future tiles. The walls, as at present arranged, will be plastered to a height of six feet only, leaving the rest to be done at a future time—in fact, everything is being carried out with regard to economy, as far as the fittings and finishings are concerned, so that the architect's original estimate of £5,400 may not be exceeded. The builders are Messrs. Carter and Sons, of Hornsey-road.

We are sorry to say that we did not receive drawings of section and plan of church in time to get them engraved for this week. They will, however, appear in our next issue.

SKETCHES OF VENETIAN ARCHITECTURE.

CASA DI PARVOLINELLI.

THIS palace (as nearly every house in Venice is so called) is situated on the Grand Canal, nearly opposite to the celebrated Church of Sta. Maria della Salute, and not far from the Palace Contarini Fasan, whose rich balconies do not fail to arrest the eye as the traveller passes along the great highway of Venice. It appears to have been built in the fifteenth century, and it seems probable that it was erected soon after the Palace Contarini Fasan, since it closely resembles it in the arrangement of the openings. This Casa di Parvolinelli exhibits the usual characteristics of the Venetian type on a small scale, though with less richness of detail than is generally met with. Here is the spacious water-gate, with small openings on either side; above is the elegant arcade (the original balconies no longer existing), and here, on the third story, is the large blank space invariably found in Venetian palaces. The name Parvolinelli is that of the present owner.

CAMPANILE ST AMARIA DEI FRARI.

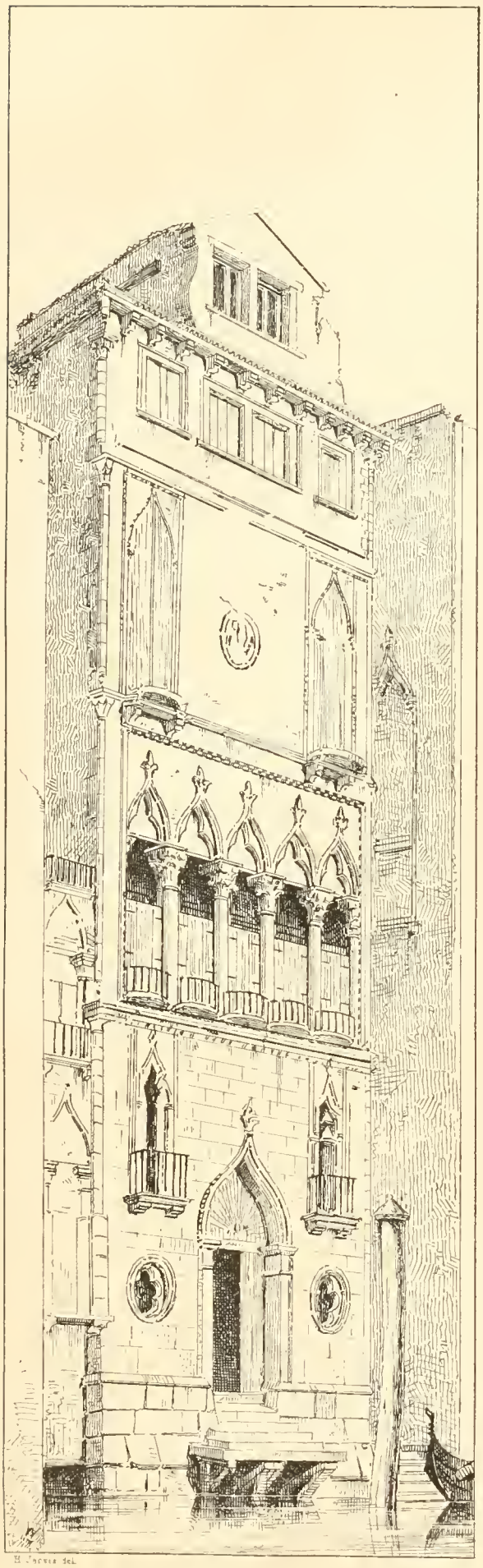
The beautiful apse of the Church of Sta. Maria Gloriosa dei Frari is no doubt familiar to the readers of the BUILDING NEWS, as some time ago an engraving of it appeared in these pages. The campanile does not present any remarkable speciality of design, but is interesting as being the oldest part of the church; an inscription on a stone at its base bears the date 1361. The refinement and purity of detail of the campanile will enable it to bear comparison with the lofty Renaissance one of St. Mark's without suffering by such comparison. There is scarcely any peculiarity of situation to lend a charm to the simple campanile of the Frari Church, unless it be its severity of form, which contrasts reproachfully with the wayward curves of the gable to the west front (not shown in the sketch), and yet taken by itself it exhibits a beauty which that of St. Mark's by itself does not possess.

HENRY JARVIS, Jun.

THE SMALLPOX—DIRT AND NEGLECT.

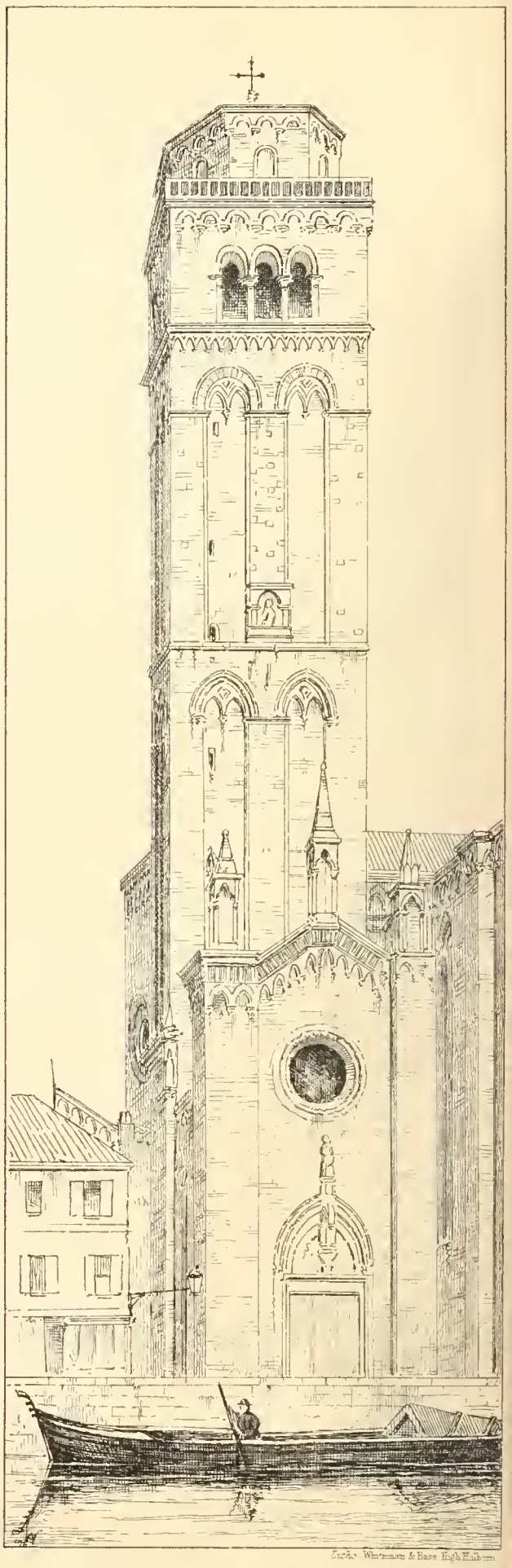
FROM the last monthly report of the parish of Marylebone, we learn that smallpox has recently made considerable progress in that parish. How this disease is intimately associated with dirt and bad sanitary arrangements, and also with the neglect of vaccination, may be gathered from Mr. Lightfoot, the temporary inspector. That gentleman says:—"Having been requested by you to furnish a report of the sanitary condition of the houses in which persons are suffering from smallpox, I beg to submit the following for your information:—'Many of the houses are in a very filthy condition, and overcrowded. Walls and ceilings dirty; drains untrapped; pavements broken in washhouses, yards, and areas, holding stagnant water, and smelling very badly; closets dilapidated and without a supply of water; butts and cisterns that require cleansing and covers; dustbins full of vegetable and other refuse, in a putrid state. In houses of this class the disease spreads rapidly; and I have observed in rooms only large enough for three persons—but where seven, eight, and as many as nine are crowded—two and sometimes three cases of smallpox in each room. I have experienced great difficulty in persuading persons suffering from the disease to go into the hospital; and where children are in question, the parents positively refuse to part with them. The greatest number of these houses did not undergo sanitary improvement during the house-to-house inspection, being situated in streets that were not visited. Those in Manning-street, Manning-place, and Suffolk-place, are, with regard to rooms, in the same dirty condition as when I first visited them, my term of office having expired before I could get the orders completed. I have carried out the measures authorised by you for arresting the progress of the disease, by placing in every room in each house a vessel containing chloride of lime, moistened with diluted sulphuric acid, and have used carbolic acid to drains, closets, and damp cellars; and, as far as practicable, have disinfected clothes and bedding. I have also set free a plentiful supply of chlorine in the Iron Hospital, and have left there also a quantity of carbolic acid for disinfecting purposes. I may add that I have inspected thirty-eight houses in which cases of smallpox have occurred, and in those houses alone I have found twenty-nine children that have not been vaccinated."

CAB FARES.—On the evening of Wednesday, the 6th February, Mr. Henry Cole, C.B., will introduce the following subject at a meeting of the Society of Arts:—"On the existing legal regulations in reference to the Cab Fares in the Metropolis, and their effect in rendering the Vehicles inferior to those provided in other European Capitals and the large Municipal Towns of this Country.'



H. Jarvis del.

Casa di Pavolinelli Venice



Lith.r Whiteman & Bass High Holborn

Campanile S.ta Maria dei Frari Venice

The Building News Jan. 8th 1867

Whitemarsh & Co. Lithographers 236 Holborn

IMPROVED DWELLINGS FOR THE POOR.

THE adjourned discussion on Mr. Kerr's paper for providing better accommodation for the poor took place on Monday, at the Institute. Mr. Kerr's one-room theory did not fare better in the hands of the gentlemen who spoke than on the preceding occasion. In fact, Mr. Kerr must, by this time, be convinced that, however much the poor may be compelled to live in single rooms, they do so from necessity and not from choice. But even if they did so from choice, that would be no reason to encourage them in such a course. By all means provide single rooms for single men, for single women, or for married couples without children; but by no means provide large rooms capable of containing three beds for families of six or seven persons. We are sorry that only an hour could be devoted to the discussion on Monday evening. Certainly when there were so many speakers present who were capable of offering valuable observations on the question, and so much of the evening was taken up in miscellaneous Institute business, that the time for the discussion might have been protracted for a short time, and more particularly as Mr. Kerr decided to put his observations in reply on paper, and send them in as a contribution, instead of giving a speech. At all events the Council of the Institute must see the importance of the question, and if they would appoint an early day for another discussion, or encourage some competent person to read another paper on it, they would do well.

PARIS EXHIBITION.—ARCHITECTURAL COMMITTEE.

MR. CHARLES FORSTER HAYWARD, the honorary secretary of this committee, has just issued a circular stating that space having been promised to the committee for the purpose of exhibiting architectural photographs, he should feel obliged if he be informed, at the earliest convenience, of the titles and sizes of any photographs the proprietors of which may like to be sent to Paris. The committee will only select the best examples, and no excessive margins can be allowed. The space for photographs has only been just granted, and as the Fine Art Court is now adjoining the Art Manufactures Court, and the photographs will be hung between, the general group of architectural objects illustrating the art and science in conjunction is so far satisfactory. The time for sending in the photographs to South Kensington is from the 21st to the 28th inst. They will be sent to Paris with the pictures in Group I. without any expense to the contributors. All communications are to be addressed to G. B. Wood, Esq., assistant honorary secretary, 9, Conduit-street, W.

THE DESIGNS FOR THE NEW NATIONAL GALLERY.

IN the last number of the BUILDING NEWS, an intimation was given that the merits of the ten competitive designs were not such as to require a second notice, but the exhibition has evoked so much criticism that many of our readers may desire a short synopsis of what may be called "the opinions of the Press," which will be found to coincide in a marked manner with those we have already expressed, added to which, it seems reasonable that a further notice of all art matters should be expected than will be found in an ordinary periodical. Far from being captious or hypercritical, if we followed the promptings of our feelings, that which could not conscientiously be praised would be passed over in silence. We have, however, seen no reason to modify, still less to alter, our previously expressed opinions, and if the present remarks should pain any, it must not be forgotten that, whereas only ten persons are directly interested in the competition, thrice that number of millions, roundly speaking, for many generations, are concerned that the National Gallery should be the best that the wealth and talent of England can provide for its greatest city. It must not be understood that excuses are made for the line we have taken, or are about to take. The only line we have ever taken, and we hope to be preserved from ever taking any other, is the straight line of impartial, though perhaps unusually free, criticism. In pursuing this course we cannot fail occasionally to run counter to some generally received opinions, but if nothing is extenuated, nought is set down in malice.

Design No. 1, by Mr. Owen Jones, does not on further acquaintance remove the impression of want of permanent character which a first view suggested. It has more the character of a continental *Kursaal*, or Biarritz pavilion, than a national gallery in the centre of a great metropolis. Of Mr. Jones's design the *Times* thus speaks:—

> Mr. Owen Jones, for example, has sent in a design, on which he has bestowed all his great skill. He has produced a standard work called the "Grammar of Ornament," and his name is associated with a system of decoration which, if not original, is at least uncommon. We approach his design, therefore, with the confidence that it will be infinitely more picturesque than the old edifice. He is so confident of this himself that he has ventured on a comparison which no other competitor has chosen to invite. He has had a photographic copy made of his design for a national gallery, and of the pictorial effect which he imagines it would have when erected in Trafalgar-square. From precisely the same point of view in the square, and on precisely the same scale, he has had a photograph taken of the existing gallery. And he has framed the two photographs side by side, so that we may compare one with the other. We must say candidly that the existing gallery does not suffer in the comparison. Judging by the photographs, we cannot help asking, why should we pull down the old building of Wilkins to make way for the new one of Mr. Owen Jones? Still more, why should we pull it down when we can improve it as Mr. Cockerell suggests?

We have carefully compared the two views, and entirely agree with the remarks; indeed, the want of scale causes Mr. Jones's building, though absolutely considerably higher, to appear actually smaller than the existing gallery. For all we see to the contrary it might not be more than 300ft. long. The *Athenæum* remarks that "Mr. Jones sends a very pleasing and elaborate design, that in its appearance suggests the Venetian-Renaissance of the sixteenth century, and marked by much of its elegance," but after a brief description the reviewer appears to come to the conclusion that

> On the whole, although the conventional elegance of this work must be admitted, there is nothing in its exterior either striking for itself or proper to a picture gallery. Reduced in scale, it would do equally well for a mansion or bank as for a purpose where the long-stretching galleries of the interior should not fail to be externally indicated. So far as architectural beauty goes, we should gain as much by removing the domes from the present gallery, and retaining its better features, as by building a new one after Mr. O. Jones's designs.

This is "damning with faint praise," but it contains a fair summary of the faults which disqualify it for a national gallery.

Design No. 2, by Mr. C. Brodrick, is thus commented on by the *Times*:—

> We are to imagine a facade that suggests the appearance of a great square building defended on all sides by a countless regiment of pillars and pilasters. On the top of this great square is placed a Greek temple, also surrounded by a vast regiment of pillars. The effect in Mr. Brodrick's drawing is sufficiently imposing; but it looks as if in such a building there must be a prodigious waste of room, and we fancy that when the eye of the Londoner becomes accustomed to such an army of pillars, with all the little urns atop of them on the sky-line, it would begin to hold them cheap and to make mirth of them. We should begin to count the pillars; we should all count them wrong; there would be a wordy war in consequence; we should have weary arithmetical calculations to show who is right; and at length the interminable pillars of the National Gallery would be given up in despair as the sand of the sea and as the leaves of the forest.

This is almost precisely what we said of the design in our last number, and now add that the defect is immeasurably increased by the fact that the columns are set at least one diameter too close together. In Mr. Murray's design, where a number of columns are used, this fault is avoided. The *Athenæum* mixes praise and censure in a rather amusing manner. The extracts are from the commencement, middle, and conclusion of the review.

> It would be hard to find a better or more carefully considered plan. He proposes to include and adapt almost the whole of the existing buildings, and, in design no. 3, for the gallery floor, . . . an apse, as before, is provided, but with arrangements that are much superior to those of Mr. O. Jones. The exterior of this design is at once admirable and objectionable; it reminds us of some of the better qualities of Soane's finer designs—is dignified, but eminently unfitted to the requirements of our climate, and painfully recalls the sooty fate of all buildings which depend for architectural dignity on ranges of great columns, recessed fronts, pediments, and large quantities of statuary. . . . . The ranges of columns are grand in themselves; their disposition, especially in the recesses of the south front, is excellent; also, the decoration of the wall-spaces with friezes and pilasters, and the cornice. On the other hand, the peripteral second story is an absurdity; a temple raised on the roof of another is destructive here, and undesirable anywhere. Mr. Murray has recourse to a similar device, but in a less unfortunate manner than Mr Brodrick's. It would be well to refine some of the parapet decorations in this design, or to remove them; the cost of statuary and bas-reliefs would be very great. Much space is lost by the colonnades.

This is as neat an example of blowing hot and cold as we ever remember to have encountered.

No. 3 (Mr. Street).—This plan is very good, particularly in the arrangement of corridor, giving access to a large number of small rooms for cabinet pictures. The great galleries of Europe are similarly furnished with accommodation for pictures which would be lost in a wide or lofty hall. The *Times* gives a very brief notice of Mr. Street's design:—

> If we understand them rightly his plans for the arrangement of the National Gallery, in so far as these relate to convenience, will commend themselves to the common sense of his readers, and they accord with the practical experience of our chief authorities in the management of picture galleries. Also we must say for Mr. Street that his design is in parts well conceived. But there can be little doubt that in the mass it will disappoint even the admirers of Gothic architecture. The roof of his building is like the roof of a barn. It is a straight line from end to end, broken in the middle by a dome. The roof we have compared to that of a barn; it is still more like that of a workman's shed, or the long monotonous roof of one of the huts at Aldershot stretched out beyond all conscience. But no doubt Mr. Street can easily correct this ugliness, unless he is too strict in his notions of Gothic.

The *Athenæum* devotes nearly a column to Mr. Street's design; we can give but very brief extracts:—

> It is impossible not to admire the courage of Mr. Street in furnishing a purely Gothic design for a building to which that style is popularly believed inapplicable. The candid student will profit by reading the vigorous apology this architect has attached to that eminently beautiful and original work, which, whether judged by its own standard or that common here, is surely the most interesting of the collection.

This is perfectly true, but we cannot help feeling that public opinion will be an echo of the review in the *Globe* of the 15th, which says:—

> The metropolitan character of a National Gallery, situate in one of the most important sites in England, required a very different treatment; and because he has not recognised this peculiarity of his task, Mr. Street has, in our opinion, entirely failed to produce a suitable design, or even to prove that a Gothic picture gallery is desirable.

Design No. 4 (Mr. Cockerell).—The plan is good, but the elevations are not. His alternative elevation is in some respects better, and in others worse. The pavilions at ends swamp the central composition. The arcade without capitals or imposts naturally wants character, and the whole exterior is an agglomerated copy of indifferent Roman examples. Mr. Cockerell can do very well on ordinary occasions, but on the present he has

taken his admirers by surprise. After mentioning that Mr. Cockerell had sent in two designs, each of which is an adaption of the old building, the *Times* remarks :—

That he has given all his heart to the work of improving upon the present edifice. He has certainly done wonders with it in both his designs, and we should imagine that unless something particularly good can be devised for a new building, the judges will be very loath to reject Mr. Cockerell's proposals. He has made the most of the building as it stands, and the public will be inclined to let it stand thus improved, if in any new design they do not find a marked superiority.

The *Athenæum* takes very much our own view of the merits of Mr. Cockerell's elevations :—

We consider the designs of Messrs. F. Cockerell and F. Penrose undesirable for lack of character, to say nothing of the oddly-shaped rooms of the latter.

No. 5 (Mr. J. Murray).—By inconsiderable alterations in the façade of the existing edifice, Mr. Murray produces a very fair result. The *Times*, after alluding to the difficulties of remodelling the National Gallery, says that Mr. E. Barry, Mr. D. Wyatt, and Mr. J. Murray have each given a remodelled view. "They seem to have worked in the spirit of those who make the best of a bad business, and to have reserved their labour of love for the new designs they had in hand." We prefer Mr. J. Murray's adaptation to any design in the exhibition, excepting his own, for an entirely new building, and may add that, judging from the remarks of the visitors, this opinion seemed to be held by many. To these designs the *Athenæum* refers :—

Mr Murray sends two designs, one of which is Greek, with Corinthian columns and pilasters, and a super-imposed temple by way of second story, a pediment of false constructional character on the west front; the last is intended to be seen from a new street in that quarter. On other grounds this design is not without grandeur and grace: it is to be preferred to its fellow, that illustrates the worst Roman mode in chamfered stone courses, detestable rustications, and those hideous pillars which put one in mind of tea-chests and Cheshire cheeses placed one on the top of the other; bearded masks decorate the keystones of the window openings on the lower tier; commonplaces of this sort ought not to be tolerated in a new public building.

Mr. Murray can afford to smile at the flippancy which calls rustication "detestable," and for the "tea-chests and cheeses, and masks," perhaps he has seen them at Somerset House. Flippant criticism is seldom sound; it is always a safer course if one happens not to know anything about a matter to say nothing. We regret that we have not space to describe this design at length. It has all the merits of Mr. Brodrick's with few of its faults, and with the exception of introducing horses as a decoration on the parapet, and relying too much on the little Grecian temple on the top story, the design is excellent.

Design No. 6 (Mr. E. M. Barry).—This is in many respects a fine design, but the defects it exhibits in every case neutralise its merits. Striking at first, the more it is examined the less will it be found to please. Apart from the undesirability of rivalling St. Paul's, it has no outward appearance of being a gallery, or, indeed, anything else. The *Times* alludes to the design thus :—

There is enough of Greek detail in Mr. Edward Barry's design to make us speak of it next. It is exceedingly able—one of the most scholarly in the gallery; and again and again, while we stood before it, we heard persons pronounce upon it as the best of all. "That's the design for me," they said. It is not difficult to see what it was in this design that attracted so many of the spectators. Londoners are accustomed to St. Paul's Cathedral, and the mass of them regard it as the chief glory of English architecture. Now, Mr. Edward Barry's design is an adaptation of the leading ideas of St. Paul's to a secular building, with a very broad facade. Therein lies the strength and the weakness of his design. We see in it the dome, the arrangement of pillars, the statues on the sky-line, and the general effect with which we are familiar. So the design touches the popular standard of excellence, and goes to the popular heart. On the other hand, the metropolitan cathedral is so unique that it may be doubted whether we can tolerate another piece of architecture in London that will suggest a resemblance to it. We are far from accusing Mr. Edward Barry of a slavish imitation of Wren. Every architect is more or less of an imitator, must work in a particular style, and Mr. Barry has shown a vigour in his design which deserves all praise. But the fact remains that some things may be imitated and others not. The finest buildings in Pall-mall are imitations of various Italian edifices. An architect may imitate a Greek temple, and no one will quarrel with him. But we must repeat our doubt that Englishmen would like to see in Trafalgar-square an imitation, however free, of St. Paul's.

We have only space to add that the *Athenæum* contains a notice of about the same length, and even more complimentary.

Design No. 7 (Mr. Penrose).—There is a certain amount of picturesqueness in this design, but it is only suitable to a provincial capital in Spain or Italy. The plan is simply extraordinary.

Design No. 8 (Mr. G. Somers Clarke).—To say that this design was a huge heap of three-storied littleness, with telescope towers attached, would not be an inapt description. The dome springs from a square, and such a composition would never form good outline. In the perspective considerable changes have been made, but the weak places are ill-concealed. In fact, the perspective is not to be relied on. The alternative Gothic view groups rather better.

Design No. 9 (Mr. M. Digby Wyatt).—This design has no central feature, and relies for distinction on a cupola at each end, or rather on three cupolas, one at one end and two at the other. These will seldom group in an endurable manner, and from many points of view will be bewildering and ruinous to the effect. The alternative design is a very artificially contrived structure, having a funny little Grecian temple atop, supported by caryatides of some size. In other respects the façade is little changed and less improved. One of the perspectives is of unusual tone, appearing to have been executed during the prevalence of a dense fog. Though we do not consider Mr. Wyatt has done himself justice in this design, of his ability there is no question whatever. The *Times* gives a long notice :—

Italian designs are contributed by Mr. Digby Wyatt, Messrs. Banks and Barry, Mr. G. Somers Clarke, Mr. James Murray, and, we may add, by Mr. Penrose, though his design is more French than Italian. Of these we have no difficulty in giving the first place to Mr. Wyatt, whose drawings have been prepared with extraordinary care, and show great spirit and invention. What first of all strikes the eye in the appearance of the facade are seven great arches on the second story, and occupying nearly the whole frontage of this story. At first sight we imagine these archways to be intended for windows; but we soon see that we are mistaken. Then we fancy that these great arches must be the magnificent supports of a grand covered balcony or verandah, and that the windows are behind. But no such thing. These arches are simply the arches of deep recesses or alcoves, and in the back of each alcove there is nothing but a statue. We are puzzled to know what the architect can mean by what seems at first to be only a most elaborate and expensive ornamentation. The meaning is this. He believes only in top lighting. His upper story is lighted from the roof, and there accordingly all is natural and well. But how light the ground-floor without windows? He has cut these deep alcoves into the upper story, which seem to be useless alcoves, and nothing more, or useful only as enormous niches for far withdrawn, timid statuary. But, in reality, the floor of the alcove becomes a skylight of the ground floor. This is exceedingly ingenious. Mr. Wyatt's designs are, perhaps, the most original and also the most showy in the gallery; whether they are the best is quite another question.

Last on the list, No. 10 is the design of Messrs. Banks and Barry. It is not lofty, nor is it imposing; but from its propriety, or perhaps practicability, it stands a better chance of being built than many of its more pretentious neighbours. The *Athenæum*, which can have nothing if not magnificent, says :—"Messrs. Banks and Barry have an ineffective exterior for their work; large wall-space within, and superior internal arrangements; we fancy the principal galleries are lighted at too great an elevation from the floor."

A good deal of this is true. The lower story is not quite satisfactory, and the pavilions are squat, but there is considerable merit about the design. We should call it correct rather than bold, quiet rather than imposing.

In summing up, the *Times* says: "Upon the whole we are not enthusiastic about these designs. They all contain good, and some admirable work, but we doubt if any will quite satisfy the public expectation, and we are sure that the judges will be not a little puzzled to know which to recommend for adoption."

In these remarks we cordially agree, and hope that no rash decision will be arrived at. That the exhibition now to be seen in the Royal Gallery represents the architectural talent of England is what few would care to assert, and still fewer endeavour to maintain.

EDINBURGH ARCHITECTURAL ASSOCIATION.

AT the usual fortnightly meeting of this association Mr. John C. Hay read a paper, entitled "Suggestions as to the Sanitary Improvement of Large Cities, and how Overcrowding may be Remedied." In introducing the subject, Mr. Hay gave interesting statistics, showing the great discrepancy between the old and new portions of the city of Edinburgh in reference to density of population, amount of disease, and proportion of rental to accommodation. While the population in the denser parts of the Old Town is 314·5, in the suburbs it is only 10·2. During the year 1865, while there were 494 cases of fever in the High-street and Cowgate district, in the whole New Town north of Princes-street there were only 38; and while in the Old Town the rents in many cases are as high as 8d. per superficial foot of floor space, those in the best parts of the New Town range from 5d. to 6d. Mr. Hay next adverted to the importance of an abundant supply of pure water, and deprecated the present monopoly, recommending that the corporation should take the supply into their own hands, as has been done in other cities. A more thorough carrying out of a general system of drainage was recommended as a most important item of sanitary improvement. With regard to the clause in Provost Lindsay's Act empowering the authorities to order the general introduction of waterclosets, Mr. Hay considered that this should be enforced, and was of opinion that in a short time their benefit would be fully appreciated by the lower classes. One of the remedies suggested for reducing the overcrowding at present so excessive in the older portions of the city was to encourage co-operative efforts on the part of the working men themselves in erecting dwelling-houses. Instances were quoted—London, Liverpool, Manchester, and other English cities—where co-operative societies of working men had purchased estates in the outskirts, and erected dwelling-houses for themselves, and found it a remunerative investment. Mr. Hay considered that if such a plan were adopted in Edinburgh it would materially relieve the over-crowding, and enable the Lord Provost to carry out his improvements at a much less cost, as rents would fall to their natural level, and properties could be acquired at nearer their actual value. A lively discussion followed, in which the views advocated in the paper were generally concurred in by the members.

YORKSHIRE ARCHITECTURAL SOCIETY.

THE general annual meeting of this society was held at York last week, the Dean of York in the chair. The Rev. G. Rowe read the twenty-fifth annual report, which stated that the society maintained ground, and, though slowly, was steadily advancing in position, and the working power of the society has increased. In one point they had not been so successful as they could have wished, the society's offer of prizes to art workmen, adopted in the last report for subjects modelled in clay, not calling forth any competitors. After an attempt to account for this, the report went on to state that the committee believed that the plan was a good one, and in furtherance of it, they recommended that for the year 1867 the subjects for competition should be carved in wood, various

articles useful in church architecture being defined for carrying out in oak and deal, the prizes to be given to the producers of the two best examples in the former series being five and three guineas, and for those in the second series two guineas and one respectively. During the year the society had successfully memorialised the Lords Commissioners of her Majesty's Treasury in support of an appeal made by the Dean of Westminster for the restoration of the Chapter-house; and at the instance of the Architectural Society of Bristol they had in a memorial to the Town Council of that place deprecated the further destruction of the mediæval buildings known as Colston's House, the site of which was said to be required for new assize courts. It was further mentioned that the summer excursion of the society had been made on the 31st of May to Bolton Abbey, on which occasion a paper was read by the well-known antiquary, J. R. Walbran, Esq., upon the history of the place. It would interest many to know that the Duke of Devonshire had instructed Mr. Street to restore so much of the Abbey Church as was necessary for public worship.

It was unanimously resolved that the report be received, adopted, and printed. The whole of the officers were also re-elected, the only alteration being the substitution of the name of the Rev. J. Palmes, on the committee, for the Rev. C. Kerry. The names of about a score gentlemen were also added to the list of members of the society.

THE LATE EDWIN STIRLING, SCULPTOR.

"W. H. P.," writing to the *Liverpool Mercury*, says:—All who have watched with interest the progress of the numerous buildings erected in Liverpool within the last twelve or fifteen years must have been struck with the great increase of sculptural embellishment displayed in their decoration. One reason of this has been that a class of workmen has been gradually rising up amongst us of a higher order than heretofore, who not only carry into execution the ideas of another, but work out their own thoughts in all the beautiful forms which nature has given us as examples. Foremost among these art workmen was the subject of this notice.

Born at Dryburgh, in the South of Scotland, in the year 1819, he early manifested a taste for sculpture. When quite a boy, some models in clay, found in a field, which were discovered to be his work, attracted the attention of Sir David Erskine, a gentleman who resided in the neighbourhood. He obtained for the incipient sculptor an apprenticeship with Mr. Smith, of Darnick. After serving his time he succeeded in obtaining a situation in Edinburgh, where he enjoyed the advantages of the School of Art there established. From Edinburgh he removed to Ulverstone, where he remained three years. He then came to Liverpool, and, after working some time with Mr. Canovan, entered into business with him as sculptors and architectural carvers. The first building of importance upon which Mr. Stirling was engaged was the church of St. Francis Xavier, Salisbury-street, in which he executed much beautiful carving. Upon the death of his partner he continued the business on his own account, being engaged upon most of the large commercial buildings which have been erected in the town. Tower-buildings, Water-street; Richmond and Hargreave's-buildings, Chapel-street; Queen Insurance-buildings, Dale-street; Parana-buildings, and Berey's-buildings, near the Exchange Station; and the recently erected North-Western Bank bear testimony to his skill and taste as an artistic carver. Upon the front of Hargreave's-buildings he executed a series of heads, in full relief, illustrating the discovery of America—among others, those of Columbus, Cortez, and Ferdinand and Isabella, of Spain. Over the doorways of the elegant building lately erected for Mr. Stock, in Exchange-street East, are figures of cupids astride upon dolphins, with other beautiful sculpture, the work of Mr. Stirling. At Brown's-buildings he modelled and carved the two gigantic figures which flank the centre doorway, the statues of the four seasons surmounting the building, and an elaborate frieze, divided into compartments, which for play of fancy and excellence of work is worthy of the closest examination. His works, however, were not confined to Liverpool. Specimens of his work have been scattered abroad throughout the country, among which may be mentioned the statue of the Prince Consort at Hastings, and the statues which crown the south front of Hooton Hall, Cheshire.

On the subject of this notice it may truly be said "he was a workman worthy of his hire." When engaged upon any work he took the warmest and most intelligent interest in it, making it his own delight as well as that of his employer, working *con amore*, without grudge of labour or trouble, in order to attain a satisfactory result. To him his art was a pleasure for its own sake, apart from any pecuniary considerations. As a master he took the liveliest interest in the progress and welfare of those in his employ, and he has been the means of training up many of the best carvers at present in the town. This characteristic of self sacrifice was shown in his devotion of two evenings every week during two successive winters to the instruction of a modelling class in connection with the Liverpool Architectural Society. The feeling for the beautiful which he exhibited in his works was but the echo of that beauty of holiness which he cherished in the inner man.

ENGLAND AND THE PARIS EXHIBITION.

HER MAJESTY'S Commissioners, with the Associate Commissioners, held meetings on Friday at South Kensington Museum. The Prince of Wales presided at both meetings. His Royal Highness read the following memorandum on the prospects of the Exhibition:—"1. Her Majesty's Commissioners thank the Associate Commissioners for the suggestions they have made in recommending jurors. They also thank the several committees of the Associate Commissioners who have frequently met in order to ensure a proper representation of objects of ancient art, modern pictures, engravings, various manufactures, printing, navigation, munitions of war, &c. 2. Her Majesty's Commissioners thank the trustees of the British Museum as well as those of other public institutions for the readiness with which they have consented to lend objects necessary for completing the Exhibition at Paris. 3. It has not been found necessary to ask for the services of the Associate Commissioners in several classes because the demands for space in those classes have greatly exceeded the amount that could be granted, and, in respect of the classes for agricultural stock, action has been suspended by the Imperial Commission in consequence of the cattle plague. 4. A statement of the representation which each class appears likely to make in the Exhibition will be laid before the Associate Commissioners, and her Majesty's Commissioners will be glad to receive their assistance in supplying some few deficiences. 5. Her Majesty's Commissioners regret that the staple industry of cutlery, for which England is remarkable, should at present appear to be most imperfectly represented; it may be hoped that by the co-operation of the Associate Commissioners and the Master Cutler of Sheffield, an adequate representation of that important branch of industry may be effected. 6. Notwithstanding this deficiency, her Majesty's Commissioners have the gratification of believing that, in other respects, the United Kingdom, India, and the colonies will be far more completely represented than in any previous international Exhibition. 7. A new and very important inquiry, namely, the effect on workmen of co-operation and benevolent associations throughout Europe, has been originated by the offer of prizes by the Imperial Commission. To each Associate Commissioner has been sent a copy of the series of questions which it is desirable should be answered by persons or establishments in this country, and the Associate Commissioners will much promote this inquiry if they will assist in causing these questions to be filled up as extensively and as soon as possible. 8. It is the earnest wish of her Majesty's Commissioners that the example set by the French in 1862, of assisting foremen of works, and artisans, to study the Exhibition, should be followed, and that the utmost facilities should be afforded to British workmen to visit and study the Paris Exhibition. Her Majesty's Commissioners express a hope that the Associate Commissioners will, in concert with the Society of Arts, municipal authorities, and chambers of commerce throughout the country, be able to assist materially in promoting such visits. 9. The executive department of the British section has provided offices for the transaction of business at 71, Avenue des Champs Elysées, Paris, where the Associate Commissioners will be able to obtain information respecting the Exhibition, and facilities for visiting it."

PERSONAL.

AT a meeting of the Town Council of Doncaster, specially convened to receive the resignation of Mr. T. B. Mason as Town Clerk of the borough, which he had held for upwards of thirty years, it was unanimously resolved to present him with a testimonial of 200 guineas and a gold box, for his long and valuable services.

Dr. Joseph Rogers has been elected by the Vestry of St. Ann's a member of the District Board of Works in the room of Mr. Warne, resigned.

On the 7th inst., John Bull Gardener, F.R.I.B.A., of Goldsmid-road, Brighton, died in the 81st year of his age. He survived his wife only eight days.

The Council of the Society of Arts have appointed Mr. Astrup Cariss, of Liverpool, Honorary Local Secretary to the Society of Arts in that district, in the room of the Rev. Dr. Hume, resigned.

Mr. J. B. Waring has been appointed general manager and Chief Commissioner of the National Exhibition of Works of Art to be held in Leeds in 1868. Anyone who knows anything of the distinguishing qualifications of Mr. Waring will no doubt say that the council could not have chosen a better man for the purpose.

Mr. E. Welby Pugin held a conversazione at his London residence, 21, Saville-row, on Monday evening last.

Mr. Sturrock, of Doncaster, the locomotive superintendent of the Great Northern Railway, has resigned that appointment, and is succeeded by Mr. Stirling, from the Glasgow and South-Western Railway.

THE PARIS EXHIBITION.—The Duke of Cambridge, the Secretary of State for War, the First Lord of the Admiralty, and Mr. Robert Napier (late president of the Society of Mechanical Engineers) will be the commissioners.

THE DESIGNS FOR THE NEW COURTS OF LAW.

THE proposed Courts of Law will be the most important architectural work which has been projected in the metropolis since the building of the new Houses of Parliament, or, more correctly, the New Palace at Westminster. Let us hope that the experience of the past may warn us against repeating the errors which have done so much to mar the utility and spoil the effect of the latter building, and which, but for the genius and industry of Pugin, would have been far more aggravated than they are. The public have already paid about three millions sterling for a building so lamentably deficient in the first essential condition of architecture that the House of Commons does not actually provide a seat for every member, while the ceiling of the chamber is lowered many feet, the whole of its fair proportion destroyed, and half of its windows buried, in order that the voice of the speaker may be heard. In the House of Peers so faulty is the design that hearing is almost out of the question, while the accommodation for the "faithful Commons" is so miserably restricted that scenes almost as indecorous as those which were said to have occurred at "Drawing-rooms" once held at St. James's Palace are repeated on each successive opening of Parliament. The difficulties to be contended with in the construction of the new Houses of Parliament will not, however, have to be encountered in the proposed Palace of Justice. The architect of the latter cannot complain of the site, and, beyond a common hall or place of rendezvous, no very large chamber need be constructed with especial view to acoustics. The architects invited to compete for the new Courts of Law are ten in number, viz., Mr. Gilbert Scott, R.A., the architect of the new public offices in Downing-street; Mr. Waterhouse, Mr. Burges, Mr. Garling, Mr. H. Lockwood, Mr. Street, Mr. Deane, Mr. H. Abrahams, Mr. E. M. Barry, and Mr. Seddon. Two of the above (Mr. E. M. Barry and Mr. Street) are amongst those who have contributed designs for the new National Gallery in Trafalgar-square. It is pleasant to be able to state, in reference to the proposed Courts of Law, that all the architects who have furnished drawings have, to a greater or lesser extent, left the beaten track of precedent, and have supplied something which, if not quite original, has many original features. Few of the designs can be described as conventional in their mode of treatment, and the

spectator will not have to recognise many reproductions of old friends, seen somewhere before, but which may not be at once identified. Many of the designs have been produced with great care, while others indicate want of sufficient study in the preparation. As a whole, however, the exhibition is creditable to the profession, and is likely to be satisfactory in this sense, that the verdict of the public may be taken upon some one or other of them without much apprehension that it will fail to realise the expectations formed of it. The drawings of Mr. Gilbert Scott, Mr. Garling, Mr. Burges, and Mr. Deane are those which will probably attract most attention. Mr. Scott luxuriates in a grand Gothic conception, and his perspective is very imposing. Mr. Waterhouse, whose assize courts at Manchester already entitle him to very favourable consideration, suggests a magnificent and appropriate pile; while Mr. Garling presents a very superb design, full of character and expression. The drawings of Mr. Burges and Mr. Street evidence the keen appreciation in which those gentlemen hold the Gothic school, while Mr. Deane presents a sketch which has the merit of being peculiarly unique in its way and thoroughly original in its mode of treatment. Indeed, the selection of Mr. Deane as a competitor is highly creditable to the late Government, as his buildings—both at Oxford and at Trinity College, Dublin—entitle him to a high place amongst the architects of his day. Those who have had experience of the library lately built in the inner Temple by Mr. Abrahams may not be favourable to the plan proposed by that gentleman; nor is the drawing of Mr. E. M. Barry very solid or imposing, though it may be likely to obtain a large share of popularity. Mr. Lockwood suggests something more subdued in its character than that presented by Mr. Scott, Mr. Waterhouse, Mr. Deane, or Mr. Garling, but his design has great merit, so far as may be gathered from a very cursory view. Mr. Seddon has been at the pains to produce a model in plaster in addition to drawings of the building which he would set up. The model suggests shadowy recollections of the "White Tower" in the Tower of London, with endless repetitions of the same in reduced shapes, and "pepper castors," the number and variety of which would gladden the heart of the late Mr. Wilkins, the architect of the National Gallery, could that worthy again appear in the flesh to examine this unique work. Exception may, perhaps, be taken to some of the designs on the score of being too ecclesiological in their character. On the other hand, it may be held that others do not sufficiently proclaim their purpose. As before stated, however, there is no reason to suppose that the exhibition will not answer the object intended, and that from among the many designs presented some one may not be selected which, when carried out, will realise a suitable building, the absence of which has long been a scandal. Fortunately, in the present competition no question can arise as to the retention of the existing courts. They have been so generally and emphatically condemned that the idea of preserving even the best of them has never entered into the mind of any rational being. The task of the judges in this case will be far less difficult than that which awaits those who may have to pronounce an opinion upon the competing designs for the new National Gallery, for the probability is that the relative claims to be considered will eventually be limited to those of Mr. Waterhouse, Mr. Garling, and Mr. Deane.—*Morning Post.*

NOTICES OF PUBLICATIONS.

The Engineer's, Architect's, and Contractor's Pocket Book for 1867. London: Lockwood and Co., Stationers' Hall Court.—We have so often spoken of this annual that it is only necessary now to say that the copy for this year is ready. It closely resembles its useful predecessors.

The Builder's and Contractor's Price Book for 1867. Revised by G. R. Burnell. Lockwood and Co., 7, Stationers' Hall Court.—This volume, as usual, contains a multitudinous variety of useful information for builders and contractors. The information is so arranged as to admit of easy reference, and with its aid the prices for all work connected with the building trade may be estimated.

Photographs of English and Scottish Scenery.—We have received a volume of twelve photographs of Scottish scenery, published by Messrs. Marion, Son, and Co., Regent-street. The photographs consist of Edinburgh, from Calton Hill; Old Town, from the Calton Hill; Burns' Monument; the Post Office; Sir Walter Scott's Monument, Nelson's Monument, Holyrood Palace, Fountain at Holyrood, and other scenes from Edinburgh. They are by Mr. G. Wilson, who is so well known as a successful photographer, and those who prefer photographic illustrations to engravings may gratify their tastes by purchasing this volume.

The Gardener's Year Book, Almanac, and Directory, 1867. By Robert Hogg, LL.D., F.L.S. Price one shilling.—This Year Book is published in connection with the *Journal of Horticulture*, 171, Fleet-street. In addition to a variety of information of the kind which one naturally looks for in an almanac, this publication gives, as its chief and distinctive features, descriptive accounts of the new plants and new flowers of 1866, and a directory of the horticulturists and gardeners throughout the kingdom.

The Post Almanac and Insurance Directory, 1867, price 6d. (W. J. Stokes, Wine Office-court, Fleet-street), is specially devoted to matters connected with fire and life insurance, on which, we believe, it is a sort of recognised authority among almanacs.

The Palmerston Series of Copy Books. (Whittaker and Co., Ave Maria-lane.) Of Mr. Vere Foster's copy books it will be sufficient to say that they are sanctioned by the Commissioners of National Education in Ireland, and that they met with the approval of Lord Palmerston, after whom they are named. The series consists of eight books with instructions.

Scotland Described. A Series of Topographic Sketches. By Alexander Murray. Glasgow: A. Murray.—Very handy as regards size, and very neatly got up, is about all we can say in favour of this volume. We neither like its arrangement nor the style in which it is written; the former is confused and inconvenient, and the latter is very slipshod, and sometimes absurd and ludicrous. In short, Mr. Murray's book is neither so useful, so readable, nor, we may add, so accurate, as we had a right to expect from one who is the author of several works of a similar kind, and one who really ought to be able to describe Scotland.

Among the various almanacs for the current year, that of the Royal Insurance Company deserves mention. The issue for 1867 contains full details of the progress made by the company, elaborate tables and diagrams of the mortality experienced during the last twenty years, and statements of the business transacted and the funds accumulated by the company year by year.

THE FINE ARTS.

THE LOUVRE.—Another fine new room has been opened in the Louvre; a large square apartment, situated in the Pavillon Denon of the new Louvre, and between the two galleries, appropriated to the French school, opened some time since. It is highly decorated; in the centre of the ceiling is a seated female figure, writing on large tablets, painted in what is called *camaieu mordore*, reddish brown tints, by M. Charles Müller. In the angles are four historical pictures, the subjects of which are:—Louis XIV. ordering the construction of the Louvre; François I. in the atelier of an artist, with a sketch of the famous Château de Chambord in the distance; St. Louis, with a view of that architectural gem the St. Chapelle, which was built by his order by the side of the Palais de Justice, where he resided, to receive the relics brought from the Holy Land; and, lastly, Napoleon I. decreeing the completion of the Louvre, which his nephew, the present Emperor, accomplished. Around the ceiling are richly-decorated vaultings. The room is surrounded by an entablature, forming a balcony, and above this are eight female figures, representing the fine arts in their various forms, and painted in false niches. On the walls are the battles of Alexander, by Charles Lebrun. The ancient apartments of Anne of Austria, which contain a portion of the classic sculpture of the museum, have been thoroughly decorated, and will shortly be opened again to the public.

SANITARY MATTERS.

The Committee of General Purposes, Winchester, have opened nine out of the eleven plans sent in for the sewerage of the town. The estimates vary from £13,000 to £20,000.

LINCOLN.—The plans sent in by the engineers, for the drainage of the city, have given rise to much discussion. Mr. Lawson's is a very comprehensive plan, its estimated cost being £50,000. He divides the city into three drainage areas—one comprising the south side of the Witham, called the low-level; one comprising the north side up to the hill, called the middle-level; and the third taking all the rest of the city, and called the high-level. He recommends that the sewage be conveyed below Heighington, four miles from the city, where there is suitable land for irrigating. Mr. Tarbottom's plan he estimates at £29,000. He proposes to erect a pumping station on the Newark-road, to lift the sewage to the requisite height for the land which is to be irrigated, viz., Bartholomew's and the Swallow Beck farms. A main drain would run from the pumping station up the High-street to the Stone Bow, and this would receive the contents of all the tributary drains on each side. He proposes to bring the sewage from the parts of the city by "girthing the hill with the intercepting lines," and thus "avoid bringing large bodies of water down the declivity of the central axis of the city." Due provision is made for carrying off "storm water," for ventilation, flushing, &c. There would be 19 miles of sewers, 272 man-holes, and 124 lamp holes. Mr. Drury's scheme has the advantage of cheapness; he proposed to use the present drains for carrying off the rain and surface water into the river, and thus keep the sewage to itself, which he would convey to tanks at the extreme corner of the Holmes Common, whence the liquid sewage might be conveyed by "tunnels to any district in the neighbourhood suitable for irrigation," the solid portions remaining in the tanks and carted away as wanted. The cost estimated at £15,400.

WAGES AND SHORT TIME.

COVENTRY.—The bricklayers have given the master builders three months' notice for a termination of the obligation of the present trade rules. They have given no particulars either of what they object to in the present rules, nor of their requirements in reference to any future code. It is said they will be asked for such particulars, and that then a conference will be held.

GLASGOW.—The masons' strike in Glasgow, which has lasted for the last nine weeks, was arranged at a meeting of masters and men, held in the Trades Hall, on Tuesday evening. The men having withdrawn their demand for a rise of wages, it was agreed to resume work on Monday morning.

THE LONDON TRADES' COUNCIL.—At a meeting of this Council, held on Monday at the Bell Inn, Old Bailey, Mr. Danter (President of the Society of Amalgamated Engineers) in the chair, the following resolution was adopted:—"That this meeting is of opinion that the position of the working man can never be much improved, and is in imminent danger of being seriously depreciated whilst the people of different countries have no regular intercommunication among themselves for the purpose of regulating the hours of labour and assimilating wages; and as the International Association affords the best facilities for bringing about that object it is hereby resolved to co-operate with that association for the furtherance of all questions affecting the interests of labour, at the same time continuing the London Trades Council as a distinct and independent body, as before."

LEGAL INTELLIGENCE.

CONTRACT AND SUB-CONTRACT.—At the Court of Common Pleas on Monday, a young lady named Best sued to recover damages for having been run over by a horse and cart, and at the trial before Mr. Justice Keating she recovered £30. Mr. Serjeant Hayes now moved to enter a nonsuit, leave reserved. The plaintiff, it appeared, was a young woman passing along the streets in London when a dustman's empty cart was coming along the street in St. James's, and the horse for some reason ran away, and was not stopped by the man driving it, who ran after it, until it had got on the pavement and knocked down the plaintiff,

who was seriously injured thereby. The cart bore the name of the defendant, who was the contractor for removing dust for the parish of Kensington, but he had a sub-contract by which another person was to remove and sift the dust for 13d. a load, the defendant finding horses and carts, and the sub-contractor servants. This being so, the cart was not under the control of the defendant's servant when it ran away. Another circumstance, which showed the truth of the saying of Lord Palmerston that "dirt was only something in the wrong place," was that the defendant paid upwards of £800 a year for the privilege of removing the dust. The defendant's principal object was to get the breeze for his brickfield, and the sub-contractor had all the metal, bones, rags, and sovereigns found. The defendant did not appoint and could not remove the man in charge of the cart, and therefore ought not to be held responsible for his acts. Rule granted.

THE STREETS AND THE SNOW.—The non-removal of snow from the streets during the late storm was the principal question before the weekly meeting of the City Commission of Sewers on Tuesday. A special report of Mr. Hayward, engineer, upon the subject, contained many interesting details as to the extent of the work to be done, and the efforts made to perform it. Mr. Reed, who happened to be in Paris at the time, said that much less was done there than in the city of London. It was contended by Mr. Bontems that the commissioners had done all in their power; but there seemed some difference of opinion as to whether the contractors were equally blameless. Mr. Deputy Elliott, on their behalf, urged "that the requisite forces did not exist to cope all at once with such a sudden storm," and that such forces had to be "improvised by degrees;" all the horses, for instance, "having to be roughed before anything could be done." Summonses, therefore, which had been taken out against the scavenging contractors, were ordered to stand over till the next meeting.

NOTICE.

*** The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at One Shilling for the first Twenty-four Words.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the EDITOR, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

RECEIVED.—J. N.—D. H.—C. F. S.—C. F. H.—C. L. E.—J. J. and Son.—J. P. S.—J. N.—M. H.—R. D. W.—P. and Son.—J. N.—J. C.—H. T.—D. K. and Sons.—F. S. S.—G. M.—S. and Sons.—C. A. M.—A. C. and Co.—G. F.—J. P. B.—T. L. C.—R. W.—W. H. F. G.—J. H. A.—J. H.—J. C.—W. O. C.—W. H. L.—D. K. and Sons.—J. W.

T. H.—When our correspondent has seen the National Gallery competition designs perhaps he may be able to speak more positively about them.

Correspondence.

WORKMEN'S DWELLINGS.

HOW MUCH THEY ARE REQUIRED FOR MEN AND WOMEN EARNING LESS THAN TEN SHILLINGS WEEKLY TO BE DECENT AND HEALTHY HOMES, AND HOW THEY SHOULD BE PROVIDED.

To the Editor of the BUILDING NEWS.

SIR,—The want of decent healthy homes is most severely felt, and is telling most fearfully upon the social and moral state of an immense population earning less than 10s. weekly. It becomes a duty on the part of working men in receipt of better wages, and all of those forming the middle class who may have carefully watched, since the enactment of the present Poor Law, the deterioration of this immense class. It cannot for one moment be supposed that its promoters ever contemplated the depressing effect it has had on the energy and self-reliance of this large mass of workers.

The working man, with the middle class, would, no doubt, be joined by those whose social position is placed above the anxieties to provide for their daily wants. Joint action would provide a remedy for these existing evils. The metropolis has the machinery at hand to carry into execution a gigantic plan of vast importance to all the inhabitants, rich and poor, beyond any plan that has been conceived on this most important subject, that of providing decent healthy homes as a first portion for a population of 250,000, thus remedying in part the evils of overcrowding, in a great measure arising from the numerous evictions for the construction of railways and public improvements, also from the increase of the population by residents, and emigration from the country.

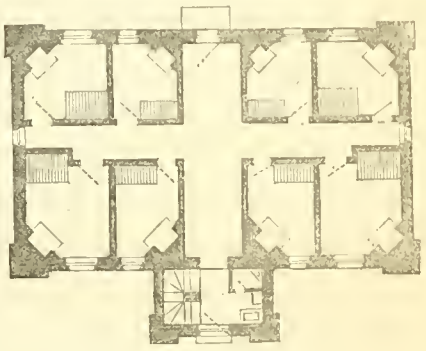
It would be utterly futile for private individuals, or companies, or parishes, to take up this question sufficiently comprehensive so as to stem the daily increasing evil—the want of single rooms at such a rent as to meet even those whose average earnings are not more than 5s. per week. They can only follow the examples of the Metropolitan Society's Improved Dwellings, Miss Burdett Coutts's buildings, the Peabody, and Mr. Alderman Waterlow's, and a few others. These are all very excellent in their way, but do not in the least meet the wants of those earning such small weekly wages. No doubt, a portion of the Peabody fund should have been appropriated for that purpose, but the trustees were frightened at the magnitude of the want to be remedied; so that the rents of the above are all adapted for those earning wages above 20s. weekly, many of whom are tenants who could well afford to be householders. The want is, and must be supplied—single rooms, to let from 9d. per week. Single women, married men and single men—the number of each class may be told by tens of thousands, great numbers of whom earn less than 1s. per day; these rents would give them a decent healthy home, also removing them from influences most deadly to their morals, and, by raising them in their own estimation, their energies would be quickened, cleanliness and thrift would become their rule, and, as we are taught "Cleanliness is akin to godliness," the good thus effected is beyond calculation, and should the plan be carried out to the full extent, there is reason to expect that calls for parish relief will be such that, with other charities, the want of poor's rates will be superseded in a few years.

Joint action should be taken by all classes requesting the Legislature to grant the necessary powers to the Metropolitan Board of Works, forming, as they do, the representatives from the various parishes which, in their "concrete" state, make this vast increasing metropolis, to borrow money from the Consolidated Fund at 3 per cent., with compulsory powers to purchase freehold sites in those dense neighbourhoods where fevers are always more or less rife, and to erect block buildings. To provide decent healthy homes for 250,000, will require about 3,000 blocks, each to contain 32 rooms, with other conveniences, at a cost of £960 per block, total cost, £2,880,000; to this add cost of sites, £2,120,000. The rent from four varied sized rooms at 9d., 11d., 1s. 3d., and 1s. 6d. per each room per week, gives an annual rent of £270,000. After payment of interest, rates, and collector, &c., the balance to be paid to liquidate the debt; thus, by decreasing the interest, and increasing the balance yearly, in about thirty-four years these freehold buildings would become the property of the metropolis.

The annexed plan, with elevation, shows an approximation as to the kind of building suitable. If desirable, a basement story could be easily added by placing the ground floor higher, so as to have the basement floor 4ft. below ground line. Although not an advocate of great height for tenants to travel, an additional story could be placed, and in some localities it might be highly desirable and advantageous to the tenants that the ground story should be shops.

The size of rooms to each floor: two, 10ft. by 9ft. to be let at 9d. per week each room; two, 10ft. by 10ft., to be let at 11d. per week; two, 12ft. by 9ft., to be let at 1s. 3d. per week; two, 14ft. by 12ft. at 1s. 6d. per week each room. The stairs and lobby, with watercloset, sink, and dust shaft to each floor, project from the main building; if formed in the corridor, it would save nearly £100. The fittings are suggested to be as follows for each room:—Welch's range, with oven and internal and external ventilators, iron bedstead, coal bunker, to contain 2 cwt. of coals, to serve as a seat. The cost of these buildings is founded on having concrete walls, concrete floors, and concrete roofs, covered with asphalte, with stone stairs, so as to be fire-proof, thus saving nearly all dilapidation and insurance. Brick building in the usual manner would cost one-third more. As concrete for walls in this country has not been used to any extent in buildings, and to those unacquainted with its qualities it is well to refer to what has already been done. In Paris are many buildings,

ELEVATION.



PLAN

10 20 30 40

some of them 60ft. in height, and many country railway stations; also, it has been very successfully used in bridges of 75ft. span. The docks and quays at Marseilles are also constructed with it, although having an excellent building stone on the spot, but the concrete gives them a saving of 40 per cent.

The Emperor Napoleon, as his contribution to the 1867 Exhibition, is erecting fifty blocks of workmen's dwellings, three and four floors in height, with three rooms on a floor and other conveniences; those with three floors in height at a cost of £240 each block. They are built by an English contractor, using Tall's apparatus in the formation of the walls.

The fortifications now building in Sussex for Government are of concrete. About fifty years since the sea wall to the East Cliff at Brighton was formed of beech shingle, sand, and hydraulic lime, which, when properly made, is stronger than brick or stone, a non-conductor of heat, cold, and sound, and impervious to all moisture and to vermin.

I am, &c.,
PETER THOMPSON.

24, High street, Marylebone.

BIRKENHEAD BATHS.

SIR,—It was with melancholy satisfaction that I saw the letters in your journal respecting the above competition, for I began to think that my drawings had miscarried, and was thinking of going to Birkenhead to make some inquiry about them. From information received from a friend in Liverpool I concluded the matter was settled. This information will no doubt be a great comfort to my fellow competitors; so I give it: "The design of the borough surveyor has been selected; the estimated cost is £18,000,"—in confirmation of which the *Liverpool Mercury* was forwarded to me, containing a letter from "A Ratepayer" (I believe) complaining of the manifest injustice to other competing architects, &c. I am sorry this paper has been destroyed, and that I cannot forward you the letter, for I expected after that official intimation would be given. Now, Sir, if the above is correct what reliance is there on printed "Instructions to Architects," the seventeenth clause of which says, "Should the estimated cost of erecting and completing the selected design exceed the sum of £8,000 in the opinion of a competent surveyor, the author will not be entitled to the premium, and the commissioners will, in such case, proceed to make another selection from the designs sent in." I say, Sir, if such is the case all the "baths" the commissioners can take, whether fresh, salt, hot or cold, Turkish or swimming, will not remove the pollution of such injustice.—I am, &c., A LOVER OF JUSTICE.

January 15.

THE GREAT COMPETITIONS.—A PLEA FOR THE PROVINCES.

SIR,—I feel sure that many of your readers must share my regret to find that the arrangements made for exhibiting the drawings for the proposed new Law Courts and National Gallery, prohibit the possibility of a large number of provincial architects seeing the drawings for both buildings, unless they can make it convenient to remain in London for nearly three weeks, or make two separate journeys—the first, for the National Gallery, now on view; and the second, for the Law Courts next month, inasmuch as the exhibition of drawings for the former closes on the 26th inst., and those for the latter cannot be seen by the profession until the 11th prox. Will you kindly bring your influence to bear upon the matter, in the hope that the authorities may make some arrangement by which the exhibition of the National Gallery drawings may be prolonged, and so prevent great disappointment, or a sacrifice of much valuable time?—I am, &c.,

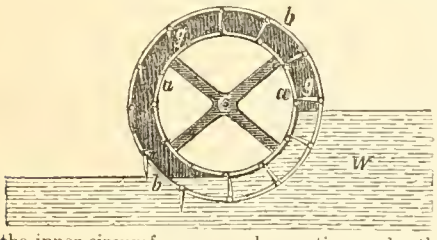
G. G. HOSKINS.

Darlington, January 9.

MACHINERY FOR LIFTING WATER.

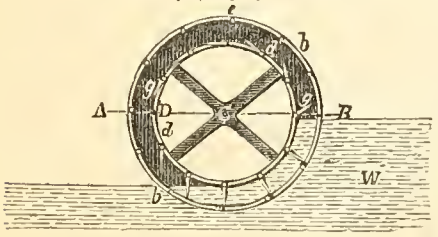
SIR,—In your impression of last week a portion of the remarks under this head once and again forcibly exemplifies the truth of the axiom that "Nothing sublunary is novel." The "articulated float wheel," precisely as illustrated and described in your columns, was, I beg to inform you, invented, patented, manufactured, and experimented with by myself and others at least thirty years ago. We applied one of these wheels to a small boat, which plied upon the River Thames for a considerable time, until it attracted the attention of Lord Cochrane, who, with several other gentlemen distinguished by their scientific proclivities, honoured us with their presence on board in a trip we all took up the river. These gentlemen expressed themselves highly delighted with the result of this excursion, and signified their intention of proceeding further in the matter. But it happened just at that time, as far as I can remember, that his lordship became reinstated in his command of the British navy, and consequently, being too much engaged to occupy himself with the scheme, it, like many other incipient plans, fell through for want of encouragement. Before this consummation, however, numerous trials had been made, which resulted in the following experience:—It was found that the wheels typified by the diagram (fig. 1) answered very well as far as wheels totally immersed were concerned, but in cases such as water-wheels, &c., where circumstances would admit of only partial immersion, some modifications were introduced, viz., the floats, instead of being attached to the periphery *b* (fig. 1) and permitted to fall against

FIG. 1.



the inner circumference *a* when acting under the gravitating influence of the water, were jointed to the perimeter of an internal annular ring *d* (fig. 2)

FIG. 2.



in such a manner that when impinged upon by the head water or tidal current they came in contact with stops *e* placed in this instance upon the outer circumference *b*.

The superiority of this system may be manifested by supposing the horizontal plane A B to be a lever, with the centre C of the wheel as a fulcrum. Of course the advantage gained is the difference between the length of the arms C B and D C, or, rather, moment of (C B g) = moment of (A C — A D) W, where C B = length of one arm, C D = length of the other, g = the impact or force of gravity of the water, W = weight of float and resistance of the air. It was discovered in the case of partial immersion that the weight of the paddles on the ascending side of the wheel sometimes absorbed all the useful effect that was produced on the other side, so that the development of power was extremely limited. I should not have ventured any observations on this subject had it not been claimed as an invention of and patented by M. de la Fontaine. A wooden model of the wheel as represented by your diagrams may be found somewhere in Somerset House. I caused another to be constructed with the before-mentioned modifications, but at this advanced period, I do not exactly remember what became of them.—I am, &c.,

S. W. WORSSAM.

King's-road, Chelsea, S.W.

CHESTER TOWN-HALL.

SIR,—The correction by a correspondent in your last issue of a slight inaccuracy on your part in referring to this matter in a former number being rather calculated to mislead, I trouble you with the following particulars. About June last it happened that the then contractor for the building found it convenient to stop work and negotiate for a transfer of the contract to another builder. It was at this time that the strike (so-called) took place, the ostensible reason being undue harshness on the part of the clerk of the works. The onus of the stoppage was thus, through their officer, thrown on the committee. The negotiations for a transfer were not concluded until September. In the meantime the men who were prominent in the strike, and who are local men, obtained employment under the builder to whom the contract was afterwards transferred, who, being also a local man, had, and still has, works going on in the neighbourhood of Chester, at which these men were taken on, and continue to be employed. Some time since a deputation from the Masons' Society, with some representatives of the local union, had an interview with our town-hall committee, when some frivolous charges were advanced against the clerk of the works, of which those that could be at all substantiated went to prove nothing more than proper vigilance in the discharge of his duty. The distinctive features of a genuine strike are thus wanting in this case—first, substantial grounds for such a proceeding; and secondly, the men are not supported by the society, which should be the case if the position assumed by them was considered justifiable by those in authority. I am told that the only real objection to the clerk of the works is that he is Irish.—I am, &c.,

DEVA.

Intercommunication.

QUESTIONS.

PERSPECTIVE INSTRUMENTS.

[191.]—It would be conferring a great benefit upon me if you or some of your correspondents would kindly inform me as to the adjustment and use of the "perspective instrument," consisting of three legs connected by a brass joint in the centre. What are its uses, and when is it advantageous to use it? CULLINGFORD.

[If our correspondent will describe the instrument more in detail, we shall be happy to explain its uses and adjustments; but it is impossible to form any idea of it from the description he gives. Send us a sketch.]

EUCLID.

[192.]—Would you kindly intimate, through the medium of your valuable paper, the meaning of the letters Q. E. D., terminating the problems, &c., of Euclid's elements?

E. P.

[Q. E. D. stands for the initials of the Latin words, *quod erat demonstrandum*, signifying "which was to be demonstrated." In a similar manner the letters also frequently met with, Q. E. F., stand for *quod erat faciendum*, signifying "which was to be done."] L. M.

CLERKS OF WORKS.

[193.]—Can you inform me if there is an institution or society for clerks of works, and what is the subscription and benefit? H. L. G.

The only society which we know of is the Builders' Clerks' Benevolent Institution. Write to Mr. F. T. Mullett, the secretary, 14, Bedford-row, who will no doubt give you all the desired information.

GAS PIPES.

[194.]—Will you oblige by a reply to the following query? A large gas stove being fixed in a room, the noxious vapours from the same is carried off by a 3in. wrought-iron pipe at the back into a flue. This pipe, as a matter of course, carries off a great deal of heat, which, of course, is all wasted. If to utilise that heat we fix round it a 6in. wrought-iron pipe open at the bottom for the air to pass up, and convey such outside pipe through a floor, and a brass ventilator at top of same to warm room above, would such be dangerous to the floor and likely to lead to it catching fire? AN OLD SUBSCRIBER.

REPLIES.

SUN-DIALS.

[126.]—To set sun-dials, whether vertical or horizontal, the upper edge of the gnomon must point truly to the pole, and the horizontal line must be perfectly level, and in a vertical dial the noon line must be perpendicular to the horizon. Having prepared the plane on which the dial is to be placed the exact time must be found by a good watch, but the preferable way is to find the accurate time by an observation of the sun with a quadrant or sextant. Having taken his altitude and noted the time by a watch, compute the time for the observed altitude, and set the watch accordingly. Having once obtained correct time the dial can be fixed at leisure, but the best time is when the sun is at its meridian. I have supposed that the dials are, of course, accurately constructed, or your correspondent's labours will be in vain. It is by no means an easy problem to construct dials, although, as they are not regarded now except in the light of toys, extreme accuracy is not of so much importance as when they served as the only measure of time. After having set the dials they should be watched and checked at intervals, for they frequently require a little shifting after having once been set up. J. J.

FIRE-DAMP INDICATOR

[170.]—A correspondent ("S. M.") inquired in a recent number as to the nature of the above-named apparatus. It is impossible to give briefly an intelligible reply to the query, and we therefore propose to explain the contrivance at such length as is felt necessary to make its peculiarities clear. Much public interest exists on the subject, and this warrants the course named. A natural law, which must have existed since the creation of the earth's atmosphere, and which was subsequently known as that of "osmose," was first noticed by Priestley and others. It was reserved, however, for Prof. Graham to discover and record many new phenomena in connection with that law. Graham rechristened the old law and called it "diffusion." Mr. Ansell has based on the law of diffusion his proposition for the indication of fire damp in mines, because he had become convinced that specific gravity, as specific gravity alone, must fail from its being interfered with by dust and draughts in coal pits. Diffusion, as now understood, is that physical motion of gases by which they travel through space or through septa, which, although pervious to gases, are usually considered impervious. In explanation of this latter statement let us assume that gases are made up of atoms or molecules which have motion in every direction. This motion not being arrested by such substances as described,—namely, unglazed Wedgwood ware, wood, india-rubber, &c., it follows that if a porous vessel be placed in a metal box and be then filled with coal gas, and is afterwards brought out into the atmosphere, the gas will rapidly escape through the pores of the vessel, while just half the quantity of air will pass into the vessel and take the place of the gas. The two gases will, indeed, have crossed each other's passage in the interstices of the Wedgwood ware. What is called effusion is that peculiar property possessed by gases which allows of their being forced out by mere mechanical pressure. The force or power of diffusion is simply equivalent to so many pounds pressure upon the square inch, and at first it appeared that effusion must be fatal to Mr. Ansell's views. That gentleman in the first instance employed india-rubber as a medium of experimentation in the form of balloons of small diameter. These allowed of the diffusion into their interior of fire-damp, and then expanding by its force gave audible signals of danger. The fragile nature of thin india-rubber, and the danger of its derangement in pits induced Mr. Ansell to seek for some other material for his indicators, and singularly enough he adopted eventually cast iron and marble. His most recent adaptation of the indicator consists of an iron funnel or cup with a stem of gas pipe U shaped. One limb of the U opens into the cup, and the other is closed by a cap of brass. Through this cap is passed a platinum-pointed copper wire. Mercury is placed in the cup, and finds its level at about 1-16th of an inch distance under the platinum point of the wire. The mouth of the cup itself is closed by means of a disc of Sicilian marble of about ¼in. in thickness, the marble forming the porous septum for the admission of gas or fire-damp into the cup. If now either coal gas or fire-damp be allowed to impinge upon the outer surface of the marble it quickly diffuses through it, expands the air within, and presses on the surface of the mercury. The latter is driven down in the cup, and by a mechanical law is made to rise in the other limb of the U tube until it touches the wire. This action completes an electric circuit, and telegraphic warning of danger is at once given, on the spot or at a distance. Such is the Ansell Indicator, and it seems to us that it must be of great value in all fiery mines. Possibly, however, it may require the power of the Legislature to enforce its use therein.

FRENCH METRES AND ENGLISH FEET.

[180.]—Many thanks for insertion of replies in Intercommunication Column last week; but with regard to the reply to "Metre," either it was a clerical error of mine or a misprint, viz., instead of "1 metre = 33·371 English inch," read "= 39·371 English inch." T. L. COLLEY.

MANUFACTURE OF SALT.

[182.]—I would advise "Enquirer" not to attempt to obtain salt by distillation from sea water. Sea water may be distilled in cases of emergency for the sake of obtaining pure water, but no man in his senses would endeavour in a commercial point of view to distil sea water for the sake of the salt in it. Let him consider the following calculations:—1,000 gallons of sea water contains exactly 27 gallons of salt—that is, 10,000lb. of water gives (270 × 2·25) in round numbers 600lb. of salt, and therefore it would require 40,000lb. of water to give a ton of salt. On the average 1lb. of coal will evaporate 10lb of water, very often not so much, but it may be safely assumed in the present calculation. On the lowest estimate it would therefore require about 1½ tons of coal to evaporate one ton of salt. The weight of one gallon of sea water is rather more than 10lb., the weight of one gallon of fresh water, but I have taken the above value to be on the safe side, and also for facility of calculation. L. P. D.

IRON IN CESSPOOLS.

[183.]—Your correspondent "Constant Reader" is not explicit. What does he mean by "a cesspool one-fifth in depth?" One-fifth what—feet, inches, fathoms, or miles? I very much doubt the practical utility of putting pieces of iron into a cesspool. It would appear to me that with the exception of chloride of lime or some disinfecting agent the less extraneous matter put into it the better. Farmers at all events would be very sorry to have any iron or solution of it in their soil. M. M.

MEASUREMENT OF LATHS.

[184.]—We have recently had several questions from correspondents on this subject. They all arise from the ambiguity respecting the fact that some bundles are 100 and some 120 laths. It would be the better plan for our correspondents to satisfy themselves beforehand about what they expect to get for their money.

[184.]—I will, with your permission, inform "Countryman" that there should be 50 ft. run in a bundle, and 30 bundles = one load. This I believe is the standard quantity, and anything short of the same would not be correct. The above are ordinary laths; there are others, for instance, pantile laths, bundle 10ft. long, containing twelve laths, 120ft. run in bundle; ditto, 12ft. long and containing twelve laths, 144ft. run in bundle. T. L. COLLEY.

HOW TO USE SPARE TIME.

[185.]—In answer to "A Would-be Goth" I think it would be his best plan to join the Class of Design of the Architectural Association, as he would there learn and have the opportunity of acquiring a knowledge of subjects intimately connected with his profession. At the same time he should bear in mind the motto of "Self Help," and not trust to schools of art or any other schools for "making up" any part of what he ought to know. Let him first find out the particular branches connected with the architectural profession in which he is deficient, obtain a little aid if necessary, but do the hard-working part of it himself, if he ever intends to become a worthy member of the profession. AN OLD STAGER.

WAREHOUSE AND GRANARY FLOORS.

[186.]—Would you allow me the benefit of your columns to reply to "A Provincial Subscriber?" He puts a case which a practical engineer or architect would require a couple of hours' study to answer even approximately. I have frequently observed myself, in common with numerous other subscribers, the readiness with which you afford and obtain for us, through the medium of your excellent journal, answers to different queries, but I do think there ought to be a limit to your wish to afford your readers information, and also a limit to their demands. I am getting out a design for a warehouse at present, and with your permission will send an answer to your correspondent in your next number, although I consider I shall be trespassing on your indulgence to a very great extent. L. P. D.

THE WEIGHT OF LIME.

[187.]—In answer to your correspondent "H. M.," I beg to state the following, which I believe to be correct:—In the stone: Plymouth stone lime, 70lb. per bushel; lias (Lyme Regis), 75lb. per bushel; lias (Keynsham), 80lb. per bushel. Ground: Blue lias (Keynsham,) 63lb. per bushel; blue lias (Lyme Regis), 70lb. per bushel. T. L. COLLEY.

TRANSIT THEODOLITES FOR LARGE SURVEYS.

[188.]—The only advantage gained by using a transit theodolite instead of a plain theodolite is a greater facility in what is termed "reversing the telescope." It is certainly a more handy instrument to use when set up, but it is much heavier and more expensive than the ordinary form. It would be folly for a surveyor to get rid of a good plain theodolite simply for the sake of the additional advantage offered by a transit, although if a person is going to buy a new instrument let him by all means go with the age and purchase a transit, as the other form will soon become obsolete. S. V.

[188.]—In answer to the question of "A Surveyor of the Old School," "Is there any advantage to be gained by using a transit theodolite for large surveys in preference to the older form, where the telescope has to be taken out of its Y's to prolong the same line in an opposite direction?" The transit theodolite preserves a symmetrical arrangement of the upper part of the instrument, and gives the advantage of a complete circle, with opposite verniers for the determination of altitudes, and makes it altogether as effective for astronomical as it is for geodetical operations. It may be reversed and set by a tangent screw, without interfering with the telescope or removing it from its Y's. Also vertical angles may be taken of any elevation or depression that is ever likely in practice to be required. Excepting these particulars, which are matters of great convenience to engineering surveyors, a "5in. Troughton" of the old form is equally suitable for large surveys (if in perfect adjustment) as the transit theodolite. I have very frequently for some years used both descriptions of instrument, and must confess that the 5in. transit theodolite lately supplied to me by Messrs. Troughton and Simms is more convenient and handier than the old form. This is confirmed by the report to me of an experienced assistant surveyor, now employed in this office, and who has been using it for the last six months. If your correspondent's excellent "5in. Troughton of the old form" is in good adjustment. I do not think it is necessary he should spend his spare cash in purchasing a transit theodolite for large surveys.—THOMAS C. THORBURN, C.E., Town Surveyor's Office, 35, Hamilton-square, Birkenhead.

NOTICE. — The Liverpool Architectural and Archæological Society, in a notice to student members, says:—The design for the second students' competition, for an east window in the English style of the thirteenth century, is to be sent in to the council on the 6th February. The third design, for a window in the style of the fourteenth century, is to be sent in on the 20th March. The fourth design, for a window in the style of the fifteenth century is to be sent in on the 17th April. The first set of drawings will be exhibited and commented upon at the next meeting. The dates thirteenth, fourteenth, and fifteenth centuries to be taken as indicating the three phases of English Gothic, commonly known as Early English, Decorated, and Perpendicular.

Building Intelligence.

CHURCHES AND CHAPELS.

BELFAST.—The foundation stone of a new Presbyterian Church, at Whitehouse, near Belfast, was laid on the 1st inst. The building will be in the Venetio-Gothic style. The materials will be perforated brick, with Scotch stone dressings. In length it will be 75ft., and in breadth about 40ft. It is calculated to accommodate 640 persons, and to cost about £2,000. Messrs. Bell and Marsh, Belfast, are the architects.

CHETWYND (NEWPORT).—A new church is now in course of erection here. It is in the Geometric Decorated style, and consists of nave and south aisle, 33ft. wide and 75ft. long, chancel 19ft. wide and 31ft. long. The exterior walls are of the local red sandstone in irregular random courses with wrought quoins. The interior is lined with white ashlar and banded with red courses. The nave is separated from the south aisle by an arcade of four arches. The columns are of polished Devonshire marble, and the capitals elaborately carved. Marble is largely used in the interior, and numbers of illuminated texts are inscribed over the arches. The seats in the chancel are of oak, and in the nave of deal varnished. The church will seat 250 persons. The tower contains a peal of six bells brought from the old church, and is surmounted by a spire, which rises to the height of 123ft. A schoolmaster's house and national schools are erected near. Mr. Ferrey, of London, is the architect. The church will cost about £3,000.

HASLETON.—The parish church of Hasleton, on the Cotswold Hills, has been reopened after general restoration, and the addition of a new aisle. The church, like most in that district, has some Norman features, but the tower and nave are of late Perpendicular style, and very simple and plain. Messrs. Medland, Maberly, and Medland were the architects, and the work was carried out by Messrs. Earle and Sons, of Northleach, carpenters, and Mr. Barnfield, mason, of Shipton.

ST. HELEN'S CHURCH.—The Marquis of Northampton has forwarded a donation of £50 on behalf of the St. Helens Church restoration fund, and has also announced his intention of restoring the noble monument of his ancestor Sir John Spencer. During the last century the monument was reduced to a uniform white by the then churchwardens, but happily Lord Northampton has in his possession a drawing showing the original colouring. Unfortunately the monument completely blocks up a good decorated arch, and which formerly communicated with the chapel of the Holy Ghost (now used as the vestry), and this may be said to be the only good piece of architecture remaining. On the south side are two fine windows, the tracery intact, but the intervening spaces bricked up. During the progress of the works some most interesting discoveries have been made in the nuns' choir—two doorways and three hagioscopes, in addition to the one behind the tomb of Sir T. Gresham. From one of the doorways a flight of stone steps has been brought to light, and these are supposed to have formed the means of communication with the dormitory of the nuns. The other doorway is of much earlier character, and at the sill, 3½ft. beneath the present level of the church, some fine encaustic tiles were found. At the north-east angle of the aisle a deeply splayed lancet window has been unbricked, and it is evident that it formed one of a series of the same character, and that the others were destroyed to make room for the three Jacobean monstrosities, at the repair of the church by Inigo Jones, in 1633. Immediately opposite, in the south aisle, the head of a window of rather later character is to be seen; this still remains bricked up. On removing the pulpit a small piscina was discovered, the lip of which is on a level with the present floor. The church presents a curious combination of various levels, and would well repay a careful investigation by some of the architectural societies. It is a matter for regret that owing to want of funds the works have been at a standstill for nearly three months.

WHITBY.—The Archbishop of York, having declined to licence the Congress Hall, on the West Cliff, a meeting was held recently, under the presidency of the Rev. W. Keane, the rector, to devise means for raising a new church on the Cliff, capable of seating not less than 1,800 persons, and to cost £10,000. The committee for carrying out this object will be composed of the clergy and churchwardens of the different churches in the town, subscribers of £20 and upwards, and laymen, who will be designated at a future meeting. Before the meeting closed, resolutions approving of the scheme, and promising support, were carried unanimously, and subscriptions may be sent to Messrs. Simpson, Chapman, and Co., bankers, Whitby. The Congregationalists and Wesleyans also contemplate building on the West Cliff.

BUILDINGS.

There were 1,289 new houses, 1 church, 1 chapel, 2 schools, 11 manufactories, and 23 warehouses erected in Birmingham during 1866.

It is said that the new Bristol Post-office—a building of some architectural pretensions—will be commenced forthwith.

The new agricultural hall, Bridgenorth, was opened by a public dinner on Saturday last.

EXETER.—THE ALBERT MEMORIAL MUSEUM.—The merits of Mr. Hayward's design are beginning to be better appreciated now that the exterior of the north wing and centre is approaching completion. The Museum is an example of what may be called French Gothic. The carving is being executed by Mr. Boulton, of Worcester, from Mr. Hayward's designs. All the capitals of the shafts supporting the window arches will be carved, and no two capitals will be alike. The cornice beneath the parapet exhibits sculptured decorations of a French order. There will be also some carving in the entrance arcade. The sum of £1,000 is still needed to complete the interior of the building already erected. If it be subscribed forthwith, the new museum will be opened this year.

NEWHAVEN, U.S.—The Yale Art Building has just been completed, the corner stone of which was laid in November, 1864. The plan of the building is such as to let in the northern light, and is erected in the form of a Greek cross, the wings running east and west, and joining upon a central building. The southern wing is 34ft. by 80ft., and the northern 72ft. by 24ft., while the central structure is 44ft. by 35ft. Portland and Trenton granite have been used in the walls, while Ohio "yellow" stone constitutes the ornamental portion of the outside work. At the main entrance are two columns of Quincy granite, which is quite as susceptible of a high degree of polish as the Scotch granite, though the veining is coarser. The outer shape of the art building is septagonal, and seven miniature towers crown the different towers. Inside, at the opening of the south wing, commences the great hall, which runs the whole length of the building to the end of the north wing, bisecting the central section. The two rooms, one on either side of the passage, are devoted to the reception of the various works of art as well as books, engravings, &c., which the college now does or may possess. The galleries are lighted by skylights of heavy glass. The walls are painted a dark maroon colour, which is said to form the best background for pictures, and are wainscoted to the height of 3ft. or 4ft. with pine, the natural colour of which is preserved by varnish. The beauty of this light lemon colour in contrast with the maroon is very noticeable, and it is remarkable that this wood has not been used more in finishing private dwellings and public buildings. It certainly is much brighter and more cheerful than the oak and walnut of the sombre tone in which Americans so much delight. In the northern gallery there is an oriel window. The total cost will be about 200,000 dollars.

STATUES, MEMORIALS, &c.

An effort is being made in Baltimore, U.S., to erect a monument to Edgar Allan Poe in that city.

AN OFFER.—A gentleman in the city, well known as a man of business, writes to the *Atheneum* as follows:—"My mission is neither literature nor art, but I admire and respect both. The Thames Embankment fronting the present Temple Gardens progresses towards completion; a bronze statue of Shakspeare would be in good keeping in that locality. If the public saw a good design, I am satisfied funds ample for the purpose would be forthcoming. I therefore am willing, preserving a strict *incognito*, to offer a premium of 50 guineas for the best design, 20 guineas for the second, and 10 guineas for the third. Should your editorial opinion coincide with mine, can you find a corner for these lines in an early impression?" The site suggested above, remarks our contemporary,

is that which has commended itself to almost everybody's mind as the most suitable for a monument to Shakspeare, from its association with the historical plays, and its vicinity to the old playhouses. We have the gentleman's name, and we can guarantee the good faith of his proposal.

THE O'CONNELL, STATUE, DUBLIN.—The Municipal Council have decided that Hogan's fine statue of O'Connell, with its pedestal of Dalkey granite, at present in the centre of the City-hall, Dublin, shall be removed to the space between the centre pillars in front of the building and facing Parliament-street.

THE LATE LORD PALMERSTON.—In consequence of the heavy expense and other difficulties, the design as originally agreed upon for a mortuary chapel at the eastern end of Romsey Abbey Church, in memory of the late Lord Palmerston, who was a resident of the town, has been abandoned, and in its stead the sub-committee recommend the insertion of stained glasss in the large windows at the western end of the church, so justly celebrated for their beauty. The memorial, if carried out, will be in close proximity to the tomb of the Temple family. The Hon. W. Cowper has stated that the suggestion has the full approval of Lady Palmerston, and has also offered to receive from the committee the funds which have been contributed towards the erection of a memorial statue in the market place of Romsey, and himself to supplement the sum to such an extent as may be necessary to secure a work of art from the hands of a sculptor of the highest reputation; whom he would select.

STAINED GLASS.

The east window of the new church at Stockbridge, in Hants, is of rich stained glass, and cost 120 guineas. It was given by Mr. John Day, of Danebury, the well-known horse trainer.

HASLETON.—The east window of the parish church, which has just been restored, is filled with stained glass representing the Crucifixion; and a small window near the font has been filled with painted glass representing Our Lord's Baptism. This window was the gift of Messrs. Medland, Maberly, and Medland, the architects. The glass is by Messrs. Heaton, Butler, and Bayne.

General Items.

A new list of members of the Society of Arts has been printed, and any member can have a copy sent to him on application to the Secretary.

CHINA CLAY.—Cornwall has for some years past done a large and profitable business in china clay, the greater part of which has been raised in the St. Austell district, where several important works are now in progress. There is every prospect, however, of a new district being opened up on an extensive scale in a short time. Fine samples of china clay have been discovered in three parishes, and the ground in various localities is believed to be very rich. Steps are being taken with a view to establish works which would afford employment to a large number of people.

THE FRENCH CONSCRIPTION AND THE INDUSTRIAL CLASSES.—A Paris paper gives, with reference to the present plan of conscription, the following trades from which the recruits forming the annual contingent of 100,000 men are taken:—"Workmen in wood, carpenters, joiners, &c., furnish nearly 6,185 men to the army; in iron, blacksmiths, locksmiths, founders, &c., 4,289; in leather, as tanners, skinners, &c., 4,333; tailors, 973 and more; bargemen and watermen, 2,513; shoemakers, basketmakers, wheelwrights, bakers, house-painters, masons, &c., 20,507; clerks, 3,703; young men of no profession, whose parents in some cases only possess a small income, 3,237; finally, field labourers, 51,329; but the proportion of the latter is sometimes greater. Thus, the contingent of 1855 comprised 75,000 agricultural labourers."

LIVERPOOL GALLERY OF INVENTIONS AND SCIENCE.—The committee of this institution invite the attention of inventors, manufacturers, and dealers to the advantages which this institution affords them of exhibiting gratuitously in this great commercial centre, models of new inventions, and objects illustrative of progress in the arts and sciences. No charge is made to exhibitors, the object of the founder (the late Sir William Brown, Bart.), and of the committee of management being to render the gallery commercially beneficial to exhibitors, as well as a means of affording interest and instruction to the general public. Forms of application for space, and further information, may be had of the honorary secretary, Mr. Astrup Cariss, 3, Cook-street, Liverpool.

FALL OF SCAFFOLDING.—A range of lofty buildings and warehouses for the storage of malt and hops has been lately erected in the Mile End-road by Mr. Webb, the builder, from designs by Mr. Dyson, on the western side of the old brewery of Messrs. Charrington and Head, to meet their increased and increasing trade, and to complete the extension of their premises it is intended to erect a ventilating shaft, to communicate with the malting floors. For this purpose a lofty scaffolding had been erected at the northern end of the new buildings, which was a conspicuous object in the east end of London. It braved the storms and inclement weather of last week, and with the return of fine weather it was intended to erect the shaft, which will rise to the height of 150ft. from the ground. At half-past nine o'clock on Monday morning the whole of the scaffolding gave way, poles and cords were snapped asunder, and the fabric, erected at much cost and with great ingenuity, fell. The whole is now a shapeless and broken mass, and the lofty scaffold will have to be erected again to complete the design. In consequence of the unsettled state of the weather no men were at work at the time the scaffold fell, and no one was injured; but some of the poles were precipitated a considerable distance, and fell near some of the men at work on the brewery. The main building was only slightly damaged by the falling timbers. The new buildings are of great solidity, and will involve an expenditure of £25,000.

THE INDUSTRIAL EXHIBITION, ISLINGTON.—The ceremony of distributing the prizes won at the Metropolitan and Provincial Working Classes Industrial Exhibition, Islington, took place at Exeter Hall, on Saturday last. Mr. G. J. Goschen, M.P., presided, and delivered an interesting address, after which the prizes were distributed. The special prizes amounted in the aggregate to £57. The first of them, a £10 note, the gift of the Agricultural Hall Company, was presented to H. A. Major, a letter-carrier, for the best painting in oil. Sums of £5 each, the gifts of the same company, were presented to R. C. Dunham, butcher, for a decimal key; W. H. Myers, printer, for a working model of railway signals; and E. R. May, late lieutenant in the Indian navy, for boat-lowering apparatus. Miss Alice Haselden, aged 17, was presented with £5, the gift of Mr. J. Harris, for the best watercolour drawing. The young lady was loudly cheered as she stepped upon the platform to receive her prize. Mr. W. A. Latta, a compositor, received a prize of £2 2s., the gift of Mr. J. E. Wilson, for the best specimen of ornamental typography. Miss Ellen M. Hammond, governess, was presented with a prize of £2 2s. for the best specimen of fancy needlework. Mr. Franklin was awarded both a silver cup, the gift of Mr. J. Howard, of Bedford, and a silver medal for agricultural machines. After the special prizes, the silver medals, 85 in number, were presented; next the bronze ones, of which there were 187; and then the certificates of honourable mention, 189 in number.

THE SUBURBAN VILLAGES AND GENERAL DWELLINGS' COMPANY (LIMITED).—The first general meeting of the shareholders was held on Monday last, at the offices of the company, No. 1, Westminster Chambers, S.W., E. Vigars, Esq. the chairman of the directors, presiding. The meeting was well attended, and the statements made by the chairman and secretary were received with feelings of general satisfaction. The company have held back in their operations, not having been able to procure a desirable estate to commence upon, and in consequence of the extreme deadness in the money market. They had been offered an estate situated near to four railway stations, and desirable in all other respects, from the Ecclesiastical Commissioners, upon very advantageous terms, and had accepted the offer. The share capital now subscribed being much smaller than at first contemplated, the operations would be restricted.

OBITUARY. — Mr. Joseph O'Brien, builder, Loughrea, died on the 4th inst., aged 44. Deceased had executed a number of fine mansions as well as public buildings in various parts of Ireland. Mr. I. I. Cherry, architect, Belfast, died a short time since. The death of the great French painter M. Ingress, at the age of 87, is also announced this week. The death is announced of Mr. George Baxter, the inventor and patentee of oil-colour picture painting. The deceased gentleman was sixty-two years of age. Some time ago he met with an accident, which proved the remote cause of the attack of apoplexy from which he died.

MEETINGS FOR THE WEEK.

MON.—Society of Engineers.—President's Inaugural Address, 7.30.
Royal United Service Institution.—"Breech-loaders with reference to Calibre, Supply, and Cost of Ammunition," by Captain J. H. Selwyn.

TUES.—Institution of Civil Engineers.—Discussion on "Ships of War," 8.
Royal Institution.—"On Vibratory Motion, with special reference to Sound," by Professor Tyndall, 3.

WED.—Geological Society.—The following papers will be read:—1. "On Chemical Analyses of Variegated Strata," by Mr. G. Maw. 2. "On the Jurassic Fauna and Flora of South Africa," by Mr. Ralph Tate. 3. "On Consolidated Blocks in the Drift of Suffolk," by Mr. G. Maw, 8.

THURS.—Royal Institution.—"On Vibratory Motion, with special reference to Sound," by Professor Tyndall, 3.

FRI.—Royal Institution.—"On Mr. Graham's Recent Discoveries on the Diffusion of Gases," by Professor Odling, 8.

SAT.—Royal Institution.—"On Harmony," by Mr. G. A. Macfarren, 3.

Trade News.

The Wesleyan chapel and schools, which have recently been rebuilt, have been heated by J. Jones and Son's hot-water apparatus. The warming apparatus of Enfield Church, recently restored, has been erected by the same firm.

CORK GAOL.—The contract for the alterations and additions to the County of Cork Gaol has been given to Mr. Evans, builder, of Cork, at £4,995; Mr. Newstead, of Fermoy, who had previously been declared contractor, having declined to fulfil his engagement in consequence of a mistake in his tender.

TENDERS.

BAYSWATER.—For alterations, at No. 29, Kensington Park-terrace, Bayswater. Messrs. Bird and Walters, architects:—

Huggett and Hussey	£501 15
Newman and Mann	379 0
E. Brown	350 0
Williams and Son	347 0
Kelly Brothers	337 0

CITY.—For the erection of two warehouses, in Aldermanbury, for Mr. Meyerstein. Mr. T. C. Clarke, architect. Quantities by Messrs. Hovenden and Heath:—

Scrivener and White	£7,183
Hill and Sons	7,167
Macey	7,159
Patman and Fotheringham	6,789
Newman and Mann	6,371
Kilby	6,310
Henshaw	6,196
Conder	6,117
King and Sons	6,098
Browne and Robinson	5,974

CITY-ROAD.—For alterations and additions to premises 85, City-road. Mr. Thomas J. Hill, architect:—

Bishop	£390
Perry	312
Anley	303
Sabey	294

FENCHURCH-STREET.—For alterations, No. 164, Fenchurch-street. Messrs. John Young and Son, architects:—

	No. 1.	No. 2.	Total.
Chessum	£869	£526	£1,395
Ashby and Horner	832	518	1,350
Henshaw	786	477	1,263
Webb and Sons	798	447	1,245

ISLINGTON.—For alterations and additions to No. 231 Upper-street, Islington, for Miss Tubbs. Mr. W. Smith architect. No quantities supplied:—

	First contract.	Second contract.	Total.
Waters	£305	£455	£760
M'Farlane	195	255	450
Sabey	185	310	495
Hunt	160	200	360
Cubitt	87	145	232

LONDON.—For alterations, &c., to Dock House Tavern, East India-road. Mr. W. Barrett, architect:—

Langmead and Way	£,1096
Sheffield	1,068
Phillips	769

MARYLEBONE.—For the erection of casual wards at St. Marylebone workhouse. Mr. H. Saxon Snell, architect Quantities supplied:—

Ebbs and Sons	£1,347
Brown	1,316
Nightingale	1,263
Hale	1,253
Kelly	1,243
Rigby	1,193
Sabey	1,176
Potter and Sons	1,130
Shaw	1,117
Crabb and Vaughan	1,083

NEW KENT-ROAD.—For building St. Matthew's Church New Kent-road. Mr. H. Jarvis, architect:—

	Church.	Spire.	Total.
Patman and Fotheringam	£7,276	£680	£7,956
Thompson	6,569	670	7,230
Gammon	6,370	605	6,975
Henshaw	6,184	728	6,912
Dove Brothers	6,335	520	6,855
*Myers and Son	6,075	530	6,605
Higgs	5,265	518	5,783

* Mr. Higgs having made a mistake, Messrs. Myers and Son's tender being the next lowest was accepted.

PIMLICO.—For alterations to the Sun Tavern, Ranelagh street, Pimlico. Messrs. Bird and Walters, architects:—

Henshaw	£647
Ebbs and Sons	589
Williams and Son	567
E. Brown	549
Newman and Mann	539
M'Lachlan	510

THE BUILDING NEWS.

LONDON, FRIDAY, JANUARY 25, 1867.

THE COURTS OF JUSTICE COMPETITION.

A FORTNIGHT ago we made some preliminary remarks on this the most important architectural battle since that for the Houses of Parliament, when the late Sir Charles Barry, by the help of Pugin, came off victorious. Who the new *Sir Knight* is to be, and by whose and what help—whether by help of good name, or legal favour, or foregone conclusion, or real art-power—are points about which we might have been earnest had the competition been free, open, and unlimited; narrowed as it is, we confess we have almost come to be indifferent, and, after seeing the plans, we really do not think art will gain or lose much by any decision the judges may choose to make, taking it of course for granted that their choice will be sure to be limited to five designs—viz., those by Messrs. Scott, Waterhouse, Street, Seddon, and Burges.

In our first article, we pointed out the varieties of plan possible to the site under the conditions laid down by the instructions. We can scarcely say that we were prepared for such a concord of opinion as exists touching the Central Hall scheme, which has been adopted in some shape or other by the great majority of the competitors. We also expressed a hope that the architects would favour us with possible views of their designs, and not merely give fancy perspectives representing the building as if it were to stand on one side of a gigantic square or platz. Some have done as we hoped they would; yet views have been sent in, as we feared they might be, the authors of which have coolly presumed to remove all the buildings between the Strand and the river. This question of perspective drawings is always more or less one of the chief obstacles in the way of fair competition, and until instructions are peremptory on this point, fixing the size and angles of the one or more views required, the public must be content to be misled, on the one hand, into undue admiration by charming realistic drawings showing things as we may see them every day, or, on the other hand, into unfair condemnation by impossible views which have nothing real about them, and which, instead of enhancing the merits of the design, only tend to damn them. As an illustration of this, we cannot help thinking that both Mr. Burges and Mr. Seddon would stand in a much more favourable light if they could be permitted to withdraw their exterior perspectives altogether; whilst, on the other hand, the attractions of Mr. Waterhouse's design depend most materially on the very admirably drawn and truthful series of views by which he has so well illustrated it. The admission of models in a competition is another important consideration. To the uninitiated public a model is always attractive, because it affords them an opportunity of forming some sort of judgment, without having to undergo the horrible task of trying to make out the relation of the several plans, elevations, and sections. But, then, it is manifest that, in order to put all competitors on the same level and give them all equal chance with the public and non-professional judges, every architect should be obliged to submit a model of his design made to the same scale and got up in the same style as the others, or, failing this, no model should be received, lest its exhibitor should obtain an undue advantage over his co-competitors. That Mr. Seddon may be inclined to quarrel with us for expressing just now such an opinion is not unlikely, seeing how much his design depends upon his model for illustration, but when the battle is over we feel confident that Mr. Seddon will be the very first to admit the justice of our argument, and even now we would dare go so far as to ask the Government to pause in such an important work as the selection of a design for a building of such magnitude and costliness until they have had models made of the other designs. There would be, too, this additional advantage, that whereas at present each man's work is separated from his neighbour's designs, and cannot be compared except by an effort of memory, a row of models would enable one to judge at a glance the merits or demerits of the general composition at least, whilst a detail model of one bay would furnish a test of the author's knowledge in a department of art quite as important as the power of grouping and massing of parts.

Before attempting to discuss the particular features of each plan we propose to make a few additional comments on the competition in extension of those we made in our preliminary article. The room where the drawings are exhibited is subdivided into ten compartments in pairs, as follow:—

Mr. Abrahams.	Mr. Scott.
" E. M. Barry.	" Waterhouse.
" Brandon.	" Street.
" Burges.	" Seddon.
" Deane.	" Lockwood.
" Garling.	

It is a somewhat singular coincidence that Mr. Scott occupies the head of the room on the right side of the passage as we enter the building, and here, we venture to predict, will be his position in more senses than one at the end of the fight. In saying this we do not wish our readers to suppose that we mean to endorse Mr. Scott's design as the best; at the same time we cannot help feeling that a man occupying the proud position which this architect has so long held in spite of the unquestioned talent which the younger members of the profession have lately shown would scarcely have dared to jeopardise his fame and run the risk of a defeat at the hands of such comparatively young men as Mr. Waterhouse or Mr. Burges, had he not possessed grounds for confidence in the issue of the struggle more solid than that of mere reliance on his artistic sense and architectural powers. For Mr. Scott must surely feel by this time that his work has not kept pace with many of his *confrères* in quality, however much it may have over-reached in quantity. The opinion has been expressed by more than one or two that Mr. Scott would have done well to have declined competition invitations and commissions altogether after his election to the Royal Academy. They argue that it is not becoming in one who has attained the highest honours open to an English architect, whose name is almost as familiar on the continent as that of M. Viollet le Duc himself, and whose private practice is not only enormous, but includes nearly all the really costly Gothic works of the day—it is not, they say, a becoming or graceful attitude to be always labouring to overwhelm the less fortunate disciples of the school to which he belongs, by throwing into the scale of competition the immense weight which the public always attaches to the name of the successful man. But then, to all this Mr. Scott may reply, in the somewhat jocular vein in which he sometimes indulges, "But if I do not enter the lists with you, where is the credit of your victory? I am the champion. I am older and have had larger practice than any of you. The world says I am A1. Beat me, and the belt is yours. It is only for the sake of our fair mistress, for the honour of Gothic art in general, and our Revivalist school in particular, that I feel constrained, until you do beat me, to put in an appearance and come up to 'time.'" Besides, in this particular competition, the greatness of the scheme may well be urged by Mr. Scott as an excuse, if any be wanted. This "greatness," and all that it involves, Mr. Scott himself has with true modesty recognised at the very outset of his report, and inasmuch as, whatever we may feel compelled to say in our criticisms hereafter, there can be but one opinion touching the great labour of mind and hand to which every competitor has been subjected in this trial of architectural strength, we think we cannot do better than give Mr. Scott's confession, if only to keep before our own eyes the difficulties of the competition, which are such as may well temper the judgment of the most severe:—"On first entering upon the consideration of the subject two impressions force themselves upon the mind: the nobleness of the project, and the vastness of the labour of carrying it out, even upon paper; and, strong as the first impression must be of the labour to be undertaken, I think all of us must have found it so much greater in reality than in idea that had we on first entering upon it realised its magnitude, we might well have shrunk back from the task; indeed, it is only the grandeur of the undertaking which has enabled one to face out the almost incredible labour of the design." After this we are not surprised to find that Mr. Scott has gone in for "the liberal rather than the literal interpretation of instructions;" and this suggests another great difficulty in dealing with this competition. Mr. Scott says the spirit rather than the letter has been his guide; but Mr. Street says, "I have assumed from the first to last that the schedules prepared with so much care for the competing architects were meant to be strictly adhered to." Here it is obvious Mr. Scott has an advantage over Mr. Street and all who, like Mr. Street, have trammelled themselves and tethered the flight of aspiring genius by the chains forged by the Commissioners. The more we see of competitions, limited or unlimited, the more apparent becomes the difficulty of doing justice. In the case before us the instructions are so complete as to tell you when and where you may depart from them; and yet, with all this completeness, one competitor interprets this to mean that the architect is not to be bound by anything, whilst another insists, if we understand his words, that this very liberality on certain points implies the strictest attention to everything laid down by the instructions. This is precisely the same rock upon which the competition for the Bristol Law Courts came to grief. It will be remembered that Messrs. Godwin and Crisp adhered rigidly to the instructions, and were awarded the premiums by a professional judge for having produced the best designs within the narrow limits of the instructions; but two or three other liberal-minded competitors took it on themselves to instruct the instructors by throwing their instructions overboard, and the interesting result is that Messrs. Godwin and Crisp have not received the commission they were entitled to, and Bristol enjoys the unenviable notoriety of being the laughing-stock of the Western Circuit. Now we do not cite this case as by any means a parallel case with the one before us. No one in the Courts of Justice Competition has been guilty of any flagrant departure from the main points of the instructions, but then the words of this document either have or have not a definite meaning. If they can easily and naturally be made to assume half-a-dozen different shades of meaning, then the Commissioners have been guilty of a grievous fault. If, on the contrary, they plainly set forth the meaning of the Commissioners in a simple, distinct, straightforward way, why should they need interpretation? And where is to be the limit of that liberality which they are interpreted to mean? If *one* has liberty to interpret according to his conscience (and consciences in these days are wonderfully elastic), we have no right to limit the liberty of others; and the liberty of some people is so great that it is impossible to say where such a doctrine might eventually land us.

It remains for us to say one or two words about the general aspect of the exhibition, and we take this opportunity of telling the *Morning Post*, first, that it ought to know better than to try to palm off a string of generalities about things it has never seen for observations founded on fact, and, second,

that it requires immense caution in the use of the puff general to hide the puff particular. As to the general style selected we may broadly say that the styles of the thirteenth century are at the bottom of nearly every design. On this general foundation each architect has given to his building his own particular treatment. Mr. Scott and Mr. Deane have as usual a strong Italian bias, the latter following (rather a long way off) the early mediæval architecture, the former almost at times leaning to that expression of the early renaissance where the Gothic arch maintained its ground though nearly surrounded by the returning tide of classic detail. The chief attractions of Mr. Scott's effort are the entrance-hall, the double ambulatory, and the domed hall in the centre of the building. In Mr. Waterhouse's design there is just a flavour of Italy, and strong evidence of having read "The Stones of Venice" more as an office duty than as an antiquary or an artist. His chief points consist in the management of the streets within the outer shell of his building, and the arrangement of his sky-line. Mr. Street shows very strongly the church influence, and even here does not forget that he is the champion of the High Church party. Mr. Seddon declares his design to be "pure English Gothic." We shall not now pause to inquire anything about the purity or the English; whatever the style may be, the building is massed with great simplicity and breadth of effect, and the mighty vaulted hall which traverses the whole length of the site is something to remember. Mr. Brandon, probably deeming that there was no such thing nowadays as originality, has sought in Westminster Abbey and the Sainte Chapelle and found—a design. Mr. Burges, with a sly wink at the present Government, and with that caution and foresight which characterise him, has prepared for possible contingencies by fortifying his law courts with a sumptuous array of strong machicolated towers; these towers, especially those flanking the entrances, are very imposing, and, had Mr. Burges given us a few street or bridge views, like Messrs. Waterhouse, Street, and Scott, or a model like Mr. Seddon, we are sure his studies of French châteaux and palaces would produce an effect as pleasing as his present view is displeasing. Mr. E. M. Barry has caught the dome and pinnacle fever, and, like Mr. Abrahams, Mr. Lockwood, and Mr. Garling, treats us to that kind of Gothic in which Batty Langley and Horace Walpole delighted, but which we had hoped would never have been resuscitated, even on paper. Art may or may not be dead, but of this we are sure that the science of archæology has made such progress that, to anyone of ordinary education, the designs which these gentlemen exhibit under the flattering supposition that they are Gothic can only occasion amusement or pity. In saying thus much, let it not be understood that we mean to make no distinction between the gentlemen just named, for, although all are outside the pale of the Gothic school, and all are probably equally ignorant of the principles of the great style in which they have felt themselves compelled to work, yet there can be no question that some are vastly inferior to others, and that the toe of the best outside the pale is close upon the heel of the least best within the pale. The great fault was in the selection of these four gentlemen. They could not choose but work, however much they must have felt it to be against the grain. The strange thing was, that, as everyone knew the building was to be Gothic—a fact fully proved by the plans exhibited—and as the competition was to be limited to twelve men, the Commissioners did not select the twelve best men of the Gothic school. They must have foreseen, if they knew anything at all of modern art and modern architects, that such men as Mr. Barry and Mr. Garling would be nowhere in competing on Gothic ground with such men as Mr. Scott and Mr. Burges. Indeed, Mr. Garling has felt this so strongly that he has declined to fight altogether on such a basis, and has sent in an alternative design after his own heart.

There is just one more point which should be noticed before we commence our detailed criticisms, and that is the all-important point of scale. We are neither giants nor lilliputians, and so long therefore as our stature remains what it is, our buildings ought manifestly to bear some relation to it. In prescribing 14ft. as the mean height of the ordinary rooms the Commissioners acted like practical men, but a glance at the various elevations is quite sufficient to show how difficult it is to prescribe for aspiring genius. Thus one architect appears to have adhered to this limit not only on the æsthetical ground of being in proportion with the architecture of the age, but on the highly practical ground of saving as many stairs as possible, and so concentrating the law offices vertically as well as horizontally; while another, regardless of the nuisance of having to run up and down stairs, and thinking possibly that deficiency in quality can be made up by increase of quantity, has defied the heavens and the public purse at the same time by raising his building to a height which would crush everything else from Charing Cross to St. Paul's. Again, in the divisions and subdivisions of the elevations there is evidence of some architects having forgotten the scale to which their plans are drawn. It is true that the scale of eight feet to an inch is that most commonly used, but, although this may in part account for certain extravagances, it by no means excuses the thoughtlessness or the audacity which has led some of the competitors to design to an eight scale when the drawings are limited to so small a scale as that of sixteen feet to an inch. This, we submit, is one of the most important points for the judges to keep in mind in making their award. It is just this sort of thing which most misleads the non-professional mind, which is somehow or another always ready to accept height as an index of grandeur, if not to take it for grandeur itself. In a building that is to stand alone, and is to be seen at a glance, of course the height should have due relation to length and breadth; but in a street front of 700ft. in length cut up into parts by towers and projections, that height which might look imposing when drawn out geometrically on paper may become overpowering and extragavant in the foreshortened views, which are the only ones capable of being realised of the building itself. It is very necessary to be as emphatic as possible on this point, because of a few not the competitors have treated their designs with apparently the utmost contempt for the site, and, instead of suiting their work to its position in the Strand, have taken no thought for what may be called the conditional elements of the case, but, ignoring all such mundane trammels, have set out their elevations as if the building were to enjoy the glorious expanse of a park or river frontage. We do not for a moment pretend to say that there ever was any idea in the mind of any architect who adopted this line of action of taking advantage of those more modest men who are simple-minded enough to believe that people ought, even in these go-ahead days, to cut their coats according to their cloth, or, in other words, suit their building to its site. But such an advantage is really taken, however unconsciously, for, unless we have a model of the neighbourhood surrounding a model of every design, it can scarcely be expected that anyone save the most cautious and deliberate will be able to draw out anything like a fair balance-sheet of the merits and demerits of some of the schemes submitted.

THE ARCHITECTURAL COMMITTEE OF THE PARIS EXHIBITION.

As the time for the opening of the Great Exposition of 1867 approaches, expectation begins to awaken and apathetic remarks give way to general speculations as to the result of all the unwearied promptings and pushing which for the last twelve months have emanated from the various quarters interested in the final issue. Everywhere, either in a quiet and unostentatious way or in a manner quite the reverse, have the South Kensington and other authorities been at work, as they are wont, perseveringly and determinedly. We cannot but think that special difficulties and objections have had to be overcome this time, and that manufacturers and others have not been too well pleased to be stirred up as was necessary, but have met the overtures of the Exhibition authorities with some lukewarmness, have hung back too much, and felt rather inclined to consider they were doing a favour in exhibiting than receiving one in being invited to contribute to the glories of the French Exhibition of 1867.

It was not so in 1851, in Paris in 1855, nor at Manchester, or here in 1862. On these occasions enthusiasm for trade, or science, or art produced an impetus which carried all before it, infused an energy into all the arrangements—a determination which went itself a long way towards overcoming any difficulty in the path.

Possibly we may account for this want of spirit from the red tape of exhibition mongers being drawn too tightly at times, so as to threaten to choke the exhibitors, and by remembering how frequent these exhibitions have been of late years, and the immense amount of time and trouble they must have absorbed. Or we may assume that another cause—the want of due care being taken of the valuable articles exhibited—has had something to do with the reluctance of exhibitors. It is highly important that not only in the transmission and return of packages, but in the actual exhibition of goods some guarantee for care and attention should be afforded by the names of the authorities at the head of the arrangements. It may not be new to some of our readers to hear of furniture damaged, carpets and hangings spoilt, models destroyed, in the last two or three exhibitions. And a desire not to afford an opportunity for such carelessness again may have something to do with the difficulties above mentioned. Some special insurance society should be established to take not only real but so-called accidental risks, and from damage which is but too often the result of pure carelessness in those connected with the exhibitions. But we trust the high constitution of the Imperial Commission will prevent any but the most unavoidable accidents from spoiling the pleasure or profit derived from the Paris Exhibition. Indeed, it would be but a graceful acknowledgment to exhibitors to guarantee a proportionate compensation for all other damage. Thus we trust the justly noble character of the first International Exhibition may be reproduced in this last, and make it possible at some future time to hold others at periods not too frequently recurring.

Still, while admitting to the full, as we do, these drawbacks to the honour or profit of exhibitors, we think something is also due to the honour and credit of the manufacture itself, and to the dignity of the art embodied, as well as to the honour of the country exhibiting and the country inviting exhibition. We should feel ashamed of ourselves as a nation if it could be said that we failed to respond in a handsome and generous manner to the invitations of our neighbours, and thanks are certainly due to those who remind us of our courtesies as well as our duties and obligations. To those who hang back we would say, "Take care that you are not forgotten in the race, and if you are who will regret it so much as yourselves?"

The immediate object in view has been the united representation of those branches of industry essential to Architecture which might either not be represented at all, or might be scattered up and down throughout the various classes and subdivisions into which the groups themselves were to be arranged. Some diffi-

culty occurred naturally at the outset to define exactly the boundaries of the arts cognate to architecture, and to state how far the Committee were justified in admitting into their Art Court, for instance, wood carving and furniture not strictly of an architectural character, while they excluded moulded ironwork in stoves, and such like objects of an architect's design. But the difficulty was solved by the stringent regulations of the Imperial Commission; while, at the same time, sufficient has been done to claim for the architect a share in the direction at least, if not the actual design, of those essentials—the fittings and furniture of a building—whether of marble, stone, wood, iron, or woven fabrics.

The classification of the Exhibition will be understood by our readers sufficiently to know that the concentric ring representing "Furniture," &c. (and a very large *et cetera* it is), comprised in what is called Group III., is somewhat removed from the one immediately enclosing the Fine Art section, which is like the kernel of a nut enclosed in many outer coatings. In this inner art group the Committee have entire charge of the exhibition of Architecture as one of the fine arts, being specially delegated to this duty by the British executive, but their space is so small that the result of any exhibition must be a poor display of architecture, and cannot, except in a very small degree, give any idea of the architectural life amongst us in the present day. The preliminary exhibition at South Kensington, of which we have already written, is the first result of the labours of this Committee; but we are now speaking of the endeavours to combine the exhibition of executed works of Architectural Art-manufacture (which are matters of the daily attention of architects, with their architectural designs themselves, as shown by drawings and models. Outside this magic circle (or oval) of Fine Art, the Committee were placed upon their own responsibility, and had to provide not only the objects but the means for exhibiting them. While engaging themselves to the authorities, on the one hand, to occupy the space assigned to them, they were obliged to seek from Art-manufacturers, on the other (somewhat reluctant to contribute) their earnest and active co-operation. By subscription amongst themselves, and by *pro rata* contributions from the exhibitors, we are informed the treasurer's immediate requirements have been satisfied, and the necessary expenses of arranging the court provided for.

Owing partly to favour and partly to the force of circumstances, the space allotted to the committee in the group where alone their Art Manufactures Court could properly be placed, has been removed so as to adjoin and be connected with Group I., the Fine Art space allotted to the drawings and models of architects. And thus it seems likely, if no unforeseen difficulties arise, that for the first time a comprehensive view of the Art and the Science of Architecture—the designs of architects, and the skill of execution of Art-manufactures in close proximity—will be afforded. As a germ of what we may one day see more fully developed, it is important to draw attention to this, and we wish all success to those engaged in the production, though we feel sure they will be the first to admit its meagreness and insufficiency compared with what might have been hoped for under more favourable circumstances.

We are informed that we may expect to find the names of nearly all those we are familiar with in the designing or executing art workmanship. We hope to see, for instance, the drawing and the model by Mr. G. G. Scott, R.A., for the Prince Consort Memorial in the one group, and in the adjoining group the actual workmanship of part of it by Messrs. Skidmore of Coventry; and if in the same way throughout, we cannot directly connect the one piece of art workmanship with the design upon the adjoining screens, we can at least be sure that generally the body of Art workers on the one side are constantly engaged in some way or other in giving effect, in substance and living colour, to the emanations of the minds of the architects. Thus a harmony of result is reasonably to be hoped for, and a combination which we only trust will be favourable alike to the individuals composing the groups and to the country represented. Messrs. Hart, Hardman, Minton, Maw, Blashfield, Ransome, and others are quite capable of sustaining the reputation of the art manufactures of England, and we trust they will reap their reward. The committee and their indefatigable officers will find their labours not unappreciated by the profession, which, when it comes to see what has been done amid great difficulties, will not fail to approve their honorary and devoted services.

PRESERVATION OF WOOD IN DAMP AND WET SITUATIONS *

IN 1846, eighty thousand sleepers of the most perishable woods, impregnated by Boucherie's process, with sulphate of copper, were laid down on French railways. After nine years' exposure, they were found as perfect as when laid. This experiment was so satisfactory that most of the railways of that empire at once adopted the system. We would suggest washing out the sap with water, which would not coagulate its albumen. The solution would appropriately follow.

Both of the last-named processes are comparatively cheap. The manufacturing companies of Lowell, Mass., have an establishment for "Burnettising" timber, in which they prepare sticks 50ft. in length. Under a pressure of 125lb. per square inch, they inject from 2oz. to 8oz. of salt into each cubic foot of wood. The cost, in 1861, was from 5 dollars to 6 dollars per 1,000ft., board measure. Boucherie's method must be still cheaper. It costs less than creosoting by 1s. per sleeper.

An American engineer, Mr. Hewson, for injecting railroad sleepers, proposes a vat deep enough for the timbers to stand upright in. The pressure of the surrounding solution upon the lower ends of the sticks will, he thinks, force the air out at their upper extremities, kept just above the surface of the solution, after which the latter will rise and impregnate the wood. In 1859, he estimated chloride of zinc at 9 cents per pound, sulphate of copper at 14 cents per pound, and pyrolignite of iron at 23 cents per gallon. He found the cost of impregnating a railway tie with sufficient of those salts to prevent decay, to be—for the chloride of zinc 2·8 cents, for blue vitriol 3·24 cents, for pyrolignite of iron 7·5 cents.

Among the numerous other preservative compounds, may be mentioned Le Gras's mixture of a double salt of manganese and lime (or zinc) with creosote, Payne's solutions of sulphate of iron and muriate of lime, forming by double decomposition an insoluble sulphate of lime among the wood fibres, Margary's solution of acetate of copper, and Ransome's liquid silicate of potassa. Payne's process met with some favour. But neither of the last are of appreciable value.

Vessel owners had long ago observed that those ships which have early sailed with cargoes of salt are not attacked by dry rot. Indeed, several instances are well attested of vessels whose interiors were lined with fungi having all traces of the plant destroyed by accidental or intentional sinking in the sea. Acting on such hints, a trader of Boston salted his ships with 500 bushels of the chloride, disposed as an interior lining, adding 100 bushels at the end of two years. Such an addition of dead weight (35,000lb. in this case) is sufficient objection to a procedure which has other great disadvantages.

The unpleasant odour of creosote is greatly against its use upon lumber for dwellings, and Bethell's process, therefore, is not described here, although the most satisfactory known. Pyrolignite of iron is offensive and also highly inflammable. The affinity of the chlorides for water keeps the structure into which they are introduced wet; besides, they corrode the ironwork. Sulphate of copper is free from these objections, and is, at present, cheaper than the chlorides. Therefore, for protecting wooden structures against dry rot in damp situations, like mines, vaults, and the basements of buildings, sulphate of copper seems preferable, and Hewson's or Boucherie's method of injecting it cheaper and more expedient, according as the timber is short or long.

II. Wood Alternately Wet and Dry.—The surface of all timber exposed to alternations of wetness and dryness gradually wastes away, becoming dark coloured or black. This is really a slow combustion, but is commonly called wet rot, or simply rot. Other conditions being the same, the most dense and resinous woods longest resist decomposition. Hence the superior durability of the heart-wood, in which the pores have been partly filled with lignine, over the open sap-wood, and of dense oak and lignum vitæ over light poplar and willow. Hence, too, the longer preservation of the pitch-pine and resinous "jarrah" of the East, as compared with non-resinous beech and ash.

Density and resinousness exclude water. Therefore our preservatives should increase those qualities in the timber. Fixed oils fill up the pores and increase the density. Staves from oil barrels and timbers from whaling ships are very durable. The essential oils resinify, and furnish an impermeable coating. But pitch or dead oil possesses advantages over all known substances for the protection of wood against changes of humidity. According to Professor Letheby, dead oil, first, coagulates albuminous substances; second, absorbs and appropriates the oxygen in the pores, and so protects from eremacausis; third, resinifies in the pores of the wood, and thus shuts out both air and moisture; and, fourth, acts as a poison to lower forms of animal and vegetable life, and so protects the wood from all parasites. All these properties specially fit it for impregnating timber exposed to alternations of wet and dry states, as, indeed, some of them do for situations damp and situations constantly wet. Dead oil is distilled from coal tar, of which it constitutes about ·30, and boils between 390 deg. and 470 deg. Fah. Its antiseptic quality resides in the creosote it contains. One of the components of the latter, carbolic acid (phenic acid, phenol), $C_{12} H_5 O$, the most powerful antiseptic known, is able at once to arrest the decay of every kind of organic matter. Professor Letheby estimates this acid at ½ to 6 per cent. of the oil. Chrysilic acid, $C_{14} H_8 O_2$, the homologue of carbolic acid, and the other component of creosote, is not known to possess preservative properties.

Bethell's process subjects the timber and dead oil, enclosed in huge iron tanks, to a pressure varying between 100lb. and 200lb. per square inch, about twelve hours. From 8lb. to 12lb. of oil are thus injected into each cubic foot of wood. Lumber thus prepared is not affected by exposure to air and water, and requires no painting. A large number of English railway companies have already adopted the system. 8lb. of oil per cubic foot is sufficient for railway sleepers.

The cost of creosoting, as this process is sometimes called, was given in 1855, by Ronald and Richardson, at somewhat less than four pence per cubic foot, in England. At one shilling per gallon, the price at which dead oil was obtainable in England in 1863, four pence per cubic foot would, we presume, be sufficient.

A process recently patented, and described in the *Scientific American*, February 17, 1866, proposes to introduce highly heated oleaginous vapours among the timber, confined in an iron tank. The patentee hopes that, as fast as the moisture is expelled from the wood, the vapour will take its place. Whether this substitution would not soon arrest itself, should it even commence, is in our mind a debatable question.

While an external application of coal-tar promotes the preservation of dry timber nothing can more rapidly hasten decay than such a coating upon the surface of green wood. But this mistake is often made, and dry rot, instead of wet rot, does the work of destruction. The reason must appear from what has been said on dry rot. Carbonising the surface also increases the durability of dry, but promotes the decay of wet timber. Farmers very often resort to one of the latter methods for the preservation of their fence-posts. Unless they discriminate between green and seasoned timber, these operations will prove injurious instead of beneficial.

In this connection, we remark, that inverting a post from the position in which it grew is by some supposed to retard decay. According to the president of the Northern Architects' Association, England, the valves close against moisture ascending through the ducts from the earth into the post. But, according to Gray, thin places only separate contiguous ducts. Fluids can pass through them in one direction as well as in the other. When age obliterates these thin mediums, nothing opposes the flow upward or downward. Further-

* From the "Journal of the Franklin Institute." By H. W. LEWIS, University of Michigan. Concluded from page 21.

more, the passage of fluids through wood is not confined to ducts; it takes place on all sides of them as well. In face of these facts, very careful experiments will be requisite to convince us that a post is more durable in the inverted than in the normal position.

III. Timber Constantly Wet in Salt Water.—We have not to guard against decay when timber is in this situation. Teredo navalis, a mollusc of the family Jubicolário, Lam., soon reduces to ruins any unprotected submarine construction of common woods. I quote from a paper read before the Institute of Civil Engineers, England, illustrating the ravages of this animal: "The sheeting at Southend pier extended from the mud to 8ft. above low-water mark, The worm destroyed the timber from 2ft. below the surface of the mud to 8ft. above low-water mark, spring tide; and out of thirty-eight fir timber piles and various oak timber piles, not one remained perfect after being up only three years." Specimens of wood taken from a vessel that had made a voyage to Africa are in the museum, and show how this rapid destruction is effected.

None of our native timbers are exempt from these inroads. Robert Stephenson, at Bell Rock, between 1814 and 1843, found that green-heart oak, beef wood, and bullet tree were not perforated and teak but slightly so. Later experiments show that the jarrah of the East, also, is not attacked. The cost of these woods obliges us to resort to artificial protection.

The tereno never perforates below the surface of the sea-bottom, and probably does little injury above low-water mark. Its minute orifice, bored across the grain of the timber, enlarges inwards to the size of the finger, and soon becomes parallel to the fibre. The smooth circular perforation is lined throughout with a thin shell which is sometimes the only material separating the adjacent cells. The borings undoubtedly constitute the animal's food, portions of woody fibre having been found in its body. While upon the surface only the projecting siphuncles indicate the presence of the teredo, the wood within may be absolutely honeycombed with tubes from 1in. to 4in. in length.

It was naturally supposed that poisoning the timber would poison or drive away the teredo, but Kyan's and all other processes employing solutions of the salts of metals or alkaline earths signally failed. This, however, is not surprising. The constant motion of sea-water soon dilutes and washes away the small quantity of soluble poison with which the wood has been injected. If any albuminate of a metallic base still remains in the wood the poisonous properties of the injection have been destroyed by the combination. Moreover the lower vertebrates are unaffected by poisons which kill the mammals. Indeed, it is now known that certain of the lower forms of animal life live and even fatten on such deadly agents as arsenic.

Coatings of paint or pitch are too rapidly worn away by marine action to be of much use, but timber, thoroughly creosoted with 10lb. of dead oil per cubic foot, is perfectly protected against teredo navalis. All recent authorities agree upon this point. In one instance, well authenticated, the mollusc reached the impregnated heart-wood by a hole carelessly made through the injected exterior. The animal pierced the heart-wood in several directions, but turned aside from the creosoted zone. The process and cost of creosoting have already been discussed.

A second destroyer of submarine wooden constructions is limnoria terebrans (or L. perforata, Leach), a mollusc of the family Assellotes, Leach, resembling the sow-bug. It pierces the hardest woods with cylindrical, perfectly smooth winding holes, 1-20in. to 1-15in. in diameter, and about 2in. deep. From ligneous matter having been found in its viscera, some have concluded that the limnoria feeds on the wood, but since other molluscs of the same genus, Pholas, bore and destroy stonework, the perforation may serve only for the animal's dwelling. The limnoria seems to prefer tender woods, but the hardest do not escape. Green-heart oak is the only known wood which is not speedily destroyed. At the harbour of Lowestoft, England, square 14in. piles were in three years eaten down to 4in. square.

While all agree that no preparation, if we except dead oil, has repelled the limnoria, an eminent English engineer has cited three cases in which that agent afforded no protection.

We do not find that timber impregnated with water glass has been tested against this subtle foe. The experiment is certainly worthy of a trial.

A mechanical protection is found in thickly studding the surface of the timber with broad-headed iron nails. This method has proved successful. Oxidation rapidly fills the interstices between the heads, and the outside of the timber becomes coated with an impenetratable crust, so that the presence of the nails is hardly necessary.

In conclusion, we cannot but express surprise that so little is known in this country concerning preservative processes. Their employment seems to excite very little interest, and the very few works where they are being tested attract hardly any attention. Those railroads which have suspended their use assign no reasons, and those upon which the timber is injected publish no reports concerning the advantages of their particular methods. Even the National Works, upon which Kyan's process was formerly employed, have laid it aside, and now subject lumber to dampness and alternations of wetness and dryness, without any preparation beyond seasoning. When sleepers cost 50 cents and creosoting 30 cents each, it is cheaper to hire money at 7 per cent. compound interest than to lay new sleepers at the end of seven years. Allowing any ordinary price for the removal of the old and laying down the new ties, the advantage of using Bethell's process seems evident. If some cheaper method will produce the same effects the folly of neglecting all means seeking to increase the durability of the material is still more palpable.

Complete and reliable reports upon the preservation of the various species of woods experimented upon in this country are greatly needed, and we hope they may shortly appear.

THE CONSTANT WATER SUPPLY FOR LONDON.

AT a meeting of the Health Committee of the National Association for the Promotion of Social Science, held on Monday evening, at the offices, Adam-street, Adelphi (Dr. Aldis in the chair), Mr. J. F. Bateman, C.E., F.R.S., read a paper upon "A Constant Water Supply for London."

The lecturer, after referring to his experience in the construction of waterworks, made the following general observations:—The question of constant supply is one which most materially affects the comfort and convenience of the poorer classes, and the inhabitants of smaller houses. In larger houses ample cistern space is generally provided to secure the equivalent of a constant supply; but where water is constantly laid on from the street mains there is scarcely any occasion for house cisterns, except for the supply of waterclosets. By proper arrangement little or no inconvenience is experienced from the occasional shutting-off of water for the changing or attaching of house services. The first cost of introducing the water to the houses is reduced to the lowest possible point, and the pollution which more or less commonly attends the storage of water in house cisterns is entirely prevented; the water is delivered in the purest, freshest, and coolest condition; and very much of the annoyance and inconvenience arising from frozen cisterns and burst pipes, which are the common attendants of the winter season, is avoided. There is no occasion for exposed pipes in out-of-the way places, for cisterns in roofs or the tops of the houses to be filled with soot and dust in summer, and to be frozen in winter; and a man may live in tolerable comfort without the dread of the water bursting above his head, and deluging the apartment in which he resides. But the advantage of constant supply to the consumer has been so often and so clearly demonstrated, that it is useless to dwell further on this branch of the subject. The question of its adoption does not entirely rest with the consumers, but with those who have to provide the water. It is believed by many that the consumption, under the constant supply system, is so great that no company or waterworks can meet the demand—it would be ruin to them if they attempted it. I cannot but think that all this is a delusion—it is not that more water is actually consumed for the use of the individual under the one system than under the other; but that the amount of waste which results from bad pipes and bad fittings constantly supplied with water is so great as to occasion serious loss and inconvenience to a water company, and perhaps in some cases to exhaust their supplies. The experience of those towns where the supply has always been on the "constant system," and where every precaution has been taken for the purpose of securing good workmanship, the best and strongest materials, and the most improved apparatus, the consumption of water per head is certainly not more, probably less, than it is in towns similarly circumstanced in all other respects, but supplied with water on the intermittent system. This is abundantly proved by the statistics of water supply in such places. For instance, the average consumption of water in the manufacturing towns of Lancashire and Yorkshire is from 16 to 20 or 21 gallons per head per day for all purposes, including trade, and of course, all the waste which may be taking place. In Manchester, the quantity consumed by about 600,000 persons, and by the trades demanding water within the district supplied, varies from 12 to 13 million gallons per day. Of this quantity it is estimated that one-third is supplied to manufacturers, leaving the nett quantity consumed for domestic purposes, including waste, 14 gallons per head per day. The experience of Preston, Blackburn, Bolton, Stockport, Halifax, Warrington, and all the other manufacturing towns in the north of England, is identical with that of Manchester; and if this be compared with the consumption which obtains in towns supplied under the intermittent system, it will be found that scarcely in any case does the supply fall to so low a point as under the constant system. In London it is 32 gallons per head per day, and in Plymouth, Devonport, Shrewsbury, Oxford, and other places supplied on the intermittent system, the consumption amounts to 30 gallons or more per day. The quantity required in different towns no doubt varies according to the class of inhabitants, the circumstances, and the habits of the people, and it is universally found that where waterclosets exist as a general rule, the consumption is greater than where they are comparatively absent. Where everything is in good order, and both the water provider and the water consumer do their respective duties properly, there is no disadvantage to either party by the supply of water on the constant supply system, while the advantage to the consumer in the facility with which he obtains water, and the trifling cost at which it can be introduced into his premises, are incomparably greater than can be enjoyed under the other system. Where, however, the intermittent system has hitherto prevailed, the desirableness, and, indeed, the practicability, of abandoning it, and adopting the constant supply, depends very much upon the consumers. If they will submit to such regulations as are necessary for preventing waste, there can be no difficulty in introducing constant supply; it will consume no more water than the intermittent system. The only changes which are required are the abandonment of all bad fittings, such as common ground taps, leaky cocks, and wasteful waterclosets. The cisterns already existing in houses which have been adapted to the system hitherto employed may remain if it be the will of the owner or occupier that they should. If they are large enough they do now practically give a constant supply, and it is only just to the provider of water that care should be taken to prevent improper use. Those who prefer to abandon their cisterns and to take their water direct from the pipes can do so at very little expense. In all new buildings there would be no necessity for the expensive paraphernalia of cisterns; a stopcock on the service pipe of the house would enable the water to be turned off whenever repairs or alterations were required to be made within the house. Little inconvenience is felt by grouping a number of houses together, commanded by one stopcock; and, indeed, it may be said that complaints of inconvenience arising from interruption to the supply of water are scarcely ever heard in towns where the constant supply is at work. If the public will not submit to introduce the best description of fittings, and to prevent waste, and will not subject themselves to the vigilant inspection which ought to be exercised by the provider of the water, and be willing to correct everything which requires correction, it will be difficult, and in some cases impossible, to introduce the constant supply. To confirm these positions Mr. Bateman referred to the experience of Sheffield, Cambridge, Manchester, and Glasgow. The general result of these examples was to show that, apart from its other advantages, the system of constant supply led to economy of water, and the conclusion at which the lecturer arrived was that there was no reason to doubt that if in this great metropolis the providers and consumers of water would both do their duty and work harmoniously together, the citizens might enjoy the benefit of an unlimited supply of water constantly laid on, without consuming a gallon more water

than, if, indeed, as much as, was now supplied by the water companies,

At the conclusion of the paper, the Chairman moved, and Mr. Rendall seconded, a vote of thanks to Mr. Bateman, which was unanimously agreed to.

Mr. J. Locke, M.P., said that it appeared to him that the fault of the intermittent system arose from the want of proper cisterns in the houses of the poor. There could be no doubt as to the advantage of a continuous supply in cases of fire; but he did not quite see what would be its advantage for domestic use where people had proper receptacles.

Mr. Rendall said that in London the poor had either no receptacles for water at all, or only such as on account of their nature and situation could not preserve the water in a wholesome condition. There was no wonder that men who had to drink such water went to the gin-shop to get something pleasanter. In those parts of London in which a constant supply existed there was no waste, and the water supplied to the inhabitants was cool, clear, and pure.

Mr. Holland referred to the advantages which had resulted from the introduction of a constant supply of water into Manchester, and said that there was not a single fallacy in regard to the subject which now flourished in London which had not to be killed in Manchester before that constant supply was obtained.

Mr. Elt suggested that the water which was said to be wasted operated beneficially by flushing and cleansing the house drains and sewers.

Captain Shaw said that there could be no doubt that, if a town was sufficiently supplied with water for sanitary and commercial porposes, at high pressure, there would always be enough for the extinction of fires.

Mr. Rendall asked whether it was not wrong that half an hour should elapse, as in London was often the case, before water could be obtained for the extinction of a fire.

Captain Shaw said that the average time within which water was upon a fire was not half an hour, but ten minutes.

Sir J. Thwaites expressed his satisfaction with the paper which had been read, but as a member of the royal commission upon the water supply of the metropolis, declined to pronounce any opinion upon the question which it had raised.

Mr. Bateman said that when a town was well sewered, and there was a constant supply of water, there would be no need to flush the sewers.

Several other gentlemen addressed the meeting, and the proceedings terminated with the usual vote of thanks to the chairman.

EARTH CLOSETS.

THE following correspondence has taken place on the earth closet question between the surveyor of Norwich, who was instructed to report on the matter, and Mr. Edward Boardman, whose very useful observations we published a fortnight since. As the authorities of many other towns are now considering the question, this controversy will most likely assist them in their decision.

TO THE CHAIRMAN AND GENTLEMEN OF THE SANITARY COMMITTEE.

Norwich Board of Health, Surveyor's Office,
December 28, 1866.

In accordance with your instructions, I beg to report to you on the practicability of the earth closets proposed to be used in Norwich instead of waterclosets, by which change it is imagined by some that the plan for intercepting sewers and irrigating works for which this corporation is now applying to Parliament for powers to carry out, will not be required, and the injunction obtained against the corporation avoided.

No. 1. It seems to me that, it is not so much the question which of the two systems of closets is the best, but whether by doing away with waterclosets entirely, the necessity for intercepting the remaining drainage, and preventing it entering the river to pollute it, will be avoided. My opinion most decidedly is, that the sewage from the houses, consisting of urine, slops caused by cooking vegetables, &c., washing refuse, and the drainage from the various breweries, dyeworks, and factories, together with the filth washed from the streets, will still be so foul that it will never be permitted to flow into the river, and that, consequently no advantage will be gained to the city by the proposed alteration.

No. 2. It has been long since proved that water is the cheapest mode of conveying away the filth of towns, and I believe that the value of the sewage in a liquid state is not depreciated by the dilution, although it is impossible to collect, in a solid form, all the valuable salts after they have been so diluted.

No. 3. In all systems of drainage it is most important, in order to ensure the proper working, that every part should, as far as possible, be self-acting, and I am quite sure that there would be so much difficulty, nuisance, and expense, in carting the earth into the city, and the collecting and removal of it when soiled, to say nothing of the almost impossibility of getting proper attention paid to the closets in cottages, lodging-houses, &c., that in practice the earth closets would not be found to answer.

No. 4. In the letter written by Mr. Boardman, sent to the members of this committee, and printed in all the local papers, he estimates that the annual cost of working the closets in this city would be £8,438, and the revenue £22,986, leaving an annual profit of £14,548. This is the theoretical view of the matter, but at Manchester, where the annual cost of emptying the privy bins is about £17,000, the soil is sold for about £9,000, leaving a loss of about £8,000 a year, instead of a profit, to which in our case would have to be added the cost of the earth (which must be of a particular description) and of the carting and delivery thereof.

No. 5. It is also stated in the same letter, that the decision of the Leamington Conference was "decidedly in favour of the dry earth." This most certainly was not the case, for the only resolutions carried were as follows: — First, "That, after careful consideration of the valuable information submitted, this congress is of opinion that the systems of allowing excrementitious matters from houses to pass into and pollute the rivers, is in all cases highly objectionable, and ought, so far as may be practicable, to be prevented." The second was, "That the system of irrigation, when carried out in a scientific manner, removes the difficulty which arises from the present noxious plan of polluting the rivers of England, but that there are circumstances in which other systems may be applicable. That as each of the systems possesses some peculiar advantage, a combination of the several systems according to the particular circumstance of each, can probably possess the most effective and advantageous results."

No. 6. In conclusion, I am quite satisfied that the board has, under the circumstances, acted wisely in deciding to intercept the whole of the sewage and to take it to one point, as, whatever may eventually be found the best method to treat sewage, the cost of the intercepting sewers will not have been expended in vain.

I am, Gentlemen,
Your obedient servant,
ALFRED W. MORANT.

MR. BOARDMAN'S REPLY.

Queen-street, Norwich, January 14, 1867.

GENTLEMEN,—As requested by you, I beg now to reply to the report of your engineer, which was read to me at your meeting of the 27th ult., and a copy of which Mr. Miller has furnished me. To prevent repetition, and that my replies may be more easily identified, I have affixed figures to divisions of your engineer's report.

No. 1. The first question raised is, "whether by doing away with waterclosets entirely the necessity for intercepting the remaining drainage, and preventing it entering the river to pollute it, will be avoided." My reply to this is, that if the waterclosets be discontinued, the main cause of the pollution of the sewers will be removed. The public, and all private urinals, can be treated with earth quite as easily and satisfactorily as with water; the other liquid refuse of towns will form so small a proportion of dirty, or diluted water, as compared with the volume of water in the river (and being free from the excrementitious matters, which is the cause of pestilential pollution), that the injunction will not be maintainable, for the Royal Commissioners tell us, "Absolute purity of water will be impossible, and need not be looked for." Of course it will be necessary to dredge the river of the accumulated mud, and keep down the weeds, as in any case ought to be done.

No. 2. I say, most emphatically, that it has not been proved that water is the cheapest mode of conveying away the filth of towns, but, on the contrary, is most wasteful and expensive; and it is a well-ascertained fact that when once sewage matter is diluted it is rendered practically valueless.

No. 3. Taking every contingency into consideration for the occupier, the earth closet will be practically as self-acting as the watercloset, with the exception of very few instances, where waterclosets have been fitted up regardless of expense. The majority of occupiers know the annoyance and expense of pipes bursting, ball-tap leaking, drains choked up, sewer-gas escaping, doctor's bills to pay in consequence; and with careless, dirty people, the watercloset is generally out of order. The earth closet will not be subject to any of the above objections. Dry earth can, and will be, supplied as punctually as the food we consume, at the necessary periods, and the application and removal will not be so formidable as imagined. Out of 3,000 waterclosets in Norwich, I suppose about 1,000 are upstairs; if six persons use one of these latter every morning, a clean pail with dry earth will be left at the door (about the weight of a coalshoot half-full); this the servant will take upstairs, and bring down the used pail; if only three persons on the average use it, the removal will be every other day. (I would remark this makes ample allowance for diarrhœa disorders.) The remainder of the closets are downstairs, and invariably next an outside wall at the back or side of the house; these can be supplied with earth and removed from outside by the man, without entering the house at all, except where there is no back entrance. The whole process is less offensive than carrying a sloppail, and not more dirty than carrying the ashes and coalshoot about the house. If the dry earth is taken to the dirtiest and most careless of people, I think they would be more likely to use it than to send for tradesmen to do the necessary repairs in the water system. The 3,000 closets, if treated with earth, would require to be supplied with about 7,000 tons of earth per annum; what is this compared with the 95,000 tons of mixed goods and coals which annually arrive at the Thorpe and Victoria Stations, and from thence are distributed over the city? Most people admit that the system is adapted for villages or small towns. If the city is divided into districts, as I proposed, they become, as it were, an amalgamation of small towns; and every business man knows that an extensive systematic arrangement is easier and more effectually carried out than a limited one, as it will afford more efficient men to supervise. Our food, and everything we require for existence, is, as it were, supplied to us in large towns haphazard; then cannot our excrementitious matter, which is infinitely smaller in bulk, be removed by a general systematic arrangement?

No. 4. Chemists tell us that the constituents of human excrements and guano are the same, but the proportions of the former are far better fitted to sustain the fertility of the soil. Agriculturists, who have tried the experiment, tell us the same. Travellers and history tell us that in China and Japan the only manure producer is man; this has been going on for thousands of years, yet the land is as productive as ever; they grow more corn than they consume, but do not lock up their capital in bullocks for the purpose of producing manure. With these facts, can it be stated to be worth nothing in England? Put the natural manure in a portable form, and it will be worth something certainly, if the farmer will now give £5 to £9 per ton for guano and artificial manure. It is stated that the known accumulations of guano will not last more than 10 or 12 years, and the supply may at any time be cut off by war (and cannot be proved to be better). Your inspector stated in the public papers last week, that "the contractor for the removal of the night soil, to whom the city pays £30 yearly, threw up his contract as being unremunerative." The contractor tells me that his reason for throwing it up is because the "flying dustmen" empty all the large and convenient bins, but leave him the inconvenient places, which, as city contractor, he is bound to empty. He has to clean silt from the street gullies, and is not allowed to make a depot even on the outskirts of the city. Why night soil has not been profitable is, because it is generally mixed with water and every kind of rubbish, and smells so offensively that it is difficult, now especially, to get men to remove it, but the keeping it dry and mixing the earth with it destroys all unpleasantness to sight or smell, and this adulteration with earth is not in greater proportion than is a good deal of the expensive manure; and the very fact of turning over vegetable soil also improves its fertilising qualities. Manchester is not under the earth system, as your report implies; instead of earth, ashes are mixed, which unsuits it for corn crops, therefore detracts from its value. (If the earth system had

been tried and been a failure, I do not think Mr. Heron, the town clerk of Manchester, would have gone to the Leamington Conference and have publicly supported it as he did.) Clay, or any soil which will grow corn, is suitable for mixture.

No. 5. The assertion I made, relative to the Leamington Conference, is fully borne out by the BUILDING NEWS of last Saturday. It says, "The overwhelming weight of opinion at the meeting was in favour of dry earth, but a different opinion was expressed as to its applicability to large towns;" but, as I stated in No. 3, its applicability to large towns is as reasonable as to small towns, for if it be possible to attend 1,000 houses, 10,000 can be done with more certainty, in consequence of the superior supervision available.

No. 6. The questions I would ask are: First, will the water system you propose to carry out stop the pollution of the river? Second, is the irrigation system a success? Third, will it prevent an injunction? Croydon is usually quoted as the successful example of the system, and after which, I believe, Norwich is to be treated. It appears to be managed in this way (see Bannehr on the "Sewage Difficulty"):—

Immediately after leaving the town outlet, the sewage passes into subsiding or separating tanks, where the larger portion of the suspended matter is abstracted from the sewage, and (it being of a very offensive character) is mixed with dry ashes or other deodorant, and is sold to farmers at such a price as barely to cover the cost of manipulation.

These tanks, I believe, in Norwich are to be at Trowse.

The clarified sewage is then conveyed to the irrigated land, the greater part of which is sown with Italian rye grass. It is thus obvious that a large proportion of the impurity is abstracted from the sewage water before it is bestowed on the irrigated land, and there is no proof that any considerable proportion of manurial impurity is eliminated from it after it has left the tanks.

When the sewage leaves the tanks, it has much the appearance of dirty soap water, and when it arrives at the river, it appears to have been divested of part of its soapy appearance; but it is far from clear, and if it were perfectly clear and bright, chemists tell us it is no evidence of purity. It is said that when the sewage leaves the town outlet, it contains 32 grains of organic matter, and when it arrives at the river, after irrigation, it still possesses 22 grains.

The process of five successive applications of Edinburgh sewage to five different fields, 222 out of 224 grains of solid matter held in suspension in each gallon, were deposited on the land; whilst only 15 grains out of 87 of the matter in solution were eliminated from it after passing over five fields.

It is obvious suspended matter may be eliminated from it by irrigation, but that is of very slight importance, as it is found necessary to separate the larger portion, as at Croydon, before applying sewage to the land.

At Alnwick, where the Duke of Northumberland had incurred the expense of making sewage available to farmers, they, after trying it for several years, refused to have it, even as a gift, because it was perfectly useless or mischievous to them!

Great stress has been laid upon the large quantities of grass grown at Croydon; it is said very nearly the same quantity is produced from the Clipstone irrigation fields by the use of pure water, and it probably would be as much if the water possessed the two or three degrees of extra temperature which sewage possesses. In the Royal Commission Blue Book, page 13, it is stated,

That there is still occasional cause to complain of the condition of the effluent water, as it sometimes comes off the land, either turbid or so imperfectly cleansed from sewage, that it pollutes both the River Wandle and the atmosphere in the vicinity.

These evils, so far as they exist, we are satisfied admit of explanation. When the water is turbid (as distinct from being foul from sewage), the cause probably is, as suggested by Mr. Gurney, that cattle sent in to graze upon the irrigated fields (a very large number in proportion to the acreage) have trodden the surface and fouled it with their dung. When the effluent water flows off, carrying both to sight and smell unmistakable signs of sewage, it has not been applied to a sufficient area of land. The smell has been most objectionable on Sunday evenings, probably because the men have neglected the work.

As to the value of the grass: Croydon has a population of 30,240, is within ten miles of London with 3,000,000 inhabitants. Norwich has no such market for grass as this, and we have no extensive dairies of cows, and I don't think it is usual to give working horses much green food, especially all the year round, so where will the grass grown by the sewage of the 75,000 inhabitants be consumed? If the following are facts, it ought to make us pause before extending sewage irrigation.

It is a very striking fact that at Edinburgh, where dairy stock are largely fed with sewage grown grass, there has for many years been a much less healthy condition, and more deaths among dairy cows than in other parts of the kingdom; it is also remarkable that Mr. Marriage, the lessee of the Croydon sewage, has lost a larger proportion of his dairy stock by rinderpest than have any of his neighbours.

On the steppes of Russia, where the rinderpest constantly prevails, there are large quantities of stagnant water, which cattle commonly drink in default of better; this circumstance is very suggestive of the cattle plague being attributable in some degree to our cattle being supplied with impure food, or polluted water, in the same way that cholera, and other analogous disorders, are traceable to similar influences among human beings; (but this question is more fully treated by Mr. Bannehr, page 10.)

There are nearly six months in the year during which vegetation is dormant; what becomes of the sewage which is produced during that period, and when the ground is frozen? It must be applied to land continually as a matter of form, but without producing any manurial result.

Mr. Morant, in his report, makes no mention of the pestiferous gas which the excrementitious matter produces when in the sewers; this is a greater evil than the pollution of our river; this will be greatly aggravated when the number of water closets is increased. I extract the following from a London paper, December 29th. After observing that more than £2,000,000 have already been spent, and other particulars about the great scheme, it states,

There is, however, a question as to the ventilation of sewers, which evidently demands attention. Though not a new subject, it has never yet presented itself in so formidable a shape as now. Unless the sewage passes off rapidly from the sewers, the foul fluid is liable to undergo putrefaction, liberating poisonous gases, and producing all the evils of a gigantic cesspool; all attempts to eliminate this mischief by carrying off the gases, or consuming them, or by disinfecting them, seem to be attended with extreme difficulty.

It is suggested to drive the sewage out by a more abundant supply of water, but I am prepared to prove this will not remedy the evil. The surveyor to the Westminster Board of Works has recently visited Paris, to obtain information about their sewers; among other matters he reports "that in Paris it is forbidden to discharge night soil by the house-drains, but every provision is made for washing the surface deposits of the streets into the sewers. From the absence of night soil the sewage is much less offensive in Paris than in London, and the water-mains and telegraph wires are laid in the sewers."

What I have attempted to prove is, that the water system of sewage is wrong in principle, wasteful, and unsuitable for the removal of excrementitious matter.

I remain, Gentlemen,
Yours obediently,
EDWARD BOARDMAN.

GRECIAN SCULPTURE.

LAST week, Dr. Kinkel, F.R.G.S., delivered his second lecture at the Bradford Mechanics' Institute before the members of the Bradford Philosophical Society. In commencing he explained the three styles of Grecian sculpture—the round, which was used for the statues in the interior of temples; the high relief, which was adopted in the exterior of these buildings, where a full light could fall upon the sculpture; and the low relief, where only a reflected light was obtainable. In his preceding lecture, Dr. Kinkel cursorily touched the question as to the tinting of sculpture by the Greeks; and now, in discussing the point more at length, he held the evidence to be sufficient to prove that the Greeks did paint their statues—not only the dresses but the hair and the flesh, in order to produce all the colour of Southern beauty, which, however, was not of the florid tint, but olive, and therefore more easily imitated in colour. And besides the advantage of obtaining a closer copy of nature, there was this, that the colouring material, in which wax was mixed, preserved them from the action of atmosphere. The Greeks copied, and followed, nature, but at the same time there was an idealism in their statuary which, however difficult to define—inasmuch as the ideal in art was to some extent mere feeling, as indescribable as the fragrance of the carnation, or the odour of the lily or the rose—was still there. This ideal—about which he would lay down no theories—was the one thing which distinguished ancient sculpture from the sculpture of modern days. He might illustrate the subject by referring to the peculiar anatomical formation of the human heel bone. In a man the heel bone projected somewhat beyond the bones of the leg, and in the animal—particularly in the horse—this projection was very marked. In ancient sculpture, especially with female figures, the heel bone was almost done away with, thus giving a lightness to the statues which was very charming. The straight line of the nose and the beautiful forehead introduced by the Greeks also gave an ideal expression to the sculpture. It must be confessed that there was no ideal form upon earth. The most perfect beauty was not ideal beauty, for it was clear that if such was the case all men must look alike, because there could only be one absolutely perfect form. All the charm of life rested upon the deep secret of individuality. In representing the ideal the artist had to unite two forms of beauty which human beings never possessed at the same time, viz., that perfection of intellectual expression which was only obtained towards the close of life, and that perfection and fulness of form which was only enjoyed at the very commencement of life. Now the Greeks had the ideal of the body, but not of the mind, as shown in the face; and herein was the difference between the earlier Greeks and the early Christian artists, for while the latter did not give the body such grace, they did give a noble expression to the features. Having thus opened his subject, the lecturer proceeded at considerable length to review the Greek "periods" of sculpture. There was the sublime period, as represented by Phidias; the beautiful, as represented by Scopas and Praxiteles; and the heroic, which came to its effulgence after the conquests of Alexander, and which might be considered as represented by Lysidas. The full efflorescence of the sublime period of Grecian sculpture was, when the Athenians undertook the rebuilding of the Parthenon—the works of which were superintended by Phidias—and the combinations of styles and subjects made the Parthenon, even in its ruins, the great school of art. But not only at this period was Athens alone distinguished for its art. There was at the same time, in the Peloponnessus, a school which very distinctly took humanity for its model, Polycletes there standing out in prominence for the accuracy of his work. After the "sublime" came the "beautiful;" and now the grand simplicity of the preceding period was changed for a style in which there was much of softness and effeminacy. The figures were no longer colossal, but they were graceful and beautiful; and Scopas, when about eighty years of age, produced the finest model of the female figure in existence. But now came the "heroic," and that was the last period of Grecian art. No longer the sublimity of Phidias or the beauty of Praxiteles pleased, the military exaltation of the Greeks leading their sculptors to revel in battle scenes and kindred subjects, and sculpture which had flourished through five centuries at last merged into a sensational style which closely resembled the sculpture of modern times.

HOW TO EXTRACT PERFUMES.

SULPHURET of carbon is a curious substance, which formerly cost about 60f. a kilogramme, and which has now fallen to the price of a few halfpence, in consequence of the great demand for it, which set chemists to the task of contriving some cheap way of manufacturing it. It is a colourless and very refringent liquid. It boils at 48 deg. Cent., and enjoys the unenviable privilege of smelling like rotten cabbage. It is the most powerful sulphuriser known, and a dissolvent of india-rubber, to which latter circumstance the great demand for it is due. According to *Galignani*, Mr. Millon, chief chemist to the hospital of Algiers, has recently discovered the singular fact that this offensive liquid is the best dissolvent of the essential oils of flowers, to which the latter owe their sweet perfumes. This discovery has suggested to M. Schnaiter a very easy way of obtaining those perfumes. He fills a large phial with the petals, just gathered, of the flower he wants to operate upon; and, having poured a sufficient quantity of sulphuret of carbon upon them, corks the phial, shakes it, and then lets it stand. The sulphuret penetrates into the substance of the petals, and expels the water they contain, which goes to the bottom. After a six days' maceration, the sulphuret charged with the essential oil of the flowers is decanted into another phial containing fresh flowers, and this operation is repeated four times, after which, if the quantity of flowers be considerable, the sulphuret will be strongly coloured. It is now necessary to separate the perfume from the sulphuret. If the quantity be small, the latter substance, which is extremely volatile, may be left to evaporate in the open air, and the residue is then treated with alcohol at 40 deg. of the areometer. But in case the quantity to be operated upon be larger, oil of almonds should be poured in, the liquid should be well shaken three or four times a day for the space of four days, then distilled at a very low temperature in order not to lose the sulphuret, and the residue is treated with alcohol, as before.

FIRE-ESCAPES.

WHATEVER may be said to the contrary—there are people who will say anything—it has been unfortunately but too often demonstrated that the means at our command for extinguishing fires and the appliances for preserving human life have not arrived at that degree of certainty and precision which the urgency of all such contingencies demands. For more than half a century man's inventive faculties have been at work endeavouring to bring to perfection the *tout ensemble* of the apparatus required whenever the cry of fire rouses the slumbering denizens of any particular locality into a state of wakefulness far more energetic and complete than that excited in them by the chimes of the early bells. The difficulty is not so much to procure a fire-escape and have it ready at hand for action, but to manage it properly. It is certainly, viewing it in the most favourable light, not an inviting means of avoiding danger, and unquestionably many timid and nervous persons are at first doubtful whether to accept its aid or run the chance of the fire which may be raging next door to them and have already seized the lower part of the dwelling they occupy. The principles upon which fire-escapes have been founded are pretty well known to our readers, but lately a new application of a well-known principle has been pressed into the service which bears upon its face the appearance of novelty.

The principle we allude to is that of hydraulic pressure, and which in this instance is employed to raise a system of metallic tubes fitting concentrically one inside the other, after the fashion of telescope tubes. When drawn out they form one large mast, to which is attached one or two rope ladders with canvas slings and other accessories. As a counterbalance to the weight of this escape when extended there is attached to the small car at the bottom a reservoir in which water is forced and which serves to raise each joint of the mast to the height required. There is a special mechanical arrangement to enable the rope ladders and slings to be worked from below, and by simply opening a cock the tubes can be made to collapse as rapidly as desired, and so allow of the speedy descent of those who are contained on the ladders or in the slings. We have seen, therefore, that this new invention, which is the design of a gentleman at Geneva, acts as a fire-escape, but in addition it combines with that duty the office of a fire-extinguisher as well. The tubes forming the entire length of the mast being hollow, serve as large water pipes, and as the top joint is finished in the manner suitable for discharging a jet of water the greatest facility is afforded for administering it in the very places where it is most required. Whatever height may be given to the escape, whether all the component tubes are drawn out or not, the mechanism is so arranged that it is always equally easy to rig the ladders and slings, which are maintained in complete order in the small car at the base of the machine. Notwithstanding the double service thus performed by this new description of escape, it can be transported from place to place with great facility. While on the one hand we should wish never to witness the practical trial of machines of this nature, yet on the other we should equally wish that they might never fail when the hour of trial did arrive.

A MEDIÆVAL FOUNTAIN.

LITTLE Lees Priory is in a rather out-of-the-way and inaccessible corner of Essex, and is therefore not so well known to architectural antiquaries as it deserves to be, for there are considerable remains of the Priory buildings and out-buildings remaining, and they offer some very good examples of the fine moulded brickwork which came into fashion, especially for mansions, in the latter part of the fifteenth century. Standing in what is now an open field, but what must have been an inner court, perhaps the cloister court, of the Priory, is a small shapeless fragment of brick and stone, which nine out of ten of those who do visit the place probably pass by without an attempt to understand it. A little consideration of it soon reveals that it is the remnant of a mediæval fountain of the latter part of the fifteenth century, and as such fountains, in England at least, are very rare, it is an architectural curiosity worth notice. It is soon seen that the depression in the ground about it is the sunk basin, of octagonal shape, and perhaps 12ft. or 14ft. across, in which the fountain stood. The fountain itself consists of a base of brickwork, upon which stands an octagonal stone canopy with ogee dome, not unlike in its general conception to the pinnacles upon the buttresses of Henry VII.'s chapel at Westminster. It is carried on shafts at the angles of the octagon with ogee arches, which carry the ogee dome above. The carving presents only ordinary late fifteenth century forms, and the architect will easily conceive the whole design. The water rose out of a central shaft and fell into the little stone reservoir overshadowed by the canopy; thence it ran, out of openings cut in the sides of the top of the reservoir, into the great basin beneath. It would be easy from what remains to make a complete restoration, on paper, of the original design, and it would be worth while for some visitor with more leisure than your correspondent had at his command to do so, as a record of a class of work which is so unusual among us.

PRE-HISTORIC REMAINS IN ORKNEY AND CAITHNESS.

ANY additional evidence as to the date from which man has existed upon the earth is of more than archæological interest; it enters into the great religious questions which during this generation have agitated the public mind. These considerations give additional value to a paper read at the meeting of the Society of Antiquaries last week, reported in the *Scotsman*, "On the Age of the Burgs or 'Brochs,' and some of the Pre-Historic Remains of Orkney and Caithness," by Mr. Samuel Laing, M.P., F.S.A. Scot. In this paper Mr. Laing has made a great contribution to the history of a class of objects of which Dr. Daniel Wilson has said that they are the earliest native architectural remains which we possess, and constitute a most important element in our national history. Mr. Laing has left to others a consideration of the constructive features of the brochs, and has devoted his attention to the facts bearing on their early date, and the condition of the people by whom they were erected. In the course of his excavations in Caithness about two years ago Mr. Laing, among other early remains, excavated a ruined burg or "broch." Of these excavations he has given a detailed account, with suitable illustrations, in a volume devoted to the purpose, and has deposited in the National Collection the whole of the objects which he discovered; thus exhibiting a desire to turn his discoveries to public account, instead of hoarding the relics, without use to any one, in a private museum. With regard to the ruined burg at Keiss, Mr. Laing believes that its remains gave clear proof of successive occupation down to a comparatively recent period, by the superposition of pavements at different levels, the addition of walls of different structure, and in one instance by the conversion of a massive doorway into a rude fireplace and chimney; that the rare instances in which objects of bronze or iron were found came, as did all the specimens of finer pottery, from the upper level, while the great mass of relics, including all those of the lower levels, consisted of articles of stone and bone of great rudeness, and of excessively coarse hard-made pottery. The food of the early dwellers in the brochs seemed from the adjoining mounds to have consisted of limpets and periwinkles with a fauna consisting mainly of red deer (sometimes of gigantic size), bos longifrons, horse, goat, hog, dog, fox, whale, cormorant, goose, and auk. In the course of a recent visit to Orkney Mr. Laing was able to accumulate many facts bearing on the same points—viz., the remote date of the brochs and their successive occupation. One of these is of a very striking character, showing that on the top of a ruined broch, which in the course of time had become a green mound, a people had placed one of their burying-places, containing many short cists, with burnt bones and relics of bronze. With regard to the rude stone weapons, and other stone objects found in graves and mounds at Keiss, of the artificial character of which doubts had been expressed, Mr. Laing had been able to discover many similar remains from brochs and graves in Orkney, in kitchen middens at Meikle Ferry, in Sutherlandshire, at Cromarty, at St. Andrew's, and in an underground house and an adjoining refuse heap at Skaill, in Orkney, where many stone flakes, circular discs, pounders, and other articles in the course of manufacture, were found.

A MEDIÆVAL TILE FACTORY.

IT is a matter of considerable interest when we find, not merely new relics of ancient art, but traces of the processes by which they were produced. Thus the discovery by Mr. Artes, at Caistor, of the potteries of Roman Durobrivæ, revealed the fact that a particular kind of ware found with Roman remains throughout England was of native manufacture. The kilns still extant showed the process of manufacture, and the fragments of damaged pottery supplied a whole museum of the kinds of ware and patterns of vessels manufactured there. Again, the discovery of a thirteenth century brickkiln at Coggeshall, Essex, with broken specimens of the manufactures scattered over the ground, proved that the plain and moulded bricks used in the Transition-Norman and Early English work of the ancient abbey there were really manufactured on the spot, a point of some interest, since they are the earliest moulded mediæval bricks yet noticed in England. And now we have the interesting discovery in the grounds of Repton Priory, Derbyshire, of a kiln for the manufacture of encaustic tiles, with specimens of the tiles remaining plentifully on the spot. The following is the account of the discovery as communicated to the *Pall Mall Gazette*:—The boys of the school have been for some time engaged in levelling a part of the enclosure known as the Upper Paddock, with a view to form a new cricket-ground. In the course of this work they uncovered a considerable number of encaustic tiles, some of which were laid in rows, others mixed with the soil. The spot where they were found is about a hundred yards south of the remains of the old Priory church. As the work went on the tiles and fragments of tiles became more abundant, and mingled with these a mass of the purest and strongest clay was found. As this bed of clay was gradually cleared away brickwork was disclosed, and, by means of much judicious and patient labour, a very curious structure was laid open. This consists of two small chambers side by side, about 5ft. long and 2ft. in width, and nearly the same in depth. One end of these chambers is open; the other end and the two outer sides are formed of strong stonework, backed by gravel, and lined with tiles in horizontal tiers. The wall between the chambers is formed of a single tier of tiles. Each compartment is arched over by six separate arches of tiles, evidently moulded for the purpose of fire-clay, and laid with great care and precision. The spaces between the arches are about equal in width to the arches themselves, that is, 5in. Of the twelve arches five only remain, the others having been broken down by the mass of clay, mingled with broken tiles, which had apparently been shovelled in when the work for which these chambers were designed had been completed. The floor is of plain blue tile. There is no doubt that this structure was used by the monks in the manufacture of encaustic tiles for the priory church, though it is difficult to say precisely how. The tiles which have been found are, almost without exception, either damaged or imperfectly executed—in fact, the refuse of the manufactory, but enough remains to show a surprising fertility of design and skill in execution. At least twenty different patterns have been made out, and some members of the sixth form of the school have displayed great patience and judgment in putting them together and making drawings of them. Two noble specimens of 16-tile patterns have been made out, besides a variety of smaller designs. They are, for the most part, of the fourteenth century, though one or two rich instances of Early English work have also been discovered. It is intended to preserve them by fixing them in proper order and combinations to the wall of the great school-room."

THE USE OF STEEL FOR BRIDGES AND SHIPS.

THE Board of Trade have issued circulars and have obtained several replies as to the probable effect of the use of steel in the construction of bridges and ships. The replies generally are favourable to its use, but it is not recommended that the weight of steel employed should be so much reduced as would be due to the proportion in which its tensile strength exceeds that of iron. It is also recommended that further experiments should be made. A certain thickness is no doubt felt to be required to provide for wear and the action of the weather, over that which might be theoretically necessary to withstand the strains to which the structures may be subjected. The Board of Trade have laid it down as a rule that the material of a structure, whether this material be of iron or steel, shall not be subjected to a greater strain than five tons per square inch. As it is well known, says the *Scientific Review*, that steel will bear a much greater tensile strain than iron, this rule of the Board of Trade operates as a great restriction on the use of steel in bridges, &c. The experiments which we at present possess on the strength of steel are neither sufficiently numerous nor authoritative to fix definitely the number of tons per square inch which will express as a rule the strains to which steel may safely be subjected. It is therefore very desirable that trustworthy experiments on this subject should be made, and continued from time to time as improvements are made in the manufacture of steel. Above all, uniformity in tensile strength should, it practicable, or, at least, as far as may be practicable, be rigidly enforced on manufacturers. It would be a great boon not only to the engineering profession, but to the public generally, were if possible to ascertain definitely the tensile strength of a specimen of iron or steel with the same facility as the density may be ascertained, and without the expensive and laborious, and, afterall, uncertain, operation of the proving machine. We hope it will not be long before the progress of science will enable us to attain to this result.

ST. GEORGE'S CHURCH, TUFNELL PARK.

LAST week we gave a perspective drawing of the exterior of this handsome and unique church recently erected at Tufnell Park, Holloway, from the designs of Mr. George Truefitt. We now give section and plan of the same church. The architect having a rather odd bit of ground to deal with has, it must be admitted, turned it to good account in an original way.

BUILDING AND REPAIRING OF CHURCHES AND CHAPELS.

THE Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held its third meeting for the present session on Monday, at the Society-house, No. 7, Whitehall, S.W., the Rev. Canon Nepean in the chair. There were also present the Revs. A. Borradaile and Robert Tritton; Messrs. John Boodle, J. F. France, Arthur Powell, and William Rivington; and Rev. George Ainslie, M.A., secretary. Grants of money amounting to £1,090 were made in aid of the following objects:—Building new churches at Byker (St. Anthony), near Newcastle; Curbar, in the parish of Baslow, near Chesterfield; East Marsh, in the parish of Great Grimsby; Parkgate, in the parishes of Rawmarsh and Gresborough, near Rotherham; Ramsdell, in the parish of Wootton, near Basingstoke Sheepscar, in the parish of Leeds and Trefolwern, in the parish of Llanbrynmair, Merioneth; rebuilding the church at Cantriff, near Brecon; enlarging or otherwise increasing the churches at Aldbourne, near Hungerford; Canton, near Cardiff, and Coychurch, near Bridgend, Glamorgan. All the additional sittings (4,175 in number) provided in the above cases, except 33, are free and unappropriated. The society also accepted the trust of a sum of money as a repair fund for St. Matthias Church, Poplar. Twenty years ago the number of the inhabitants of Great Grimsby was about 4,000. By the census of 1851 it had reached 8,800; in 1861, it had further increased to 11,067; and at present it may be computed at not less than 17,000, and this number is increasing as fast as houses can be raised. The only church is situated at the extreme end of the town, farthest removed from the quarter where the greatest influx has taken place, and where, within the last six years, a new district has risen of not less than 8,000 inhabitants, all fishermen and dock labourers, so that a new church is most urgently required. The district of Parkgate has sprung into existence within the last few years in connection with the Parkgate Ironworks. At present there is a population of 3,000, and it is very rapidly increasing. The people are nearly all poor; only eight houses are rated at £20, the rest are below £7. The proprietors of the works refuse to contribute anything towards this object. A convenient site has been given. There are thirty-six churches in the parish of Leeds, but this gives no idea of the need. The nearest church to the district of Sheepscar has sittings for less than 200, the population being 5,000. The parish of Llanbrynmair is nine miles by four and a half in extent. The proposed church is intended for the accommodation of 700 of the inhabitants at one end of the parish, the nearest of whom are two miles, and the majority four miles, distant from any parochial church or chapel. The above extracts are taken from the details of some of the many urgent cases submitted for aid, but the society was not able to assist them so effectually as they would have done, and as the cases deserved, from lack of funds.

THE DUKE OF CORNWALL HOTEL, PLYMOUTH.

THE building of which we give an illustration to-day, and of which we have spoken in Vol. XII., page 574—viz., the Duke of Cornwall Hotel, Plymouth—has given rise to a great deal of wise and unwise criticism, and is in itself so remarkable amongst the numerous buildings of its class lately erected that we think it worth while to again call attention to it. And here we may mention that already it has become the occasional resort of royalty, having received visits from the brother of the Emperor of Russia and our own Duke of Edinburgh, within the short time it has been opened. This fact shows its capacity for the extensive accommodation required by such personages.

The position of the building is a point which has ruled the architectural design considerably, and when we look to the plan we see how the difficulties have been met and made subservient to the requirements of the building. But we cannot see all the difficulties, for the section would show that the ground rises so very considerably on the Citadel-road elevation that the mezzanine floor level in front becomes almost on the ground level at a very short distance back. In addition to this the whole of the basement and a considerable depth of the ground floor has been excavated from the solid limestone rock, which has been partially used in the construction of the building. The railway station is immediately in front, the docks and landing places, and the Hoe (or Port of Plymouth), are close at hand, and the views towards Mount Edgecumbe, the breakwater, and the rest of the grand sea prospect, as well as the wild moorland scenery of Dartmoor and the Tors of Cornwall, are uninterrupted from the first and upper floors. Turning to the interior of the building we find the accommodation to be of an extent and character quite worthy of the commanding position we have just described. To commence with the ground floor. Passing through a somewhat remarkable glazed porch or portico (published in our number for March 2, 1865) and up a broad flight of granite steps, we pass the vestibule, and immediately front the bar and office, behind which are the manager's rooms, communicating directly with the basement kitchens, and cellarage. The corridors right and left, as well as the entrance and inner halls, are paved with Maw's tiles, and the grand staircase leading up from these is of Portland stone, supported on wrought iron strings at the outer edges of the steps. On the right is the coffee-room, size about 65ft. by 25ft., and about 20ft. high, occupying the circular corner with smaller reading rooms, &c., at each end, and a special service of lifts, &c., adjoining. Above this is the ladies' coffee-room, a circular apartment, with some of the best sitting and bed-rooms of the first floor *en suite* therewith. On the left of the entrance is the dining-room, measuring about 42ft. by 22ft., and the same height as the coffee-room. The mezzanine floor is omitted over these to obtain proper and proportionate height.

On the first floor are, as has been stated, the best sitting-rooms, some 20ft. by 16ft. (*en suite* with bed and dressing-rooms, with perforated wood cornices), as also the ladies' coffee-room, in all respects worthy of its fellow on the ground floor. On the second floor are twenty-seven sitting and bedrooms, some with dressing-rooms, and with a height of 12ft; on the third floor about twenty-eight rooms, with a height of 9ft.; and on the fourth floor twenty-five rooms of the same size as those beneath. From the fourth floor ascends the tower staircase, leading to the fifth and sixth floors (these in the tower only), each containing several good bedrooms. From the octagon room or lantern, approached by a spiral staircase, the whole town and neighbourhood of Plymouth lays spread out, as in a picture, before the beholder. Luggage and other lifts afford ample means for the expeditious transport of visitors' effects from the bottom to the top of the building, while one of the now-so-generally-used travelling-rooms (space for which is provided) is intended one day to effect a similar transfer of his person. Hot and cold baths are fixed on every floor. The exterior is constructed of the local materials—granite and limestone—as well as terra cotta (manufactured by Blashfield), and some brickwork for chimneystacks, &c. The combination of these materials offered difficulties as well as afforded opportunities to the architect, who produced some really valuable pieces of architectural work, as will be seen in the details in the margin of our view. Some of the cornice and balcony blocks are amongst the largest ever made in the material, and the columns and caps among the hardest and most delicate. These, set in the severe granite frames of the 4ft. thick walls, show the contrast desired by the architect to be obtained between the massiveness of the supporting construction and the delicacy of the filling in of the openings. One peculiar feature is the way in which the chimneystacks are worked in with the upper floor—which is constructed out of the roof itself—boldly assisting the construction, as well as contributing to the skyline and general effect. The necessity of a regiment of chimneys is evident in such a building, and the architect was right in not endeavouring to conceal this necessity, but to let it exhibit itself, and form a special feature in the work.

The building, which was commenced in July 1863, and finished in July, 1865, was erected by Messrs. Call and Pettick, of Plymouth, from the designs and under the superintendence of Charles Forster Hayward, Esq., F.S.A., and honorary secretary of the Royal Institute of British Architects, at a total cost, exclusive of the site, of about £25,000.

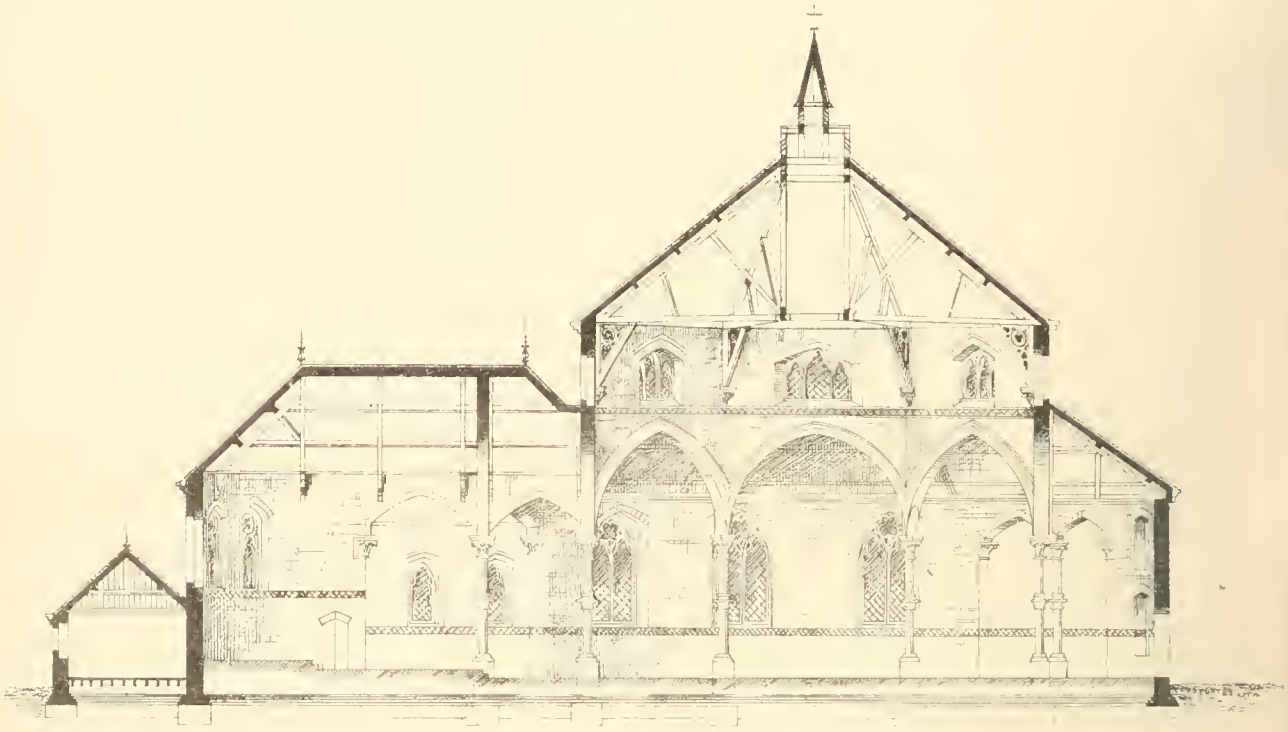
We particularly desire to correct an error in our mention of this building (page 575 of last year's volume), where the cost is stated at £140,000, which, even if furniture and the cost of site, &c., be added to the above, is nearly £100,000 wrong; and we think our correspondent of that date might have informed himself more correctly before making the statement.

The building, on the whole, is one of the cheapest, as well as one of the finest and most remarkable, in the West of England.

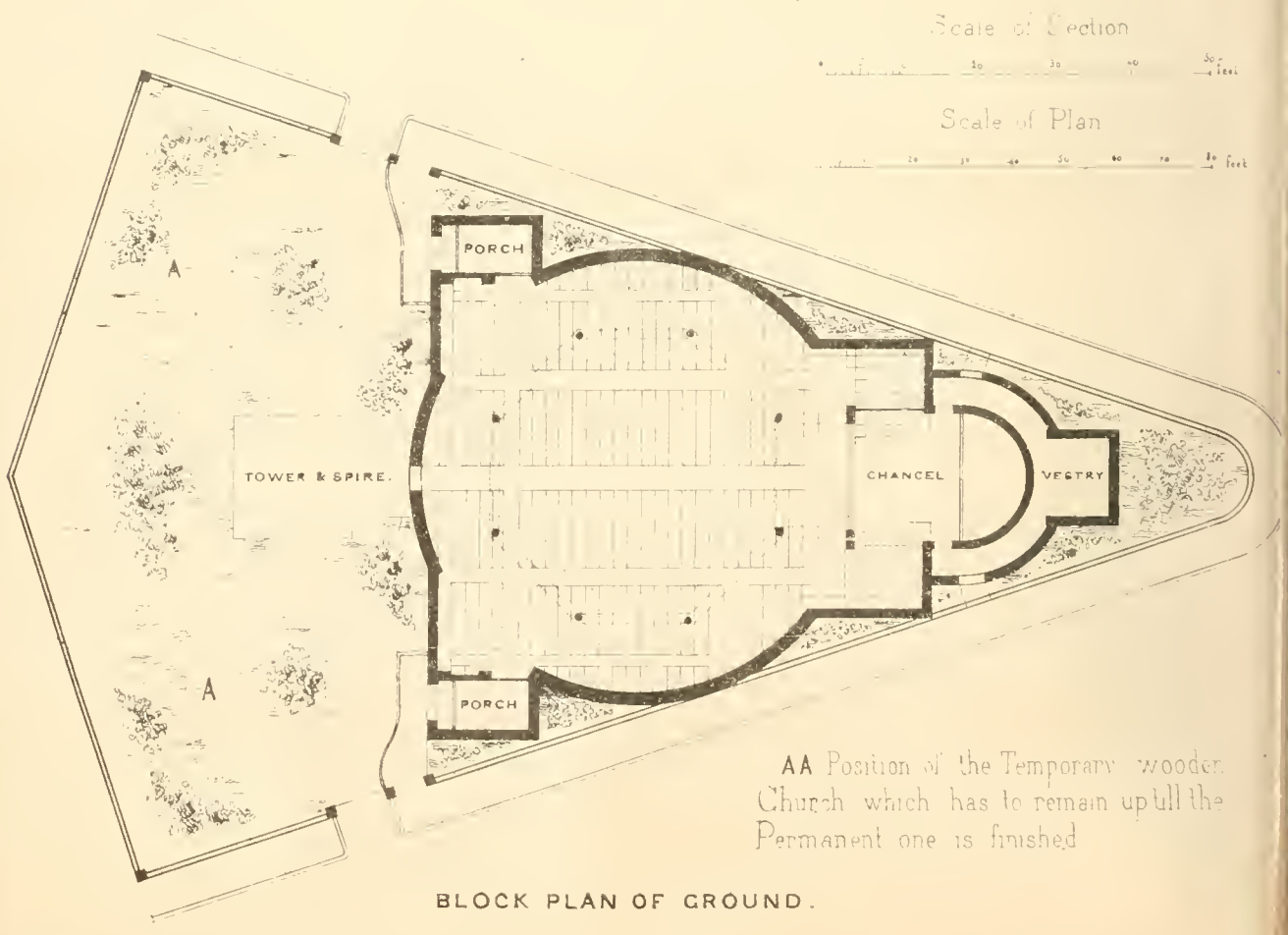
The tariff of the prices of admission to the Paris Exhibition has now been published. There are to be three separate enclosures—the park, containing the Exhibition building itself; the Horticultural Gardens; and the Billancourt enclosure, which is especially devoted to agricultural matters. The prices for the first week are exceptional—20f. for the opening day and 5f. for the rest. From the 8th of April the charge for admission to the park will be 1f., that to the garden 1f. 50c. The enclosure Billancourt will have a special tariff as yet undetermined. The price of a season ticket will be 100f. for a gentleman and 60f. for a lady. In order to avoid the trouble and delay of the signatures which were formerly required on entering, the holders may send two of their photographed portraits, one to be affixed to the ticket of admission, the other to remain in the hands of the administration. There will also be issued cards of admission for a week subject to the same conditions, and conferring for the time the same privileges as the season-tickets.—*Pall Mall Gazette.*

St. George's Church: Tufnell Park:

Mr. G. TRUEFITT, ARCHT.

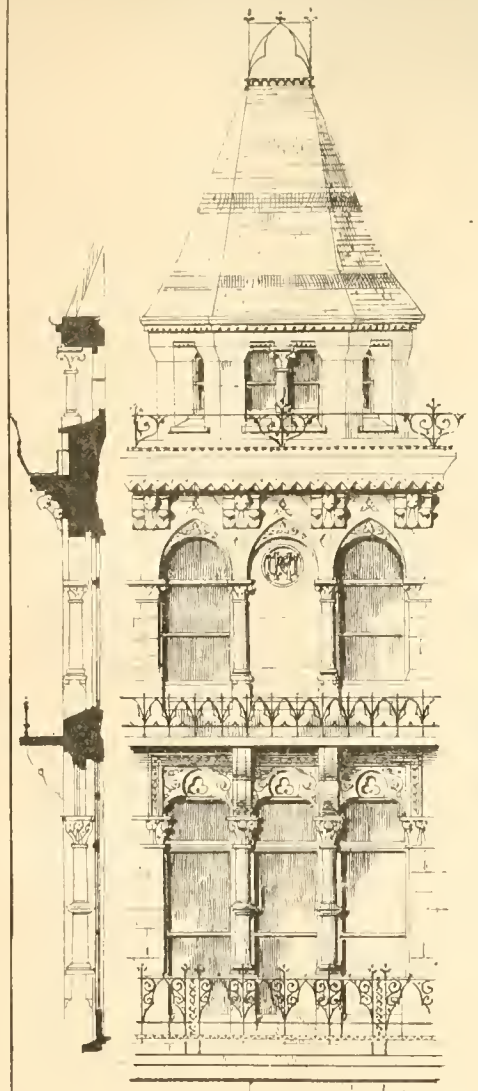


SECTION.

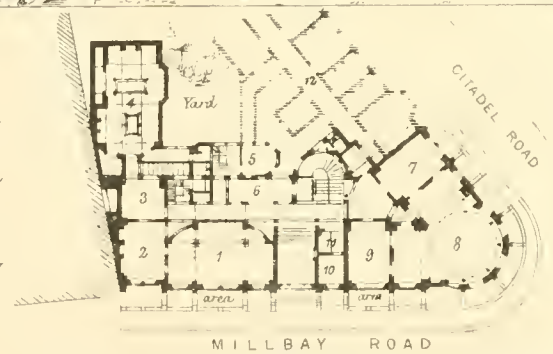


BLOCK PLAN OF GROUND.

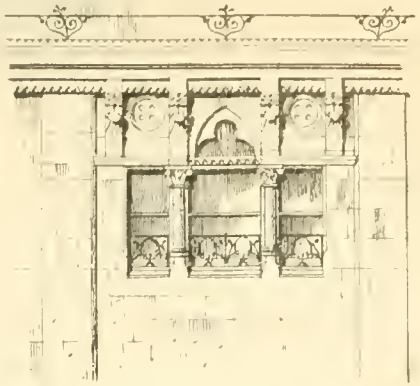
Whiteman & Bass Lithographers 236, Holborn
F. Des Portes lith.



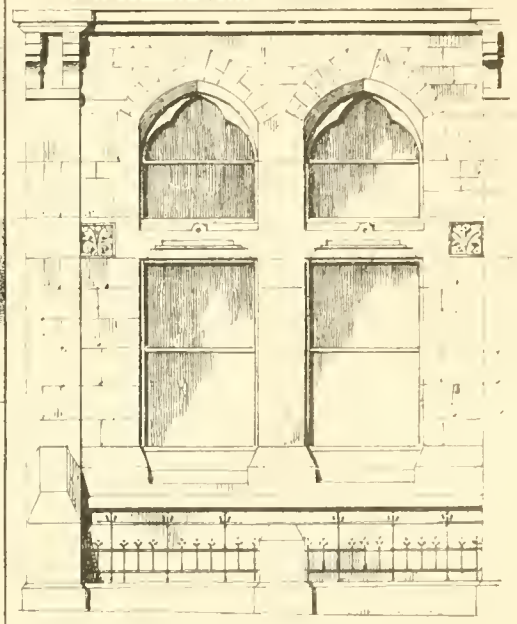
DETAILS OF TERRACOTTA WORK
1st 2nd & 3rd FLOORS



1 Dining Room
2 Club Room
3. Smoking Room, En Suite with
4 Billiard Room
5 Manager
6 Bar
7 Ladies Library
8. Coffee Room
9 Reading Room (Ladies Coffee Room &c. over these on First Floor)
10 Board Room
11 Luggage
12. Future Extension of Building
13. Railway Station.



TERRACOTTA WORK IN THIRD FLOOR OF TOWER



DETAILS OF GRANITE WORK ON THE GROUND FLOOR

Duke of Cornwall Hotel, Plymouth.

Chas. Forster Hayward, F.S.A. Architect.

Whiteman & Ba[illegible] Lith. Printers 230 Holborn

KING FROST.

KING FROST is a bit of a tyrant. When the mood is on him he reigns almost supreme; and he is particularly an enemy to the strength and durability of building materials. He peels off the face of good stone, and sometimes snaps it in two, as mentioned by a correspondent in our Intercommunication department of to-day. He plays havoc with mortar, unless it is of the very best description; he penetrates the very interstices of iron and steel, causing them to fracture at less than half their ordinary breaking strain; he bursts leaden pipes, causing no end of domestic discomfort; and he even disarranges and weakens the structural properties of glass. A case in point occurred on Sunday evening last at the Clapham-road Station. A gentleman on alighting from his carriage suddenly disappeared as through a trap-door, in consequence of stepping upon a flooring of glass about a yard square which covered a shaft, and was precipitated about seventeen feet. The glass, though very thick, had been made brittle by the frost. The gentleman, as may be imagined, suffered considerable injury, being very much cut. The question, we suppose, now arises, who is liable for the damage. King Frost cannot be arrested and arraigned. We suppose that the railway company, which is invested with almost sovereign power, and is consequently held by jurors rigidly responsible for the right exercise of that power, will, as usual, have to pay the piper. That is a question, however, beyond our province. We only took pen in hand to record some of the passing antics of King Frost, and to caution builders as to the strength of glass when the ornamental waters of the metropolis are covered by skaters.

CLEAR THE WAY.

THE public thoroughfares of this great and overgrown metropolis are defective and inconvenient in many respects, but they have one or two defects that are more felt than the others. Speaking generally, they are badly named and numbered, the majority are vastly too narrow and intricate for the requirements of the traffic, while not a few of them are effectually closed against all traffic whatever by private turnpikes. In commenting recently upon the stupid system, or rather want of system, adopted in the naming of the streets of the metropolis, we quoted some curious results obtained from a glance at the London Directory. It was shown that not only are there scores of streets bearing the same name, but there are certain names—the list, in fact, is a long one—that are repeated as street designations scores of times. For example, there are as many as sixty streets within the metropolis answering to the name of York-street. And this number does not include terraces, crescents, places, roads, &c., bearing this once popular title of royalty, but only the streets so called. It was also shown that what is really one street, a straight line of thoroughfare, is frequently divided and subdivided into three or four "streets" having different names and different sets of numbers. The result of all this is a great deal of confusion, mistake, and unnecessary labour and trouble. But this, after all, is perhaps the least of the inconveniences to which we have alluded. The renumbering and renaming of our streets is a much more easy matter than their enlargement. It is here where the shoe really pinches. We are all alive to the fact that the great majority of the London thoroughfares—within the area of the city itself there are very few exceptions—are miserably inadequate to accommodate the general traffic. There are upwards of 900 streets in the city alone. Of these only, 194 have sufficient width for one line of vehicles, and 174 in addition are without thoroughfares. There are only 86 which admit of two lines of vehicles, and 68 which admit of three or more. Thus, it will be seen that upwards of two-thirds of the city streets are incapable of carrying any considerable stream of traffic at all. We have been grumbling for years at this state of things, without being able to help ourselves. As regards the city there is no doubt that the almost priceless value of land there is the great obstacle in the way of any sweeping improvements in this direction. But there are other parts of the metropolis where the difficulty does not press to anything like the same extent, and in these localities much might be done that remains undone. But great as is the obstacle that presents itself, it is not insurmountable; at least, it ought not so to be. If wealthy railway companies can obtain power to cut up London in any and every direction they have a mind to, what should hinder a great and wealthy municipal corporation from effecting improvements manifestly for the public good. A railway company has recently pulled down miles of dwelling-houses in the very heart of the metropolis in order to carry out a new line of railway, and yet the city authorities either can't, or won't, remove a single block of buildings, the existence of which in the middle of one of its leading arteries causes the most serious obstruction to the general traffic of the metropolis. How long, for instance, are we going to tolerate Middle-row, Holborn? It has been doomed for years, but Mr. Bumble is awfully slow to move in the right direction. The clearing away of this block would be so very great an improvement to this locality, so enormous a relief to the tremendous vehicular traffic of Holborn and Gray's Inn-lane, that it is more than surprising that it should be allowed to remain year after year. In the city, as everybody knows, matters are about as bad as they well can be. Look, again, at the condition of Chancery-lane and Fetter-lane. The traffic here is nearly always in a dead lock, and it requires the constant presence of a couple of policemen to keep these thoroughfares something like passable. Considering their situation these streets ought to be at least 20ft. wider than they are. If we cannot widen the Poultry, or a dozen other streets in the city, we might, at all events, pull down such obstructions as the Middle-row, and the block of buildings forming Boziers-court, Tottenham Court-road. The removal of this latter would be a real improvement to this important neighbourhood, which is one of the great omnibus termini of the metropolis. At present an excellent opportunity offers of abolishing this block. Half of it has had to come down in consequence of a recent fire, leaving, we think, two houses standing. Of course, so soon as the weather will permit, this obstruction will be rebuilt, and so the opportunity for improvement will be lost. When things come to the worst they mend, they say. Let us hope that the proverb will apply in the case of the streets of London. In the meantime we wish success to the endeavours of certain members of the Metropolitan Board of Works who desire to see the private turnpikes abolished throughout the metropolis. At a recent meeting of the Board, Mr. Shaw moved, pursuant to notice, "That a petition be presented by the Board to Parliament to repeal any authority given to private individuals to erect gates or barriers across streets or thoroughfares, so as to obstruct the traffic therein, in cases where the maintenance of such streets or thoroughfares is paid for out of the public rates." He said that, "as Parliament had called upon the different vestries to make a return of all gates and barriers in the streets of their respective parishes, and to state the circumstances under which they were erected, and at the same time to intimate any attempts made by the parish for their removal, it appeared to him to be a good opportunity for the Board to petition Parliament to get rid of these considerable obstructions to traffic altogether." We think so too. We have no desire to interfere unnecessarily with "vested interests," but these bars are very numerous, and tend greatly to increase the obstruction complained of, and as a necessary consequence, they increase street accidents. As was justly remarked, these turnpikes are a public nuisance. They benefit only a few owners of property, who do not contribute to the tax for metropolitan improvements, who pay nothing towards the expense of lighting, cleansing, or repairing the streets, the maintenance of which falls upon the ratepayers, who are not permitted to have the use of them. It was complained at the meeting that on the Bedford estate the bars and gates on the south side of Euston-road prevent a direct thoroughfare from Camden and Kentish Towns, Hampstead and Highgate, to New Oxford-street, obliging vehicles to turn off, and proceed a long distance for those destinations out of the direct road. In the Euston-road—the termini of three metropolitan railways—we are told a continual obstruction by these barriers is the cause of many accidents and great loss of life. We might mention other localities where the nuisance is scarcely less felt. Mr. Shaw's motion was very warmly supported, and the following resolution was adopted unanimously by the Board:—"That it be referred to the Works and General Purposes Committee to take into their consideration the existence in the streets of the metropolis of many barriers, gates, and private tolls, to the obstruction of the general traffic, with power to take counsel's opinion thereon, and to report their recommendation to the Board. If the Board carries its point—as we hope it may—it will earn the thanks of the entire community.

ARCHITECTURAL PROSPECTS.

IN all quarters, and among men of every shade of opinion, there is now stronger than ever a desire for a new style of architecture. A good deal of ingenuity and cleverness has been brought to bear theoretically upon the subject; but hitherto, except to some extent in one direction, little practical progress has been made. That this desire should grow upon us in these days of uninstructed copyism is not to be wondered at. When we consider the enormous outlay that architecture has cost the nation during the last fifty years, the thoughtful man cannot fail to have great misgivings as to our getting any considerable advantage from the art as pursued generally in this day. There is far too much copying, and, worse still, far too little real knowledge of true art. In numberless cases, buildings are encumbered with a mass of unmeaning, inartistic, and badly-executed ornament in place of intelligently beautified construction. Profusion usurps the place of taste, and vulgar expense that of modest, thought-bred beauty. Many seem to think a veil of ornament, however coarse and tasteless, makes up for poverty and mediocrity of design. Our readers must have noticed this exhibition of mediocrity and vulgarity in the works of several of the city architects. Some of the buildings literally covered with foliage and other sculpture are among the worst buildings of our day. Of all ornament, perhaps the use of granite and marble columns has been most abused. In one building in London at least, the sturdy granite columns and the puny pilasters of the same material have been so arranged as to give the appearance of the whole ornamental part being something stuck on to the real building,—as if, in fact, a few good crowbars judiciously inserted might fetch it all down without affecting the stability of the edifice. The use of granite to support, perhaps, a badly-executed bit of stone rope can surely be nothing else than a ridiculous misapplication of an excellent material. It seems that some imagine that the beauty of the material will excuse the greatest absurdity of treatment. Granite, above all other stone, should surely not be used without some apparent constructional reason. At any rate, it must be a grievous mistake when the use of so strong a substance does not apparently assist the stability of a building. In certain instances it seems scarcely able to support itself.

There is another vice which cannot be too

strongly reprobated, which disgusts the art-lover, from which, also, we cannot escape go where we will—it has become so common and is so widely supposed to supply the place of art. We allude to the lozenge and notch dodge—for a dodge it is, and nothing else. It is sickening to see the notching and boring that some people mistake for invention, and, what is pretty nearly as bad, the fantastic bevelling that is made to supply the place of good moulding and carving. It is just such stuff as to to take possession of the fancy of a man without power or originality. Any young lady who took to architecture instead of crochet or cross-stitch could invent such things by the hour together. A spot here and a notch there, and a sweet bit of shallow incising up a-top, all together form a charming design, tolerated by the multitude as long as it is fashionable, but as certain to be laughed at or hated as soon as the fancy has departed. The great desirableness, if not necessity, for a new style is urged by such considerations as these; but then comes the question, How is it to be gained? Mr. Griffith suggests a geometrical system founded upon nature. Of the value of observing proportion carefully and studying nature as intimately as possible we can have no doubt. Nor can we shut our eyes to the fact that few of the present day have done either; but we must see by practical experience how his system would work before giving an opinion upon its practicability. Professor Fergusson seems to expect wonders from the study of the constructional principles of Indian architecture. Of this we feel very doubtful—the climate, the purposes for which buildings are required, the tastes and habits of the people, are so entirely different in the two cases. That a clever man may get some valuable hints, especially in the matter of design, from this interesting architecture there is little doubt; but any adaptation of the architecture to our varied wants, as a style, is more than questionable. What are we to do then? A leading article in one of the daily papers gives a very gloomy view of our prospects. The age is not one of art. *Apropos* of the New National Gallery, it says:—"The thing we possess and have been obliged to call our National Gallery is really too contemptible for criticism." And our hopes for the future are not much better. We can't get a Vatican, and it is hopeless "to expect a parallel of the Louvre in Trafalgar-square, but it may be confidently maintained that the principles of elevation and arrangement perceptible in the Louvre are those which should govern the plan for any new National Gallery." But alas! all that the *Standard* anticipates, however humiliating the admission may be, is that we shall get "a pistaccio of pillars and posts, dead walls, ill-placed windows, meaningless decoration, and inconvenient rooms." The writer, however, is rather foggy on the subject, for, says he, after all, there are some grounds for disbelieving his own prediction, "inasmuch as London has lately put on a decidedly better appearance, and we are trying, at all events, to be architectural with our railway termini, hotels, bazaars, arcades, museums (why not musea, if we have termini?), and exhibitions," with all our buildings, in fact, of the slightest consequence. Still, notwithstanding all this, if there is any sense in the article at all, there is actually a danger of any new design "being spoilt by the effacing of the original design, however bad that may have been," which in the present instance has been pronounced by the writer himself to be too contemptible for criticism. But perhaps we do not see the meaning of the writer. His words are these:—"What the nation wants is a picture gallery; and as a mistake in stone or brick is not easily rectified and usually spoilt (? what) by the effacing of the original design, however bad that may have been, we should hesitate most conscientiously before adopting a plan or giving up a site to the caprices of an ingenious architect." If we have mistaken the meaning we are sorry for our denseness, but really such masterly language is a little difficult of certain interpretation. We wish we could quite understand the writer of the article in question, for he has discovered the real source of the evil, but unkindly hides his great discovery under a heap of words worthy of any of the Sibyls. "We mistake the proper nature of architecture for the real nature of the world, and as long as we do that we shall never have a National Gallery" worthy of being compared with the works of our forefathers. If the writer had gone to see the designs for the new National Gallery he might have known that, unsatisfactory as they are as a whole, still our prospects were not so bad as all this. There are four or five of the designs which, though falling far below what we ought to expect from the architects of the day, would be infinitely superior in every way to the present abominable building. The art criticism of the *Standard* is certainly not of a higher order than the art of the day, which is little likely to gain any advantage or enlightenment from such writing as this.

There is, however, no doubt that a study of these National Gallery designs only bears out what we have said in the beginning of this article. There is a lack of progress in most of them, though many are very scholarly, which bodes ill for the future. To expect, however, any new style to spring up spontaneously, Minerva-like, from the head of any single creator, is against all history. Such a thing has hitherto never happened, and in all human probability never will. In all previous times and countries development has been the rule; one style of art has gradually passed into another, and no doubt this will be so again. But before we can run we must learn to crawl. Architecture has till quite lately been so much a question of mere copying without any idea that art training was at all necessary or even desirable, that no wonder so little advance has been made. This, however, we may say for certain, that what advance has been achieved is due to a consistent and steady perseverance in one particular style. There was a saying when we were schoolboys that nobody could write good Latin prose or verse till he could think in Latin, and such mastery of an old style seems necessary before we can hope to develope from it something new. If any new style is to rise it seems of the nature of things that it should be by development. Possibly more than one new style may in the course of years be imperceptibly developed, according as the Mediæval or Classical styles are so learned as to become living art in the hands of a true artist. Then comes the difficult question, of which style we shall begin with. A correspondent some time back advocated the Greek as most perfect, and asserted that a wholesome development from it had already begun in Scotland. This we doubt. When the Grecian style of architecture is allowed to be one of the most perfect, if not the most perfect, that the world has seen, it does not by any means follow that it would be perfect or in fact good in any way for a different age, climate, or people.

What care I how fair she be,
If she is not fair to me?

The fact of an architecture being admirably suited to such a country as Greece with its lovely wild scenery, clear skies, and matchless materials would preclude it from such a land as England, which is the opposite of all this. If there was any analogy between the two conditions it would seem to be in the purpose to which Greek architecture, as far as we know it, was devoted. What was the ordinary-life architecture of the Greeks we can scarcely guess; absolutely no remains of such exist, though it is true we have a few hints scattered about the classic authors. It is only in its religious phase that we really know anything about it, and this is the very phase of it that has almost unanimously by common consent been agreed to be unfitted for our present wants. Our opponent, whom we cannot compliment either upon the clearness or fairness of his arguments, talks about preferring to execute work in the most perfect style to designing in that of the middle ages, just as if it was the easiest thing in the world to rival Greece in its best period, though none of the conditions which produced their glorious art exist, or can exist, at the present day. You might just as well, in the same off-hand way, recommend the production of a play like Æschylus' or Aristophanes' as anything approaching the architecture of Athens. One point alone, probably among the least difficult of ancient problems, the sculpture of the human frame, in the perfection it reached in the glorious Periclean era, has hitherto baffled the best among us, though they have given their life to the study and their extremest labour to the work. Beautiful as Gibson and Storey have been in much they have done, their happiest efforts have never touched the best Greek works. There can scarcely be a doubt that the most probable source from which a wholesome and useful development may be looked for is the European architecture of the earlier part of the middle ages. Its scope is so much wider, its remains are so widely scattered and so numerous, as to be open to the study of all. The buildings of these ages also are of so many kinds. We have cathedrals, churches, halls, palaces, and even country houses and cottages. This fact alone is of the utmost value to aid a thorough study of the art—to enable some great artist or school of artists working in unison so far to make it their own as to be able to make it grow. When such a mastery over the style has been gained, so far from the objection sometimes urged against Mediæval art, viz., that it is incompatible with the highest description of sculpture and painting, being true, it is probable that the new style, if such happily be developed, will be owing to our greater knowledge and practical facility. It is to the practice of fine art in stone, metal, and colour by true artists that we are to look for improvement and advance. This we feel certain will be the case, whether a new style be wrought out of the Classical or Mediæval ones.

SOCIETY OF ENGINEERS.

ADDRESS BY THE PRESIDENT.

THE first meeting for the year of the above society took place on Monday evening in the lower room, Exeter Hall. The chair was taken by Mr. Zerah Colburn, the retiring president, who introduced Mr. W. H. Le Feuvre, the president for the present year. After the reading of the minutes of the previous meeting, and other preliminary business, Mr. Lewis Otrick moved, and Mr. Brun seconded, a vote of thanks to the retiring president and council, after which the new president proceeded to read his inaugural address. Mr. Le Feuvre, in the course of a very lengthy and able address, congratulated the Society of Engineers on the progress it had made during the twelve years it had been in existence. Turning thence to the matters in which the society had a vital interest, he noticed the recent collapse in the commercial world, which had so seriously retarded all railway and other engineering works. Another and a more recently discovered enemy with which the British engineer had to contend was, however, the cheap work of our Belgian rivals. The race of competition was now, in fact, in favour of Belgium; so much so, that although in the case of the late Amsterdam Exhibition English work was used in the commencement, before the work was completed it was found that what was required could be procured much cheaper from Belgium. In the case of the New Pimlico Wheel Works, his (Mr. Le Feuvre's) firm, had to give way to Belgian contractors; and for India work was actually shipped from Belgium to London, and thence transhipped to Bombay, at a less cost than it could have been purchased at from British manufacturers. In short, the inroads of foreign competition had at length reached to such an extent that one of our leading railway companies had invited a French firm to compete with our manufacturers for the supply and erection of the ironwork of their terminal station in London. Glancing at the much discussed prospective scarcity of coal, the President expressed his hope

that a substitute might be found to some extent in petroleum, with which experiments were at present being made under the auspices of Government. A singular result had recently been obtained by the introduction of a jet of steam into the flame of petroleum. The flame, which had hitherto been dull and red, now became white and clear, its volume was five-fold increased, and so complete was the combustion that the soot which was created under the ordinary mode of ignition almost wholly disappeared. Compressed peat had been successfully used for smelting purposes, and therefore he trusted that long before our coal had become exhausted various substitutes would have been found. With respect to colliery accidents, he thought that their danger might be much repressed by lighting the mines with gas, arranged in large chambers divided into compartments, and also by increasing the number of shafts. Turning to our shipping, he noticed the great stride we had made when we substituted iron for wood in the construction of ships, and there was every prospect of quite as great a further improvement by the substitution of steel for iron. The gas and water supplies came next under review, the lecturer stating that there was a waste of 100,000 tons of coals in London alone in consequence of the leakage of gas. Coming to the enormous losses which we continue to suffer from the ravages of fire, Mr. Le Feuvre said that we could not but come to the conclusion that up to the present moment we have only arrived at very inadequate means to cope with this destructive element. The loss of life and property by fire seems rather to augment than diminish. Without reference to the deplorable loss of life occasioned by colliery explosions, almost a thousand lives are yearly sacrificed by fires of ordinary occurrence, and the annual loss of property is considered, upon an average, to exceed £2,000,000 sterling. These are facts grave enough to demand our most urgent attention. It is demonstrated beyond all doubt that, after a fire has reached a certain stage, the application of water tends to spread instead of limiting its ravages. It is evident that this must be the case in conflagrations arising from inflammable oils, and substances resembling them in property. One of the greatest disadvantages attending the use of water for the extinction of fire consists in the impossibility of directing it to the seat from whence the principal danger o extension proceeds. The flames in most case decompose or convert the water into steam before it can reach the body of material in combustion and consequently it can only be advantageous in' protecting to some extent surrounding property by copious saturation. This is, in some cases, as destructive as fire itself. What we require before any advantage can follow the application of water to the extinction of fire, is the suppression of the flames, so that water might be afterwards directed upon the red-hot embers with successful results. The quick dissemination of flame is the only dangerous element to contend against in outbreaks of fire, as it involves every combustible body within its reach. Some years ago a means of annihilating fire was introduced into this country in the form of a machine known after the inventor's name. Some such system as that embodied in Phillip's fire annihilator would seem to be the only way of placing in our hands an agent enabling us to effectually arrest the progress of flame upon its immediate outbreak. The principle of the fire annihilator was to exclude the access of the atmosphere, supporting and aiding combustion by the sudden generation of large volumes of vapour in the vicinity of the material on fire. This vapour, being directed through a hose into a chamber filled with flames arising from the burning of inflammable substances, caused their almost immediate subsidence, and the burning embers remaining were extinguished by water. Vapour, having something of diffusive properties, will seek out the locality of a fire should it be hidden, as in the case of a fire occurring in the hold of a vessel, whereas water must flow in abundance over parts where there is no fire raging, and its application is in such cases useless. The fire annihilator obtained a wide reputation, and was practically and successfully adopted. All the vessels chartered by the emigration commissioners were compelled to have a certain number of these machines on board. The system was approved by Brewster, Arage, Faraday, Glaisher, Dumas, Herschel, and Liebig. From some unexplained circumstance, this invention has passed away from public attention. The insurance system was apparently brought to bear against its progress, arising from the impression that without fire there is no risk, and without risk no insurance, and aided, probably, by other circumstances, the fire annihilator in its earlier form is no longer known. A modification of it has lately been introduced under the title of the Extincteur, which, however, does not seem to have those features which led the original fire annihilator to have so much attention bestowed upon it by men of scientific research. It is to be hoped that some effectual means may speedily be discovered to afford protection from the ravages of this dangerous element. It is lamentable to reflect that we are at this moment liable to a repetition of the circumstances which attended the destruction of the late church at Croydon. This seemed like a voluntary sacrifice made to call the attention of the scientific world to the unguarded situation in which we are placed with respect to disasters of this nature. We have to add to the list of catastrophes arising from fire recently, the destruction of a considerable portion of the Crystal Palace, at Sydenham, involving a loss to nearly the extent of a quarter of a million. It was stated that, owing to the severe weather which existed in the locality and direction of Croydon Church at the time, and the impassable condition of our roads, no aid could be brought to the spot in which the fire was raging. After some notice of sanitary engineering, the lecturer turned to the character of our prevailing architecture, which he said could not fail to be of interest to a society like theirs. He said: We have still to regret the absence of anything like conformity in the several practices of architects and engineers, and no doubt the character of our nation, judged by its architecture alone, would not stand very high. We have, of course, no modern undertaking which for style could be compared with Westminster Abbey or St. Paul's. The more we go back into the architecture of our country, the more grand and refined it seems to stand out. We have at length reached no style or character of architecture at all. I consider this to arise in a great measure from the attempted estrangement between professions which are analogous, and the failure of modern architects to accommodate their design to the progress of engineering science. A system is now being extensively adopted with regard to modern buildings which may be called, more or less, a system of iron architecture. The immense gain in strength and durability, in buildings where this material is employed, is undeniable. Architecture is the science of building, and therefore the engineer to an iron bridge or other structure in which iron is employed is as much an architect as the designer of Gothic structures with stone roofs, flying buttresses, and pinnacles. Considering the church of St. Peter at Rome, and the cathedral of St. Paul, and other so-called architectural works from a constructive point of view, it will be found that what is now called civil engineering was exercised by the architects of those structures in a very great degree. They built with the materials convenient to be used, according to the locality of the structures, and their works have remained commanding and imperishable. Until it is conceded that there can be but one science of building, we cannot look forward to any works likely to deserve our own admiration or the admiration of others. It is apprehended that, out of the numerous designs lately submitted to a committee of selection with the object of improving our present National Gallery, or erecting a new one, not one of the designs sent in is likely to be adopted; whereas, had the co-operation of some of our more eminent engineers been enlisted in this undertaking, there is no doubt it would have tended greatly towards improving the nature of the designs, and the results might consequently be expected to have been more favourable. Proceeding to consider the influence of the engineering profession on the civilisation of the time, the lecturer said: Our profession, no doubt, has a considerable influence upon the civilisation of our time. Domestic architecture, which is one of the earlier indications of improved social changes, is indebted to us. Then we have the development of railways to consider; the construction of harbours and docks for our shipping; the manufacture and distribution of gas; the purification and supply of water; the drainage of our large towns; the construction of bridges; iron shipbuilding; agricultural machinery; telegraphy; the improvement of ordnance and other defensive implements of war, and all those aids to progress which compose the features of particular eras, or mark the character of nations. Where the arts of peace predominate, the tranquillity of kingdoms must remain secure. It is owing, no doubt, to the extent of our manufactures and enterprise that the prosperity of our nation must be chiefly attributed. Those undertakings arising from the co-operation of business-men have contributed largely towards establishing the reputation of our country. There are certain disadvantages, however, allied with our systems of local government which it should be our aim to eradicate. They are the cause of very considerable public inconvenience, and in many cases expose us to the ridicule or astonishment of our contemporaries. Our metropolis, containing a population of 3,000,000, has been for nearly a week in a helpless state of inactivity in consequence of the inefficient means we have at our disposal for clearing away the snow, and the utter want of system and care in the paving, lighting, cleansing, and traffic arrangement is well worthy of the attention of our profession. The snow might be removed at night by means of snow ploughs, and rapidly melted by heat at convenient places. The relaying of our pavements and streets might be effected by improved machinery, and a diminution of time and inconvenience would thereby ensue. The introduction of subways, as suggested by the Metropolitan Board of Works, would tend to prevent the incessant breaking up of our main streets. The lighting of our public thoroughfares is a disgrace to this city; the designs of our lampposts and lamps are neither novel nor elegant; our finest streets are in comparative darkness as soon as the shops are closed. The cleansing of our streets is effected by means of manual labour at the most inconvenient hours of the day; the watering-carts lay the dust, and, raising mud ankle deep, destroy the macadam, create dirt, bespatter our persons and carriages. The encounter of the mud cart and its two or three attendants complete the delights of a summer day's walk, ride, or drive in town. The traffic arrangements in our streets in the metropolis must shortly receive attention, as we are informed from statistics obtained that more accidents and loss of life take place in the streets in our metropolis, than on the whole of our railway system in the United Kingdom. How is this occasioned? we may naturally inquire. The immensity of the traffic might be relieved by employing the present area of our streets in a twofold manner, viz., by constructing subways for traffic under or above our existing streets. The grave and lamentable accident on the ice in Regent's Park is attributable to that negligence which, in some form, continually endangers the public safety. It would perhaps be advisable to remove the systems of local government which now control matters connected with the convenience and safety of the public by substituting some scheme of centralisation. The character of our public works, too, has long been the subject of severe comment. The operation of the numerous vestry boards in our various parishes is inefficient. Whether the condition of our streets is owing to the incompetency of the vestries as they are at present constituted, or whether the system under which their operation is carried out is inadequate, it is manifest that the public at large have at present to endure the most unreasonable perils. After the construction of new streets of houses, the roadway is allowed to remain in a most objectionable and dangerous state for a long period. It is not uncommon to observe a street of large and well-built houses through the roadway of which none but an army in sight of a besieged capital would pass. The anomaly is that, during the time that this condition of the roadway continues, the vestries are receiving rates for the object of its improvement. In cases where property is chargeable in perpetuity, for purposes of cleanliness and repair, it would be advantageous, and unattended with difficulty, to procure a large sum for carrying out the requisite work, to be afterwards refunded out of the rates. The condition of the dwellings of our labouring population has, under the obscure operations of local boards, become a subject of national reproach. It is to be hoped that, under the auspices of our present Premier, who recently stated that he was warmly interested in this subject, some important steps may be made to remedy the condition of the dwellings of the poorer classes. If property has its duties as well as its rights, there is at present a pressing claim for their performance, and a wide scope for their exercise. On the subject of inventions the lecturer remarked that inventors and inventions subject to the patent laws of this country labour under many disadvantages. They are supposed to have the privilege granted by the State of a monopoly for a period of fourteen years, to reap whatever pecuniary benefit might be derivable from their invention; but it need hardly be

stated that this is not the case, owing to the incomplete nature of the information afforded by the Patent Office as to the novelty of inventions. An inventor, after having, with great expenditure of time, trouble, and money, perfected his invention, goes to the further expense of having a complete search made among the patent records to ascertain the fact that his invention has not been patented before, and this search proving satisfactory, he applies for his patent. No sooner, however, has a description of his invention appeared in print than he is informed that the identical invention has previously been made and commercially used, though not patented or made generally known; thus the patentee finds himself in the position of having spent his time and money to no purpose, without having any possible means at his command whereby he might have obtained the information before taking out his patent. It is to be hoped that some substantial improvements in our patent laws may be carried out during the current year.

OUR WORKMEN—THEIR LABOUR, REWARDS, AND TRIALS.

PROFESSOR LEONE LEVI recently delivered a lecture at the Shire-hall, Stafford, on "Our Workmen—their Labour, Rewards, and Trials," the Earl of Harrowby in the chair.

Professor Levi, on rising to address the audience, was received with loud applause. He commenced by an elaborate sketch of the vast extent and the great variety of the products of human labour, and from that deduced the fearful loss which was involved in the frequent suspension of this productive effort by strikes. He showed how essential for the development of the faculties of man was the necessity for exertion. Speaking of the numbers of the working classes, Dr. Levi said:—"Altogether I have calculated that the number of persons actually at work in the United Kingdom amount in round numbers to 12,000,000, of whom about 5,000,000 are men of 21 years and upwards, and the remainder women, and boys and girls under age. What proportion of the domestic class, including wives, mothers, and children, not classified as workers, should be added to arrive at the total number of the working classes it is difficult to say. Ordinarily we take each adult male to represent a family of 4·50 persons, and at this rate the working classes would number 22,000,000, being little more than two to one of the entire population of the United Kingdom. What is the economic condition of so large a number of persons? What are their resources? What is their mode of life? What a number of social problems present themselves when we enter on so great a topic. The reward which the labourer demands is more substantial than mere applause. It consists in a share of the produce of his labour, which shall at least be sufficient for good lodging and clothing for himself and his family. And here we are brought to the difficult question of the relation of capital and labour. Wealth, it is true, is the result of labour, but the workman depends on the capitalist for the raw material and implements to work with. We might fancy the capitalist and the labourer agreeing to act jointly in a kind of partnership in which one puts his labour, the other his capital. But the labourer cannot wait till the article is completed and sold to divide the produce with the capitalist. Nor can he work on the chance that the article may be sold, or may prove profitable. Better for him to receive something prompt and certain than a larger sum at a distant time, and contingent on the success of the enterprise. Nor would such an agreement answer the capitalist. He must look to the best time for selling his merchandise. He cannot expose himself to the pressure of the labourer, or to the danger of disagreement. Better for them both to substitute the contract for wages, or the purchase and sale of certain services for a certain remuneration. In the contract, both parties are free to act as they please, the one to demand and the other to give whatever their respective interest may suggest. But even this freedom is controlled by certain economical laws. The labourer must remember that he is interested in the extent of capital destined or appropriated to the payment of labour, that he depends on the increase of the same for his own welfare, and that whatever he does which diminishes or retards such increase, must necessarily recoil on himself. The capitalist must remember that the labourer must live, that he must maintain his family, that he must educate his children, and have a share of relaxation and enjoyment, without which life is a burden. He must not forget that the best way to make a labourer work well is to pay him well, to keep him happy and cheerful, strong and healthy, and that if he will deal justly by his labourers, they will neither neglect their labour nor be disaffected, they will neither complain nor be disposed to strike. If on the one hand the employer has a right to endeavour to lower the wages, lest by enhancing the cost of the production too high he becomes unable to compete with the foreign producer, and thus lose the trade altogether, the labourer has a right to expect that the wages shall bear a certain proportion to the profits of the undertaking, be they high or low. And while the competition among labourers is favourable to the master in keeping the wages at the minimum limits of the labourers' wants, the freedom of labour, an extensive field of labour in the colonies of America, and the right to combine among themselves to control as far as possible such competition, enable the labourers to resist the attempt to lower the wages below what is just and necessary." After indicating in general terms the conditions which regulate the rate of wages, the lecturer pointed out the want of decent homes, often of substantial food, by working men, and urged the necessity, from the greater demand for intelligence in the workman, that more attention should be paid to the education of his children, and he impressed attention to this as a duty on working men, as well as on those whose position in life enabled them to assist in affording the means. Dr. Levi appeared to think the representations made as to the competition of Belgium in the iron manufacture had been exaggerated, and proceeded to speak of Trades' Unions:—"Trade unions have been the subjects of great animadversion of late. But let us do justice to the good they perform, in the discipline and order they maintain in the trade, the check they impose on riot and excess, the help they afford to the sick, the poor, and the widow, and the many purposes they subserve of charity and beneficence. There are points in their action decidedly objectionable. The restrictions they put to the number of apprentices, and all hindrances they impose on the freedom of labour, admit of no defence. Any endeavour to thwart the introduction of machinery is absolutely wrong and useless. And decidedly wrong is the exercise of any moral or physical coercion for inducing all labourers in the trade to act with them. We cannot dispute the right of any one to influence others with his views; but I have no hesitation in saying that all intimidation or coercion used for that purpose, whether by applying terms of opprobrium on the reluctant party, or injuring his tools, or any other means, is most reprehensible. If we prize independence of action for ourselves, we must allow it to others also. But what shall I say of strikes and lock-outs? Not a word in their favour. Nothing could be more injurious to masters and operatives than to bring matters to such extremes. Any concession is better, and arbitration is better still. The cessation of production, the heart-burnings, the uncertainty of transactions, the endless quarrels—oh, what an amount of evil do they engender. Calculations have been made of profits and losses from such strikes. But one thing is certain. The nation loses always. Addressing myself particularly to our working men on these important subjects, I must certainly say: Take care, lest in the hope of bettering your condition, you only open up for yourselves a source of suffering and privation. Take care, lest in obtaining the co-operation of your co-labourers, you resign to others that freedom of action which it is most desirable you should always preserve. Remember that the winter before us is likely to be a trying one, that provisions will be dear, house-rent high, and even clothing costly. To strike and throw off labour now is quite suicidal. Better "half a loaf than no loaf at all." If, however, our working men do sometimes err in committing themselves to a perilous course, let us remember that it is not always and altogether their fault. Not the least of the trials which await our working men at every step is, in fact, the difficulty and haphazard way in which they must move in order to better themselves. How seldom do we hear of masters taking the initiative in raising the wages in times of prosperity. How often do they wait till compulsion is almost exercised upon them." As to the earnings of the working classes, he said:—"Collectively the working classes exercise considerable influence on the nation. I have estimated upon very good basis, though necessarily in a general manner, that the 12,000,000 persons at work annually earn £418,000,000. Comparing this income with the income of the middle and higher classes, I find that the income assessed to income-tax, paid principally by the latter, amounts to £327,000,000, whilst probably £100,000,000 more is supposed to be the property of such class under £100 or not assessed to that tax, making in all £427,000,000. Apparently the difference between the income of the two classes is not so material. But when we take the number of persons belonging to each into account, the result is very different. If we take the working classes to number as I have said, 22,000,000, and the middle and higher 8,000,000, it will follow that the £418,000,000 will give a proportional income per head of about £19 per annum, or £85 per family, whilst the £427,000,000 will give a proportion of £53 per head, or £238 per family; these proportions, however, varying in the various grades of society from £20 to £300 per family in the working classes, and from £50 to £50,000 in the middle and higher. The accumulation of capital among the working classes, however, has been very great of late. In 1830 the number of depositors in savings' banks was 17 in 1,000 of the population, and the amount of deposits averaged 11s. 3d. per head. In 1848 the number of depositors was 39 in 1,000, and the amount of deposits 30s. 8d. per head. In 1865 the number of depositors was 48 in 1,000, exclusive of the depositors to the Post-office savings banks, and the amount of deposit 30s. per head inclusive of the deposits in the Post-office banks over and above the amount invested in friendly societies, building societies, and co-operative associations." He regretted that £70,000,000 was annually spent in the United Kingdom in ardent spirits besides wines, and that £50,000,000 of this was spent by the working classes. He concluded by an earnest and eloquent exhortation to working men to avoid excess, and to strive to improve their positions and their homes.

THE EXHIBITION OF DESIGNS FOR THE NEW NATIONAL GALLERY.

(From the *Westminster Gazette.*)

ON viewing these designs one is simply tempted to ask—where *are* our architects? For it is impossible to concede the merit of true architecture to any one of them. Where they are original, they are fanciful and extravagant; where they are adaptations, they are unsuccessful; where they are copies, they are misapplied; where they are practical, they are ugly; where they are meritorious, they would be costly; where they are picturesque, they would be impossible. I will leave others to discover their merits, such as those of arrangement, &c. I will speak only of their architectural defects, which are lamentable in the extreme. And, first, let me remark generally how unfit they are in the main for their destination. They may be palaces, banks, clubs, coach manufactories, mortuary memorials, athenæums, scenes in a grand opera, or fancy examples for a new edition of "Pugin's Contrasts;" but picture-galleries in modern, dirty London, they are not. A contemporary thus writes of them:—

> Viewed merely as works of art, many of the drawings are of a high order of merit, but it cannot be said that they represent precisely what is required. Some, for instance, are too palatial and domestic in their character; others suggest city banks (without the money); some call to mind the clubs of Pall Mall, and others the Mansion House, or the great hotels at Charing Cross and Cannon-street. In few do we find that impress of originality which ought to characterise our generation and the age in which we live, and many, it must be admitted, do not fulfil the first condition of true architecture; that is, they do not proclaim their object and purpose.

And what is far worse than this, there is scarcely a monstrosity, or anomaly, or inconsistency, or misapplication, or violation of principle against which we have cried out during the last twenty years which is not now perpetrated in one or other of these designs. There are the same useless features, the same colonnades, mouldings, and pediments which have been reproduced *ad nauseam* in every direction; the same eccentric recesses, and semi domes and makeshifts—there are doorways big enough for giants—sham domes only calculated to produce draughts and store up wind—the same absurdities of detail, vases, and pots, and pyramids, and pyramids growing out of pots, and balls perched on the tops of pyramids, and winged horses and tripods, and marvellous vegetable productions—the same want of true feature where

it is required, and the same amount of distorted features without a necessity, like wens and bunions which disfigure the human form. But of simplicity, dignity, power of form, proportion, fitness, there is literally next to none. There is but little evidence of real genius—its force, individuality, and vigour. The architects invited to compete were ten in number, and all have sent drawings. The names of the gentlemen competing are:—Mr. Owen Jones, Mr. Somers Clarke, Mr. G. E. Street, Mr. F. P. Cockerell, Mr. Digby Wyatt, Messrs. Banks and Barry, Mr. J. B. Murray, Mr. E. M. Barry, Mr. Cuthbert Brodrick, and Mr. Penrose. I will hastily glance at their respective designs.

Banks and Barry.—A mass of windows and doors multiplied and piled upon one another—a general flatness and want of character pervading the whole building, the front of which is broken by four square tower-like masses, each having a small square turret at the angles, surmounted by a mal-formed roof. Not an original idea throughout—the same common-place monotony and poverty of invention which is still visible in most of their productions.

Edward Barry.—A still more insipid and wearisome monotony. Engaged columns *ad infinitum*—rows of pots and other absurd details, three useless domes terminating outside in a collection of spikes. The entrance hall and grand staircase forming apparently the *corpus* of the building, and the picture galleries comparatively insignificant adjuncts. In short, there is scarcely a fault which this building has not; but it is not more lamentable than the same architect's station at Cannon-street, where the roof appears to have slipped through the supporting towers, and is about the worst thing ever seen, both in construction and effect.

Somers Clarke.—Style—a sort of Moorish-Italian-Spanian-melodramatic, displaying a considerable amount of eccentric originality, but thoroughly impractical and costly. It wants balance and consistency. The different varieties or adaptations of styles blend no better than oil and water. And *can* anyone tell us for what purpose that overpoweringly lofty tower rears itself alongside? For what earthly purpose is it intended? It is divided into some ten or eleven floors, the use of which it is not easy to conceive; and one entire side is pierced with a number of irregular slits, which quite defy interpretation.

Cockerell.—A most dismal-looking structure—resembling more a huge cemetery church than anything else. A great eyeless dome, and details like Paris furniture in the time of the First Empire. The drawings are absolutely depressing. What would the actual production be?

Brodrick.—A childish multiplication of columns without motive or reason; a temple, with more columns perched on a temple, having a rectangular roof, covering a flattened dome within. Tower roofs like a collection of pastry, surmounted by crowns.

Murray.—Really deplorable; long unbroken rows of those eternal columns, some of them with those most hideous square blocks intersecting them—the upper story composed principally of blind windows, hollowed into niches, about seventy in number—a monstrous square block rising up—it is difficult to make out exactly where—like a huge tank at waterworks.

Penrose.—A collection of villa doors and windows, pilasters, pyramids in pots, panels, a bust, and a chimney—nothing more.

Owen Jones.—Very much like a bit of the old Exhibition, with Renaissance pilaster, &c., attached.

Street.—The only Gothic design, but by no means satisfactory. Wants unity, balance, and consistency. Parts of it are like a church, others like a school; it is collegiate, monastic, domestic, all in one. It has Mr. Street's usual great merits, and his usual faults. It looks as if it had been designed in bits at intervals under different inspirations. Parts are bald as a washhouse—others are overclothed with ornament; and ornament too all out of proportion, and sometimes misplaced and too obtrusive. It is too mediæval; it looks too much like a collection of favourite bits from different places introduced because they are nice; so it is not a building of the day, and gives one a totally wrong idea of its destination. It is just the sort of building which, with all its merits, gets people against Gothic work, and this is much to be regretted.

Digby Wyatt.—A magnificent dream—a scene for an extravaganza—a perfect orgy of misplaced ornamentation—a face, as it were, covered with eyes, noses, and other features, without a solitary inch of cheek or forehead. The front elevation exceedingly striking and original, but, as far as one can make out, defective in construction, and mystifying in its various parts. What look like tombs beneath semi-domes hollowed out of the upper walls turn out to be skylights for the lower floor. This is a sort of unreality, not, however, so bad as that of the domes (for this gorgeous structure rejoices in three lofty domes), the upper portion of which—to a height of some 40ft. or 50ft. perhaps above the ceiling below—seems entirely devoted to a twisting iron staircase and a water tank. They are gorgeous shams. The windows of the great hall and staircase are adaptations of those of the Certosa. The great entrance doors are of an appalling character—of huge size, flanked by gigantic caryatides, surmounted by a balcony and arch window, the proportions of which are on such a scale that they dwarf and crush all around them.

One word about all these designs in the lump. The architects seem mainly to have forgotten that their buildings were to be made for the pictures, and that the pictures were not painted for their buildings.

STATUE OF THE LATE PRINCE CONSORT AT MANCHESTER.

THE inauguration of the statue of the late Prince Consort, erected in the centre of Albert-square, Manchester, took place on Wednesday. A committee was appointed to undertake the work in January, 1862, and the offer of the then mayor (Mr. Goadsby) to present a marble statue, on condition of the city affording a suitable site and finding money for a pedestal and covering, was accepted. The statue, which is by Mr. Noble, of London, and is of Sicilian marble 9ft. high, representing the Prince in the robes of the Order of the Garter, has been completed some time. The memorial building in which the statue is placed, and the rich Gothic canopy over it, were designed by Mr. Worthington, of Manchester. The report presented to the committee describes the work as follows:—The memorial building is raised 5ft. above the surface of the street, on granite steps, occupying a square of 35ft. The base of the structure is 20ft. square, and 15ft. 6in. to the platform on which the pedestal, which is 6ft., stands. The entire height from the pavement to the summit of the vane is 80ft. Four open arches above the basement support a grand canopy, forming a shrine, in the centre of which, on a pedestal of coloured polished granite, stands the statue. The four arches are surmounted by lofty gables, and the external angles are abutted by four square piers or buttresses rising in solid masonry to the level of the springing of the great arches, shortly above which level they disengage themselves, and rise up as detached and elaborately enriched pinnacles; these pinnacles illustrate subjects in which the late Prince Consort took active and practical interest. Each pinnacle has two stages above the springing of the arches, the upper stage being an open canopy supported on polished granite shafts; these four canopies contain figures of Art, Science, Agriculture, and Commerce. Art is supported by Music, Sculpture, Painting, and Architecture; Science, by Astronomy, Mechanics, Chemistry, and Geometry; Agriculture, by Spring, Summer, Autumn, and Winter; and Commerce, by Europe, Asia, Africa, and America. The four great gables contain a circular open panel enriched, and in the three triangular spandrels are medallions containing twelve heads, representative of Art and Science—Michael Angelo, Wren, Inigo Jones, Raphael, Beethoven, Mendelssohn, Goethe, Schiller, Milton, Shakspeare, Tasso, and Dante. On the summits of the four gables are winged angels, holding gilt trumpets; the spire is banded with polished gray granite, and the shafts of the main archways are of the same material. The pedestal supporting the statue consists of a deep red granite-centred block, with angle shafts of gray granite, bearing the simple inscription "Albert" on the south side. On the centre of the piers or buttresses are shields carved in stone representing the arms of England quartered with those of Saxony differenced with the late Prince Consort's own label of three points argent, charged in the central point gules, alternated with the simple arms of Saxony emblazoned with foliated bands and arched coronet on a field barry of ten, or and sable. Each shield is surmounted by the peculiar coronet of the late Prince, which differs from the Imperial Crown in having eight instead of four arches, rising from strawberry leaves and curved. Each shield is encircled by the garter, with the usual motto, and below on a label is the motto, "*Treu und fest.*" These armorials are repeated in the eight angle panels of the basement, and on the intermediate panels (of which there are five) are carved the various crests of the Prince. The memorial is enclosed by a rich and elaborate wrought iron railing or grille, by Skidmore and Co., of Coventry. The angles are encircled by gilt foliated finials, and shields engraved with the arms are placed at intervals along the cornice of the railings, a central one bearing the full quartered arms emblazoned in colours. The emblematical figures were executed with excellent taste and finish by Messrs. T. R. and E. Williams, of Manchester and Liverpool. The memorial bears the following inscription round the base:—"In grateful acknowledgment of public and private virtues, Albert, Prince of Saxe-Coburg and Gotha, Consort of her Majesty Queen Victoria, erected by the inhabitants of Manchester, A.D. 1866. The statue was presented to his fellow-citizens by Thomas Goadsby, Mayor of Manchester, 1861-2." The total cost of the memorial, exclusive of the statue, has been £6,249 15s. 4d. The ceremony of inauguration was exceedingly brief and simple. The committee met at the Town-hall at one o'clock, when Mrs. Goadsby, widow of the late mayor, read a few lines formally presenting the statue on behalf of her late husband to the Mayor and corporation. The committee and other gentlemen then went in procession to a temporary building fronting the southern face of the statue, and Dr. Fairbairn, C.E., read an address of inauguration. The statue was then unveiled in the presence of a concourse of many thousand people, who cheered lustily.

THE PARIS EXHIBITION.

A PARIS correspondent says the Exposition Universelle is evidently not about "to disappoint the promise of its spring;" it is to be universal. The Germans are going to send us an iron house, with room for a "respectable family," which is made entirely of iron, put together like a Chinese puzzle, weighs very little, is brought, in fact, from Germany for about five pounds sterling, and is capable of being warmed but not burned.

American schools are to be represented (chiefly through Massachusets liberality), in models of the best school houses, and representations of the most approved apparatus and modes of instruction, school books, results of education and educational laws. Every sort of religion and manners have free and equal welcome, and, as an offset to the above, Spain will exhibit a national characteristic—six bull fights—for which a Spanish company are making preparations on a gorgeous scale.

All the gods and goddesses in the Versailles gardens are to be washed and mended for the Exhibition season. A more begrimed and dilapidated set of Jupiters, Pomonas, and Hebes than those which adorn the Grand Monarque's stately *plaisaunce* can hardly be conceived.

A CHINESE RESTAURANT.—Among the wonders of the coming Paris Exhibition, will be a Chinese Restaurant. It will be borne on the shoulders of a celestial. The kitchen department is of the lightest bamboo, and will be borne on the said celestial's left hand, while he will cook, keep up his fire, &c., with his right. The bamboo edifice is divided into three stories. The lower contains the plates and dishes, the second the wood and matches, and the *rez-de-chaussee* the *batterie de cuisine*, ovens, &c.; the larder, stocked with meat, fish, and vegetables, is at the back of the structure. It appears that these ambulatory cooks and their kitchens are to be seen wherever Chinese workmen are congregated, and serve a hot cutlet or a fried fish for a few farthings.

PERSONAL.

THE following gentlemen have been elected members of the Architectural Association:—Mr. Charles Moxon, Mr. Williams, Mr. H. Jeckell, Mr. Turner, Mr. Bainbridge, Mr. H. Jackiers Mr. Seare, and Mr. Parkon.

Mr. Ellis, of Austinfriars, is the architect of the new works for the Great Northern Brick Company near Hitchin.

At a meeting of the Society of Engineers held on Monday, premiums were presented to Mr. Cecil Wessely, for his paper on arched roofs; to Mr. Thomas Cargill, for his drawing of the bridge Place de l'Europe, Paris; and to Mr. Arthur Jacob for his "Reservoirs and Embankments."

The Duchess of Leeds and Lady Herbert of Lea have each contributed £10,000 towards the purchase, for Roman Catholic purposes, of Prior Park; and a Yorkshire gentleman has given £5,000 for the completion of the unfinished chapel.

Mr. J. R. Herbert has undertaken to paint a picture or a series of pictures, for the new Roman Catholic church at Kilburn, the work of Mr. W. Pugin.

Captain Mark Huish, for many years general manager for the London and North-Western Railway, died on Friday.

E. J. Reed, Esq., Chief Constructor of the Navy, will occupy the chair, and S. W. Worssam, Esq., the vice-chair, at the fourteenth anniversary festival of the London Association of Foremen Engineers, to take place at the Freemasons' Tavern on February 16 next.

It is understood that Sir R. A. Glass will shortly retire from the chairmanship of the Atlantic Telegraph Company. Sir Charles Bright, M.P., is spoken of as his successor.

The following gentlemen were elected members of the Society of Arts at its last meeting:—S. J. Addis, 49 and 50, Worship-street, E.C.; John Becke, Northampton; Samuel Richard Bosanquet, Dinastow court, near Monmouth; Alexander Glendining, jun., Redleaf; Robert Jobson, 32, Great St. Helens, E.C.; T. W. M'Crirrick, Bitterly-court, Ludlow, Salop.

The first meeting of the year of the Society of Engineers was held on Monday evening. At the termination of Mr. Le Feuvre's address the following gentlemen were balloted for and elected members of the society:—Harry Maull Finch, Colombo, Ceylon; John Jasper Horner, 30, Avenue-road, Hammersmith; Ewing Matheson, 32, Walbrook, E.C.; Jabez Church, Hamlet House, Chelmsford; Joseph Bennett Howell, Sheffield; Thomas Jourdain Hay, 19, Great College-street; Arthur Jacob, B.A., Croydon; Henry Gielgud, 3, George-yard, Lombard street; John Wood, Church-street, Nuneaton; Charles Sexten Baylee, 11, Oakley-crescent, Chelsea. Associates: Joseph Cash, Hove, near Brighton; Johannes D. F. Hald, 9B, New Broad-street; James Young, Davidson, 5, Brunswick-place, Lewisham; William Oxford, Grosvenor-road, Pimlico.

SCHOOLS OF ART.

It has been proposed to establish Government Schools of Art at Banbury and Maidstone.

KIDDERMINSTER.—The annual meeting of the School of Art here took place last week, Lord Lyttelton in the chair. Mr. Brinton read the report, which stated that as regarded the attendance of students at the Artisan Class, the committee were unable to speak favourably; whilst the progress of the older and more advanced students was satisfactory, there was an extremely scanty supply of that succession of junior students upon which the progress, and, indeed, ultimately, the existence of the school, depended. The decrease in the number of junior and artisan students had, under the new regulations, seriously affected the amount of aid received from the Government.

WAGES MOVEMENT.

A CORRESPONDENT writes:—"What will the men want next? The masons employed upon the new Post Office, Darlington, struck on Saturday, December 29 1866, because the contractors brought some worked stone into the town, consisting of some balusters, 13in. high by 4½in. square. They were turned at York by Union men. The Darlington men own that they could not work them, but they say that if they had been allowed to work the top and bottom beds they could have been sent anywhere to be turned, and then they might have been set. The clerk of works proposed to them, at a meeting, to take 1-16th off the top and bottom beds, but they would not hear of it. Fresh balusters must be worked before they will resume work. It is rather fortunate for them that they are on strike during the frost, as if they were not they would be receiving nothing. As it is they are receiving the lodge pay."

A letter in the *Times*, from a Clyde shipbuilder, says that the London shipwrights are paid 40 per cent. higher than the Clyde shipwrights, or 7s. per day against 5s., and he anticipates that shipbuilding must soon cease on the Thames.

THE PRINTING AND BOOKBINDING TRADES AND THE FACTORY ACT.—The Commissioners appointed to inquire into the employment of women and children having, in their fifth report, recommended the application of the Factory Act to the printing and bookbinding trades, a movement to get the recommendation carried into effect has been set on foot; and on Monday a deputation from the letterpress printers of Edinburgh waited upon the Lord Advocate, in his chambers, upon the subject. The deputation submitted some statistics to his lordship, with the view of showing the necessity for the application of the Factory Act to the printing trade. The Lord Advocate expressed his hearty sympathy with the object of the deputation, and assured them that he would bring the subject under the notice of the Home Secretary. The deputation took the opportunity of directing the attention of the Lord Advocate to the present law of master and servant, and expressed a hope that a bill would be brought in during the next session of Parliament to abolish imprisonment for breach of contract; and they were informed that their views on the subject would be represented to the Government.

THE BUILDING TRADE.—On Friday last a large and influential meeting of the master builders of England and Scotland was held at the Victoria Hotel, Leeds, the Mayor of Manchester (Mr. R. Neill) in the chair. The greatest unanimity and good feeling was shown, and a resolution was unanimously passed to amalgamate the Yorkshire Association of Master Builders with the General Association of Builders. When the business of the meeting concluded, the General Builders' Association were entertained at the Victoria on the invitation of the Yorkshire Association of Master Builders, Mr. A. Neill, of Bradford, in the chair.

THE POTTERIES.—The carpenters and joiners of the Staffordshire Potteries have given notice to their employers of a demand for an advance of 6d. a day in their wages, raising them to 30s. a week, and a reduction of the hours of labour to the extent of two and a half hours a week, the change to come into operation on May 1. The builders in reply have offered the men 6d. an hour, making the wages 29s. a week, but they decline to reduce the hours of labour below 58 hours a week. The operatives have not had time to decide upon the offer of the masters, but, as it will, if adopted, introduce the system of working and paying by the hour, it is not unlikely to be refused by them. The difficulty with the bricklayers, which has been pending since May last, and has ever since prostrated the building trade of the district, has only just been removed by a reference of the dispute to arbitration.

INVERNESS.—A meeting of employers was held here on the 16th inst., when it was resolved to establish a local association in connection with the General Builders' Association. A committee was appointed to draw up rules and regulations, and report to a general meeting to be called as early as possible.

WATER SUPPLY.

LEEDS.—At a meeting of the Leeds Town Council on Monday, the Waterworks Committee reported that the original estimate for providing a further supply of water for the borough had been increased from £150,000 to £300,000, the chief reason for the additional cost being that, under the advice of Mr. Hawksley, C.E., provision had been made for more than double the amount of storage of water originally determined upon. This largely increased estimate, however, does not include a sum of £110,000, which would have to be expended upon the pipes necessary to convey the water to consumers. A long discussion took place on an amendment proposed by Mr. Addyman, recommending, on account of the immaturity of the scheme, that the bill should not be proceeded with next session; but the recommendation of the committee was confirmed by a large majority.

LEGAL INTELLIGENCE.

At the Newcastle Police-court, at the instance of the Corporation, the Newcastle and General Gas Company, were summoned for supplying an inferior quality of gas to that specified in their Act of 1864. A fine of £5 was inflicted.

MASTER AND SERVANT.—A master must provide for his servants decent and reasonably-comfortable accommodation, and not endanger their health. This rule was laid down in the Liverpool County-court on Tuesday by Mr. Blair, the judge, in a case in which Mr. Palmer, pianoforte manufacturer, was sued for balance of wages by two servants, cook and housemaid. The defence was that the girls left without notice, and so forfeited their wages. It was proved for the plaintiffs, however, that the room in which they slept was in such a bad state that the rain came in and wetted the bed in which they slept, and that they had both suffered in health as a result. They had then felt compelled to leave the place. The judge decided in favour of the girls, ordering payment of the amount claimed, and 2s. 6d. each for attendance.

A QUESTION OF CHIMNEYS *versus* ROOFS.—At the Bail Court last week, Mr. Kingsford, a dentist in Piccadilly, sued Mr. Wells, a jeweller, his next door neighbour, for damages for the fall of a stack of chimneys. The defendant pleaded a number of pleas, the principal one being that the chimneys fell by the act of God, there being a hurricane at the time. Moreover, on the part of the defendant it was urged that the plaintiff's roof was in a dilapidated state. In 1859 the defendant had the premises examined and repaired. In October and November, 1865, the weather was exceedingly boisterous. Other chimneys in the neighbourhood were blown down, and bricks came down defendant's chimneys. Trees were at that time blown down in the parks, and the hurricane was so great that it blew off the roof of the London, Chatham, and Dover Railway Station. Defendant found the rafters of the plaintiff's house to be very slight and much decayed; the stack of chimneys in question was not more than fifteen years old. A gentleman from the Meteorological Department of the Board of Trade was called, and he stated that on the 22nd November, 1865, at eight o'clock in the morning, it was blowing a strong gale, which had greatly increased at half-past nine o'clock; the force of the wind on that day was 11. With a force of 12 no ship could carry a sail. A greater force of wind had not been registered for a number of years. The jury returned a verdict for the plaintiff, adding that they were of opinion that the defendant was not aware of the dilapidated state of the chimneys.

IMPORTANT QUESTION AS TO TRADES' UNIONS.—The case of Hornby (appellant) *v.* Close (respondent), in the Court of Queen's Bench last week, raised a very important question with reference to trades' unions and benevolent institutions. The appellant and respondent are members of the United Order of Boilermakers and Iron Shipbuilders, and the respondent was summoned before the justices of Bradford for having, as an officer of the society, unlawfully withheld the sum of £24 8s. 5½d., belonging to the society. By the Friendly Societies' Act justices have power to deal with matters of this kind, though the society be not enrolled, provided the purposes of the society are the same as or analogous to the objects enumerated in that Act for other purposes which are not illegal. At the hearing of the case it was shown by the rules that this society had two objects, one in the character of a trades' union, and the other benevolence, and the justices declined to entertain the summons, and dismissed it. Mr. Mellish and Mr. Macnamara contended that the decision of the justices could not be supported. The Court, however, confirmed their decision.

DISPUTED CONTRACT.—HARVEY *v.* LAWRENCE.—This was an action tried on the Western Circuit before Mr. Justice Byles. A rule *nisi* for a new trial, and to set aside the verdict for the plaintiff having been obtained on the ground of the refusal to receive certain evidence as to £38 worth of lead, last week the Solicitor-General showed cause against the rule, and Mr. Coleridge, Q.C., appeared in support of it. The plaintiff, it appeared, is a builder at Torquay, and the defendant is a merchant at Liverpool. The plaintiff contracted to alter, build, and enlarge a house called Cadwell House, about two miles out of Torquay, for the defendant, for £930, according to certain specifications, subject to the power of the architect, who lived at Torquay, to make alterations. The house was finished, and the lodge and gates, and the architect gave his certificate. It was then found that the width of the gate entrance had been narrowed, and that Mr. Lawrence could not drive his carriage through the gates. This had to be altered, and a dispute arose as to the cost, and as to a set-off of £38 for old lead, which the plaintiff contended had been taken into account under the contract which he had entered into. The Court were of opinion that the rule must be discharged. If the contract had been to execute the work according to the drawings, there might have been something in the objection; but the contract was to execute the works according to the drawings, specification, and directions of the architect; and it must be taken as a fact that the architect did give directions. The objection, therefore, failed. As to whether or not the builder was entitled to the £38, the evidence was not satisfactory, and the Court would speak to Mr. Justice Byles. Rule discharged accordingly.

IMPORTANT DECISION UNDER THE EJECTMENT ACT.—At the Clerkenwell Police court, on Monday, Mr. Cooke delivered judgment in a case which was brought before him by Mr. Treherne, solicitor, under the following circumstances:—Mr. Treherne applied on behalf of Mr. Richard Brown, the owner of the house No. 2, Prebend-street North, Islington, in the occupation of Mr. Thomas Charles Redfern, under the 13th section of the 3rd and 4th Victoria, cap. 84, for an order to affix to the premises, they being deserted, calling on Mr. Redfern to show cause why he should not either pay the back rent, or why an order should not be issued by the magistrate giving the landlord possession of the premises. An action was brought by Mr. Brown against the occupier for arrears of rent, and a judgment had been obtained for the amount of one quarter's rent, but that judgment had not been put in execution. Mr. Treherne contended that there was now the whole of the rent due, notwithstanding the judgment of the County-court, the judgment not being put into execution, and hence his application for the magistrate's order to

be affixed to the deserted premises. Mr. Cooke, after havingreferred to several cases, said he must decline making the order, but the order might be granted when another three months rent became due.

THE RECENT SNOWSTORM.—On Tuesday, at the weekly meeting of the City Commissioners of Sewers, held at Guildhall, the four scavenging contractors to the Commission were fined in sums amounting in all to £985—viz., Mr. Reddin, £280 10s.; Mr. Easton, £313 10s.; Mr. Stephens, £192 10s.; and Mr. Winn, £200; the whole of the penalties so imposed, with the exception of £26 in the case of Mr. Stephens, being for neglecting to perform conditions of their contracts as to the removal of snow during the snowstorm, which began on January 2.

NOTICE.

*** The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at One Shilling for the first Twenty-four Words.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the EDITOR, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

RECEIVED.—W. B. and Co.—J. J.—W. M.—J. D.—H. W. B.—C. C.—F. C. C.—J. C. J.—J. H.—A. R.—E. L. C.—J. L.—F. P.—R. F.—T. B.—C. F. H.—R. F.—W. G.—R. and S.—T. D.—H. J., jun.—J. N.—B. and D—J. D.—J. T.—W. H. L.—J. C.—W. and S.

"Gothic's" opinion on the mansion now erecting for Richard Hornsby, at the Spittlegate Ironworks, may be quite correct, and if so, we should be glad to illustrate it in our pages. Can he send us a drawing?

T. OLLIS.—We cannot undertake to answer general questions, such, for instance, as the merits of printing machines We think it is desirable to keep as close as possible to professional matters.

The correspondent who signs himself "A Bloated Aristocrat" must be a fool.

A COUNTRY SUBSCRIBER —The BUILDING NEWS will be published at threepence permanently. The subscribers, however, will not be the losers, as they will find as we go on. We will give our reasons for altering the price in our next number.

Correspondence.

A NEW WAY TO UTILISE SEWAGE.

To the Editor of the BUILDING NEWS.

SIR,—I was glad to find by a letter of Mr. Beardman's, which appeared in your columns of the 11th instant, that the question of the disposal of the excreta of our town population was opened for ventilation. The subject is, undoubtedly, of the utmost importance, for in it are involved considerations affecting the health and lives of all the inhabitants of towns, as well as the means of producing food for our rapidly increasing population, the figures concerning which can scarcely be estimated, so vast are the interests involved in this great question. This word "question" naturally suggests the reflection that, if we had adopted an unexceptionable method of disposing of the offensive matters of our population, there would be no doubt or question for solution. Thus we have admitted errors to cure—the problem is how best to accomplish this.

The old method of storing human excreta in cesspits, although, in an economical sense, preferable to the hydraulic system in affording valuable agricultural manure, has been found so repulsive as to have encouraged the introduction of the watercloset to a considerable extent, but it is now becoming painfully evident that the modern is little if at all to be preferred to the old system; because, although the former may appear to have obviated the more palpable evils resulting from the latter, it has been the means of introducing evils of other kinds of a very serious character. I allude particularly to the pollution of drinking water, the generation of poisonous gases in our sewers, the production of sickness and death in almost numberless cases, and, as a climax to all, the utter impossibility of satisfactorily disposing of the polluted water called "town sewage," even although we may be willing to forego the advantages which, under other circumstances, we might be able to derive from the polluting matters as manure, and are thus driven to the necessity of relying on foreign supplies of manure, to the value of many millions sterling annually, to compensate for our waste. For we shall not be permitted to continue the practice of conveying town sewage into running streams—the law is against it; nor shall we be able to resort to an extensive system of "sewage irrigation," because, notwithstanding the extravagant pretensions set up in favour of it, and the "fact" that four or five crops of coarse Italian rye-grass may be grown by sewage irrigation for two consecutive years, with the necessity for breaking up the irrigated parts every third year in consequence of the land having become too gross to allow grass to grow because of the surface being coated with fœcal matter deposited by repeated irrigation; yet we have the still more important and satisfactory fact that in Lombardy seven or eight crops of more wholesome, because unpolluted, grass are annually grown by irrigation with pure water, without the necessity of breaking up the land every third year. The truth is, grass is not a manure consuming vegation, but it grows abundantly by the aid of air and water only, and, therefore, it is fallacious to suppose the manurial or polluting element in sewage is to any important extent eliminated by its use as an irrigant, because the real polluting matter is in solution, and cannot be thus separated, as was shown many years ago by a series of analyses of Edinburgh sewage, when it appeared that, in five successive applications of sewage to five different fields, 222 grains out of 224 grains of matter in suspension when it entered on the first field were found to have been deposited on its leaving the last of the five fields; but only 15 grains out of 87 grains of matter in solution were found to have been eliminated by the five successive applications. Now, as the urine constitutes about nine-tenths in quantity, as well as from four-fifths to six-sevenths of manurial or polluting matter, it is evident sewage irrigation is quite ineffective for divesting sewage of its impurity, even although sewage may be thus deprived of its repugnant appearance, or, in fact, of its colouring matter, for the recent analyses of London well waters by Dr. Letheby show the danger of relying on such deceptive appearances as bright sparkling water.

I must not, however, trespass too much on your space, but I beg to refer you to my pamphlet on the "sewage difficulty," in which I have entered pretty fully into the various phases of this important subject. Although this subject is surrounded with difficulties, I think we must be careful, in attempting to overcome them, to avoid committing ourselves to erroneous schemes; because in so doing the remedy might be worse than the disease. Of such a character do I consider Dr. Hawksley's new scheme for remedying the evils of the present sewage arrangements.

Dr. Hawksley occupied about two hours of time which might have been more profitably employed at the "Leamington Congress," in delivering a paper on the earth closet system, in which he sought to show that if the inhabitants of London would adopt the use of Moule's earth closet, which would only require the collecting men to call daily with fresh supplies of dried earth, and remove the pails containing the earth charged with the previous day's product, then the difficulties and mischief produced by the present arrangements would be obviated, and the ratepayers might realise a profit of, I think he said, 7s. per head annually. I coincide in the Doctor's opinion that even the scheme he proposed would be far preferable to the hydraulic method of polluting an enormous quantity of water, which cannot be satisfactorily got rid of; but I deny the correctness of his conclusion that any profit whatever could by the utmost stretch of probability be derived from so cumbersome, and, with the prepossession of Londoners in favour of the watercloset system, perfectly hopeless and impracticable a proposal. Londoners will, however, have to reform their present sanitary arrangements, but they will not consent to do this until they have spent many more millions in abortive attempts to patch up the present erroneous system, or until the population has been decimated by some fearful visitation consequent on bad sanitary arrangements. There is, however, ample scope and necessity for sanitary reform in other parts of the kingdom, and to those localities should we direct attention.

As I have no right to cavil at other persons' schemes without being able to propound something which I believe to be better, I will now briefly propose my remedy, and in doing so I feel I am open to have my plans controverted as freely as I have criticised those of others. Manurially and practically, the pollating and mischievous elements in town sewage consist of the excreta of the population. Although there are other polluting matters, these are so trifling and unimportant as to be hardly worth notice. The excreta of each adult amounts to about 1 cwt. of fæces and about 10 cwt. of urine annually. The urine possesses, as proved by oft-repeated analysis, from four-fifths to six-sevenths of the manurial value as well as of nearly all the power for mischief by percolation. Each ton of human urine, unmixed and undiluted, is worth chemically for manure 20s. I therefore propose to collect the urine passed during nondefecation separately and apart from the fœces as far as possible, by means of my fixed or portable saving urinals, without the slightest offence or annoyance, and then remove it to the suburbs, where it would have, as I have already said, an intrinsic manurial value of 20s. per ton for agriculture. But as it would not be suitable for market in a liquid state I treat it chemically by means of very inexpensive agents, so as to obtain the full manurial value known to be inherent in urine, after which I evaporate the merely aqueous portion and thus convert it into a dry concentrated powder manure possessing all the requisites for agricultural purposes. It is obvious the urine might be collected from tanks at convenient intervals, or even by a system of underground pipes such as is adopted in localities where it is collected for use by woollen manufacturers. By these means I obtain a far more satisfactory result than could possibly be obtained by preparing and conveying into the town two or three tons of dried earth to be used as a vehicle for taking back to the country a preparation of manurial matter which, after all, could not possess more than one-half or one-third the value of its cost.

Having thus provided for the collection and manipulation of by far the larger as well as more valuable portion of the excreta, there would not be much difficulty in providing for the disposal of the more repugnant although less valuable portion of the excreta, the fœces. This I would accomplish by the means indicated in my pamphlet; but, instead of using dried earth, which, although nominally most abundant, is nevertheless not so easily obtained as some other suitable matters, I should use, at the rate of about 2 cwt. yearly for each person, a cheap and easily available carbonaceous matter produced in towns, and which would be in a more concentrated form than earth. Such a system as I have briefly alluded to would undoubtedly produce a very large profit, without creating the slightest annoyance or injury to health, and thus be the means of obviating the evils of the present sanitary arrangements, as well as producing an abundance of concentrated manure suited to all agricultural purposes. And now a few words as to the pretensions set up by Mr. Moule respecting the deodorising effects of dried earth. Such a claim is evidently a mere delusion, because so far back as the year 1838 Mr. Thomas Swinburne patented a dry or earth closet, and published a prospectus which I recently reprinted in the *Leamington Courier*, drawing attention to the advantages derivable from its use and the disadvantages of the hydraulic system. I was the inventor and co-patentee of Moule and Bannehr's earth closet, which I relinquished in Mr. Moule's favour because I placed but small value on it as an agent for solving the sewage difficulty.—I am, &c.,

Exeter, January 23. J. BANNEHR.

DANGEROUS WALKING.

SIR,—At the present season of the year, one of the greatest dangers to which pedestrians are liable arises from the slippery state of the coal plates on the pavement. I refer particularly to those that are smooth on top. These covers may be said to be more or less dangerous at all times, but they are especially dangerous in wet or dirty weather. The recent severe frost and snow storm rendered them as smooth as glass, and the consequence was that a number of serious accidents occurred to old and young, owing to the impossibility of always avoiding walking on these plates, or knowing their position when the pavement is covered with snow. Within the last few weeks I have witnessed several mishaps where women and old folks have received severe injuries from having slipped their foot on these nuisances.

Casualties of this nature must be very numerous in the metropolis, since there is hardly a street door without a coal plate in front of it, and it so happens that the plates commonly in use are the plain or smooth surfaced ones. If they could all be abolished, and roughened plates substituted in their stead, it would be a blessing, say I. Really I consider that this is a matter of some public importance, and deserving the attention of district boards of works. Is there any reason why proprietors and landlords should not be instructed to lay down roughened coal plates, if it can be shown that smooth ones are a public nuisance and a danger? The difference in price between the two articles would be but a few shillings, so that no hardship would be inflicted on proprietors by being obliged to conform to such an order. On the other hand, we should thus get rid of at least one of the dangers of the streets of London.—I am, &c., PRO BONO PUBLICO.

DURABILITY OF ZINC.

SIR,—I feel obliged to point out that the opinions expressed in the BUILDING NEWS of the 11th inst., as to the durability of zinc, are calculated to mislead those who have no practical knowledge of the subject. A great many properly constructed roofs of good zinc have now been erected all over the country, and in most instances, after careful inquiry. The advantages of a zinc roof are well understood by the highest authorities in such matters. The chief advantage is, not its lightness, but its durability; when once properly laid it wants no repairs, and when well constructed, if a sheet becomes injured in any way it is easily taken out and replaced.

So called galvanised iron is not more durable—in fact, is not durable at all, for it depends solely upon the protecting surface of thin zinc with which it is coated. Galvanised iron is being removed from various important roofs and being replaced by zinc. I shall be happy to give your correspondents any information as to the mode of forming a good and lasting roof of zinc, the three main requisites being—pure metal, a proper thickness, and right workmanship. For the evil results which occur where all or any of these particulars are neglected, I need only refer to the experience of your correspondent, "J. R." (Intercommunication, January 11). The effects of steam in a very large railway station, where there was no boarding, and where galvanised iron had perished and zinc has been substituted, was anxiously inquired into by myself and the engineer of the railway company, but no good reason appeared why steam should do harm.—I am, &c.,

JAMES EDMESTON, Architect.
5, Crown court, Old Broad-street, E.C.
January 21.

CHESTER TOWN-HALL.

SIR,—A correspondent in your last number, who signs himself "Deva," accuses my letter in the previous number of being "calculated to mislead," and, without showing wherein its tendency to do so consists, he proceeds to give his version of the strike and its consequences, and in such a manner as to surprise those who, being citizens, are acquainted with the facts. From his letter it might naturally be inferred that the strike and transfer of the contract were simultaneous, and almost consequent on each other, when the fact is that the strike had been pending some weeks previous to the transfer. The strike was at that time a local one, confined to the Chester branch alone, and unsupported by the Masons' society at large; still men from a distance on learning that the stoppage was the result of a turn-out, refused to work on the job. Finding this to be the case the executive of the society were communicated with, and two delegates were sent to investigate the matter at the beginning of last month; the result being that the strike is now countenanced by the society. These are facts of which "Deva" must be cognisant, though apparently not honest enough to assert them. I omit, as I did before, all allusions to the cause of the dispute, as my sole object is to tell the truth, and not to be a party to any deception if I am aware of it.—I am, &c., JOHN FRANCIS.
27, Pitt-street, Chester, January 22.

Intercommunication.

QUESTIONS.

CARVING.

[195.]—You will very much oblige me if you can inform me, in your "Notices to Correspondents" of next week's issue, what is the best authority for a carver to obtain a knowledge of the way in which figures such as saints, gods, and goddesses, &c., should be represented.
A WORKING MAN.

COMPOSITION FOR MODELLING.

[196.]—Would any of your numerous readers inform me, through the medium of your journal, the best composition for a beginner to model with—one that is easy to cut, for I find plaster of Paris too hard for me to use at present? By so doing they will greatly oblige NOVICE.

STONE DAMAGED BY FROST.

[197.]—Will you kindly insert the following in your valuable "Intercommunication Column," in the hope that I may obtain a solution to it from some practically experienced man, to whom I would be much obliged? What damage, if any, is done to stone (placed on its natural bed in a building) that has been riven asunder or lifted up by the frost? Size of blocks about 2ft. 3in. by 2ft. by 2ft. No weight is placed upon the stone at present. And if the stones were built in, and the work was finished, whether it would then have been damaged in a similar manner? To be more concise, is the stone so fractured as sound and good in a building as it was before the frost so affected it?
A SUBSCRIBER.

ALTERING CRANES.

[198.]—Having lately been obliged to raise the level of my wharf floor whereon a crane stands that I have used for some years, it would be a great convenience to me to be able to change the pitch of the jib so as to get a higher lift. The present length of the arm, which consists of a couple of round iron bars, is 10ft. 6in., and the height of the post is 3ft. 6in. As the old post is worn out I shall put up a new one, and I should be greatly indebted to any of your correspondents who would let me know, when I have made it 15ft. long instead of 13ft. 6in. (the length of the old one), what will be the reduced length of the arm or tie-bars in order that I may use the same jib, which is an excellent, sound, and thoroughly seasoned stick, and I should be sorry to lose it. I should also wish to know whether the difference in the pitch of the jib will make any alteration in its strength, and if so, to what extent. The crane lifts up to 2½ tons, and the foundation is perfect.
WHARFHOLDER.

METALLING.

[199.]—Could you inform me in your next number what are the proper contents of a heaped bushel of metalling? I have had several measurements of mine lately questioned upon this point, and I wish to be certain that I am doing my work rightly. SURVEYOR'S ASSISTANT.

IRONWORK FOR FRANCE.

[200.]—In doing ironwork intended to be put up in France, do the regulations of the Board of Trade here agree with those of the French authorities? An answer to this question will oblige a DRAUGHTSMAN IN IRONWORK.

[By no means. If you are engaged in getting out drawings for ironwork in France you had better at once communicate with the officers of "Les Ponts et Chaussées." With respect to wrought iron, for instance, the rule of the Board of Trade is that no portion of any structure of that material shall be subjected to a greater strain than 5 tons per square inch of nett area. The corresponding rule in France fixes the maximum strain at 3·82 tons per square inch of gross area, and the other regulations are similarly at variance with ours.]

CAST-IRON GIRDERS.

[201.]—I require the assistance of your readers in the following case. I wish to know how to obtain the breaking weight with the load spread evenly over the girder, of a cast-iron girder having the following dimensions:—The depth is 1ft. 9in., the span 20ft.; the breadth of the top and bottom flanges is 10in. and 5in. respectively, and the thickness of each 1¼in. The middle part is about 1in in thickness. I am about to increase the present load upon it, and I wish to ascertain if I may do so safely.
C. C.

CONVERSION OF STANDARD WEIGHTS.

[202.]—Is there any rule or formula for converting pounds troy into pounds avoirdupois. Very recently the question has frequently been put to me, and you would confer a favour upon me if you would allow me to use your valuable medium of intercommunication for the purpose of satisfying myself.
A COUNTRY SCHOOLMASTER.

[Our correspondent may convert pounds avoirdupois into pounds troy by multiplying by the constant 1·2152, and can of course reverse the operation by dividing by the same constant instead of multiplying.]

WEAR AND TEAR OF MACHINERY.

[203.]—Five years ago I started mechanical works which have not paid as I was led to expect, and I am therefore determined to sell off my premises and stock and retire from the concern altogether. It would be conferring a favour upon me if you or some of your numerous readers would give me some idea of the percentage liable to be deducted from the first cost for the wear and tear of the various machines and implements since I first started. They were all new at the time I have mentioned, and have been carefully handled and used during the time they have been at work. RETIRER.

PARLOUR STEAM ENGINES.

[204.]—Can you give me any information on these machines? as I have seen them mentioned in some of the public papers. People in country towns are frequently very ignorant of things with which Londoners are quite familiar.

[The Parlour Steam Engine is simply a scientific toy. It goes very rapidly. By using scent instead of water for getting up the steam a refreshing perfume soon pervades the room.]

WATER PRESSURE.

[205.]—I take the liberty, through the medium of your intercommunication column, of asking your readers to be so good as to inform me what is the pressure per square yard on a dam when the velocity of the current acting upon it is three miles per hour, and also when it is four miles.

HOT WATER FOR CEMENTS.

[206.]—I should feel obliged if any of your readers can inform me, through the medium of your intercommunication columns, whether there is any advantage or disadvantage in mixing cements, mortars, plasters, &c., with hot instead of with cold water? If any of your correspondents have tried experiments on cements, &c., with hot water, and have found any perceptible difference in facility of working, rapidity of setting, durability, or otherwise, I should esteem it a favour if they would give me particulars of the results, or refer me to any publication in which I can find a description of them.
AMATEUR.

MEASUREMENT OF TIMBER.

[207.]—I have received the invoice copied below from a timber dealer, and I don't know how it is calculated:—

40 Spruce Deals,	12ft. 3 × 7			Ms.
40 do.	12ft. 3 × 9	C 1	2 26 6-18.	
40 do.	12ft. 3 × 11			

If you would have the goodness to show me the mode of doing it I can assure you I should feel very much obliged.
MILO.

PERSPECTIVE INSTRUMENTS.

[208.]—Many thanks for your insertion of my inquiry in your columns. I find from a list of instruments that the one I want information upon is called a centrolinead, and what I now desire to know is the principle of its working, its adjustment, and when it would be advantageous to use it (for I know several draughtsmen who never use it). I have looked into several books on mathematical instruments, but have not been able to find a description of it.
CULLINGFORD.

[The instrument alluded to by our correspondent was invented many years ago by Mr. Shuttleworth, who was rewarded by the Society of Arts for his invention. It is of great use in perspective drawing, but of not the slightest use in any other kind, and scarcely one draughtsman in ten knows anything about it except he be continually engaged in making perspective designs. The centrolinead consists of a blade about 2ft. 3in. long, a stock 1ft. 4in. long and 2½in. wide, and an ivory scale 8in. long and divided into ten parts is attached to it. One edge of the stock has a small re-entering angle about 7½ degrees at the centre, and it is along this edge that the ivory scale is applied. One of the uses of the instrument is as follows:—If the draughtsman desires to draw converging lines to one or more inaccessible vanishing points, let him ascertain from the plan how far the vanishing point is from any point in the horizontal line. Place the angle of the centrolinead stock on that point; lay the edge of the blade along the horizontal line, and refer to the scale for the figures corresponding to the number of feet and inches in the required distance, and at those points fix pins in the drawing board. The vanishing point will be as many feet and inches distance from the angle of the instrument as the pins are distant in divisions and subdivisions from the same angle. The value and full use of the instrument can, of course, only be learned by actual practice and study.]

REPLIES.

IRON IN CESSPOOLS.

[183.]—To be explicit, for "M. M." and others' sake, allow me, Mr. Editor, to state that I have to fill up a cesspool (15ft. deep by 5ft. in diameter) one-fifth (3ft.) in height from the bottom, with small pieces of iron, to utilise the contents for garden manure. In doing this I only carry out instructions from my employer, who had been advised to adopt it by a friend, and I honestly confess that in my practice of upwards of thirty years, I have never known such a thing used or advocated; and I, with "M. M.," doubt its utility; yet in these days of advancement there may be some chat can throw some light upon it. If so, I should feel much obliged for any information they can give. CONSTANT READER.

CEMENT FLOORS.

[189.]—In answer to yours of the 11th inst. (No. 189.), respecting cement floors. By using the washed road grit in three substances—coarse at base, second centre, fine at surface; 3in. for public foot traffic, 2in. for yards, 1½in. for kitchens, scullery, and cellars, one in three of the best Portland cement. This surpasses all round beach or York stone, as it has no flaking properties, but angle and binding. Having done some in Ramsgate, at several instances, one for public traffic, in King-street, adjacent the market, in 1860, there being no appearance of wear on the surface of that yet, nor do I think there will be. Should advance of thickness be required for sewers, horses, carts, or waggons, use well-burnt hard batts, bedded in blue mortar, not flushed, will give a key for the concrete, and form a solid, 6in. thick. To prevent slipping in frosty weather, cross it with a sharp tooth rake into lines; reverse to form squares, that must act with just as the concrete is setting; also for stables, coachhouses, meat, and fruit markets. A different groove would be for fish and cattle markets or roads 1½in. wide, 1in. deep, would form a level that would stand traffic, and not crush when thoroughly set to form by using well-seasoned oak laths 1½in. wide, 1in deep, across roads, &c. The surface to be executed rough, with a ditto floating rule, the laths to be removed after concrete being set. Such could be thoroughly cleansed in any department, there being no joints for corrosion, as in other pavings, for filth.—I am, &c., JAMES SAXBY, Guilford Lawn, Ramsgate, January 16.

GAS PIPES.

[194.]—I am inclined to think that the 6in. protecting pipe might with safety be carried up through the floor as "Old Subscriber" mentions, but all such experiments are extremely hazardous. In new buildings the authorities never permit any naked pipe serving as a flue to be brought into contact with the woodwork, and when we consider the fatal and innumerable accidents that have been caused by the overheating of pipes and the consequent ignition of the wood in contact with them, we cannot but feel they are right. No one would probably maintain that the plan proposed by "Old Subscriber" is not to all appearance a perfectly safe one, but at the same time I think no one would like to maintain that in the event of the outside pipe becoming overheated an accident might not ensue. L. P. D.

Suggestions.

UNDER this head we hope to give from time to time some useful hints on matters appertaining to materials, construction, public convenience, domestic economy, and a score of other matters which will be found both valuable and interesting to our readers. As we shall to some extent be depending on correspondents to give variety, scope, and utility to this column we most respectfully beg to solicit practical suggestions from all for the good of all.

COAL FIRES.

In order to keep coal fires in stoves over night G. S. B. suggests that the fire be covered with firebricks fitted to the size of the stove. On removing the bricks in the morning a clear fire will be found, much easier revived than when ashes are used as covering.

SOFTENING LEATHER.

Permit me to suggest the use of castor-oil for softening leather which has become hardened either by time or exposure to weather. Hardened boots rubbed with this oil and let stand for forty-eight hours become soft and pliable; so also do driving bands, harness, &c. P. F. N.

ACCIDENTS ON ICE.

After the catastrophe in Regent's park, which sent a thrill of horror through the British heart, many suggestions were made to prevent accidents in future, or if they occur to mitigate them. The most practical hint thrown out, we think, was that of suspending ropes across the waters in the parks, as if from clothes poles, so that when an unfortunate slips through the ice the rope may be lowered immediately for his assistance.

DOMESTIC FIRES.

The suggestion made by Mr. Samuel Warren in reference to economising fuel, and which appeared in the last number, has called forth many responses. One correspondent says, "I have tried the plan and found it to answer capitally." Another says, "How extraordinary that so simple a thing was never suggested before." Our correspondent is wrong here; it has been acted on, we hear, for some years past. Mr. Warren, in another letter to a contemporary, says, "I beg to inform your readers, first, that the plates are equally applicable to large and small grates. Secondly, that the plates last a long time, mine having been in use seven years, and I see no reason why they should not last seven years longer. Thirdly, the cinders falling on the hearth after poking the fire should from time to time be placed on the fire, as they contribute greatly towards keeping it at a uniform red heat. Fourthly, the plate is specially useful in a kitchen grate, securing an excellent ruddy and uniform frontage for roasting, and here also, the cinders on the hearth are a very valuable addition to the fire. Lastly, after the fire has been once made up by and bye will be seen (say in about two hours' time) a hollow in the fire caused by the combustion underneath. Then press down the top of the fire, and you have a second in excellent order; and so you go on, as may be necessary, adding as much fresh coal as may be deemed requisite. With myself a fire of average size, made up about ten or eleven a.m. lasts, with a few occasional fillips by way of pressing down and poking up, till half-past four or five p.m. without fresh coal. I find that these plates are rapidly getting into use everywhere; and in a Hull paper just sent to me it is said "the uniform testimony is that it answers admirably."

Building Intelligence.

CHURCHES AND CHAPELS.

A new Primitive Methodist chapel at Rawden was opened last week, and the cost, including school-rooms, will be about £2,000. Mr. Drewing is the architect.

The Countess of Huntingdon's chapel, on Mount Ephraim, Tunbridge Wells, is about to be rebuilt from the designs of Messrs. Wimble and Taylor, of Walbrook.

Croydon Church is to be restored by voluntary subscriptions. Upwards of £6,000 was raised at a public meeting held the other day, and the churchwardens have received £9,200 from the insurance offices.

The Rev. Prebendary Charles Mackenzie has just taken possession of the living of All Hallows, Lombard street, which has been united by Act of Parliament with the Parish of St. Benet, Gracechurch. The spacious church of the last-named parish, situate at the corner of Gracechurch-street and Fenchurch-street, will consequently be removed in the course of a few weeks, the materials sold, and the site devoted to secular purposes. With a portion of the purchase money a new church will be erected in the parish of Stepney, with an endowment of £300 a year for the incumbent.

HUDDERSFIELD.—The New Connexion new chapel in High-street, though not quite finished, was opened recently. It has been designed in the Decorated Gothic style of the fourteenth century, by William Hill, Esq., architect, of Leeds, whose design was selected from a limited competition of architectural designs publicly exhibited previous to selection. The new building stands clear of others—the four elevations being built of pitched-faced wall stones in courses, this stone being from the Longwood edge quarries. The ashlar and other hewing stuff are from the contractor's quarries at Crosland-hill. The ground plan is a parallelogram 96ft. by 60ft., with transepts, vestries, and staircases projecting from each side, and at the north end, making a total width of 88ft., outside measurement, and total length 96ft. The total cost of the chapel will be about £9,500. The contractors for the works were Abraham Graham and Sons, masons; Robert Whiteley joiners', carpenters', and smiths' work; H. Garton, plumber; John Brook, painter; D. Tunnacliffe, plasterer. Mr. William Smith has acted as clerk of works. The stone carving has been executed by Mr. S. Ruddock.

POPLAR.—The large and beautiful church of St. Stephen lately completed in the East India Dock-road, Poplar, was to have been consecrated on St. Stephen's day December 26 last, but owing to the illness of the Bishop of London and the desire of the principal subscribers that no other prelate should officiate at the opening ceremony, the consecration will not take place until the Bishop of London is sufficiently recovered to take part in the ceremony and preach the consecration sermon. Mr. Henry Green, the shipbuilder, has given £6,000 towards the building and endowment fund of the church. The ladies of the new district of St. Stephen have presented a magnificent stained glass window for the chancel, at an expense of 200 guineas. The seats in the church are all open, and there are no pews, but in one part of the building there are comfortable seats with backs to them for the accommodation of aged and infirm persons of both sexes. It was intended to erect a lofty tower and spire at the south-east angle of the church, and the height was to be 180ft.; but owing to the want of sufficient funds, the plan cannot at present be entirely carried out. The tower has been abruptly terminated at a height of 50ft. The architect of the church is Mr. Francis, whose designs have been carried out by Mr. Howard, the builder. The total expenditure on the new church will not be less than £20,000. There will be no ritualism or histrionic services in the new church. The first incumbent will be the Rev. Mr. Little, of Walthamstow.

TORQUAY.—A church is about to be erected at Ellacombe, Torquay, for the accommodation of this fast increasing neighbourhood, at an outlay of about £5,000. Sir Lawrence Palk, M.P., has already given the ground, and competition designs are to be advertised for. Babbicombe Church Torquay, is still progressing. The nave is approaching completion, but this, is with the exception of the tower, the only work yet commenced.

BUILDINGS.

BRADFORD.—THE NEW EXCHANGE.—This building, says a local contemporary, is fast approaching completion. The exterior, with the exception of the final touches from the hands of the carvers in stone, is now all but finished; and the great hall, it is hoped, will in a month or two be completed. The medallions which are now being sculptured along the front of the exchange represent men among statesmen, navigators, engineers, and manufacturers who have cleared the way for trade, and to whose lives and labours towns such as Bradford owe their prosperity. Next to the tower, in the place of honour on the Market-street front, the head of Cobden is appropriately placed, and next to that is a finely chiselled head of Mr. Titus Salt. These are all that are finished on this front, but heads of Stephenson and Watt are partly completed, and there are to follow in order Arkwright, Jacquard, Gladstone, and Palmerston. Along the Bank-street front the heads already finished are those of Sir Walter Raleigh, Drake, and Columbus, and these are to be supplemented by Captain Cook and Commodore Anson. In front of the tower under the canopies, there will be statues—one of Bishop Blaize, patron of the woolcombers.

GLOUCESTERSHIRE.—THE NEWNHAM NATIONAL SCHOOLS.—The contract for these buildings has been taken by Mr. Coleman, who is proceeding with the works under the direction of Messrs. Medland, Mabely and Medland, the architects to the committee.

GLOUCESTERSHIRE.—SEVERN BANK HOTEL, NEWNHAM.—The contract for this building was taken by Mr. Coleman, of Chaxhill, at £3,300, and he is now progressing with the works. The hotel comprises large coffee room, smoking room, commercial room, bar, manager's rooms, kitchens, offices, and conveniences on the ground floor, with some private sitting-rooms and bed-rooms on the first and second floor. The hotel, as its name implies, stands on the banks of the Severn, and commands beautiful views of the river and the neighbouring hills. It will, no doubt, become a place of resort during the summer months, both from its proximity to the Forest of Dean, which abounds in beautiful scenery, and from the absence of proper hotel accommodation for the district. The architects are Messrs. Medland, Maberly, and Medland of London and Gloucester.

STATUES, MEMORIALS, &c.

A movement is on foot to erect a monument over the grave of the late Mr. Robert Dick, of Thurso, the distinguished botanist and geologist.

Arrangements are being made for the erection of a monument to the memory of the late Sir W. Wynn, Bart, at Rhosymedre.

Mr. Charles Bacon, the sculptor, is at present executing a bust of his Royal Highness the Duke of Edinburgh.

General Items.

The Liverpool Town Council have agreed to present a bill to Parliament for powers to abolish the existing slaughter-houses in the town, and to build public abattoirs at Stanley, near Liverpool, to be subject to the control of the Corporation, at a cost not exceeding £200,000.

The nineteenth annual ball in aid of the funds of the Builders' Benevolent Institution will take place on Thursday next, the 31st inst.

The Liverpool Town Council has agreed to support the Liverpool Tramways Bill, which is to be brought before Parliament in the ensuing session.

THE NEW CEMETERY, BELFAST.—The joint committee appointed by the Town Council to investigate the merits of the various plans for the new cemetery on the Falls-road, Belfast, have selected the design of Mr. Gay, of Bradford, subject, we understand, to several alterations. The area of the cemetery is 45 acres within the walls, and the laying out of the ground, planting, draining, and boundary walls is estimated to cost about £10,000

CAUGHT.—A person living in the Rue Montmartre, Paris, finding that his coals were being stolen from his cellar, disposed amongst the heaps some petards of his own manufacture, made to resemble lumps of coal. On Thursday a violent explosion was heard in the porter's lodge, where the stove, pipe, and all had been blown up; this explosive detective had done its work, and the *concierge* was arrested.

AN ANCIENT PASSAGE.—A party of sappers and miners are again engaged in exploring the ancient passage leading from under York Tower of Windsor Castle, in order if possible to trace its source. This passage, it will be remembered, was visited by some members of the Antiquarian Society, a few months since, and created much speculation as to its origin

PARIS AND LONDON OMNIBUSES.—The Paris Omnibus Company, having found it necessary, in order to increase their receipts per omnibus in proportion to their increased expenditure, recently determined on constructing omnibuses to carry twenty-six passengers, *i.e.*, two more than hitherto; but in affording the necessary accommodation they found the weight of the omnibus so much increased as to exceed the powers of the horses, and so create a serious difference in the wear and tear of the stock. In this difficulty they applied to the London General Omnibus Company, whose omnibuses, constructed to carry twenty-six passengers, besides the driver and conductor, weigh only 23 cwt. A visit has accordingly been made to the works of the latter company by one of the directors and the manager of the coach factory of the Paris company, which has resulted in the purchase and shipment to Paris of a London omnibus, constructed, and complete in every particular, for the London streets, at the coach factory of the London General Omnibus Company, to serve as a model.

OBITUARY.—We regret to announce the death of another of those eminent scientific experimentalists and discoverers of whom the present age has been so prolific. Sir William Snow Harris, F.R.S., universally known as the inventor of the only safe method of lightning conductors, died this week. He was born at Plymouth in 1792, and was of humble origin.

An esteemed correspondent, and an authority in such matters, in a letter says :—" I am delighted with your criticisms on the National Gallery competitions; the drawings are almost beneath contempt. Why don't you have a slap at Barry's Cannon-street shed? where the roof looks as if it had slipt through the supporting towers. This, I believe, of all unshapely things, is the most unshapely and unconstructional."

THE RECORDER OF HULL'S PLAN FOR SAVING COAL.—Mr. C. Johnson, of Hull, says that he has adopted the suggestion of the Recorder of Hull for saving coal, by covering the bottom of the grate with a plate of iron, with the following result :—" The result in my house, where I have had quarter-inch iron plates fitted at the bottom of two fire-grates, at an expense of 2s. each, is a saving in coal of about one-third, with a considerable increase in heat. A large number of persons here have already satisfactorily tried the experiment, and the use of the plate is likely to become general in this locality."

QUEENSLAND LAND REGULATIONS.—To encourage the settlement of farm hands in the colony an act has been passed by the Queensland Legislature enabling persons to lease from 30 acres to 2,560 acres on the following terms :—Any of the country lands which are frequently being put up to auction beyond the distance of two miles from the boundary of any town or village at an upset price of 20s. an acre, if not sold at the auction or by selection within thirty days after being offered at auction, will be leased to first applicant at an annual rent of 2s. 6d. an acre, paid in cash or emigrants' land orders, the eighth payment to secure the full purchase of the land, after which a deed or grant in fee simple will be issued by the Government. This is specially intended, and no doubt will have the effect of encouraging the settlement of sheep farmers with limited means, as well as agriculturists, on the extensive and fertile lands throughout the colony. The extent of the new colony of Queensland is nearly twelve times that of England and Wales.

CONSECRATING A GAS FACTORY.—The city of Moscow was lighted with gas for the first time on December 27. At two in the afternoon a large number of persons who had been invited were present at the consecration of the gas factory, when a "Te Deum" was sung. The guests, after partaking of a breakfast, proceeded to the Kremlin, where the lighting was to commence. The people had gathered around a gas lamp opposite the Cathedral of St. Michael, near the Czar's bell. A platform covered with red cloth had been erected and was occupied by a military band. At half-past four the mayor ascended the platform, took a taper intended to light the lamp, whilst one of the other gentlemen turned on the gas, the band playing the national hymn. The music had not ceased before the whole Kremlin was lighted, as well as 2,016 lamps in the streets of the city.

THE NEW DOCKS AT SUEZ.—A recent letter from Suez says :—" The new careening dock constructed by the Viceroy, Ismail Pacha, near this town, was inaugurated yesterday in presence of the Consuls of England, Italy, and France, and numerous Egyptian dignitaries. It is about 425ft. long, nearly 100ft. wide, and more than 31ft. deep. It is in advance of Suez, in face of the mountains of Attaka, and has the desert to the left. At a given signal water was admitted from the sea, and the dock was filled. Then the steamer "Taka," belonging to the Viceroy, entered amidst shouts from the people. The "Taka" was afterwards removed, and the dock was emptied—an operation which lasted six hours. The dock has been executed by French and Egyptian engineers."

THE BRISTOL ASSIZE COURTS.—The time for holding the spring assize will soon be here, says the *Western Daily Press*, and still there is no hope of anything being done in the matter of the new courts. We may expect a strong reprimand from the judges, and another representation to the Home Secretary. What is to be done? Is anything to be done? Do the council intend to adopt either of Messrs. Godwin and Crisp's designs, or do they intend to throw the subject open for another competition? Perhaps it is in contemplation to memorialise the authorities to take away the privilege of a criminal assize which we prayed for so earnestly. Bristol is certainly placed in a most ludicrous position, and citizens, when they hear of the stinging sarcasms current at more go-ahead places, will be compelled to "grin and bear them." We are not satisfied with our king now that Jupiter has answered our prayer.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

1581 C. H. MURRAY. *Improvements in machinery for making bricks.* Dated June 8, 1866

The patentee claims cutting the clay into the form of bricks by forcing the clay forward by means of a pushing board or otherwise against a series of fixed wires, so arranged that the clay is pushed on or forced past the wires on to a movable board provided with handles, so that twelve or any other convenient number of bricks may be removed at the same time, as described. *Patent completed.*

1597 F. W. KUEZ. *Improvements in the construction of locks.* Dated June 12, 1866

This lock consists, principally, of two strong bolts connected together by a bar running at right angles thereto, the whole sliding together and actuated by a toothed pinion working into a toothed rack securely fixed to the middle of the said bar. The spindle which carries the pinion is also provided with a disc, having a notch or projection formed thereon; two or more tumblers are provided, which successively catch into or against the notch or projection, and prevent the disc and spindle from turning till the tumblers are pressed back by a projection from the bit of the key. The end of the spindle is squared, so that the pipe of the key, which is similarly formed, fits over it, and turns the spindle whilst the bit of the key raises the tumblers. One turn of the key will shoot the bolt, but by giving two or more turns, according to the length of the rack, the bolts can be thrown a greater distance into the recesses made to receive them, and thus a greater security will be afforded. The lock is further secured by means of fixed wards, and by a revolving guard, inside the keyhole, which turns with the key, and closes the keyhole before there is any action on the tumblers. *Patent abandoned.*

MEETINGS FOR THE WEEK.

MON.—Royal Geographical Society.—Papers to be read—1, "A Geographical Inquiry, with reference to the Best Site for a Capital of India," by the Hon. George Campbell. 2, "On the Inland Navigation of Travancore," by Mr. C. R. Markham, 8.30.

TUES.—Institution of Civil Engineers.—Discussion on "Ships of War," 8.

Royal Institution.—"On Vibratory Motion, with special Reference to Sound," by Professor Tyndall, 3.

THURS.—Royal Institution.—"On Vibratory Motion, with special reference to Sound," by Professor Tyndall, 3.

FRI.—Royal Institution.—"On the Crystal Palace Fire," by J. S. Russell, 8.

Royal United Service Institution.—"The Best Mode of Recruiting for the Army, and the Influences bearing upon that Service," by Captain R. C. Noake, 3.

Architectural Association.—"Oyster Culture Architecturally Considered," by Mr. J. P. Seddon, 7.30.

SAT.—Royal Institution.—"On Harmony," by Mr. G. A. Macfarren, 3.

Trade News.

The tender for the diversion of the Lime-kiln Dock and Blackwall sewers has been given unanimously to Mr. Webster for £20,000. An amendment was made to let Mr. Ritson have it for £18,500, but met with no support.

Mr. C. N. Foster, of Whitefriars, is the contractor for the new works for the Great Northern Brick Company, at Hitchin; and the Messrs Dixey, of Abchurch-lane, are the contractors for the erection of the new bridge over the canal at Westbourne Green

TENDERS.

ASCOT.—For house and stable at Ascot. Mr. Rushworth, architect :—

Haywood	£3,877
Norris	3,276
Higgs	3,263
Simpson	3,089
Sawyer	2,880

KENT.—For Kent County Lunatic Asylum, new office buildings, dining-hall, &c. The accepted tenders are—Mr. Stiff for contract No. 1; Messrs. Weeks and Son for contract No. 2; and Mr. Aldridge for contract No. 3.

NAMES.	Contract No. 1.—Builders' work.	Contract No. 2.—Smith & founder.	Contract No. 3.—Plumber & glazier, &c.	Contracts Nos. 1, 2, & 3.—The whole of the work.
Sollitt, Strood				28,114 0 0
Simms and Marten, London				24,325 0 0
Anscombe, Maidstone	19,635 0 0	1,760 0 0	3,040 0 0	24,350 0 0
Wallis and Clements, Maidstone	18,967 0 0			
Wilson, Canterbury	18,747 0 0		3,007 15 0	
Vaughan, Maidstone	18,650 0 0			22,597 0 0
Grensted, Maidstone	18,550 0 0			
Naylar and Son, Rochester	18,187 0 0	1,370 0 0	2,640 0 0	22,093 0 0
Matthews, Dover	18,000 0 0	1,259 0 0	2,999 18 0	22,258 18 0
Stiff, Dover	16,767 0 0			21,195 0 0
Young, Carrington, and Co., Perth and London		1,590 0 0		
Shrubsole, Maidstone		1,409 0 0		
Spencelargh, Rochester		1,377 16 7		
Butchard, Gravesend		1,375 0 0		
Smyth and Co., Dover		1,369 0 0	2,746 0 0	
Russell, Strood		1,352 10 0		
Garrett and Co., Maidstone		1,350 10 0		
Drury and Biggleston, Canterbury		1,310 0 0		
Colling, Maidstone		1,300 0 0		
Weeks and Son, Maidstone		1,285 0 0		
Foord and Sons, Maidstone			2,889 18 0	
Chandler, Dover			2,867 0 0	
Cruttenden and Son, Maidstone			2,747 0 0	
Fryer, Maidstone			2,616 0 0	
Hyles, Maidstone			2,597 0 0	
Aldridge, Rochester			2,338 0 0	

HOLBEACH.—For the new carved roof of nave of Holbeach Church :—

	Deal.	Additional for oak.
Milson, Donnington	£890	£455
Brown, Lynn	831	258
Paterson	820	233
Bennett, Lynn (accepted)	740	160

LEADENHALL-STREET.—For the erection of premises, 69 and 70, Leadenhall-street, for Messrs. Pound. Messrs. Humphrey and Son, architects :—

Myers	£6,179
Rider	5,991
Heashaw	5,979
D. King and Sons	5,960
Sparks	5,890
Ecoor	5,890
Ashby and Sons	5,875
Hart	5,831
Ashby and Horner	5,800
Brass	5,634

LONDON.—For alterations, &c., to the Talbot public-house, Caledonian-road, for Mr. W. Jones. Mr. T. Brookes, architect :—

J. D. Cowland	£875
Turner and Sons	797
Langmead and Way	775
Gillett and Wisbey	750

TUNBRIDGE WELLS.—For rebuilding the Countess of Huntingdon's chapel, Mount Ephraim, Tunbridge Wells. Messrs. Wimble and Taylor, architects :—

Edwards Brothers	£5,611 6 0
Walker	5,301 12 0
Grinsted	5,066 2 9
Dove Brothers	4,570 0 0
Simms and Marten	4,534 0 0
King and Sons	4,277 15 0
Anscombe	4,073 0 0

WEDNESBURY.—For the erection of cemetery chapels, lodge, and entrance gates for the Wednesbury Local Board of Health. Messrs. W. and S. Horton, architects :—

Lovatt, Wolverhampton	£2,687 10 0
Jeffrey and Pritchard, Birmingham	2,652 10 0
Stockton and Sons, Oldbury	2,550 0 0
Briley, Birmingham	2,499 17 1
Burkitt, Wolverhampton	2,369 0 0
Crutchley, Walsall	2,349 10 0
Haffner, Tipton	2,264 10 0
*Trow and Sons, Wednesbury	2,258 0 0

* Accepted, subject to modifications.

WOLVERHAMPTON.—For extensions to the Wolverhampton Union Workhouse. Mr. J. R. Veall, architect :—

G. and F. Higham	£1,100
Lovatt	1,085
Birkett	1,066
Roberts	999
Plank	974
Thompson (accepted)	935

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

PROPERTY SALES.

JANUARY 21.

AT THE GUILDHALL COFFEE-HOUSE.—By Mr. Rowbotham.—Freehold residence, No. 7, Stafford-road, Tredegar-road, Bow, let at £23 8s. per annum—sold for £235.

Freehold residence, No. 8, Stafford-road aforesaid, let at £21 per annum—£235.

JANUARY 22.

AT THE MART.—By Mr. W. T. Jones.—Leasehold residence, No. 53, Sussex-street, Warwick-square, Pimlico, let at £48 per annum, term 73 years from 1860, at £8 per annum—£155.

Leasehold residence, No. 5, Albion-terrace, Grosvenor-road, Pimlico, let at £55 per annum, term 71 years from 1862, at £9 per annum—£185.

AT THE GUILDHALL COFFEE-HOUSE.—By Messrs. E and H. Lumley.—Freehold two residences, situate in the Bridge-road, Redhill, Surrey—£975.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

John Hitchcock Chubb, Belgrave street, builder, Jan. 30, at 11—Sydney Dyne, South Norwood, carpenter, Jan 30, at 1—John Faulkner Mathews, Reigate, builder, Feb. 4, at 1—William Bing Naish, University street, Tottenham-court road, house decorator, Feb. 4, at 1—Daniel Simpson, Grange-road, Bermondsey, plumber, Jan. 30, at 12—Maurice Benjamin Solomons, Stafford street, Piccadilly, commission merchant, Jan. 30, at 2—William Barton Barnard, Grundy-street, Poplar, house decorator, Feb. 6, at 2—Abraham John Cave, Vernon street, Clerkenwell, house decorator, Feb. 7, at 1—William Cranstown Day, Rotherbithe, plumber, Feb. 4, at 2—Thomas Dieny, Compton street, Clerkenwell, jobbing carpenter, Feb 4, at 1—Abraham Evans, Great College street, Camden Town, contractor, Feb. 4, at 1—William Wallace Redgrave, Grove street, South Hackney, builder, Feb. 6, at 12.

TO SURRENDER IN THE COUNTRY.

Thomas Churchward, Torquay, carpenter, Jan. 29, at 11—J. Mottram, Ecclesfield, slater, Jan. 31, at 1—J. King, Rixon, Wellingborough, brickmaker, Jan. 30, at 11—Paul Sharpe, Hereford, builder, Feb. 1, at 12—Edward Speed, Oldham, lath render, Jan. 30, at 12—Thomas Taylor, Norwich, painter, Jan. 29, at 11—W. Willey, Stanhope, Durham, contractor, Jan. 31, at 10—Edward Williams Wynne, Liverpool, commission merchant, Jan. 29, at 11—John Thomas Hall, Brightside Bierlow, Yorkshire, joiner, Feb. 13, at 12—Joseph Hawkins, Stafford, joiner, Feb. 4, at 12—John Morgan, Neath, builder, Feb. 1, at 11—John Pickering, Wakefield, joiner, Feb. 2, at 11

THE BUILDING NEWS.

LONDON, FRIDAY, FEBRUARY 1, 1867.

THE COURTS OF JUSTICE COMPETITION.

ARTICLE III.

IN our detailed notices of this competition, we propose, first, to devote an article to each design as arranged in the exhibition; we shall then place in direct comparison what we opine to be the chief merits and the great faults of each, and finally review the leading criticisms and opinions which may be made public during the time the exhibition remains open. The first men to enter the lists are Mr. Abrahams and Mr. Scott. As we have not yet been favoured with a copy of Mr. Abrahams' report, and as Mr. Scott has been kind enough to send us a copy of his, we propose devoting this article to a consideration of the design submitted by the latter gentleman.

That this design, with its report, exhibits a vast amount of very laborious work is unquestionable, and when Mr. Scott tells us that it has employed his best thoughts and time and aspirations for three-quarters of a year, we cannot feel surprised. On the contrary, far from feeling astonished at the length of time the subject has occupied Mr. Scott's attention, we are, as we have always been, immensely surprised at the brief period allowed for the preparation of such an important set of drawings, and the solution of such a difficult problem. When we consider for a moment the multifarious engagements and the many very hard tasks which our leading architects are called upon to fulfil in the course of their ordinary practice, and when we have learnt to appreciate the magnitude of this competition, and what it is which constitutes the problem to be solved, we cannot but be struck with amazement at what we can only regard either as the ignorance or the coolness of the Commissioners in putting so short a limit to the time for thinking out such a stupendous subject. That Mr. Scott should give the Commissioners a gentle hint on this very point, in the second paragraph of his report, is not to be wondered at. He tells us, in the modest and earnest language usual with him—"Others may possibly have greater facility of arrangement than myself, though I have probably had as much experience in arranging large buildings as any man; but I may say that to me, the labour has been such that, though I embarked in it vigorously on the very day after I agreed to join in the competition, I have ever since been hard at work upon it, often giving to it eight hours or more a day for many days together." We most heartily sympathise with those unfortunate, or, as some would say, too fortunate, architects who have been committed to such desperate slavery: nor can we help coming to the conclusion that the Commissioners have acted with a most unwise haste, to say the least, for they must have known, if they cared to give a thought to the subject, that the design they sought and the country needed was no every-day matter, nor was it likely that it would well forth, at a moment's notice, in the head of any, even the most accomplished of architects, nor flow out, like Tupperian rhymes, in spite of preoccupied brains and the crowd of thoughts which the daily practice of a well-to-do architect must necessarily generate. If, then, in the capacity of critic, we have to recognise and point out more failures than successes, errors of judgment which a second thought would have corrected, faulty design which has been forced out of an overworked intellect, or hurried, incomplete, imperfect drawings, which have been made as it were against time, it must not be taken as by any means a correct or unqualified measure of the art-stature of the architect, but rather as another proof, if any proof were needed, of the utter incapacity of the English people to appreciate, we would almost say to apprehend, the spirit of art, or see anything beyond the narrow boundaries of trade and merchandize. It is this essentially shoppy aspect of architecture which Englishmen persist in taking—a view which assumes that Gothic or Classic, or anything else, can be bought by the yard, and that the best shop is that which has been the longest established and employs the greatest number of hands. It is this wretched little vanity of us that will not permit us to see the use of anything higher or nobler than ourselves, even if we are so far removed from idiocy as to believe that anything *can* be higher or nobler, which is at the root of all the miserable failures in the history of modern architecture. It may be that Mr. Scott believes he is to be judged by men who know more of his art than he does himself, or it may be that he accepts as true what we have said, but from what are called motives of policy, or from an overflowing tenderness of heart, declines to act as he would, were he physician, poet, painter, sculptor, or engineer. This tenderness in a great art age may be all very well, but at a time when the people only care for accommodation—when there is no architectural knowledge, not even in the so-called artists, the architect who would be of any use to his craft and to the world must assume a different attitude to that to which architects are, as a rule, accustomed. He must lead and not be led, nor must he at every slight provocation enter upon an elaborate defence of the line he has adopted, or dream of making any apology because people care not to understand him. We have been led to these remarks from finding in Mr. Scott's report some six pages devoted to what we can only call a defence of the "architectural treatment" of his design, which goes so far as to include a defence of Gothic art in general and Mr. Scott's Gothic in particular. "That this style," says Mr. Scott, "*is* suited to Law Courts and offices has been practically proved at Manchester. That design was made very soon after my own designs for the Government offices. I was driven by adverse circumstances, and the mistaken prepossessions of one great man, to abandon my design, while Mr. Waterhouse was so fortunate as to carry his into execution, and in doing so has proved the absolute truth of all which I had in vain urged respecting my own." We are not at present writing a biography of Mr. Scott, or we might make up a chapter on every sentence in the pregnant remarks just quoted. The great point we wish now to note is the confession that an architect, who we may fairly presume has a will of his own, was driven by the mistaken prepossessions of another man. Now in all seriousness we ask Mr. Scott, Can he expect to lead—can he suppose that men will acknowledge his power, when he himself submits to be driven by what he knows to be "mistaken prepossessions?" In the general suavity of manner and kindly feeling which are so eminently characteristic of this architect, we were learning to forget how at a critical moment he left his first love, and like the Red Cross Knight, became entrapped by the still greater suavity of a "subtill Archimago;" but this attempt at an excuse or an apology for an act which shook to its foundations the trust his brethren had learnt to place in him only opens the old sore, and makes the case worse than it was before. In this, however, there is little difficulty in discovering a certain nervousness or restless anxiety, which appears not merely once or twice, but manifests itself throughout the report, and in almost every drawing. This is the one great defect of the design before us, and, if Mr. Scott can produce nothing better in architectural composition and detail than that of the elevation towards the Strand, the world will probably have to thank the late Lord Palmerston for having bullied whatever promise there might have been in the architect of the Foreign Office to such a pass as to be nearly akin to death. That he did not quite kill Mr. Scott is evident from the bits of his old power which he here and there displays in some of his drawings for the Courts of Justice. We can only hope that Mr. Scott, who is by no means an old man, will gather his mantle more closely around him, and nurse a strength which he undoubtedly once possessed, but which people now say is failing, and so obtain many a future triumph.

The general plan which Mr. Scott has adopted is very unlike all the others, in as much as the outer shell of building does not completely surround the site, being omitted towards the Strand in order to give more space to the central block of building. The outer shell, or the buildings towards Carey-street, Clement's Inn, and Bell Yard, are devoted to the minor departments of the law, the projection of the site towards Clement's Inn being devoted to the Record department. Within the outer shell is an area or street opening into the Strand. Bounded by this internal street on the north, east, and west, and by the Strand on the south, is a huge block of buildings, with a central projection towards the south of one-third the length of the main building, and "an open space" in the centre of the block. This central mass is devoted to twenty-two out of the twenty-four courts required, and the chief offices. The other two courts, the Divorce Court and the Bankruptcy Court, though on the same floor and connected with the general group, are drifted off to the right and left, "each to its proper department," that is to say, the Bankruptcy Court is in the midst of the department towards Bell Yard, and the Divorce Court is towards the southern end of the Clement's Inn façade. Each of these is connected with the general group of courts in the central block by a bridge across the internal street. We will now consider the arrangement of the court floor as involving the essence of the great question of concentration.

Beginning with the centre of the building, what we have above described, in Mr. Scott's words, as an "open space," is, in fact, no such thing, the "open space" being very considerably cut up into four small areas by a central octagonal hall, and corridors leading therefrom. In the centre of this hall is a great circular lift, about 8ft. in diameter. Round this are two concentric staircases of iron enclosed by an octagon; beyond this, leaving ample space, come the great walls of the octagonal hall. The four cardinal sides open into corridors. The four diagonal sides are recessed so much as to bring the octagon very nearly to a square; the corridors lead us to a very elegant and spacious ambulatory of nearly 30ft. wide, divided into two aisles by about forty-six shafts supporting quadripartite vaulting. This ambulatory, which Mr. Scott says far exceeds Westminster Hall in superficial area, is one of the chief charms of this design, perhaps the chiefest. Opening out from this ambulatory, the outer aisle of which is prolonged through the east and west blocks, are the chief courts, arranged as follows:—On the north, to the west of the centre, which is occupied by a corridor, is the court of the Lord Chancellor; then an open area, and we come to the courts of the Lords Justices and Vice-Chancellor Stuart; then another open area and Vice-Chancellor Wood. To the east of the centre we have the Master of the Rolls, an open area, Vice-Chancellor Kindersley, the spare Equity Court, another open area, and the additional Banco Court which was only hypothetically asked for. In the eastern block we have the three Courts of Queen's Bench and in the western block opposite we have the Admiralty Court, the extra Ecclesiastical Court and the Exchequer Chamber. On the south side we have in the centre the spare court required, which Mr. Scott jocularly calls the "Sensational Court;" presuming that this court is intended for causes of more than usual public interest, the extra size required for this court has induced Mr. Scott to project

it apse-like into the ambulatory. To the east of this central feature we have an open area, then two of the Courts of the Common Pleas, another open area, and the third Court of Common Pleas; and to the west we have the three Courts of Exchequer similarly arranged. We have already said that the Bankruptcy and Divorce Courts are placed in the midst of their own departments. One more court remains to be described; this, the Appellate Court, which, as its name implies, differs from all the others, is placed in the very centre of the Strand front, and it is only fair to Mr. Scott to note that he has anticipated the objection that would naturally arise to the position of this court, on the score of sound in the following passage:—"The front windows are sufficiently elevated above the street to prevent annoyance from sound. They would also be double glazed with plate glass. They need never be opened, as ample ventilation is provided without them." Considering the enormous traffic of the Strand, which would necessarily be increased rather than diminished by the erection of the Courts of Justice, we must confess that the position of this court is by no means a desirable one; the other faults of the arrangement above described are comparatively minor ones; thus the projection into the ambulatory of the central court ruins the architectural effect of the south walk. The separation of the Courts of Exchequer from the other Common Law Courts by the introduction of this "Sensational Court" is also undesirable. For the rest no one can fail to see that the courts are brought well together, and every convenience afforded for the legal public without waste of room or unnecessary display. Transversely the arrangement of this central block of buildings is as follows:—Beginning from the inside we have, first, the ambulatory, then the courts, then the judges' rooms and staircases, then a corridor, and then barristers' rooms, judges' clerks' rooms, &c. These last have a story above them, entered from a gallery in the corridor, so that the latter may receive plenty of light over the flat roofs of the judges' retiring rooms. The chief mistake in such an arrangement as this seems to us to be the lack of privacy for the judges, as unless they are constantly going up and down stairs their only means of intercommunication would be by a corridor which is also used by the barristers. Passing, now, to the external shell, we have the chambers and offices of the judges and chief clerks in equity at the back of their respective courts, and connected with them by covered bridges. This is all as it should be; but when we turn to the Common Law Department we find that the judges' chambers are pushed to the ground floor, in order to find room for the Court and Offices of Bankruptcy. This we think a mistake, arising, no doubt, from Mr. Scott's anxiety to provide not only all the courts positively required, but also the extra ones which were suggested—in other words, spoiling the completeness of his plan in order to give more courts than can be perfectly adapted to the site. The western side of the outer shell, as well as the projection beyond it into Clement's Inn, is for the main part given up to the courts on this side, and here it is that Mr. Scott's differs materially from any of the other plans. The boundary of the site on this side was exceedingly irregular, and the consequence of this was that in June last Mr. Scott wrote, on behalf of the competitors, asking for an extension of the site, and obtained leave to make such projections or extensions of the building westward as the architects might find desirable, so long as they preserved an equivalent in area for Clement's Inn, and abided by certain other arrangements which it is not necessary to specify. This "privilege" Mr. Scott has, we think, unwisely taken full advantage of by projecting beyond the main line of his west front two Record towers, at a considerable distance apart, and between and beyond these a large pile of building devoted to the Probate Office. The odd thing is that, in order to secure this and possibly to get a greater width for the central projection in the Strand front, owing to the peculiar line of Pickett-street, he has positively sacrificed some 30ft. of the main frontage, and, as we think, spoilt in a measure both his plans and elevations. We shall not attempt to go into the arrangements of the various offices, either in this or in any other design. But we have yet to notice two things—the sections or rather that portion of them which relates to the levels, and the elevations. Now the level of Carey-street, or the north side of the site, is about 17ft. higher than the level of the Strand, the difference of level from north to south being immaterial. Mr. Scott has taken the Strand level as the level of his internal streets, and as the floor of his lowest story. This difference in level it is as well to keep strongly before us, for Mr. Scott truly observes that, owing to it, great confusion may arise, as what is ground floor in one place may become first floor in another, and what is ground floor in the Strand may become basement in Carey-street. Mr. Scott has rightly taken the court floor to be defined by the instructions which makes it some 38ft. or 40ft. above the Strand level. The way in which this 40ft. is treated towards the Strand, that is to say, in the central block, is very different from the arrangement at Carey-street. In the former, for instance, there is a story immediately beneath the court level devoted to witnesses, attorneys, &c. This floor is one level throughout, and though the rooms below the court are low, those exterior to the courts, and which therefore come below the judges' rooms, &c., are raised by the additional height of the bench to the ordinary dimensions of the other stories. Below this we have one lofty story for public offices, and then we come to the basement, which is half a story above the level of the Strand. Now in Carey-street we have three stories below the court level, or what would be the first floor to Carey-street, and the third floor to the internal street; and the report is not unlikely to confuse, as it describes the floor immediately below the court floor "The upper ground story," the lower of these stories being so placed as to be half above and half below the level of Carey-street. This seems to us to be a very good arrangement. We wish we could say the same of all Mr. Scott's endeavours to deal with what he calls its architectural character and design. On this point, Mr. Scott tells us that, though essential, it should be postponed to all practical considerations; that he exercised an almost "stoic virtue" in studying the practical arrangements, to the exclusion of nearly every thought of art, labouring day by day over the juxtaposition of rooms and the locating of departments, frequenting the law offices till he was almost ashamed to show himself in them with his roll of papers in his hand; and then follows another confession, which is very important indeed:—"I confess I could not have kept myself up to this pitch of virtue had I not the prospect before me of at length clothing my work in a sightly garb, and rewarding myself at last by the application of art to that which had hitherto been merely contrivance." We have not now time to discuss the question involved in this confession, to separate the architect into a virtuous contriver on the one hand, and into an artistic dresser on the other hand. To divide his power, genius, or whatever you like to call it, into two or more parts, with the idea that these can have a separate life and action, seems to us as suicidal as it well can be, and about as unphilosophical as if the eye were to say to the hand, "I have no need of thee;" or the head to the heart, "I have no need of you." We may return to this hereafter. It is enough to say that we think Mr. Scott's architectural power declared itself in his Gothic designs for the Foreign Office, in his design for the Hamburg Exchange, and in his new Town Hall at Preston, much more than in any of the drawings for the Law Courts. It is true that Mr. Scott insists that his design is the outcome of the plan, and that nearly all the great features of what people call the architectural composition result from the practical distribution of the building. We can only say that the requirements of the Commissioners, even though contrived with Spartan courage, are not the sort of things to encourage the development of art. In the towers which flanked the projection towards the Strand, Mr. Scott was unfettered, and so practically he makes them both clock towers, for, although one is to serve as a ventilating tower, its great purpose would appear on its four sides, in the shape of huge sun-dials. These towers and the whole composition which they flank we look upon as the greatest defect in the design; the portals are low and out of proportion with the superstructure. The smaller features remind us of the most unsatisfactory parts of the Foreign Office designs, and the attempt to secure lightness has resulted in monotony, the effort to grasp repose and strength has ended in baldness. That much of this would have been obviated had the architect had time to think out the subject, and give that reconsideration which a building of such magnitude demands, we do not for a moment doubt. The designer of the double ambulatory and the interior of the porch and vestibule, with the help of such draftsmanship as is manifested in this latter drawing, could scarcely fail to have produced a building incomparably finer than that depicted in the general views, had he but had time commensurate with the thought and experiment required for such an exceptional work. Indeed, we have at times felt it difficult to say the hard things we have said when we have reflected on the enormous labour which has been crammed into nine months; but the architects, having accepted the conditions, must abide by the result; and after all it is only a question of comparison, as no one of the designs exhibited has had anything like sufficient thought bestowed upon it to justify the expenditure of a million and a half of money. The great question to be decided is not whose design is prettier from this point of view or from that point of view, or whether the Central Hall schemer or the Corridor schemer should win the day, but which architect shows the greatest grasp of the whole subject; and who, not as a contriver of rooms or a dresser of walls, but as an architect in all the grandeur which the name implies, is most likely from the evidence before us to carry out the building in every respect to a successful issue.

RAILWAY VIADUCTS.

The frequency of calamitous accidents in connection with arched viaducts—a form most extensively adopted in railway construction, and occurring in continuous miles upon our suburban lines—seems to call for condemnation from the press, and a strict investigation from authoritative quarters. An isolated failure may be referable to especial circumstances, but the constant recurrence of similar accidents points to unsoundness of principle. It is hardly necessary to state that the favourite and prevailing form of arch in these works is the elliptic, and that of all the forms in common use the elliptic is the weakest. It is the least homogeneous, the least uniform in its curvature, at the best; but we do not find in the examples now under contemplation such models as were presented to the admiration of passengers by Mylne in the late bridge at Blackfriars. We are, rather, doomed to wonder at the degree to which so graceful a curve can be distorted and degenerated. There are sharply-pinched haunches with a broad expanse of intervening work infinitely more allied to the notion of a flat soffit than to anything fairly to be denominated head or crown. The infirmity of such a line is obvious: the under and outer faces (the intrados and extra-

dos) of the arch are of equal dimensions, and the voussoirs lose their sustaining, wedge-like shape. The danger of such a form would be great, even with masonry of the nicest workmanship and blocks of the largest size—with hard, closely-fitting material requiring and admitting only a very small amount of mortar. What, then, must be the peril when very considerable spans are attempted in a few—seldom more than four—half-brick rims, in very common mortar, whose defective quality is sought to be atoned for by profusion in its use?

The Trinity Bridge at Florence, the bold design of Bartolomeo Ammanati, architect to Duke Cosmo I. (1566-1569), is of course the staple authority of adventurous moderns. The centre arch of this famous bridge is 95ft. 3in., and the two at the sides are each 85ft. 6in. in width, the rise being only 14ft. 10in. and 13ft. 7½in. respectively. But there is one peculiarity in the St. Trinity not usually copied or even noticed. The arches are slightly pointed, though the angle is discernible only from beneath, being concealed on the faces by the marble shields which decorate the crowns. The depth of the voussoirs is 2ft. 9in. throughout, and there is a total thickness of 4ft. 2in. between the face of the soffit and the surface of the road. The piers are 21ft. wide, in accordance with the safe but disproportionate massiveness common before the days of Perronet. The flattened ellipse conveys, perhaps more than any other, an impression of completeness with a limited elevation. It falls agreeably into the vertical lines of the piers, and is eligible where the utmost headway is requisite; but it would certainly add to the supporting power of the arch if the apex were pointed, and yet further if the central portion were regarded as partaking of the character of a beam with a maximum depth at the crown, for, let the yielding point be where it may, no part is more prompt to follow that yielding than the middle section of the work. It is here, too, that water-setting mortar should be especially employed, and every means be applied to prevent the destructive action of percolating moisture.

It has been thus far assumed that a particular form of arch must be used, and the superior strength of segments, simple or pointed, is not thrown into contrast; but there are two distinct forms of constructive design that may well be compared when the question of safety is under review. The most primitive kind of bridge conceivable is, perhaps, the trunk of a tree thrown from one bank of a stream to the other; the next, two such trunks, with a flooring of planks supported by them. The Euphrates at Babylon had a bridge of this sort, with piers or abutments of stone, and the framework being removed at night kept the predatory Assyrians from nocturnal maraudings. Without stopping to examine how stone piers might be extemporised by boats, as ascribed to Darius, or whether the bridges of Xerxes across the Hellespont had much affinity with the suspension principle of modern examples, it is sufficient to perceive in the Babylonian instance the existence of beams and flooring. This principle of beams and flooring must have been in common use for ages previous to the invention of the arch, has kept its ground in the face of that discovery, and is not, apparently, likely to be superseded. In timber construction the original beam would be sometimes represented by a supporting framework of struts, ties, and braces, and to each aggregate of this kind we should apply the term "rib." In the disposition of the several parts an endless variety would be observable, but the leading elements have been handed down from the remotest periods to our own day.

The Greeks were not perhaps eminent bridge-builders, but the Romans acquired unprecedented skill in arcuation, and were thus enabled to substitute for wood the more durable material of stone. The ancient examples were of very moderate width, and the footways were raised and protected by parapets. Masons of other times and places are known to have adopted the mechanical systems of the carpenters they followed, and these may have continued to construct bridges with ribs of stone, as did their descendants and imitators of the Middle Ages. Thus, the twelfth century bridge, at Avignon, with twenty-two arches, has for each arch four ribs or series of vault stones, separately built. This bridge had an elbow to the current, but its singularity in this respect disappears by comparison with the Old English specimen of three branches at Crowland, in Lincolnshire. Not, however, to forget the main subject, it may be said that the old stone bridges of this country were generally built with ribs.

Next, in point of time, comes the application of iron, an application still novel, and a material in this particular comparatively new. The properties of the others greatly intensified make up its own. In its manipulation the mason gives way to the smith, but the carpenter becomes so much the model that carpentry appears with necessary modifications to be reproduced in iron. In bridges the rib principle is again made use of, and with most economical effect. We will not now discuss the question of simulative iron arches; it must be admitted they are strong. They can be placed moreover with direct reference to the superincumbent strain. Thus, at Westminster they are much closer under the roadway than under the footpaths, and in railway works they can be applied at the precise point of necessary support. Where the forces are so concentrated as in railway trains, it seems only rational that the sustaining power should also be concentrated; and when all circumstances are taken into account it may appear that few methods would surpass in lightness, facility of erection, durability, even cheapness, and our chief object at the present moment—safety—of iron ribs in lieu of brick arches.

THE SEWAGE DIFFICULTY—EARTH CLOSETS, &c.*

THE time is evidently approaching when the whole question as to the best mode of dealing with the sewage of towns will have to be reconsidered, and when, as it is to be hoped, it will be satisfactorily solved. There is no doubt that the subject is one of those which calls loudly for the interference of scientific and practical men. It is a great point gained by those who seek for such reforms that the public are day by day becoming more and more interested in them, and that the sewage difficulty and its surroundings are now discussed with a freedom which false delicacy for a long time prevented. The statistics furnished by various authorities in reference to the positive evils, as well as the intolerable nuisances, arising from defective sewerage, and the published experiences of those who have devoted time, study, and labour towards remedying those defects, furnish admirable data upon which to base future action. In matters of this nature, a little actual experimentation is worth much theorising, and facts are far more valuable than the most ingenious speculations. It is unquestionable, nevertheless, that the papers on sewage, water supply, &c., read before such societies as the National Association for the Promotion of Social Science and other bodies of a cognate character, as attracting attention, and by familiarity lessening and not breeding contempt, have their value, and must on no account be disparaged.

The now celebrated sewage conference which took place appropriately enough in the Royal Pump Rooms at Leamington† last October gave prominence to a system of what might be termed domestic sanitation, which had previously occupied the attention of several gentlemen of eminence, but which, in principle at least, is almost as old as the creation of man—we mean the earth-closet arrangement. To Mr. John Hitchman, of Leamington, indeed, belongs the merit of suggesting the general practicability of commingling dry earth with those materials which now pass in almost all towns into sewers and drains, and afterwards of utilising them as nature, which is ever thrifty, appears originally to have intended they should be utilised. Since then Mr. Boardman, of Norwich, has very ably shown the possibility of applying the plan with advantage and economy in the city of Norwich. The communication of the last-named gentleman in reply to Mr. Morant, and which appeared in the BUILDING NEWS of the 25th ult., is a very good exposition of the earth-closet system and its correlative superiority over existing modes of dealing with household sewage, although, as in all cases of suggested improvement, the would-be improver will have to encounter much active antagonism. Last week we gave some more correspondence, and this week we give Mr. Morant's rejoinder. We have published this correspondence at length, as it relates to one of the most important social questions which can occupy the minds of Englishmen at the present moment. As there was an apparent discrepancy between the speeches and the resolutions, as given by our special reporter, of the Leamington Conference, we wrote to that gentlemen for an explanation. He says, in reply, that whilst the opinion was in one direction, the resolutions which were passed after several hours' debate, and when many had left the room, were in another.

Perhaps, however, the author of the pamphlet entitled the "Sewage Difficulty" has contributed yet more complete evidence in favour of earth *versus* water closets, than either of the persons just named, whilst his facts and inferences are strongly put and lucidly drawn. In his instructive treatise on sewage, and how to deal with it, Mr. Bannehr has avoided as far as was possible technicalities, and he carries his reader forward with almost irresistible force. A very pertinent question is that propounded at the fourth page of the pamphlet under notice, viz., What is sewage? and the answer given is explicit.

> I will (says the author) take the word sewage to mean simply what its name implies.—the water in and from sewer or service drains; and, therefore, as not necessarily containing any human excreta or other manurial matter whatever; although sewage is in many instances polluted with, and made a medium for conveying the most offensive and repugnant matter with which we are acquainted—human excreta—as well as many other matters But it is very common to hear "night soil" called sewage because sewage sometimes contains in an elementary—that is, in a fresh or undecomposed state—the fluid and solid matters which if they were in a state of admixture would constitute night soil. And it is this confused idea of the identity of "sewage" and "night soil" which serves to cause much misapprehension respecting the sewage difficulty. It should, however, be remembered that, although sewage may contain a certain amount of human excreta, sewage is not, like night soil, suitable for manure; because as a rule, at the time it leaves the town, such manurial matter has not undergone the process of decomposition which is essential for changing its elementary state and making it suitable for nourishment of vegetation. . . . . It may be taken as an axiom that what will support animal life is unfitted for the nourishment of vegetation, and that what will support vegetable life is quite unsuited for the sustentation of animal life.

Mr. Bannehr, who has evidently devoted years of patient inquiry to the subject upon which he treats, enters next into a statement of the chemical characteristics of the two parts of the excreta, solid and fluid, and adduces also the tables of Dr. Thudicum as to the market value of the various components, in support of his own calculations. The sewage system of Croydon, that of irrigation, is criticised and condemned by the writer of the "Sewage Difficulty," who endeavours to connect with it certain cases of rinderpest as resulting from the consumption by cattle of

* "The Sewage Difficulty: its Cause, Effects, Remedy. Considered in Reference to its Sanitary, Commercial, and Agricultural Aspects." By J. BANNEHR. London: R. Hardwicke, Piccadilly.

Report of the Sanitary Committee of the town of Nottingham, for the year ending September 30, 1866. James and John Vice, Nottingham.

† *Vide* BUILDING NEWS, November 2, 1866.

sewage-fed grass. The rather too well-known phenomenon, if the term be admissible, of the liberation of a certain quantity of sewer gas when the handle of a water-closet is lifted, is mentioned and explained. "It arises from the admixture of the various matters in the sewers producing gaseous exhalations which escape to the outer atmosphere,"—by the action of the beneficent and wondrously-beautiful law of the diffusion of gasses, "and cause in such instances pernicious effects."

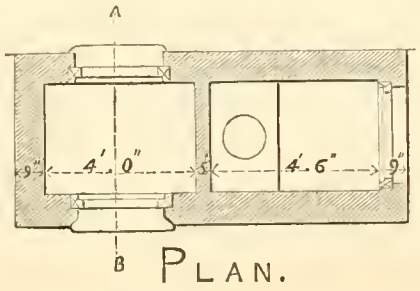
Some remarkable facts are adduced with regard to the sewerage of Birmingham, which is generally termed a well-drained town. Mr. Bannehr tells us—and he has furnished himself with incontrovertible evidence in support of his facts in this as apparently in all other cases to which he refers—that the main drain at the sewage outlet discharges in dry weather about 15,000,000 gallons daily. Assuming the population to be 300,000, this is a rate of 50 gallons per day for each individual, whilst the average consumption of water does not exceed 10 gallons for each person. The discrepancy shown by these figures is due to the circumstance that "the sewers drain the shallow springs," as was proved when the drains were constructed, for many of the wells of the town then ceased to yield water. "It naturally follows that if the water percolates into the drains from above their level, the drains will also permit a portion of their contents to pass through fissures and cracks into the springs below their level. . . . Such is the disgusting condition of much of the Birmingham water that an analytical chemist there has discovered 260 grains of organic impurity in the gallon, and of this quantity 150 grains absolutely consisted of human excreta!" Many propositions for dealing with the "sewage difficulty" in Birmingham have from time to time been made, but they have not been realised. Some of them were, indeed, positively and manifestly impracticable, whilst others, if practicable, could only have been effected at a ruinously heavy outlay. The author of the "Sewage Difficulty," indulges in some very severe remarks upon the Metropolitan Board of Works, in reference to the main drainage system as being carried out under their direction, prophecies the failure of that scheme to effect the great objects sought, and broadly asserts "that the whole of the systems in force for the hydraulic disposal of the excreta of town populations are in error." They are nothing more nor less than "ingenious methods of polluting enormous quantities of water (which ought to be kept as pure as possible to meet the indispensable requirements of a very rapidly-increasing population), and thus producing a maximum of evil without any corresponding advantage." These are unquestionably sweeping remarks, and they are perhaps due to some extent to the enthusiasm of the writer, rather than to the exact reflection of actual facts. At all events we are not disposed, even in presence of the startling array of evidence summoned in their justification, to take them as infallible dicta. One of the mistakes into which promoters of inventions and of innovations upon existing institutions almost inevitably fall, is to overstate the case they wish to sustain, and thus to damage instead of strengthening it.

Having (as Mr. Bannehr thinks he has) demonstrated that all the systems of disposing of excreta at present pursued in England, whether by means of the watercloset, irrigation, of the cesspit, or of the dumb-well, are alike inadequate for their purpose, he proceeds to the solution of the "difficulty" in his own way. In lieu of the ordinary waterclosets in dwelling houses he would introduce an arrangement which, so far as an ingeniously-constructed model which we have inspected is concerned, appears likely to prove efficacious. Above the ordinary seat and in a fitting receptacle or reservoir he places a supply of carbonaceous powder, which by means of a channel at the bottom of the reservoir is at a fitting time allowed to deposit itself on a ledge or shelf under the seat, and of course out of the range of the seat orifice. There is a flat plate or disc under the orifice, and this is placed between the seat and the shelf, and is so contrived that it closes the outlet channel except when the disc is fully open. The disc is provided with a brush on its lower side, so that, in the act of closing the disc, the brush sweeps forward a portion of the deodorant powder so as to make fall upon and cover the ordure deposited in the receiver below. Thus the moisture will be to a considerable degree absorbed, and the escape of offensive odour prevented. These operations can readily be made automatic by the application of simple yet ingenious mechanical apparatus to the Bannehr closet.

One objection which naturally presents itself to the mind in connection with the plans of the author of this scheme consists in the apparent trouble involved in the subsequent removal of the deodorised material. This, however, Mr. Bannehr meets by the statement that it would be unnecessary for the "collecting men" to enter the premises except at intervals of one, two, or more years, "because the strong receptacle might be made sufficiently capacious to require very infrequent attention, and the receptacles for urine might be so constructed—by the aid of pipes, &c.—as not to demand the entry upon the premises of collecting men at all. In fact, says the very confident originator of the scheme, "the whole of the details might be so carried out as not to be any source of annoyance or of offence to delicacy whatever, even in respect of the most fastidious."

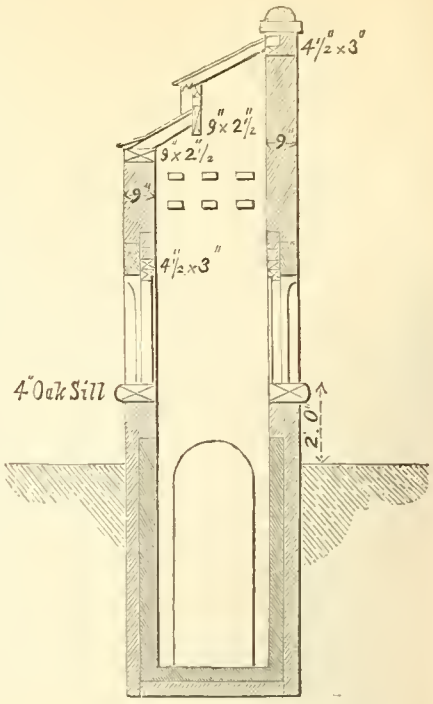
It is not essential to follow the author of the "Sewage Difficulty: its Causes, Effects, and Remedy" into his comparative estimate of sanitary and pecuniary advantages supposed to be contingent upon the adoption of his plans. Such estimates, although it may be that they are framed conscientiously, are not always strictly reliable, and we shall content ourselves with having directed the attention of our readers to the nature of the propositions, and by advising them to obtain for themselves the excellent publication in which those propositions are more elaborately explained.

The sanitary committee of the town of Nottingham have supplied a brief but explicit report of their operations in regard to the various and important points implied and understood by the term sanitary, during the past year. It is gratifying to note the energy and ability with which those operations seem to have been performed. The water supply and the sewage questions have been intelligently and practically dealt with. Many surface wells have been altogether abandoned, and the inhabitants of Nottingham are now provided almost universally, we believe, with water from the mains of the Waterworks Company. In the matter of privies and closets much has been done by way of improvement, the general principle adopted being the admixture of earth or ashes and night soil, with the exclusion of extraneous water and proper ventilation. We have the satisfaction of introducing here a plan, section,



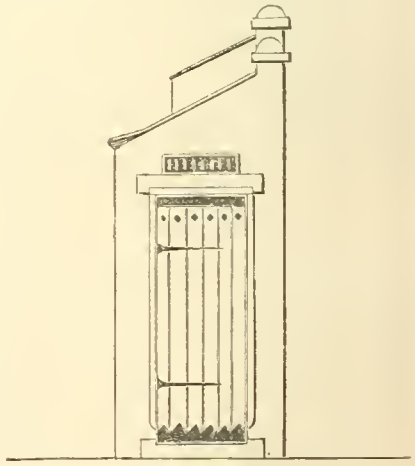
PLAN.

and side elevation of a single privy with ash-pit arrangement, and which will thus make the matter more readily understood. The plan, which can be extended so as to combine pairs, or blocks of any number, is simple. It consists in its chief feature of a water-tight pit or receptacle, so formed that all soil falls



SECTION A.B.

directly into its centre, and to the lowest level, so as to be immediately covered by the next deposition of earth or ashes. The committee record their opinion that dry earth is probably the best deodoriser, and state that a daily covering of that material prevents all smell, absorbs all liquid, and aids in forming a manure equal to guano. Ashes, which are supplied from all houses, though not equal to dry earth, produce similar effects, and thus this domestic refuse and heretofore nuisance may not only be rendered innoxious but of great agricultural value. By adopting the figured dimensions of the illustrations in


END ELEVATION.

the construction of such works, facilities will be afforded for removing the material, whilst the relative positions of the groundline, the ashpit door, and the seat, will not allow one part to become overcharged. The cost of such a construction as that shown above, according to the experience of the Nottingham committee, ranges from £9 to £10.

No drainage is necessary in these cases, and by the method of ventilation pursued perfect immunity from disagreeable odours is obtained. We apprehend that the time is not distant when the example of Nottingham will be followed by other towns, in the densely-peopled districts of many of which filth and disease now reign paramount.

Archæology.

ARCHÆOLOGY is one of the popular pursuits of the present generation, and one which has had and still has a powerful influence on its mental progress. The very name is an invention of the present generation, and serves to distinguish the scientific character of the study as at present pursued, from the too often fanciful and speculative antiquarianism of a past age. One evidence of the popularity of the study and the energy with which it is pursued is to be seen in the organisations which have been established to secure co-operation among the students and encouragement from the sympathising public. There are, besides the ancient chartered Society of Antiquaries, two metropolitan societies, which embrace the three kingdoms within the scope of their operations, and nearly every county has its county society besides. Another evidence is the considerable amount of literature which has accumulated on the subject within the last five-and-twenty years. The books and pamphlets fill a fair-sized library; every society has its special publication of Transactions; the literary periodicals give a share of attention to it; and the London and provincial papers gladly insert occasional paragraphs of antiquarian news. But with all this interest felt in the subject, and all this attention devoted to it, archæology has no special organ in the weekly press, nor is there even any weekly publication to which the antiquarian student may look with the knowledge that his tastes have been specially catered for: and that he will there be tolerably sure to find a record of archæological discoveries, notices of the new archæological books, and the latest news of archæological circles, and the opportunity of communicating with his brother archæologists by means of correspondence.

The BUILDING NEWS has resolved to endeavour to supply this want. It has arranged to devote to the subject a portion of its space weekly; it has taken steps to secure competent correspondents in various parts of the kingdom; and it has put the special department into the hands of a competent editor. It only remains to solicit the co-operation of those who are specially interested in antiquarian pursuits, and to beg them to favour us, for the common benefit, with the means of communicating early intelligence of antiquarian discoveries, and of making these columns interesting and useful to the antiquarian reader. Communications to be addressed to the Editor, 166, Fleet-street, E.C.

BRITISH CAVES ON THE BANKS OF THE THAMES.

IN "Camden's Britannia" there is an account of some remarkable excavations near Tilbury, on the north shore of the Thames, which he supposes to be of British origin, and to have been made as granaries for corn, according to a custom of the Celtic tribes, for whose existence he quotes Tacitus as his authority. Since Camden's time these remarkable caves seem to have been lost sight of. They are not mentioned by the county historians, and they do not, although so near London, seem to have attracted the attention of the modern school of archæologists. There are good reasons why they should not be often visited. They are in an out-of-the-way, uninhabited part of the country for a stranger to reach; they are not easy to find when the visitor has reached the place; when found it is necessary to have a long and stout rope to lower and raise the explorer, and force enough to do it; and when the five of them are now open—about five more have been open within a few years, but are now closed by the falling in of the surface soil—there are also a number of other conical depressions just like those which are known to be the mouths of filled in shafts, which we may fairly suppose to be also of the same nature. We found the farming men whom our friend had sent to help us standing beside a conical pit, like the mouth of a small crater, with an open shaft at its apex. When the rope and the force are there it is not everybody who cares to be let down, astride of a stick at the end of a rope, into a narrow shaft, which is he does not quite know how deep, and leads to he is not quite sure what. A party of adventurers have, however, recently organised a visit, and one of them obliges us with notes of what he saw. These Dene holes, as the country people call them (Dane holes) are situated in a wood called Hairyman's Wood, in the parish of Tillbury. They had brought a long stout rope, and had tied a short stick at one end, and invited us one by one to sit across the stick and allow ourselves to be lowered down the crater, and down the shaft of unknown depth to which the crater formed a convenient funnel. It looked ugly, but one of us volunteered to make the first descent. The shaft was about 3ft. in diameter and about 85ft. deep. At the bottom of the shaft we came to a cone some 25ft. high, which would just have filled the crater above, since it consisted of the loose soil which had crumbled in from the sides of the shaft and formed the crater. At the bottom of the shaft were two openings opposite to one another, each of which gave access to a group of three caves. The ground plan of the caves was like a six-leaved flower, diverging from the central cup, which is represented by the shaft. The central cave of each three is about fourteen yards long and four yards wide, and about six yards high. The side caves are smaller, about seven yards long and two yards wide. The section is rather singular: taken from end to end, the roof line is horizontal, but the floor line rises at the end of the cave, so that a sketch of the section from end to end of the two principal caves is like the outline of a boat, the shaft being in the position of the mainmast. The section across the cave is like the outline of an egg made to stand on its broader end. They are all hewn out of the chalk, the tool marks, like those which would be made by a pick, being still visible. A good deal of loose chalk lies on the floor, fallen probably from the sides. It is under this chalk that there is a chance of finding some traces of the original use of the caves; the caves were dry and the air pure. We descended another shaft which led into other caves, much like in plan and dimensions to those above described. If the rest of the open and closed and conjectured shafts led to similar caves the total amount of cave room is very considerable. We saw nothing which could give a clue to the purpose for which these singular excavations were made, or to the date of their excavation, unless the pickmarks which we saw indicate that they were dug out, not with flint or bronze celts of the usual shapes, but with a metal tool like a pick of later date than the age of celts. We were told there are similar Dene holes on the south side of the river, which we hope to explore some day.

MEDIÆVAL FOUNTAINS IN ILLUMINATED MSS.

A CORRESPONDENT writes:—I was interested in your account of the fifteenth century fountain at Little Leighs, having some time since in vain sought for any English mediæval examples. I found some authorities in the illuminations in MSS., but usually they were so defective in drawing that they served only as suggestions of the general form and character of the structure, which had pleased the illuminator's eye, and which he tried to represent. A description of two, which I saw again last week in turning over the rich pages of the fourteenth century MSS. "Histoire du Roi Melindus," in the British Museum, may interest your archæological readers. One consists of a shallow octagonal basin, placed upon a base of one step. In the middle of this basin stands a short, stout, octagonal shaft, with well-moulded base and capital. The capital carries a design composed of four lions' heads facing outwards, from whose mouths water issues into the basin beneath. On these lions' heads is placed a smaller flat circular basin with embattled edge, and from the middle of this upper basin rises what seems to be intended for some such fanciful waterwork as those we see in the shop window just west of Temple Bar, where Mr. Lipscombe's filters are sold. In the drawing there is a short upright pipe, on the top of which is what I take to be a hollow sphere, with several short pipes inserted in it, out of which water is represented as gushing. I conjecture that this sphere was turned round in some way by the force of the water, and so the water was ejected from the pipes in fantastic shapes, and produced the kind of effect which always attracts a group of gazers round the window aforesaid, and which our fourteenth century ancestors were not above admiring. In the illumination a knight sits on the step of the fountain, and rests his elbow on the margin of the lower basin. A lawn surrounds the fountain, there are flowering plants above, and trees in the background, and a gateway on the right. The scene seems to be a mediæval garden.

The other fountain has on a raised step a deep circular basin, with areaded sides. From the middle rises a twisted shaft, which carries two lions' heads, from whose mouths the water flows. The numerous allusions to fountains in the mediæval romances prove that they were common then—more common than they are now; the constant allusions to the bath show that it was then in universal use among well bred people; and we are led to suspect that some of the sanitary arrangements five hundred years ago were superior to those of the present day, and to wish that architects would now give us baths universally in our houses, and fountains frequently in our public places.

Dr. Bruce is about to issue by subscription a new edition of his work on the Roman wall. It will not be merely a reprint of the work, but will contain additional matter, the result of later surveys and discoveries, and additional plans and woodcuts. It is a standard and valuable work, which ought to be in every antiquary's library.

The Rev. H. J. Ellacombe, the well-known campanologist, is engaged upon a volume on the bells of Devon. He has visited every church tower in the county, and copied all the bells, more than two thousand in number. It will be a valuable contribution to the ecclesiology of the county and to the campanology of the kingdom.

Mr. John D'Alton, the Irish historian and antiquary, has just died at Dublin. For upwards of half a century he had collected materials for the history of nearly every Irish family of note. Mr. D'Alton was a member of the Irish bar. Among his published works were "Memoirs of the Archbishops of Dublin," several Irish historical essays, and a national romance, entitled "Dermid, or Erin in the Days of Boroihure." He was also for many years a frequent contributor to the *Gentleman's Magazine*, besides various Irish periodicals. He has left behind him a large collection of valuable MSS.

Mr. Charles Roach Smith, who is known to all the world as an antiquary, is just now earning reputation in a very different field. He has been giving dramatic readings at Rochester, with unbounded applause. Twice as many tickets were applied for as were issued, and the reading was repeated. He has since been reading at Lewes, as he had done previously in Bedfordshire. He is said to display very great dramatic power.

POTTERY AND PORCELAIN.

A COURSE of six lectures "On Pottery and Porcelain" (the Cantor lectures) is now being delivered at the Society of Arts by William Chaffers, Esq. The first lecture of the course was delivered on Monday, the 21st inst. Mr. Chaffers illustrated his remarks by the exhibition of a collection of very fine specimens of ancient pottery of the Egyptian, Greek, Etruscan, and Roman periods, which were attentively examined after the lecture by the members. Behind the chair were placed numerous diagrams of the forms of Greek vases, drawings of the potter's wheel, a Saxon grave, urns, &c. The lecturer commenced by speaking of the nature of clay, and the various changes it was subject to from its primitive state, through all the intermediate stages, until it culminated in the perfect vase, dwelling upon the desiccation and baking the clay, the means adopted by potters in the formation of vessels, viz., the potter's wheel, modelling tools, moulds, &c., the skill exercised by the artists in decorating the ware, and the difficulties they had to contend with in painting upon the moist clay; the nature of the glazes employed by the ancients; the shrinkage while in the kiln, and many other curious facts in connection therewith. Mr. Chaffers alluded to the extraordinary circumstance that notwithstanding the fragility of specimens of ceramic art, and their liability to injury, our museums throughout Europe abounded with perfect and uninjured examples not only of pottery, but of the still more fragile material, glass. For the preservation of these we are indebted to the simple piety of the ancients, who, according to their rites of

burial, placed in the grave those objects which the deceased esteemed most during his lifetime. Thus we find by the side of the skeleton, in the simple tumulus of earth, in the cinerary urn, or in the stone sarcophagus, gold and silver personal ornaments, fictile vases, and other ceramic remains, glass vessels, weapons, &c.; and this is the source of our possession of such valuable testimonies to the habits and customs of the ancients, for, without exception, all the relics preserved to us have been discovered either in places of sepulture, or in the exhumation of long-buried cities, devastated by conquest, or overwhelmed by volcanic eruptions. The lecturer then noticed the description given by Herodotus of the city of Ecbatana, the capital of Media, surrounded by seven walls of as many different colours, which he inferred were of bricks, or tiles with enamelled surfaces, and compared it with a building of similar character, described by Sir H. Rawlinson as still existing at Birs Nimrud, in Chaldæa, which from the custom of placing cylinders in the buildings, is ascertained to have been restored by King Nebuchadnezzar 605 B.C., who designates it "The seven spheres of Borsippa." This structure consisted of six stages, each about 20ft. high, of pyramidal form, dedicated to particular planets, and vitrified or glazed with the colour attributed to it by astrologers. Adverting to the glazed Babylonian bricks, Mr. Chaffers showed the early knowledge of the use of the stanniferous enamel glaze as a covering for earthenware. He alluded to the researches of Mr. W Kennett Loftus in Chaldæa, who discovered piles upon piles of earthenware coffins covered with glaze in a cemetery at Warka, proofs of the successive generations by whom this method of burial was adopted from its foundation until the place was abandoned by the Parthians, a period probably of more than 2,000 years. The earthenware of Egypt next claimed his attention, which he described as a sort of silicious frit, frequently covered with a greenish blue glaze; the deities and emblems discovered so abundantly in the catacombs and tombs were many of them steatite, carved into form, and placed in the kiln. The earthenware vessels were used to contain the waters of the Nile, and for various household purposes. The favourite ornamentation on their vases was derived from the lotus, its buds and flowers, the borders and details being taken from the petals, stems, and divisions of the calix. The most flourishing period of Egyptian art is assigned to a very remote date, viz., 2,000 years before our era. The period of the Ptolemies is known by the marked influence of Greek artists. The frit gives place to a pottery, coarse and soft, sometimes painted on the plain surface, and sometimes glazed. This was continued down to the second and third centuries of our era, when Egypt was under Roman domination. In speaking of the Greek fictile vases, Mr. Chaffers said they were found in large quantities in the sepulchres of Etruria during the last century, and hence they were erroneously called Etruscan, even after they were still more abundantly discovered in Magna Græcia, Sicily, Attica, &c. It is indisputable that these vases are the productions of Greek artists, and the style of painting the designs as well as the inscriptions are decidedly Greek. This portion of the lecture was illustrated by some remarkably fine Greek vases kindly lent to the lecturer by Mr. Felix Slade, Mr. Henderson, Mr. Battam, and M. Rollin. For the purpose of classifying the Greek vases he divided them into five periods, assigning approximate dates of antiquity, as follows:—First archaic period, previous to the eighth century B.C.; second archaic period, from the eighth to the seventh B.C.; third archaic period, from the seventh to the sixth B.C.; fourth, the finest period, from the sixth to the fourth B.C.; fifth, the decadence, from the fourth to the second B.C. The peculiar characteristics of each period are as follow:—The first archaic period: Of these, the earliest specimens of Greek fictile art, most are discovered at Athens, Corinth, Melos, Camirus in Rhodes, and Etruria. They are very rude, painted in reddish brown or black, on ash-coloured ground, with chevrons, concentric circles, stars, &c., and primitive representations of men and animals. The vases of the second archaic period are abundantly supplied from Camirus, in Rhodes, as well as in other parts of Greece. They show a great improvement in the drawing of the figures; they are usually of cream-coloured clay, painted with crimson and white, and red on black, the details being scratched with a point, the style of ornamentation being two or more rows of animals (real or imaginary), of birds, harpies, sphinxes, &c. In the third archaic period are found the most valuable Greek vases, of a more artistic character than those which precede it. The figures are painted in black, on a red ground, and the designs are confined to a square tablet between the two handles, the rest of the vase being painted a lustrous black. Mythological and heroic subjects are now introduced, and complicated groups of figures, chariots, and occasionally inscriptions. The fourth is the best period of Greek art. These vases may be especially distinguished by the designs being left red, the ground filled in with black, and the details of costume, features, and anatomical delineations produced by black lines. Sometimes are found black figures on red, and red figures on black, on the same vase. This may be considered a transition from the archaic to the more artistic style. The fine vases of Nola may also be attributed to this period. The fifth period may be called the decadence, and dates from the accession of Alexander the Great, B.C. 336, to B.C. 186, when it is presumed the fabrication of painted vases altogether ceased, shortly after the edict of the Roman senate against the celebration of the Bacchanalian festivals in that year. As we approach the second century B.C. we find less freedom in the design, a certain mannerism in the drawing, as well as a greater profusion of ornament.

Various specimens of Etruscan pottery were exhibited to illustrate the lecturer's remarks, and the Roman section was copiously illustrated by selections from his own collection, displaying the most striking varieties. The red ware of Arretium was described, as well as the Samian ware, so frequently discovered on the sites of Roman cities, ornamented in relief with mythological subjects and elegant scroll patterns; it was used by the Romans at the table for their meals. Mr. Chaffers also described other varieties of Roman ware found in Britain and Germany, and vessels of various forms, small drinking cups, inscribed with short convivial sentences, as "Imple," "Reple," "Bibe," "Vivas," "Da vinum;" mortaria, lamps, clay statuettes, &c., specimens of which were upon the table. In conclusion, he spoke of the Saxon period, and described the contents of some of the Saxon or Frankish graves which are dispersed over Northern Gaul, and the earthenware vessels so commonly found among them.

PROPOSED SCHOOLS AND ALMS-HOUSES, WALWORTH.

These buildings, of which we give an illustration elsewhere, are about to be erected near the Elephant and Castle Railway Station, for the congregation of the Rev. C. H. Spurgeon. They consist of eighteen sitting-rooms for aged females (each with scullery, coalplace, and a recess for bed to be closed by curtains), schools for 200 children, and an eight-roomed teacher's house. There is a covered playground under the girls' school. The walls are of brick with stone dressings. The details given below our view are taken from the elevations, and merely explain the general arrangement, not the precise design of the ornament. The architect is Mr. James Cubitt, of Addington-square, Camberwell.

GUILDHALL IMPROVEMENT.

The Guildhall Improvement Committee have presented a report to the Court of Common Council, on the subject of a new library and museum. They state that having directed the City architect to prepare and submit designs and an estimate for the erection of a new building which would give ample space both for the reception of books and antiquities belonging to the Corporation and for the accommodation of visitors, that gentleman has prepared a ground plan of the present arrangement of the Guildhall and offices, providing for the erection of a new library and museum on the ground between the eastern end of the hall and Basinghall-street. The new building will contain a basement floor, with an area of 9,000 superficial feet; a ground floor, which will be used as the museum, with a like area; and an upper floor, which will be devoted to the purposes of the library, and will contain an area of 6,000 superficial feet. On this floor it is proposed to erect a gallery, which will materially contribute to the space required for the reception of the books. Since its foundation by the Corporation in 1824, the Guildhall library has been steadily increasing, until at the present time it consists of one of the most valuable assortment of works of standard literature to be found in the country, and in addition to this it possesses the largest and most complete collection of works in relation to the City of London which is known to be in existence. The necessity of making some proper provision for these collections has long been felt. The expense of carrying out the architect's designs and plans, exclusive of fittings, would be about £25,000, including the amount (£2,300) already granted by the Court for the improvement of the present building. This sum the Court will be asked to vote at their next meeting.

LE MANS CATHEDRAL CHEVET.

Towards the year 1220 the ancient apses of most of the French cathedrals were demolished and rebuilt, with the view at some future time of reconstructing the whole of the buildings in the then new style. The scheme for rebuilding the whole of the cathedrals was not realised in many cases, a fact which is not to be regretted, since we thus have preserved to us the original naves of the round arch style. The work of rebuilding the cathedral of Le Mans stopped at the transepts. M. Viollet le Duc* has pointed out that the chevet of this cathedral, with its two aisles of different heights, presents a precisely similar arrangement to that of Bourges, the apsidal chapels of which, however, are considerably deeper than those at Le Mans. The Chapel of the Virgin (shown on the left side of the sketch) is, as frequently occurs, two bays longer than the rest of the chapels of the apse. It is elevated on a crypt. The doorway is of much later date than the chapels; the steps leading to it are entirely of wood. The original cathedral of Le Mans, which dates from early in the eleventh century, consisted of a nave covered with a wooden roof, with north and south aisles and north and south transepts, each having an apsidal chapel on the east side. There was an apse eastward of the crossing, with one aisle covered with a barrel vault. Portions of the transepts of the eleventh century are still remaining on the north side of the present chevet. During the twelfth century the vault over the nave and transepts was built; it is hexapartite, in square bays. The clerestory, with its two-light Angiovine windows, was at the same time constructed, and the early arcade and triforium restored; the lofty pillars were built against every alternate pier to carry the vaulting.

Henry Jarvis, jun.

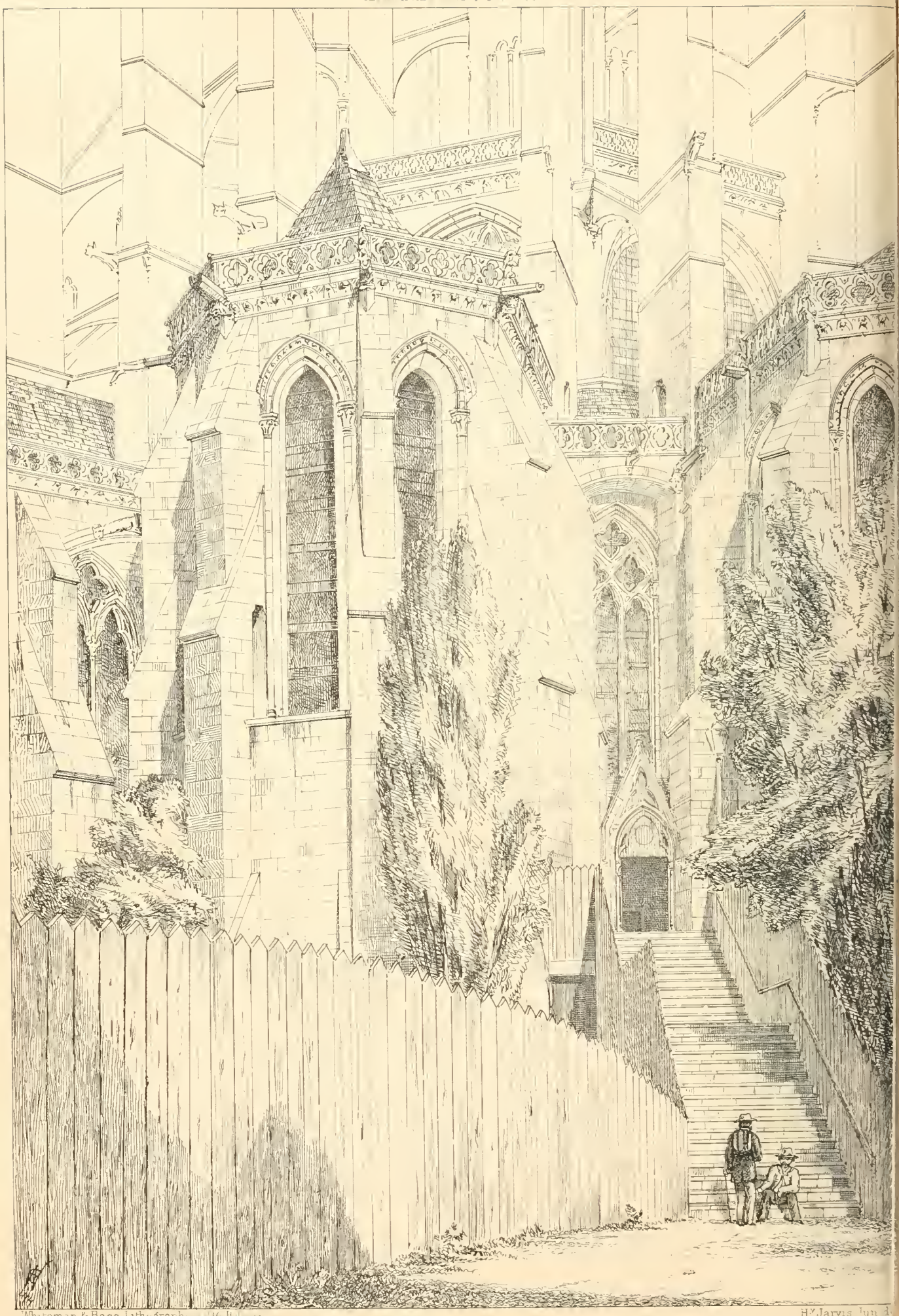
THE PARIS EXHIBITION.

A very useful feature of the arrangements is a covered way which leads from the railway station just beyond the limits of the grounds to one of the side doors of the building itself, so that all who arrive by rail will be under shelter the whole way; this covered way is nearly finished, and will shortly be connected with the entrance by a vestibule. On the other side of the building is another large covered way for carriages to pass under and set down their occupants.

Beyond the Exhibition grounds, the steel bridge, which crosses the opening made in the quay, is completed; a large and convenient landing place is being formed for those who arrive by water, and who may enter the grounds of the Exhibition either by the way beneath the bridge or by the main entrance in the quay. On the right and left of this landing place, but on a level with the quay, two large restaurants have been erected, and one of these will, it is said, be under the direction of two well-known English caterers.

The portion of the machinery gallery which has been assigned to Great Britain contains eighty large clerestory windows. It is intended to fill these with blinds of a decorative character, and a window has been offered to each of the most important corporations of Great Britain, chambers of commerce, civic companies, and railway companies, to enable blinds illustrating the manufactures, &c., peculiar to the town, or decorated with designs heraldic or otherwise, to be erected. Among those which have at present accepted these invitations are the corporations of London, Edinburgh, Glasgow, Liverpool, Belfast, Newcastle-on Tyne, Bradford, Oldham, Rochdale, Stoke Chamber of Commerce, the Honourable the Mercers Company, and the Stockton and Darlington Railway Company The British executive will fill several windows, with blinds illustrating the early history of inventions. Stephenson's "Rocket," Braithwaite's "Novelty," Hackworth's "Sanspariel," being the earliest trial locomotives; Symington's steam paddle-engine, which was the first successful engine of the kind; Watt's "Sun and Planet" beam engine, and Arkwright's loom furnish subjects.

* "Dictionnaire de l'Architecture," Tome ii., p. 355.



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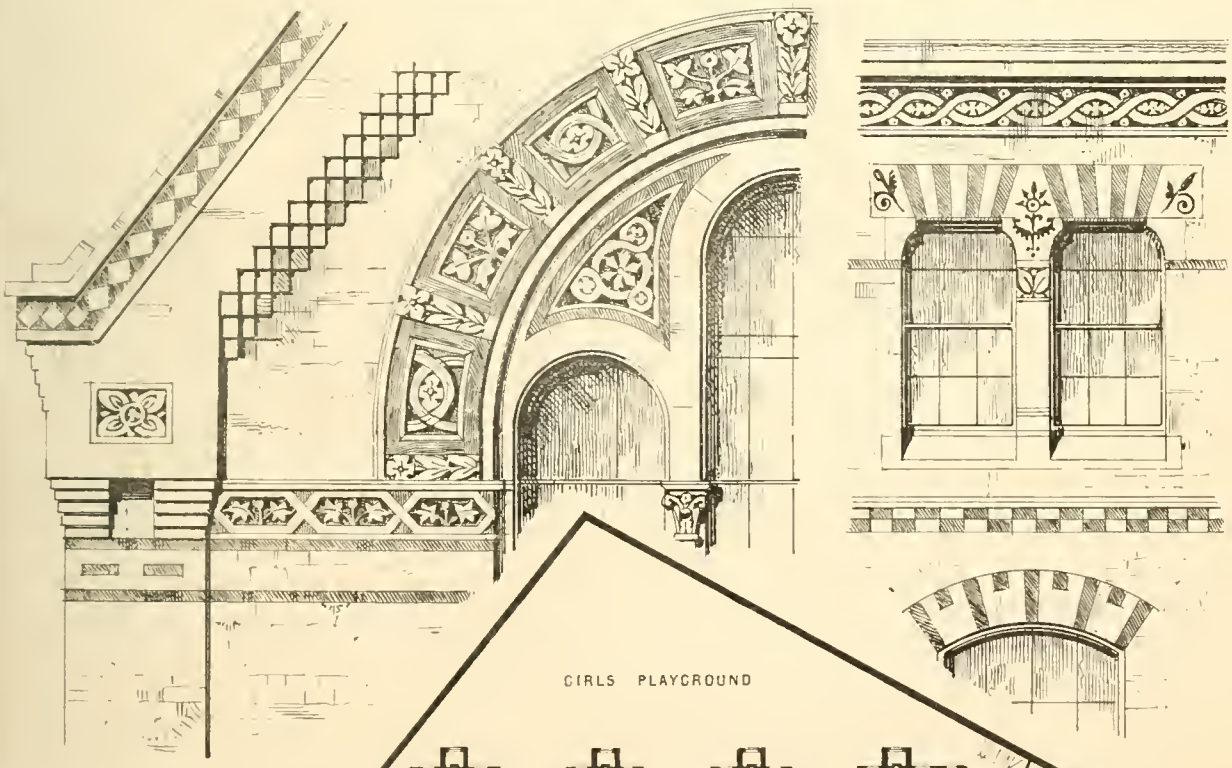
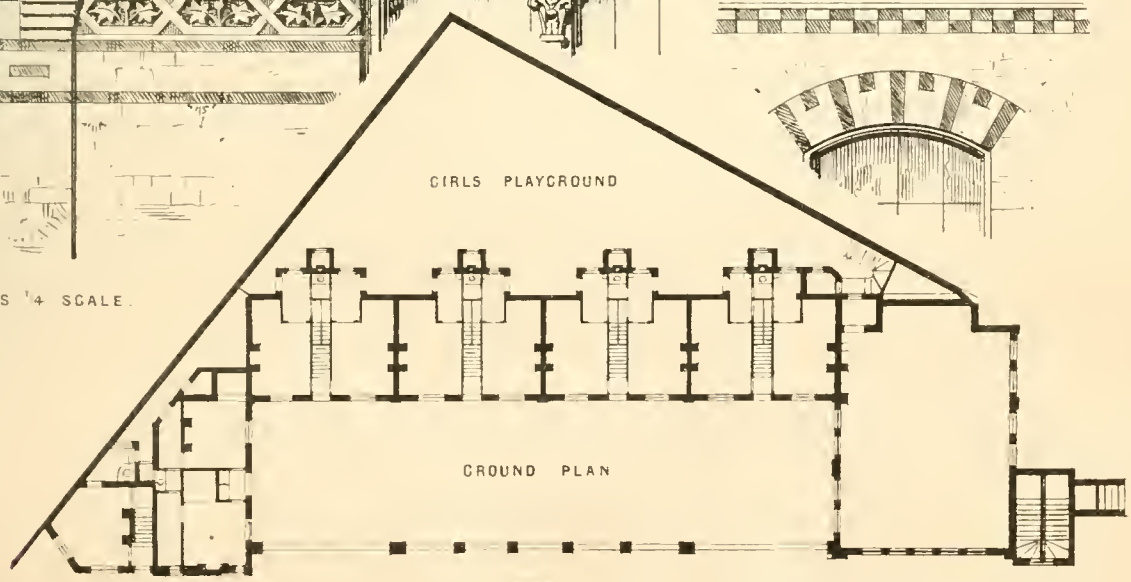
Le Mans Cathedral Chevet from N·E





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Proposed Schools & Almshouses, Walworth. — Mr. JAMES CUBITT, ARCHT.

LANDSEER'S LIONS IN TRAFALGAR SQUARE.

JUST a few minutes before arranging for the press we had a glance at the lions which have just been put on their respective pedestals in Trafalgar-square. The first thought that strikes one in looking at them is, Why has there been such a tedious delay in their production and erection? For many years the vacant places in the square have been the butts for critics and cynics, and Sir E. Landseer's name has been mentioned not over reverently in the matter. After waiting so long, public expectation has naturally been on the tiptoe. Great things have been expected, and in some minds great will be the disappointment. At the first glance, and when close to them, the lions look too big for the site, but when looked at from a short distance the objection loses its force. The lions are all the same size, and they are very much alike. The bodies and legs appear, in fact, as if they were cast in the same mould; the expression of the face differs, we believe, in each instance, and herein will be found the artist's merit. Each lion appears as if he were arranged to sit for his portrait. The forepaws in each instance are stiff, formal, and artificial. In fact, no lion could sit in such a posture more than a minute without pain. Why each body should be exactly alike, why each head should be almost in the same position, why each mouth should be open and the tongue in the same place, must be best known to the artist. If they were to differ at all, why not differ more? Then each figure would have an interest of its own, beyond the facial expression which it now presents. There is a grand repose in the back part of each figure; but the spreading out of the fore paws indicates anything but repose. There is, however, throughout a structural symmetry about the figures, which palpably shows that Sir Edwin has imitated nature with considerable care. It is, we think, not only a pity, but a mistake, to have made the noble brutes so closely resemble each other, and particularly when so much time and labour and money have been expended in their execution. It must be admitted, however, by the most critical, that these additions impart a sense of completeness and an air of majesty to "the finest site in Europe."

EARTHWORK AND MASONRY IN THE PARIS EXHIBITION.

SO much attention has been bestowed upon the superstructure or metallic portion of the approaching Paris Exhibition that probably many of our readers will be surprised to learn that the masonry and earthwork constitute combined a rather formidable item in the total expenditure. The amount of the contract for these two portions of the work is close upon £80,000. Of this sum more than half is absorbed in the formation of the terraces and the masonry in the foundations, and the rest in masonry above ground, including the walls of the *grande nef*. The formation of the terraces was commenced by constructing the platform of Le Champ de Mars, which comprised 230,000 cube yards of excavation, employed for filling the hollows. The cutting and filling were paid for at the rate of 8d. per cube yard for the double operation. About the same quantity of filling was also obtained for the same purpose by permitting stuff to be run to spoil by anyone who wanted some place to shoot it. The excavation for the foundations proper of the Palace amounted to 80,000 cube yards, and were paid for at the rate of 1s. 6d. per cube yard, which price of course included running it to filling where required; the larger portion of it being used in bringing the ground in the interior of the building to the proper level. When this operation was completed the whole surface of the made ground was well punned and watered, so as to thoroughly consolidate it and render any subsequent sinking or unevenness impossible. An extra price of a penny halfpenny was allowed for this work per cube yard. Some idea of the labour and expense attending the operation of watering the ground may be gathered from the fact that the contractors erected for the purpose ten reservoirs, to which water was conducted by numerous leaden pipes, having an aggregate length of two miles. The water was distributed from jets; the contractors agreed with the waterworks company for a daily supply of 17,000 gallons, and the total cost was about £1,000. Under the item "terraces" must be included the formation of the principal road running concentrically with the curve of the Palace, and situated about half-way between the limits of the Palace itself and those of Le Champ de Mars. The making of this road consumed nearly 12,000 cube yards of flints and 8,000 of sand; the whole being supplied from an immense pit dug near L'Ecole Militaire. The excavation, cartage, and spreading of the flint stones was paid for at 3s. 1d. per cube yard, and the sand at 8d. The surface was afterwards rendered smooth and in a suitable state for traffic by rolling it in the same manner as all newly macadamised roads are done in Paris. It is only we who retain the barbarous custom of laming and cutting the feet and legs of horses by allowing them to draw loads over roads, every stone of which bears a strong resemblance to the small three-pointed pieces of iron used in the times of barbaric warfare, to impede the advance of cavalry.

The masonry underground includes that used in the construction of the subterraneous galleries, some of which are concentric with the plan of the building, and others radiating; also, that in the foundations of the galleries appropriated to the fine arts and the records of industry and in the foundation of the curtain walls of the principal gallery. In these parts of the building upwards of 40,000 cube yards of masonry were used, of which 11,000 were of rubble masonry, built with mortar, at 12s. 3d. the cube yard. About the same quantity of béton was employed at 9s. 2d. the cube yard; the remainder was built of masonry in cement at 14s. 1d. per same unit. The arches of the subterraneous galleries are built of béton concrete on the Coignet principle, and consumed 10,000 cube yards of material at £1 7s. 6d. per yard, which price included all charges for centreing, fixing, and other labour. The culverts and drains for drainage and surface water are built of the same description of concrete; their diameter varies from 1ft. to 1ft. 7½in., and cost per running yard 4s. 8d. and 5s. 10d. respectively. Connection between the iron columns and the drains is maintained by earthenware pipes at 10d. per running yard; this price is low, but as a set-off no deduction was made for the holes formed in the masonry for the passage of the pipes. Nearly all the mortar is made in pug mills worked some by steam and others by horse power. As an illustration of a few somewhat unusual contingencies the contractors had to provide for, it may be mentioned that they purchased nearly 5,000 square yards of straw matting to protect the fresh masonry from the effects of frost; they constructed a large number of movable sheds to allow the work to be carried on under cover, and furthermore they provided a large quantity of additional clothing for some of the workmen. It was stipulated by the authorities that the contractors should complete all the earthwork and masonry belonging to the half of the Palace facing the quay by the 1st of February in the present year, and the works of a similar nature in the other half by the 1st of April following, under the penalty, in case of non-compliance, of £20 for every day of delay beyond the specified time. As many changes were made from time to time in the original designs, it was only by working night and day that the work was finished at the time stipulated for.

The masonry above ground comprises the side walls of the two galleries already alluded to, and the curtain walls of the *grande nef*. The former are 37ft. 6in. in height above the ground, and 2ft. thick at the base, and 1ft. 7½in. at the top, and are built partly of masonry and partly of béton. The manner in which the béton is used is as follows:—Commencing at the base, a layer 5ft. in height, composed of béton in horizontal lengths of 11½ft., alternating with lengths of rubble work of 5ft. throughout the whole length of the wall; over this layer is placed a layer of rubble work 1½ft. in height, then again a layer of béton and rubble as at first, with a layer of rubble only on top, and so on until a height of 20ft. is reached, the rest of the wall being built of rubble in cement. The alternations of masonry and béton present no visible appearance, as the whole surface of the walls is plastered over. The plastering was priced at a fraction over 3d. per square yard. The curtain walls of the principal gallery are constructed without any béton, and, deducting openings, are equal to about 6,000 cube yards; 600 cube yards of American pine are also used for wall plates, wooden bricks, and other purposes. These walls follow closely upon the erection of the pillars, and each pair of bays is finished ten days after the adjoining columns are in position. About 20,000 square yards of flooring are completed, comprising the following formation:—A bottom layer of béton, 3·15in. in thickness, is first deposited, consisting of stone and mortar in cement; over this is spread a layer, or rather a coat of mortar in cement, composed of sand and cement, in the proportion of 12 cwt. of cement to 1·3 cube yards of sand, the whole being carefully levelled and smoothed. The arrangements respecting the workmen employed and the labour in general are excellent, and we therefore extract a brief account of them from "Les Travaux Publics:"—Any workman desiring to be engaged on the works must present himself either 20 minutes before the commencement of the day's labour, or in the evening immediately at its termination, at one of the gates of the Champ de Mars, and, on stating his object, will be attended to by one of the foremen of the particular trade he belongs to. If he is engaged, he will receive a "carte," containing his name, address, and the number, which will serve, besides, to identify him; on it is also written the number of the workshop where he is employed, and, after the first day of his trial, the pay he is to receive will be inscribed upon it. Admission to the works is only obtained by his presenting his "carte" daily, which is signed by one of the contractors. Every workman must bring his own tools, and they must, moreover, be in good working order. Excepting between the months of April to October, the day is divided into ten working hours, and the hour is taken as the base for calculating wages. Ten minutes before the time for beginning work the bell is rung, and the men can come in, the doors are afterwards closed, and those who are too late, locked out until a cessation of labour occurs. Every workman quitting his work without the consent or knowledge of his foreman is liable to a fine of 5f., besides the deduction for time lost. Pay day comes the second Sunday of every month, and for this purpose an especial office has been built in the Champ de Mars; but checks, not exceeding in value half the wages gained by the workmen at the time, are given out every Saturday to those who want them. The men must give eight days' previous notice to their respective foreman when wishing to leave the service, or otherwise they will not receive whatever amount of pay may be due to them. Those who are dismissed, are paid off at the close of the day's work; and anyone in a state of drunkenness is summarily expelled the premises.

To ensure a due and skilful professional attendance upon those who may suffer, either through their own indiscretion and negligence, or through the inevitable contingencies attend-

ing all large works of a similar nature, a rebate of 2 per cent. is levied upon all wages to provide for medical assistance. Two medical men attend regularly at the works upon the wounded and the sick, to whom medicines are supplied gratuitously; visits are also made to those of the men who may be confined to their beds. Workmen who are laid up in consequence of injuries received through no fault of their own, but in the legitimate course of their labour, receive half pay while incapacitated for work; this is the usual arrangement with most of our own large firms. On the other hand, those who may be injured while in a state of intoxication, or from a disregard of ordinary prudence, or disobedience of orders, are allowed gratuitous medical aid, but nothing more. During the period of cholera, the Imperial Commission ordered tea to be distributed free to all the workmen, and although we, who do not drink tea as a medicine, may be inclined to doubt the efficacy of the precaution, yet none will dispute the liberality of the action.

YORKSHIRE ASSOCIATION OF MASTER BUILDERS.

THE half-yearly general meeting of the members of this association was held at York, on Monday, Mr. Archibald Neill, of Bradford, in the chair. The attendance, in consequence of the importance of the business to be transacted, was large, and represented the principal building firms in all parts of the county. A report of the committee was read, containing a variety of recommendations, one of which was the doing away entirely with the bond, a document which had been devised for the purpose of knitting the members together into a united body, and inflicting certain penalties for an infraction of the rules of the association. It was counsel's opinion that the document possessed no power, and it was therefore resolved to do away with it, resting for the future entirely on the honour of the members of the association. Of the other recommendations the first and most important was "That the Yorkshire Association of Master Builders join the General Builders' Association, but that we retain our present arrangements as a Yorkshire association." A very lengthy discussion on this point was introduced by Mr. A. Mault, the representative of the General Builders' Association, who read the rules of the general body. The advantage of such a junction was acknowledged on all hands, whilst it appeared to be thoroughly appreciated that only by the strength of unity could reforms be brought about between masters and workmen, and architects persuaded to guarantee the quantities which they furnished and adopt articles of agreement. During the discussion the evils of the day system of working were pointed out, and the advantage of the hour system both to man and master descanted upon, and a variety of inconsistencies indulged in by the workmen referred to. As to the latter it was stated that in some places bricks were not allowed to be manufactured, or stone dressed by machinery. These were fetters upon the building trade which, it was argued, must be ultimately broken, and with this end in view a junction of the Yorkshire with the General Builders' Association was but the initiatory step. In fact, it was stated that in certain places in the county notice had already been given to the workmen of the intention of the masters to adopt the hour system. Ultimately the full recommendation of the committee was carried out, the Yorkshire association retaining its present arrangements as a county body, and becoming merged into the General Builders' Association. The secretary of the Yorkshire branch was then instructed to give certain notice of strikes impending, and to him the names of men likely to be or already on strike were also requested to be furnished by employers. This was a step which, from the discussion, appeared to possess some importance, in order that men on strike might not migrate to other towns and find employment from members of the association. An important discussion next took place upon the best means of adopting the hour system throughout the association. Mr. Mault, whilst stating that the Birmingham Association of Masters had determined to try their strength with the men on this point, added that the General Builders' Association had deemed it unwise at present to take the initiative in such a step. It was one, however, which he thought it most desirable the builders of the country should give their attention to, in order that a uniform system might be adopted throughout the country. During the discussion a variety of difficulties and anomalies were pictured as existing under the present system, whilst there was also the additional anomaly that in a few places the hour system is at present in force, and with such manifest advantage to the men that they were ready to strike sooner than submit to an alteration. It was ultimately resolved "that this branch association recommend to the general association at its annual meeting the consideration of the desirability of giving a general notice for the adoption of imposed trade rules, including the hour system, at as early a date as possible." The subject of the best means to be used to induce architects to furnish and guarantee quantities, and to adopt articles of agreement, were referred for consideration to the next meeting of the General Association of Builders, to be held at Bristol, and the association was requested to bring the matter to a satisfactory settlement as early as possible. A sub-committee was appointed for the purpose of watching over any bill or bills which might be brought into Parliament affecting the trade, and also to consider any question not brought before that meeting. Local associations were exhorted to use every endeavour to extend the usefulness of the association by pushing it into new districts, after which it was determined that the next meeting of the Yorkshire branch should be held at Harrogate. The meeting then adjourned to the Royal Station Hotel, and about eighty gentleman sat down to a most excellent repast. The after proceedings under the presidency of Mr. Woolley and Mr. Whiteley, were kept up until the departure of the later trains of the day.

BUILDERS' WORK AND WAGES IN NEW SOUTH WALES.

RESOLUTION passed at the Carpenters' and Joiners' Society:—

"That we form a committee to inquire into the present depression in trade, and call delegates from other trades with the view of ascertaining the amount of distress existing amongst each trade or calling in the colony of New South Wales."

To the Secretary and Members of the Amalgamated Society of the United Kingdom.

Gentlemen and Fellow Workmen,—We the undersigned, as delegates of the various trades of Sydney, hereby forward you a correct account of the great depression existing among all classes of skilled and unskilled labour in the colony. It is with extreme regret that we feel it our duty, and a very painful duty, to make you acquainted with our present depressed condition. Owing to the great want of employment experienced by all trades and callings, more especially among the building and iron trades, labourers in the building trades also, we wish particularly to warn you against the glowing but false accounts that often find their way to the United Kingdom by almost every mail. We can assure you that the labour offices are daily besieged by willing and anxious hard-working men, offering their services for any kind of employment or wages; but the demand for labour is as scarce as the applications for employment are numerous.

We do not wish you to understand that we never had New South Wales in a distressed state before now, for we can assure you that the colony has not been worth a man in the United Kingdom, who was doing moderately well, or getting a moderate amount of employment, to leave to come here for these last six or seven years; in fact, employment is always hard to obtain, and where obtained is mostly of short duration.

We will now give you a truthful statement of the wages paid and received by the best workmen in the colony and city of Sydney, and that is the very highest received by any trade or calling:—Stonemasons, 10s. per day of eight hours, but not in a shop or under a shed, as in the old country, but under the scorching sun of Australia, no protection either from hot winds or drenching rains, but knock off and go home, lose the time, and, consequently, the money, from the already-too-small amount of wages; carpenters and joiners, 9s. per day, not in shops such as you have at home, as we call it, but most of our work is done in sheds that are neither wind or water tight, or else in the buildings, and subject to all the annoyances of the plasterers and all other trades when the work is prepared in the building; bricklayers, 10s. per day, or £2 10s. to £3 per rod of piecework; plasterers, 9s. per day, or from 6d. to 10d. per yard of piecework, and, if at daywork, there are no hawk-boys, but the mortar is pitched on the board, and in nine cases out of ten you must dispense with the labourer when the floating is done; painters, 8s. per day; iron trades, ranging from 5s. to 10s. per day of ten hours; slaters, all by the square, from 6s. to 8s. 6d.; plumbers, 10s. per day; bricklayers' labourers, 8s. per day; brickmakers deliver bricks within four miles of the kiln for £2 5s. per thousand (the fuel costs them for burning about from 10s. to 15s. per thousand); quarrymen, from 8s. to 10s. per day of ten hours. We cannot give you a correct account of cabinetmakers, upholsterers, French-polishers, tailors, shoemakers, &c., but we can assure you that they are in a most deplorable condition, as the most of their branches of trade are imported from England and other countries.

In the above we did not tell you how many of each trade, or the average, were employed, but we will do so to the best of our knowledge;—Masons, about two-thirds only employed; carpenters and joiners about the same—if anything, a little less; painters, we are sorry to say, only about one-third; bricklayers and plasterers, about two thirds employed; bricklayers' and plasterers' labourers, we are sorry to say, only about half; and the iron trades, only about two out of every ten in employment—they are in a most deplorable condition.

Now we dare say you will think the wages in New South Wales are very high, or, at any rate, very good, and wonder what we are complaining about, but when we show you the expenditure side of the account we think, if intending emigrants are not quite Australian-mad, they will at once see that there is no balance in favour of the Australian wages, saving nothing about the unsteadiness of employment. In the first place, if you wish to live in or near the city, for a house of four small rooms you will have to pay from 14s. to 20s. per week rent; if in a court or alley from 10s. to 15s. per week; if in the suburbs, for a four roomed house from 10s. to 15s. per week; and the smaller the house the more rent you have to pay in proportion. Firing and lights will cost about 4s. per week all the year round. Vegetables cost about 250 per cent. more than in England. Only fancy giving 8d. for a small cabbage! That is the price now. Bread averages about 5d. the 2lb loaf; beef and mutton average about 5d. per pound, pork about 7d., veal, about 7d.; bacon and cheese, about 1s. 6d.; milk, 8d. per quart; groceries, about the same as in England, only very inferior, generally speaking; boots and clothes, about the same (slops), but there is much less wear in these things here on account of the greater amount of perspiration, as in all hot countries you may often see people as wet as if they had been dipped into a pond—we might easily say 100 per cent. more here than in England.

Now there is another cause of complaint of a very serious nature There is not the slightest inclination on the part of employers to take as apprentices any of the thousands of young Arabs, as they are colonially called, and the consequences are that they are entirely dependent on their parents; and, also, there is no sort of industry that young girls can engage in, except millinery and dressmaking, which is already overdone, and their pay is down almost to starving point. What we are going to do with the rising generation is an everyday question, but no one appears to be able to answer the question. We are sorry to say that our streets are thronged with unfortunate girls as a consequence of non-employment. The Government are building and enlarging gaols all over the country, and our benevolent institutions are all full, and one or two are getting additional wings built to accommodate the numerous applications for relief. There is one institution in Sydney that gives out once a week the large number of 1,800 2lb. loaves. It is nothing uncommon to see a respectable mechanic call in where other men are working to seek employment, or such other assistance as we may be able to give him; these are principally new arrivals, and most of them have travelled overland from Queensland, a distance of 500 miles or 600 miles The distress there no doubt you have heard of before now The colony of New South Wales has been getting gradually worse these last seven years, chiefly owing to the great amount of emigration and the falling-off of our goldfields, and more so through the great amount of importation of almost every article we left our homes to come here to manufacture.

We are, gentlemen, yours respectfully,
HENRY JAMES HOLLAND, Chairman.
JOSEPH COOPER.
EDWARD REYNOLDS, Secretary.
(Delegates from Joiners' Society.)
THOMAS GOSTELOW, Chairman.
EDWARD COTTRELL, Treasurer.
JOSEPH M'NEILLY, Secretary.
(Delegates from Painters' Society.)
THOMAS NORTH.
JOHN WILKINS.
(Delegates from Bricklayers.)
THOMAS HASSELL.
DENNIS HARRIS.
(Delegates from Labourers' Society.)

Sydney, New South Wales, November 12, 1866.

RECONSTRUCTION OF LONDON.

THE Commons' Select Committee of last session on the local government of the metropolis, though it did not complete its investigation, took evidence upon various topics from persons filling offices which cause them to be well acquainted with the way in which the poor of London live. A member of the Whitechapel Board of Works states that there are in that district 5,000 houses in courts and alleys and small streets requiring constant supervision, for there is such an indifference to cleanliness that if you make places decent they are soon again in a most filthy condition. Other witnesses say the same; but the medical officer of Newington observes that, as a rule, the accommodation the people have very much determines their character as to cleanliness. Their habits would be better if wretched lodgings did not exercise a degrading influence upon them. The Whitechapel witness declares that there is a certain progress towards better habits observable even in the lowest grade of life. "The other day," he says, "I saw in a back street an advertisement by a landlord who had rooms to let in houses of the poorest description, that the supply of water was abundant; a few years ago such a thing would not have been mentioned as recommendatory of such premises." But, as things still are, the poor are housed in a manner thoroughly discreditable to the metropolis. Very many of their houses are quite unfit for human habitation; houses in which there can be no thorough ventilation; houses built back to back, or against the dead wall of a towering warehouse; houses in courts that are no thoroughfare, and, perhaps, not above three yards

wide. "Sometimes," says the vestry clerk of St. George's, Southwark, "there is no room in the yard for a dustbin, and the people throw into the street what should go into a dustbin, and our scavengers take it away; we get it done as rapidly as we can." When fever breaks out, the sick person, in many instances, will not go to a hospital, and the authorities have no power to compel him to be removed out of the district, nor at all if he has a "proper lodging," with only one family in the room; so he lies there, and spreads infectious disease. The clerk of the Rotherhithe Local Board gives an account of his application for the only remedy open to him, closing premises as unfit for habitation. He says, "I served fifty-seven notices in one street, but, before orders could be obtained from the magistrates, the fever spread throughout the district, and we lost a curate and a relieving officer through it." The power to deal with nuisances is, and perhaps must be, limited. A vestryman of St. George's-in-the-East says:—"There is a large dust yard on a contractor's premises in a very close and confined district, and we have twice obtained an order from a magistrate for the removal of the refuse, but when the quantity is 700 or 800 tons it takes a long time to remove it. It is excessively disagreeable during the time of its removal, and dangerous in hot weather: it ferments, and when moved after being there a long time it is exceedingly offensive. The fact is this is not a fit place for such an accumulation, but the magistrate did not consider that he could give a prohibitory order limiting the quantity that should remain there in future." The witness added, "It would be better to pay compensation, and get the owner to go elsewhere, than to allow it to continue." There is a vast amount of preventible sickness and preventible waste of life in London. Act after Act is passed, but the remedy is not thorough. The overcrowding increases, and the people poison one another by it. The poorer parishes are weighed down by their rates, and as Mr. Reodle, of Southwark, had to say, the easiest way to avoid expense, is not to have inspectors enough, so that the whole truth may not be found out. But a remedy is spoken of by more than one of the witnesses before this Parliamentary committee. The vestry clerk of St. George's, Southwark, says, "We have not been able to do much in the removal of inhabitants from houses, because we have really nowhere for them to remove to. Many of the houses in this parish are so built as to be unfit for habitation, and many of the courts are such that they would be injurious to life whether overcrowded or not. There is scarcely any other remedy than pulling the neighbourhood down and reconstructing it. You could not pull down a thousand houses at once without first having others ready to receive the people, but you might pull down a few at a time." The vestry clerk at Rotherhithe can point out seventy or eighty houses there incapable of being made fit for habitation, and in some instances no house ought to be built upon the site. The vestry clerk of St. Martin-in-the-Fields is for power being given to the local authority to compel the owners of houses "almost uninhabitable" to close them or take them down and rebuild them; to live in them brings disease and death, and the occupation of such houses should be stopped. A vestryman of St. Pancras speaks of houses there built in such narrow courts and passages that they never could be wholesome habitations, and he considers it would be for the public good that they should be taken down. Everybody feels that it would be a blessing if such houses were burnt down without injuring anyone. In the case of injury from objectionable manufactures practically almost impossible to be got rid of, the vestry clerk of Bermondsey is of opinion that if such works in that parish could be stopped, the compensation that would be awarded would not be equal to the loss and injury the inhabitants have sustained from them. The low class of house property to which we are referring gets much into the hands of persons of small means; and if for this or other reasons the reconstruction should be undertaken by the authorities, it is argued that the expense would fall upon the metropolis generally, because the peril from these festering plague-spots is proximate to all London, and if the work were done by each parish for itself, there might in a parish be a burden too great for its resources, since under the present system the poorest ratepayers pay the highest rates. But, by some means or other, "if there's a will there's a way."—*Times.*

The well-known sculptor, M. Jules Klagman, has just died at Batignolles.

HOUSES OF PARLIAMENT.

THE *Times* says that since the last sitting of Parliament considerable alteration has been made in the House of Lords, in order to lessen, as far as practicable, the risk of conflagration. There was a very large accumulation of easily combustible material over the ceiling, which had been employed in making arrangements for certain methods of ventilation long ago condemned as failures, and abandoned accordingly. The numerous openings in the ceiling for the outlet of the vitiated air from the house, the manner in which the woodwork was distributed, and the desiccation of the wood in consequence of the ascent of the highly heated products of combustion from the large gas burners 9ft. underneath, were conditions obviously most favourable to ignition and rapid combustion; and if, unhappily, fire had broken out in that part of the House, it would have been subdued with great difficulty, in spite of the constant attendance of firemen with all their appliances at hand and in good order. The combustible matter removed consists of dry seasoned pine, laths, and quartering, and the total weight is not far short of 20 tons. There were 6,700 square feet of flooring, an inch thick, with the framed quartering to support it; nearly 2,000 square feet of partition, formed of upright quartering, covered on both sides with lath and plaster, several doors and minor partitions, extending over about 500 square feet. The total surface would thus exceed 9,000 square feet of dry wood, of which the greater part was only a few inches above the ceiling. During the recess of 1865 a large quantity of useless, dry, and readily inflammable pine wood was taken away from above the ceiling of the House of Commons. Even if fire should occur in or above the ceiling of either House every part is now accessible to the firemen, and would be so fully exposed to the action of the water ejected from the hose that there is every reason to believe it would be speedily extinguished. In both Houses of Parliament the risk of conflagration may now be regarded as very greatly diminished.

The damp, it is said, is playing havoc with the eight frescoes in the upper waiting halls of the Houses of Parliament. They cost the country some £500 each, but are now literally crumbling away from the wall. Sir W. Hayter's picture of the House of Commons on its meeting after the passing of the first Reform Bill, which cost the nation a large sum of money, hangs in an obscure committee-room, where the damp rising from the river daily impairs its colouring. There are plenty of vacant spaces in the building where it could be placed with advantage, and where the colouring of the picture would at the same time be preserved. Two new frescoes are ready for placing in the Peers' Lobby, but it has been decided to defer fixing them until the Easter recess.

LIVERPOOL ARCHITECTURAL SOCIETY.

THE usual fortnightly meeting of the members of this society took place on Thursday, Mr. F. J. Kilpin (the president) in the chair. Mr. Boult, referring to an article in the scientific papers descriptive of what was called a recent invention for the manufacture of useful and ornamental articles out of sawdust, exhibited a specimen of the work twenty years old. It consisted of a beautifully carved and polished letter weight, which had all the appearance of a piece of black marble. The President said he had heard of bread being made out of sawdust, but he had never heard of sawdust being converted into marble, and he thought the process would be more expensive than marble itself.—Mr. J. A. P. Macbride, sculptor, read the paper for the evening, on "Toxteth-park: the site of Sefton-park, and the surrounding district; its history, topography, and antiquities." The paper was illustrated by a large number of sketches from the pencil of Mr. Whitby Williams, of old buildings in the park, which Mr. Macbride said would shortly be swept away. In the course of a discussion which followed the reading of the paper the opinion was expressed that some monument should be erected in the town in honour of Horrocks, the astronomer, who lived and died in Toxteth-park, and a hope was expressed that in the laying out of the new park care would be taken to preserve the relics of antiquity within its precincts. The President said he thought it would be admitted that in making the purchase for the new park the corporation had shown a far-seeing and comprehensive wisdom, which would tend very much to the promotion of the health, pleasure, and profit of the present and future generations.

WAGES MOVEMENT.

The strike among the joiners of Kendal continues, and is as must be the case, the cause of much suffering and inconvenience.

The Amalgamated Engineers of Blackburn having received notice of a reduction in wages of 1s. a week to all employés earning 25s. or more a week, have resolved not to work more than four days a week on those terms, or to cease work altogether. The Amalgamated Engineers have a fund of £120,000, and the Ironmoulders £30,000.

SOUTH STAFFORDSHIRE.—The workmen of the Wednesbury Ironworks have agreed to accept the reduced wages, and to go to work as soon as the furnaces can be got ready for them. The dispute in the iron trade in South Staffordshire is, therefore, at an end for the present.

THE EIGHT HOURS' AGITATION BY FACTORY OPERATIVES.—On Sunday a meeting of delegates from the various cotton manufacturing towns in Lancashire, Yorkshire, Cheshire, and Derbyshire, was held at Accrington, the object being to further the eight hours' agitation with the view to get an Eight Hours' Bill passed by the Legislature as an amendment upon the Ten Hours' Bill and its provisions, so far as they relate to employment in the cotton manufactories of this country. Resolutions were adopted in favour of an eight hours' bill. The question of arbitration in cases of disputes was next considered, and resolutions agreed to to petition Parliament to adopt a bill instituting courts of conciliation and boards of arbitration for the settlement of all disputes between employer and employed.

WATER SUPPLY.

BRECHIN.—A special meeting of the Police Commission was held last week—Provost Guthrie in the chair—for the purpose of considering a report by Mr. James Leslie, C.E., Edinburgh, as to the best and most economical supply of water that could be provided for the burgh. Mr. Leslie's report described four schemes varying in expense, the cheapest of which was a scheme for a supply by gravitation from the Noran. This he seemed to recommend as the best scheme, and stated that the expense might amount to about £10,000 or £14,000, according to the quantity of clay or iron pipes that were laid. It was agreed generally to approve of Mr. Leslie's report.

LONDON.—The Registrar General, in his report on the Health of the Metropolis, states that last week nine water companies state that they supplied London on a daily average with 94,054,159 gallons, equal to 427,331 cubic metres, or about as many tons by weight. This was nearly a ton of water, or a cubic metre, to a house. Dr. Frankland's careful and impartial analysis shows that the solid matter in 100,000 parts of the waters ranged from 31·34 (Chelsea) to 39·40 (Kent): the organic matter from 0.69 (New River) to 2·64 (East London). The waters, except those of the New River, were turbid when drawn from the mains.

LEGAL INTELLIGENCE.

Mr. Commissioner Kerr has decided that railway companies are answerable for damage arising on the detention of goods *in transitu*. This will open up a wide field for future damages, which will be very interesting from time to time.

OBSTRUCTION OF LIGHT BY NEW BUILDINGS.—The Lord Chancellor gave judgment in the case of Calcraft *v.* Thompson last week. It was an appeal by the plaintiff from a judgment of the Master of the Rolls. The facts were briefly these:—The plaintiff was owner of two houses, numbered 2 and 3, Dunster-court, Mincing-lane, and the defendant was proprietor of No. 38, Mincing-lane. It appeared that at the top of plaintiff's house, No. 2, Dunster-court, there was a room of considerable size, the roof and sides of which were, for the purpose of obtaining the greatest possible amount of light, constructed principally of glass. The room was used by the tenant for exhibiting samples of foreign produce. The defendant had added a new story to his house, and built a large chimney before the filing of the bill, the effect of which was, as the plaintiff alleged, to darken his windows. The plaintiff filed his bill for relief, but the Master of the Rolls dismissed it with costs. The Lord Chancellor, in giving judgment, was of opinion that the plaintiff had not made out such a case as to warrant the interposition of the Court. Evidence of surveyors had been adduced on behalf of the plaintiff; and without considering the value of that evidence, he felt bound to disregard it, because the plaintiff had refused to allow the surveyors of the defendant to enter his house to give their view of the case on the defendant's behalf; and if he (the Lord Chancellor) had entertained any doubts as to granting the plaintiff relief, this fact would have satisfied him that he ought not to interfere, and that the plaintiff should be left to his remedy at law. The appeal must be dismissed, and with costs.

THE LIABILITY OF PUBLIC BODIES.—An important decision was given in the Court of Exchequer (sitting *in Banco*) on Tuesday, affecting the liability of public bodies for the results of negli

gence on the part of their servants. The vestry of Bermondsey were making a sewer in Blue Anchor-road, when a Mr. Juniper stumbled, in the dark, over a heap of dirt left by the workmen, which caused his death. Mrs. Juniper then brought an action, and obtained a verdict, with £875 damages, which the vestry appealed against, and now moved for a rule to set aside. In giving judgment the Lord Chief Baron said that recent decisions had finally settled the principles of the law as applicable to cases of this nature, and it was now authoritatively settled that the members of a public body created for public purposes, although having only public duties to perform, receiving no salaries, and having no funds out of which to pay damages, were liable for the damages caused by the negligent performance of their duties. The rule was refused, and the verdict therefore stands.

Light and Air.—In the Vice-Chancellor's Court, on the 26th ult., before Sir John Stuart, the cause of Lyon *v.* Dillimore came on on an appeal against the Chief Clerk's certificate finding £100 damages due to the plaintiff for injury to his light and air. The plaintiff was a toymaker and ship modeller, and carried on his business in a workshop at the back of his premises. The defendant was engaged in erecting a riding school in the rear of the plaintiff's workshop, so as, as the plaintiff contended, seriously to interfere with the plaintiff's light and air, and he accordingly filed this bill. On the case coming on on motion it was referred to chambers to ascertain what damage, if any, had been sustained by the plaintiff. The Chief Clerk had fixed the amount at £100, and this was an appeal against that decision. Mr. Greene, Q.C., and Mr. F. H. Colt appeared for the defendant, and contended the amount was once paid. Mr. Bacon, Mr. Surrage, and Mr. Jason Smith appeared for the plaintiff. The Vice-Chancellor said he had frequently expressed his view to be that where a matter was referred to the discretion of one person his judgment ought not to be disturbed where it was honestly and fairly given merely because another person might have taken a different view. Perhaps he might have thought £100 a large sum, but as the Chief Clerk had taken a different view he should not disturb it. The motion must be refused with costs, and the defendant must pay the costs of the suit.

NOTICE.

*** The Building News inserts advertisements for "Situations Wanted," &c., at One Shilling for the first Twenty-four Words.

TO CORRESPONDENTS.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the Editor, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Received.—J. P.—T. P.—U. M.—J. N.—R. A.—S. W. and Co.—D. K. and Sons.—R. D G.—G. M. B.—B. and Co.—L. Bros.—J. D.—T. M.—E. L. C.—G. C.—A. W. M.—S. W. and Co.

G. H. G.—Should be glad to receive the articles.

Jas. Downes and Son (Colchester).—The address of Messrs. Lambert, who supply the patent taps, is Short-street, Lambeth.

T. K.—We know of no such book.

"One."—To give general information on the necessary studies for a mining engineer would be rather wide of the mark in a building journal.

Delta and Others.—The reason why the Building News has been increased from twopence to threepence weekly, is that when sold at twopence it did not pay if we gave more than one page engraving. When two pages of engravings were given, so costly is lithographic work, that there was an actual loss on every copy sold. We, therefore, had to do one of two things either to give one page engraving and charge twopence, or two page engravings and charge threepence. We decided to do the latter, and to give a supplement when necessary. These supplements will sometimes consist of extra illustrations. For instance, the week after next we shall give, besides the ordinary two page engravings, two additional pages of *coloured* engravings.

Correspondence.

EARTH CLOSETS.

To the Editor of the Building News.

Sir,—As I find that you have published a letter of Mr. Boardman's, and my reply, and also a further letter from him, I forward to you a copy of my rejoinder, which was read at the meeting of the Board of Health last Tuesday. And I shall be glad if you will add that after much discussion the following motion was carried with only one dissentient:—"That the system of earth closets is not applicable in this corporate district." I send this thinking that you will like to print the result of the discussion.—I am, &c.,

Alfred W. Morant.

Norwich Board of Health, Surveyor's Office, January 29.

To the Chairman and Gentlemen of the Sanitary Committee.

Gentlemen,—I beg to offer a few remarks upon Mr. Boardman's letter of the 14th inst., and in the first place again to express my opinion that preventing the filth from the waterclosets entering the drains will not enable the Board to dispense with the proposed intercepting sewers; and besides it should be remembered that without a portion of these sewers being made, some parts of the district, such as the Newmarket, Ipswich, and Unthank's Roads cannot be drained at all, in addition to which the estimated amount of expenditure also includes the cost of draining Thorpe, Catton, Heigham, and other parts of the district now entirely unprovided for, and which must be sewered at some early period even if the comprehensive plan now proposed be not carried out.

At the meeting of your Committee on the 28th of Dec., I most particularly called your and Mr. Boardman's attention to the necessity of sewers for the purpose of conveying away the liquid refuse of houses, factories, and surface washings of streets, and asked Mr. Boardman what he proposed doing to purify the liquid filth before it was allowed to enter the river; he said he would provide a filter for each house or series of houses. I objected to this as being not only impracticable but also another source of nuisance and expense, and he was requested by the chairman particularly to turn his attention to this point, and to define the means he intended to apply for purifying such sewage. In his answer to my report, I find, however, that he has evaded the question, and I am not at all surprised at this, knowing as I do the great difficulty, nay, even the impossibility, of carrying out any such system.

Great stress is laid upon the danger of the gases evolved from sewers; no doubt some nuisance does occur from these foul gases, but a good supply of water (so used as to discharge the sewage into the outfall before putrefaction takes place), combined with a proper system of ventilation, will greatly obviate this.

Mr. Boardman and the advocates of the earth closet system appear to object to all sewers, but I cannot imagine that it is desired to return entirely to surface drainage—the liquid filth running along the sides of the street until it eventually reaches the river would not, I conceive, add much to the salubrity of the city or comfort of the citizens.

* * * * *

At Winchester, lately, the Local Board inspected the ash closets invented by Dr. Taylor, and used at Romsey, and came to the conviction that, however effectual the closets might be for certain objects, they do not and cannot effect the great object of main drainage or sewerage works, the getting rid of cesspools, and the prompt and rapid removal from town houses of all fluid or semifluid refuse, which, if stored up, would enter the putrefactive state and create the nuisances all are too familiar with.

In my former report I alluded to the absurd value placed upon the night soil of this city. Our contractor has lately refused to remove it and take it for nothing; and at Aldershot camp, though the ground is of the poorest description, no one will take the refuse of the privies gratuitously, and it costs the War Office from £500 to £600 a year to get it removed.

At Yarmouth also, until within the last four years, the privy bins were emptied by boys and men with carts, who were very anxious for the muck, as they obtained a ready sale for it; now the inhabitants have to pay in order to effect its removal. The Corporation used to receive several pounds a year for the rent of the ground on which the manure is deposited; now they are obliged to let the ground at a nominal rent. The contract for scavengering used to be £100 a-year, now it is £350, and it is a singular fact that the contractor has nearly the whole of the manure of last year still unsold.

I may add that if it can be proved that the abolition of waterclosets will render sewage sufficiently innocuous, the earth closet system is not, in my opinion, nearly so good and convenient as that of Captain Lemire.

There is, no doubt, much truth in the argument used by the opponents to the outlay required to be incurred for the proposed sewerage works in this city—namely, that the question of the best means of utilising sewage is at present in its infancy; but when it is considered that there can be but little difference of opinion as to the necessity of taking the sewage out of the river and taking it to one point there to treat it as may seem best (as pointed out by Mr. Miller and myself in our joint report of the 15th January, 1866), and that as the constructing the sewers will occupy about two years, we shall have the opportunity of taking advantage of any improved method which may be discovered during that period, so that there cannot be any reason why the works should not be carried out as recommended by the Special Sewerage Committee and confirmed by the Board.

I would add that, although irrigation may not ultimately prove to be the best method of purifying and disposing of sewage, it is at this present time certainly the best and most remunerative mode yet known. It has been tried successfully on a large scale, and I believe (although I did not at first advocate the system) that the Board has done wisely in deciding to try it, particularly as, from the manner in which the intended works are to be arranged, it will be easy to adapt them to any improved system which may eventually be discovered. It should also be understood that the Board has hired nearly twice the quantity of land generally manured with the quantity of sewage due to the population of Norwich, with the express intention of preventing any risk from saturation, and also to obviate some other objections raised by the opponents of the system of irrigation.

It is quite a mistake to assert that nothing but grass can be grown, as several other crops have been found to be greatly increased by the use of liquid sewage manure.

I will not take up your time with any further statements in favour of irrigation or in answering the objections quoted by Mr. Boardman (some of which are indeed anticipated in my first report). They have frequently been made before, and as often denied and refuted

It is a fact that the system is found practically both to purify the sewage so that it can be allowed to enter rivers without fouling the water, and also to produce most satisfactory results in a monetary point of view. The old saying that an ounce of practice is worth a pound of theory may well be applied in this case.

In conclusion, although I am quite aware that I might gain a temporary popularity by recommending earth closets or any other plan to stave off the dreaded "Drainage Scheme," I feel so assured that, under existing circumstances, the cheapest plan in the end will be for the citizens to boldly meet the difficulty and at once carry out the proposed plan (which has been long and carefully considered) that I cannot help strongly urging this opinion even at the risk of present unpopularity.

I am, Gentlemen, your obedient servant,

ALFRED W. MORANT.

Norwich Board of Health, Surveyor's Office, January 18, 1867.

[We have for want of space left out two or three passages of Mr. Morant's letter.—Ed. B. N.]

DURABILITY OF ZINC.

Sir,—We have seen in your number of the 4th inst. an inquiry respecting the durability of zinc roofs, and in your number of the 11th inst. two replies to it, which condemned zinc as a covering in a very summary manner. Perhaps the best answer which can be given to the two latter letters is that our company, who are the manufacturing agents of the Vieille Montagne Company, undertake to give legally-binding guarantees against all repairs arising from any deficiency in the quality of materials or workmanship for periods of from fifteen to twenty-five years, according to the gauge used. This is also subject to the conditions imposed by the Vieille Montagne Company, that the work shall have been passed by Messrs. J. and R. Fisher, the architects of that company.—We are, &c.,

Fred. Braby and Co.

Fitzroy Works, Euston-road, N.W., January 28.

CLASSICAL ARCHITECTURE IN EDINBURGH.

Sir,—So it is alleged that Classical architecture is receiving a new development in the "Modern Athens." Where is the evidence of this? In the new General Post Office?—a structure abounding in attached pillars, circular-headed pediments, balusters, and shallow-dentilled cornices; the design having been tinkered upon by one official and then another till all spirit has been burnt out of it. In the University Club? where the Coragic monument has been split in two, and the one half placed over the other to do duty as an oriel window: here you have the usual acanthus, honeysuckle, and fret, all sandpapered into inanity. In the City Bank? where fluted pilasters and balusters are tacked on to the wall surface. In the Sheriff's Court? where attached columns, rising through two stories, are superimposed upon a rustic basement, balusters as usual, and vases resembling cabbages, which same vases have sprouted up as vigorously as that vegetable on two other buildings here.

These four buildings are the most recent we have and it puzzles me to find out in which of them there is any sign of development. Is it a pleasure for me, think you, to break images? Far from it I would hail with delight the smallest symptom of development, but it has not as yet shown itself and it won't do to let conceit puff itself up and palm off dry bones as a living reality. We are rather a conceited lot, priding ourselves on our Classical knowledge. Some of us are indignant that a selection has not been made from our numbers to compete for the great prizes in London. We have men of talent here, Sir—men who strike out new ideas, who add Doric porticoes to a pyramid, and say "There is something original and grand."

If we have to design a church in the Gothic style, it must not be simple, but grand, and plaster is the best medium of producing a grand effect at small cost; development in that style does not obtain more than in the other. Our Academy opens in a few days. Will there be aught worthy of note in architectural design exhibited there? In painting there often is. We have recruited the ranks of the Royal Academy lately to some extent; there is development in that line. The grand and colourless Classical style has been abandoned by our painters—when will the architects follow?—I am, &c.,

Edinburgh, January 30. Iconoclast.

BIRKENHEAD BATHS COMPETITION.

SIR,—In these days of reform, is it not wonderful that some improvement has not been brought about in the matter of public competitions? Year after year the younger members of the architectural profession, whose perhaps sole chance of progress and distinction depends upon success in these *certamina artis*, submit to be gulled by the apparently honourable "instructions," put forward by various boards, commissions, and others. In the face of adverse and not unfrequently unfair decisions, they too often are content to suffer in silence the bitterness of successive defeats; where the injustice is unusually glaring they at most put forward a feeble protest against it, and finally allow the matter to sink into the limbo of past mistakes, glad to forget each failure, but hoping against hope, when each new opportunity offers. Surely there must be some remedy for these little less than swindles.

The competition for the proposed public baths at Birkenhead seems to be a peculiarly flagrant case. The instructions are framed on what appear to be the strictest and most honourable principles. The amount of tinting allowed and forbidden on the drawings was specified to the nicest shade, the amount of accommodation very carefully set forth, and generally the document reflected the very highest credit on the Town Surveyor, whose name was appended as a guarantee of its accuracy, and shall we say, to round the sentence, good faith. Amongst other things, the expenditure was not to exceed £8,000, and should the probable cost of the execution of the design first selected be found, upon examination by a competent surveyor, to exceed that sum, the sense of justice which so sternly swayed the official mind at Birkenhead would cause it at once to be set aside, and a fresh selection to ensue. This commission, if in common with other corporate bodies it possess not the conscience of ordinary mortals, would appear to have been at least free from their weaknesses. Its eyes refused to be dazzled by ultramarine skies, it would not yield its judgment captive to the charms of gorgeous perspectives (for it was expressly stipulated that these latter were not to be furnished), but all things were to be determined by the crucial test of cost. All this, however, turns out to be a specious,—nay, an impudent—sham. The drawings have now been for just five months in the hands of the commision without one word from them to the competitors concerning their decision, the purport of which at last oozes out only through the channels of the local press. And what a decision! As far as the matter is at present understood, it would appear that they have positively selected the design of the very Town Surveyor whose name appears on their instructions, and who is probably *ex offi io* a member of their body; and, moreover, the estimate for this design amounts to £18,000, considerably more than double the limit imposed upon the so-called competition.

I want to know if there is no remedy against all this really barefaced injustice. The *dei majore* of the profession, the members of the Institute, lulled as they are into a peaceful quiescence concerning all external matters by the sound of their own and each other's sweet voices, will of course take no pains to stir in the business. The Architectural Alliance, which has before now done good service in similar cases, makes no sign. If, in point of fact, such is really the state of this matter, will those gentlemen (and they are probably not a few) who were, like myself, *bona fide* competitors come forward and join me in obtaining counsel's opinion as to whether compensation cannot be obtained from the commission by all whose designs were in accordance with the instructions?—I am, &c., H. L.

CHESTER TOWN HALL.

SIR,—As the surviving partner of the original firm of contractors for the above I feel called upon to notice the letter of "Deva" which appeared in your impression of the 18th inst. I have to complain, in the first place, that "Deva" has very unnecessarily pulled the contractors into the discussion, which, I take it, has reference only to the strike, and in the second place, that having done so, he has kept back part of the truth. His assertion that "about June last it happened that the then contractor for the building found it convenient to stop work and negotiate for a transfer of the contract to another builder," is not only very wide of the mark, but is calculated to mislead the public and damage me. I m, therefore, under the necessity of making the following explanation:—The contract was originally taken by my father and myself when trading as George Clark and Son, but about six weeks after the signing of the contr ct, namely, on October 31, 1865, my father died, and his executors wishing to settle the estate, urged me to get some one to take the contract off our hands; to this I demurred until about March, when they told me plainly that they would not act unless the estate was relieved of the Chester Town Hall contract. I then, to prevent family difficulties, commenced negociations with the present contractor, and at a very considerable loss, turned over the job to him in September last. We did not stop the work, the strike did that. Had neither the strike nor the transfer taken place the work would have been going on still in our hands.—I am, &c., GEORGE CLARK.

[It is not necessary for the public interest that any more letters should appear on this question.]

CRITICISMS ON COMPETITIONS.

SIR,—I have often been struck and much pleased with your honest and impartial remarks on designs submitted by different architects in competitions. But there is one thing which I scarcely think justifiable- namely, to make those remarks before the contest is ended. In a certain ense you become the judge, so fa rat least as those appointed to that office may be led by your remarks. You therefore may be the means of throwing hundreds of pounds out of the pocket of one man into the pocket of another. Peradventure, however, you may be the means of having a better structure erected. I think it would be better to make your remarks after the decision of the judges is made known.—I am, &c., JOHN RAITBAY.

5, Minshall-street, Manchester.

[As we have an object in view,—namely, the improvement of the architecture of the country, and as we have no respect for persons, and are influenced only by public motives, we think it "writ down in our duty" to embrace every opportunity to offer criticisms on passing events We think they are the wisest judges who listen to suggestions from all quarters before they decide. Criticisms, if worth anything, must be more valuable before than after an adjudication.—ED. B.N.]

CANNON STREET STATION.

SIR,—I observe in your last issue two references to the "shed" roof of the Cannon-street Station, in each of which its design is ascribed to the architect of the hotel, Edward M. Barry, Esq. Allow me to say that this is an entire mistake. Mr. Barry is responsible for the hotel only, and the engineers for the station and roof.

ONE ENGAGED ON THE WORKS.

Intercommunication.

QUESTIONS.

FREEDOM OF ARTICLED CLERKS.

[209.]—I am informed that an architect s articled pupil is permitted, with or without the consent of his principal, to attend the architectural school at the Royal Academy. Will you kindly inform me how far this is true?

A PARENT.

NEW LIGHTS IN OLD OPENINGS.

[210.]—Would you be kind enough to inform me, through the medium of your paper, whether putting new sashes into old openings looking on to some adjoining property would prejudice in any way the prescriptive right to light through such windows? This is to settle a question raised and for future reference.—EDWARD DAVIES, 9, Temple-court, Liverpool.

PISTON PACKING.

[211.]—Would any of my fellow readers give their opinion of the following. The packing of the piston gets rotten a few days after it has been renewed. I think it is caused by imperfect condensation or bad water or it may be the steam pressure being so high (55lb.) it burns the packing. Any information gladly received. P. W.

PILING.

[212.]—Is there a rule for guiding one in proportioning the weight to be safely put upon piles? When the ground is bad there would be more likelihood of the piles getting down with a heavy weight upon them than if the foundation was hard. If any of your numerous correspondents could oblige me with any information on this subject I should feel much obliged to them, as I have sought far and wide before I ventured to trouble your readers with my request. HELLINGWORTH.

THE ADULTERATION OF GAS.

[213.]—It seems to me that the ratepayers of the metropolis and other large towns which are supplied with gas should be better informed than they are as to the simplest and most effectu l modes of testing its purity and actual illuminating power. As matters stand at present the purchasers of gas—which they generally have to pay a very high price for—have scarcely any means of checking the quality of the article supplied. Could not you, sir, throw some light of a practical nature upon the subject, and thus enable us to see our way towards obtaining this necessary of civilised life in an unadulterated state? The various processes of purification pursued by the large gas companies are perhaps tolerably well understood, but there is a wide spread conviction among the general public that their meters register the passage of other substances than carburetted hydrogen, pure and simple, and that therefore they have to pay for what they don t get—gas of the highest illumin ting power. My own conviction is that atmospheric air, which should be free to all, is frequently paid for, when passed through gas pipes, at 4s. or 4s. 6d. per thousand feet. Is there any easy mode of detecting this imposition? If so, you will oblige me and many others by explaining it. CARBONIC ACID.

CHOKE-DAMP, AFTER-DAMP, STYTHE, &c.

[214.]—In reading the reports published day by day of the inquest on the bodies of some of the poor fellows who so unfortunately perished in the Oaks Colliery when the terrible explosion occurred t ere lately, I have been puzzled by the singular technicalities employed by some of the witnesses. In fact to understand them all one would require a miner's dictionary, which I have not got, and which perhaps does not exist. Possibly you or some of your correspondents may be able to enlighten me on at least some of the obscure points. The word fire-damp I believe means coal gas, but what of choke damp, after-damp, stythe, dampe, black-damp, white damp, and fire. I imagine that I am far from being alone in my ignorance, and others may be equally thankful for explanations.

INQUIRER.

REPLIES.

IRON IN CESSPOOLS.

[182.]—The union of oxygen with organic matter causes the decomposition of that matter. When oxide of iron is present this union is effected much more rapidly than when the organic matter is left to itself—*e. g.*, one may sometimes see lying on the sea shore a piece of timber with a bolt hole and perhaps bolt in it. This hole will be found to be much more decayed than any other hole which has no iron or rust about it. ECCE.

COMPOSITION FOR MODELLING.

[196.]—Your correspondent "Novice" has made a mistake in the terms he uses. Plaster of Paris is never used for modelling. The proper material is modelling clay, which is worked into accurate contours by various modelling tools of different sizes and shapes. These tools are made of hard, well-seasoned wood, and although well adapted for making an impression on clay would not produce any effect upon a material so hard as plaster of Paris. I think "Novice" is confounding taking casts from models with modelling. I do not know what he means by using the word "cut" in connection with the subject. He had better take a few lessons in modelling at one of the London Schools of Art, the West London School, for instance, where I have been. A MODELLER.

STONE DAMAGED BY FROST.

[197.]—Will you allow me to inform "A Subscriber" that I should not hesitate to use the stones he mentions a second time. I should dress the edges and turn the broken surfaces a bit, and they would be as good as ever they were. Had the stones not been left exposed they would never have been injured by the frost in the manner described.

MASON.

ALTERING CRANES.

[198.]—With your permission I will give "Wharf-holder" the information he desires. The length of the tie-bars will be reduced to 8ft. 3in. in order to allow the old jib to be used. The change in the angle of the jib will be on the safe side for its strength, so that if it were perfectly strong enough before it is sure to be so now. C. C.

METALLING.

[199.]—In reply to your correspondent I beg to acquaint him that he may consider a heaped bushel of metalling to measure about 2,700 cubic inches, and that if he makes his calculations on this basis he may rely upon their standing test. At the same time in my own practice, I never shave the thing too closely; give and take is the principal to go upon, and I have always found it answer best.

A BROTHER SURVEYOR.

CAST-IRON GIRDERS.

[201.]—I think, if you will allow me, I can satisfactorily answer the query of your correspondent "C. C." The breaking weight of any cast-iron flanged girder can be obtained by the use of Mr. Hodgkinson's formula $W = \frac{A \times D \times C}{L}$, where A is the area of the bottom flange D the depth of the girder, L the span, and C a constant equal to 26 All the dimensions must be in inches. In the particular example referred to $A = 10 \times 1\frac{1}{4} = 12{\cdot}5$ square inches; $D = 21$in. and $L = 20 \times 12 = 240$in. We therefore have $W = \frac{12{\cdot}5 \times 21 \times 26}{240}$ and solving the calculation we have the breaking weight at the centre the beam equal to $28\frac{1}{4}$ tons. The breaking weight of the beam spread evenly over it, as "C.C." intends doing, will be just double this, that is, 57 tons. As the load will be stationary, and not bring any violent shock or jerk upon the girder a fourth of this breaking weight may be safely put upon it. Thus the girder will bear 14 tons uniformly distributed over it with perfect safety, but it would not be wise to exceed this amount. ENGINEER.

[201.]—"C.C." will obtain the breaking weight of his girder by using the formula $W = \frac{A\ D\ C}{L}$, in which W = breaking weight; A = area of bottom flange in inches; D = depth of girder in inches; C = a constant, in this case 50; and L = span in inches. Or taking the dimensions in in.

he gives $W = \frac{12{\cdot}5 \times 21 \times 50}{240} = 54{\cdot}68$, or $54\frac{3}{4}$ tons nearly, as the weight, equally distributed, that will break it.

N. S. P.

[201.]—In answer to "C. C.'s" inquiry regarding the strength of a cast-iron girder of the following dimensions:—Length, 20ft., depth, 21in., area top flange, 6·25in., bottom, 12·5in. Let A = area of bottom flange, D = depth of girder, in inches, L = length between supports in inches, W = breaking weight in tons at centre. Then we have $W = \frac{A\ D\ C}{L}$ 98·40 tons. For distributed load $\frac{\times\ 2}{56{\cdot}80}$ a factor of safety of 6 gives 9·46 tons, as a safe load for the girder. The example "C. C." gives is a very defective girder, as four square inches might be deducted from the top flange without interfering with the strength. Four square inches multiplied by the length of the girder is equal to 240 cubs. of iron wasted. W. S. VAUGHAN.

Queen's Insurance Buildings, Liverpool.

WEAR AND TEAR OF MACHINERY.

[203.]—No man knows the market value of anything until he tries to sell it; I should be afraid of disappointing

"Retirer" were I to tell him how much I lost upon an occasion similar to the one he describes. But he may consider himself lucky if he sells his whole stock and concern for one-third of what they originally cost him.

EXPERIENCE.

WATER PRESSURE.

[205.]—The gentleman desiring information upon this subject may use the following rule:—Let P be the pressure in pounds per square foot, and V the velocity of the current in miles per hour, then $P = 4{\cdot}085 \times V^2$. With a current of three miles per hour the pressure will be about 36½lb. to the square foot, and when the velocity is four miles it will equal 65lb. In using this equation it must be borne in mind that it is only approximate for very high velocities.

H. E.

HOT WATER FOR CEMENTS.

[206.]—Hot water should not be used either in mixing Roman, Portland, or Parian cement, or plaster of Paris. Chilled water might be used, but the cement would be stronger with cold water.

J. S.

[206.]—The query of "Amateur" appears to show that he had not reflected much before putting the question. He ought to be aware that in mortar and concrete, for instance, when the sand and lime are mixed dry the slaking of the lime when cold water is added in reality makes hot water of it, as it raises the temperature to a high point. Independently of the fact that hot water has no effect upon the quality of the mortars and cements used it would be simply impossible to have hot water always ready for building purposes.

J. T. H.

MEASUREMENT OF TIMBER.

[207.]—In answer to your correspondent "Milo," battens, deals, and pines are generally, but not always bought by the standard of 120 12ft., 1½in. × 9in. He must therefore reduce his deals to sizes, as under:—

120 12ft. 3in. × 9in. the exact average width equal to
1,440 ft. run 3in. thick.
2
2,880 ft. run, 1½in. thick.
9
11) 25,920
12) 2,357 ft. run, 11in. wide.
196 5-12ft. lengths, = 1 C 2 16 5-12 standard
120 1 C
60 2 qrs.
16 5-12
1 2 16 5-12

The 1 2 26 6-18, as charged, must be an error.

BUILDER'S CLERK.

Building Intelligence.

CHURCHES AND CHAPELS.

Mr. R. D. Gould, of Barnstaple, is erecting some churches, schools, and parsonages in Devonshire which have been favourably noticed by the local societies.

A New Episcopal church is about to be built in Alloa, Scotland. The new edifice will be of stone, and will have a tower and spire. The architect is Mr. Withers, of London.

The congregation of the Independent Church in Collins-street, Melbourne, Australia, are erecting a new place of worship. It is to be completed in nine months, and it is designed to accommodate 200 persons.

AMERICA.—St. Mark's Church, on Green Island, was consecrated by Bishop Potter on December 12. The edifice, says the *New York Churchman*, is a perfect model for beauty of design and finish. The material of the exterior is rough finished blue stone, the style of architecture being much the same as that of St. John's Church, Troy. The dimensions of the church proper are 30ft. wide by 90ft. long. A Sunday-school building, 22ft. in width by 60ft. in length, is connected with the main edifice by a structure 20ft. square. The spire is about 60ft. in height. The seats are of chestnut and the ceiling of walnut. The stained glass windows at either end of the church are beautiful specimens of art. The device upon the chancel window represents St. Mark with a lion crouching at his feet. The opposite window is a memorial from the children of St. Paul's Church, and represents three children singing. The edifice was built through voluntary contributions, some citizens fairly outdoing themselves in liberality, and cost 17,500 dollars.

FULFORD.—A new church at Fulford, near York, which has been erected at a cost of £5,000, and designed by Mr. J. P. Pritchett, architect, Darlington, has just been consecrated and opened by the Archbishop of York. The style of the church is the Early Decorated, and at the south-west corner is placed a tower and spire, 140ft. high. The name of the church is St. Oswald's, and the contractor for the works was Mr. Weatherley, of York. The pulpit and reading desk were executed by Messrs. Forsyth, and Co. of London; the altar rails were supplied by Messrs. Skidmore and Co., of Coventry; and the carving was done by Messrs. Burstall and Taylor, of Leeds.

YORK.—The foundation stone of a new Baptist chapel in Priory-street was laid last week. The building will be in the Early Decorated style. The plan consists of a nave and aisle, with transepts. The length of the nave will be 78ft., and the width 24ft. 6in. The width will be 44ft. between the aisle walls, and 49ft. 6in. across the transepts. The height to the eaves above the clerestory will be 32ft. 6in. and to the collar beam of roof 44ft. 6in. The timber work of the roof of both church and schools will be exposed to view. The exterior of the church will be faced with stone, the dressings in Whitby stone, and the walling of Bradford sets, in thin beds. At one corner of the church will be a tower, the height to the top of the pinnacle being 61ft. At the other end will be two gables, one being the school, and the smaller one the transept of the church. The architect is Mr. W. Peachey, of Darlington. The contractors are—For the brick and stone work, Messrs. C. Bowman and Co; plastering, Mr. M. Croft; slating, Mr. T. F. Wood; carpenter and joiner, Mr. W. Bellerby. The total cost, including the land, will be about £5,000.

BUILDINGS.

On Wednesday week last a new Wesleyan School was opened at Blackpool. The school was built to afford accommodation for 260 persons at a total cost of £546.

Another addition to the orphan houses on Ashley Down, Bristol, is about to be made by Mr. Müller, at a cost of £20,000, and the contract for the erection of the new building has been undertaken.

LEEDS.—The directors of the Queen's Hotel at the Wellington (Midland Railway) Station have completed an additional wing to the hotel, thus increasing the total number of rooms in the building to 140. One of the principal features of the addition is a spacious well-lighted hall, 80ft. long, 35ft. wide, and 18ft. in height. The total cost has been about £13,000.

MELBOURNE.—The inaugural ceremony of the Victoria Deaf and Dumb Institution took place on the 13th of October. The building, which is adjacent to St. Kilda-road, was formally opened by the Governor. Including the fencing and out-buildings, the edifice cost £6,800. Towards the liquidation of that amount Parliament has voted £4,000, and a sum of £1,800 has been received from private subscriptions, leaving £1,000 still to be provided. The building is surmounted by a lofty tower.

General Items.

Mr. E. Lynam, the Wakefield borough surveyor, who a short time ago sent in his resignation, has been induced to withdraw it.

The Eastern Railway Company (France) has just adopted a new third class carriage. It is two stories high, and contains seats for 80 persons.

The following gentlemen were elected Fellows or Associates of the Royal Institute of Architects, on Monday last:—As Fellows:—John Clark, 2, James-street, Bedford-row, W.C.; William Henry Crossland, 25, Park square, Leeds; Henry John Paull, Manchester. As Associates:—Charles James Moxon, 28, Denbigh-place, Belgrave-road, S.W.; William John Bowyer, Cambridge; Edward Joseph Hansom, Clifton; Edmund Kirby, Liverpool.

The following gentlemen have been elected members of the Society of Arts:—Phillips Bevan, Albert-terrace, Windsor; Sir John Francis Davis, Bart., K.C.B., Club Chambers, Regent street, S.W., and Hollywood, Henbury, Bristol; Admiral Sir Henry J. Leeke, K.C.B., K.H., Theydon-park, Epping, Essex, and 5, Euston-place, Leamington; Evan Lewis, Aberdare; Thomas Henry Phillips, 51, Lime-street, E.C.; Joseph Pitter, 2, Thanet-place, Strand, W.C.; George W. Railton, Alderley-edge, Manchester; Howland Roberts, Neilgherry-house, Hampstead, N.W.

On Saturday last the Bristol Art and Industrial Exhibition was closed, after having been opened 24 days, and visited by 2,000 persons. The receipts amounted to £185, and the expenditure about £100, leaving a balance of £85.

INSTITUTION OF NAVAL ARCHITECTS.—The next annual meeting of this institution will be held in London on the 11th, 12th, and 13th of April next. Papers intended to be read, together with any drawings connected with them, should be sent to the assistant secretary, No. 7, Adelphi-terrace, on or before the 21st of March.

CIRENCESTER.—The distribution of prizes gained by students of the Cirencester School of Art took place last week, the Earl of Bathurst in the chair. The report stated the school had obtained one silver medal out of twenty, and two bronze medals out of fifty, distributed among the 100 schools in the kingdom, and that the school was surpassed only by nine of the largest schools of art, including the metropolitan. An able and interesting address was delivered by Mr. J. B. Atkinson, of London.

STEAM ON COMMON ROADS.—Mr. Page, the well-known engineer, has started a plan for converting high roads into railways, which recalls Sir Robert Peel's dream of twenty-five years ago:—"Some new discovery which shall enable us to lay down a light railway on the turnpike roads at (say) £2,000 a mile." Mr. Page proposes to do this by means of peculiar locomotives, with extra guide wheels on independent axles. The wheels of the axles are to run, not on iron, but on tramways of creosoted wood, as indestructible as iron, but giving by friction much more power to the engine. The guide wheels and wheels of the carriages will run on light iron rails.

MOUNTAIN ATTRACTION.—The pendulum experiments now carried on in India in connection with the great Trigonometrical Survey under the direction of Lieutenant-Colonel Walker, R.E., have led to certain new and important conclusions as regard mountain attraction. Theoretically, the nearer the observing stations are to the Himalayas, the greater the force of gravity; but the reverse is found to be the fact, and the difference between theory and fact diminishes with the increased distance of the stations from the hills. Commenting on this phenomenon in a communication to the president of the Royal Society, Colonel Walker writes:—"This seems a remarkable confirmation of the Astronomer Royal's opinion, that the strata of earth below the mountains are less dense than the strata below plains and the bed of the sea." Is there not something in this result worth consideration by geologists

ST. KATHERINE'S DOCKS.—We regret to observe that the front wall of the passengers landing place St. Katherine's Docks has since the recent thaw exhibited signs of extensive settlement. Although there has been a gradual settlement apparent for a long time, still no one was prepared for anything so sudden and extensive as has taken place. The building which is only one storey in height, must be entirely taken down, and the greatest care will be required to prevent accident happening from the extremely uncertain condition of the wall. The sinking of the wall has thrown several of the iron columns which support the roof considerably out of position, so much so that unless shoring is immediately resorted to, the effect of a single tide may be to bring down the roof, very possibly carrying the parapet on the street with it. The primary cause of this state of things, we believe is a notoriously bad foundation. It is very seldom indeed that fractures so very extensive take place in so very short a time.

COPPER SMOKE.—For generations past efforts have been made to utilise or neutralise the smoke emitted from the various copper works of the kingdom, which is known to be so injurious to all vegetation around. In the neighbourhood of Swansea, which is the principal seat of the copper trade, there are thousands of acres with hardly a blade of grass upon the ground, and in many instances the smelters have had to pay heavy damages for the injurious effects of the smoke on adjoining properties, even trees many miles distant being affected. About twelve months ago Mr. H. H. Vivian, M.P., adopted an invention at his works in order to see whether something could not be done to abate the nuisance, and, if possible, utilise the smoke as well. A considerable outlay was incurred in giving a thorough practical test to the invention, and at the meeting of the West Glamorgan Agricultural Society, Mr. Vivian announced that his efforts had been crowned with entire success. The smoke is condensed, and by judicious admixtures a very excellent superphosphate is produced, which is especially suitable for root crops. Mr. Vivian calculates that in a short time he will be able to produce annually sufficient manure for 40,000 acres of land. The success attained will no doubt induce other copper smelters to follow the example, and many thousand acres, which are now almost a barren waste, will then be made fertile ground.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

1580 J. CRANSTON. *Improvements in horticultural rections.* Dated June 8, 1866

In performing this invention the inventor proceeds to construct a simple and economical form of glass house by hinging together ordinary sash frames in such manner, and by so connecting them to the wood sill plates and uprights of the structure, as to admit of the house being opened right and left at the ridge or other apex of the roof, so as to allow a passage down the centre when required, the whole being capable of closing by drawing together the two sides of the house. *Patent abandoned.*

1598 F. W. KURZ *Improvements in the construction of safes or strong rooms.* Dated June 12, 1866

In the first place, instead of having a door or doors to open upon hinges, as usually adopted, the inventor employs two or more doors sliding in grooves. Instead of employing a single sliding door, he proposes to apply two or more sliding doors, so arranged as to slide in grooves one behind the other, and to divide the safe or room into two or more compartments by a partition or partitions, so that only one compartment is open at a time. By this arrangement the grooves in which the doors slide are carried round all four sides of the opening, that is, right, left, top, and bottom; and there is no long slit or opening for the doors to slide out through, as they do not slide out beyond the safe, but merely slide one before or behind the other. This element of weakness being thus dispensed with, the safe or strong room is rendered much more secure, and the introduction of wedges or other tools for breaking open the same much more difficult. As a further protection, he also proposes to fill up the top or bottom groove, or both, in which the front door slides by means of a hinged bar, which cannot be removed until the other door, which slides behind it, has been opened. He also fixes a dovetail bar across the opening, about midway between the top and bottom, on which bar a dovetail groove in the back of the sliding door fits. *Patent abandoned.*

1688 C. F. COTTERILL. *Improvements in the manufacture of earthenware and other pipes, and in machinery or apparatus to be employed in the said manufacture.* Dated June 26, 1866.

This invention relates to such pipes as are made double and in segments, that is, pipes which consist of two concentric pipes one within the other made by being built up of segmental pieces. The said pipes are usually made of earthenware and are principally used for conveying water and sewage. The improvements in the manufacture of the said pipes consist in making the segmental pieces much thinner than usual, and filling up the space between the inner and outer pipes with cement, so as to consolidate the whole into one compact mass instead of leaving the space between the two pipes empty. *Patent abandoned.*

1706 E. AMBROSE. *Improvements in venetian blinds and blind fittings, and in machinery for making the same, parts of which machinery may be used for other purposes.* Dated June 27, 1866.

The patentee claims, first, the suspension of venetian blinds by the top lath being hung on pivots in fixed brackets or supports, instead of in the usual manner. Secondly, the two modes described of fixing the ends of blinds to their rollers, so as to dispense with nailing and sewing. Thirdly, the arrangement of winding apparatus described. Fourthly, the elastic holder for the shade cord of venetian blinds. Fifthly, the mechanism described for planing the two sides and edges of the laths by the fixed planes, as described Sixthly, the arrangement of planes and cutters for planing and cutting blind rollers, as described. Seventhly, the apparatus hereinbefore described for planing laths of venetian blinds and similar articles, by first passing such laths or other articles through paint, or dipping them in paint, and afterwards scraping and finishing them by means of fixed elastic scrapers and brushes, as described. Eighthly, the apparatus described for cutting the short narrow tapes, and marking the broad vertical tapes of venetian blinds. Ninthly, the apparatus described for punching the holes in the laths of venetian blinds, whether the punch for the purpose be worked by a handle or by a lever; and, lastly, the arrangement of fixed scrapers for scraping laths required to be reprinted. *Patent completed.*

MEETINGS FOR THE WEEK.

MON.—Royal United Service Institution.—"A Light, Short Gun, throwing a Sharp-edged Discoidally formed Projectile," by Lieut. General W. N. Hutchinson. 2. "The Working of Heavy Broadside Guns," by Mr. A. W. Drew, 8.30.

Royal Institution.—Monthly Meeting, 2.

Society of Engineers.—"On Safety Valves," by Mr. T. Baldwin, 7.30.

TUES.—Royal Institution.—"On Vibratory Motion, with special Reference to Sound," by Professor Tyndall, 3.

Institution of Civil Engineers.—Discussion on "Ships of War;" and, "Description of the Clifton Suspension Bridge," by Mr. W. H. Barlow, 8.

WED.—Geological Society, 8.

THURS.—Royal Institution.—"On Vibratory Motion, with special Reference to Sound," by Professor Tyndall, 3.

Chemical Society, 8

Linnean Society, 8.

FRI.—Royal Institution.—"On Public School Education," by Rev. F. W. Farrar, 8.

SAT.—Royal Institution.—"On Harmony," by Mr. G. A. Macfarren, 3.

Trade News.

TENDERS.

BETHNAL GREEN.—For rebuilding house, No. 7, Green-street, for Mr. G. Baugh. Messrs. Tolley and Dale, archi- :—

Withers	£756
Forrest	748
Higgs (accepted)	677

BROMPTON.—For new sewer, Yeoman's-row, Brompton, for the Kensington Vestry:—

Bond	£587
Williams	400
Atkins	397
Moxon and Mutton	395
Thackeray	395
Lacey	385
Wigmore	374
Thirst	340
Whittick (accepted)	295

CITY.—For rebuilding Nos. 2 and 3, and alterations to No. 4, Finch-lane, City, for Mr. Alfred Pursell. Mr. Herbert Williams, architect. Quantities supplied by Mr. C. Reilly:—

Turner and Sons	£3,299
Ramsley and Sons, Birmingham	3,180
Ashby and Horner	2,890
Ashby and Sons	2,869
Conder	2,721
Newman and Mann (accepted)	2,637

SHEFFIELD.—For the new drapery establishment, Sheffield, exclusive of stoves, chimneypieces, warming apparatus, gas or any fittings, for Messrs. Cole Brothers. Messrs. Flockton and Abbott, architects:—

Wilson	£10,350 0 0
Robertson	10,300 0 0
Huddleston	10,132 0 0
Barber	9,966 10 6
Gomersall (accepted)	9,650 0 0
Clubley and Stringfellow	9,494 0 0

SHEFFIELD.—For counter and desks, at the new Sheffield and Rotherham Bank. Messrs. Flockton and Abbott, architects:—

Manuel and Son	£710
Eadon and Son	500
Johnson and Son (accepted)	420

STOKE NEWINGTON.—For the erection of two villas, Stoke Newington, for Mrs. Burdett. Mr. T. Hill, architect:—

Nash	£2,897
Patman and Fotheringham	2,575
Carter and Sons	2,530
Longmead	2,447
D King and Sons (accepted)	2,360
Maclachlan	2,152

STRAND.—For alteration at the Rising Sun Tavern, Strand. Mr. William Nunn, architect:—

Anley (accepted)	£521

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

PROPERTY SALES.

JANUARY 28.

AT MASONS' HALL.—By Messrs. P. and J. Belton.—Leasehold six houses, Nos. 1 to 6, Church-street, Wimbledon, producing £64 per annum, term 40 years from 1866, at £12 6s. per annum—sold for £790.

JANUARY 29.

AT THE MART.—By Messrs. Farebrother, Clark, and Co.—Freehold three houses, Nos. 3 and 4, High-road, and 2, Derby-road, Tottenham—£1,085.

By Messrs. Debenham, Tewson, and Farmer.—Leasehold warehouse, situate in Counter-street and Hay's-lane, Tooley-street, Southwark, let on lease at £210 per annum, term 26 years unexpired, at £24 10s. per annum £2,100.

Leasehold premises, Nos. 26, Tooley street, let on lease at £110 per annum, term 26 years unexpired, at £20 per annum—£1,050.

Leasehold house and shop, No. 27, Tooley-street, let on lease at £62 per annum, term 26 years unexpired, at £10 per annum—£660.

Leasehold house and shop, or warehouse, No. 47, Tooley-street, producing £105 per annum, term 20 years unexpired, at £14 3s. per annum—£1,010.

Leasehold house and shop, No. 48, Tooley street, let at £70 per annum, term 20 years unexpired, at £7 per annum—£590.

Leasehold house, with shop or warehouse, No. 49, Tooley-street, let on lease at £115 per annum, term 20 years unexpired, at £10 per annum—£980.

Leasehold house, with shop or warehouse, No. 51, Tooley-street, let on lease at £70 per annum, term 21 years unexpired, at £20 per annum—£860.

Leasehold house with shop, No. 52, Tooley-street, also a stable in the rear, let on lease at £100 per annum, term 21 years unexpired, at £9 12s. per annum—£900.

Freehold business premises with yard, No. 5, West-lane, Spa-road, Bermondsey, let on lease at £10 10s. per annum—£220.

AT THE GUILDHALL COFFEE-HOUSE.—By Messrs. Broad, Pritchard, and Wiltshire.—Freehold cottage, situate at Yalding, near Maidstone, Kent—£160.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Joseph Atkins, Slough, builder, Feb. 13, at 2—William Clark, London street, Tottenham court road, contractor, Feb. 7, at 11—William Elliott, Tenterden, plumber, Feb. 11, at 12—William Henry Golightly, Eton street, Regent's park, journeyman carpenter, Feb. 6, at 2—James Richard Juster, Merton, carpenter, Feb. 7, at 1—James Risely, Woolwich, shipwright, Feb. 6, at 12—John Rowe, Westbury road, sanitary engineer, Feb. 13, at 12—Charles Simons, Euston road, builder, Feb. 11, at 11—William Harris, Plaistow, builder, Feb. 11, at 2—Charles Nichols, Tottenham, builder, Feb. 14, at 1—John Plowman, Merton, builder, Feb. 11, at 12.

TO SURRENDER IN THE COUNTRY.

Charles Clare, Oldswinford, builder, Feb. 11, at 10—W. Middleton, Leicester, builder, Feb. 12, at 11—James Parsons, Midsomer Norton, builder, Feb. 6, at 11—William Parris, Thurlaston, builder, Feb. 11, at 12.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9	0	£10	10	Archangel, yellow ..	£12	0 £13 0
Quebec, red pine	3	5	4	15	St. Petersburg, yel...	10	10 11 10
" yellow pine..	2	15	3	10	Finland	8	0 8 10
St. John N.B. yellow	0	0	0	0	Memel	0	0 0 0
Quebec Oak, white ..	5	10	6	0	Gothenburg, yellow	9	0 10 10
" birch.....	3	10	4	10	" white	6	0 8 10
" elm	3	10	5	0	Gefle, yellow.....	9	0 11 0
Dantzic oak	3	10	6	0	Soderhamn	9	0 10 10
" fir	2	0	3	10	Christiania, per C., 12 ft. by 3 by 9 in. yellow	18	0 22 0
Memel fir	3	0	3	10	Deck Plank, Dantzic, per 40 ft. 3 in.	0	14 1 4
Riga	3	0	3	6	PUMICE STONE pr ton	6	0 8 0
Swedish	1	18	2	3	OILS, &c.		
Masts, Quebec red pine	6	0	8	0	Seal, pale....per tun	45	0 46 0
" yellow pine..	5	0	6	0	Sperm body 127	0	0 0
Lath wood, Dantzic, fm	4	10	5	10	Cod	40	0 0 0
" St. Petersburg	8	10	7	10	Whale, Sth. Sea, pale	45	0 0 0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Olive, Gallipoli.....	63	0 0 0
Quebec, white spruce	13	10	21	10	Cocoanut, Cochin, ton	58	0 0 0
St. John, white spruce	13	0	15	0	Palm, fine	41	0 0 0
Yellow pine, per reduced C.					Linseed	36	10 0 0
Canada, 1st quality.	17	0	19	10	Rapeseed, Eng. pale..	41	0 0 0
2nd do.....	12	0	14	0	Cottonseed.....	31	0 37 0

METALS.

IRON:—						
Welsh Bars in London .. ..per ton	5 15 0	0 0 0	3			
Nail Rod ..... d	7 15 0	8 6 0	2½			
Hoops ..... do	17	9 10 0				
Sheets, Single ..... do	9 17	10 15 0				
Staffordshire Bars .. .. do	7 17 6	8 10 0				
Bars, in Wales ..... do	5 15	6 0 0	3			
Rails ..... do	5 15	6 0 0	nett			
Foundry Pigs, at Glasg. No. 1 .. do	2 14 0	3 7 0				
Swedish Bars ..... do	10 10 0	12 10 0	2½			
STEEL:—						
Swedish Keg, hammered .....per ton	15 15 0	16 0 0				
Swedish Faggot ..... do	10 10 0	12 10 0				
COPPER:—						
Sheet & Sheathing, & Bolts ....per ton	88 0 0	91 0 0	8			
Hammered Bottoms ..... do	101 0 0	0 0 0				
Flat Bottoms, not Hammered .. do	94 0 0	96 0 0				
Cake and Tough Ingot ..... do	76 0 0	77 0 0				
Best Selected ..... do	84 0 0	89 0 0				
Fine Foreign ..... do	84 0 0	87 0 0				
Yel. Metal Sheathing & Rods ....per lb	0 0 7½	0 0 8				
LEAD:—						
Pig, English .....per ton	22 5 0	22 10 0	2½			
" Spanish Soft ..... do	13 7 6	0 0 0				
Shot, Patent ..... do	23 10 0	24 0 0				
Sheet ..... do	21 5 0	0 0 0				
White ..... do	30 0 0	31 10 0				
SPELTER:—						
On the spot .....per ton	22 6 0	22 15 0	nett			
TIN:—						
English Block .....per ton	90 0 0	0 0 0	2½			
do Bar ..... do	91 0	0 0 0				
do Refined ..... do	93 0 0	0 0				
Banca ..... do	89 0 0	0 0 0	nett			
Strait ..... do	86 0 0	86 10 0				
ZINC:—						
English Sheet .....per ton	28 0 0	0 0 0				
Devaux's V. M. Roofing Zinc .... do	27 0 0	0 0 0	*			
* And 5 per cent. discount if laid upon the new system.						
QUICKSILVER .....per btl	6 18 0	7 0 0	3			
REGULUS OF ANTIMONY.						
French ..... per ton	34 0 0	0 0 0	2			

THE ART JOURNAL, price 2s. 6d. Monthly.—Line Engravings in the FEBRUARY NUMBER:—1. E. M. Ward, R. A.—"James II receiving News of the Landing of the Prince of Orange," by F. A. Heath. 2. Gustave Dore—"Elaine," by H. Robinson. 3. H. Le Jeune, A.R.A.—"The Elf," by J. Stancliffe and L. Stocks, A.R.A. Literary Contributions:—"Historic Devices and Badges," by Mrs. Bury Palliser (illustrated); "Modern Painters of Belgium—F. De Braekeleer. C. Baugniet, H. Bource," by James Dafforne (illustrated); "Hymns of the Church" (illustrated); "Physiology of Binocular Vision—Stereoscopic and Pseudoscopic Illusions," by A. Claudet, F.R.S. (illustrated); "A Memory of James and Horace Smith," by Mr. and Mrs. S. C. Hall (illustrated); &c., &c.

*** An Illustrated Catalogue of the Paris Exhibition will be issued with the Art Journal for 1867. Intending Subscribers are respectfully requested to send in their names early.

London: VIRTUE and Co., 26, Ivy-lane, Paternoster-row.

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TO CARPENTERS, BUILDERS, and Others.—For SALE, some well-built nine-roomed CARCASES, in an admirable situation for Selling and Letting when finished. Term, 99 years. Ground rent, moderate. Two-thirds of the purchase money can remain if required. For particulars, apply at the Estate Office, Tufnell Park road, Holloway, and of Mr. Clarkson, surveyor, 38, Great James-street, Bedford-row, W.C.

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BUILDERS' BENEVOLENT INSTITUTION.—WANTED, a PLOT OF LAND, not less than 3 acres, and not to exceed 7 miles distance from Charing Cross, for the purpose of Erecting Almshouses in connection with the above named charity. It must be Freehold, Land-tax and Tithe free. Particulars to be forwarded to the Secretary, Mr. A. G. Harris, 23, Southampton-street, Bloomsbury-square, W.C.

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Invested Funds	£3,177,616.
Fire Premiums received in 1865	739,332.
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Distemper Brushes, Sash Tools, Stippling Brushes, Gilders' and Grainers' Tools.
These goods are made of the best materials and workmanship, and have obtained a high reputation among the chief decorators in the kingdom. Varnish and Colour Manufacturers, Oilmen, Merchants, &c., are supplied on the lowest terms. Price Lists forwarded on application.

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Manufacturers of the above Articles, particularly wish to direct the attention of the Trade to their
IMPERIAL PATENT FLAX SASH LINES,
Of which they are now making four qualities, and they strongly recommend that in all cases they should be purchased in preference to the PATENT LINES made from Jute, which Article has neither the STRENGTH nor DURABILITY of FLAX, consequently cannot give so much satisfaction to the Consumer. They also invite the particular attention of Upholsterers and Blind Makers to their Improved Patent Blind Lines, which are very much superior to anything ye offered to the trade.
They can be obtained of all Ropemakers, Ironmongers, Merchants Factors, and Wholesale Houses in Town and Country.
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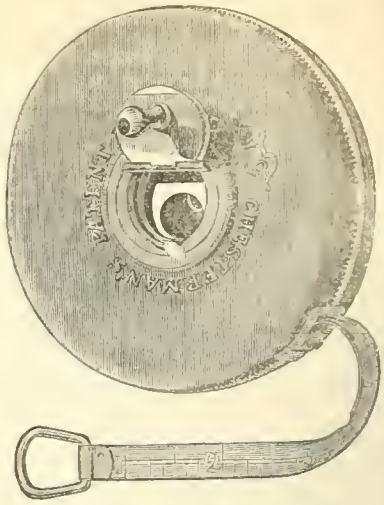

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Specifications Drawn and Revised.
DISCLAIMERS AND MEMORANDUMS OF ALTERATIONS PREPARED AND FILED.
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Messrs. Robertson, Brooman, and Co., Undertake (upon Commission) Orders for all Engineering Constructions. Railways, Locomotive, and other Steam Engines, &c., &c.

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Thonet Bros.' Austrian Bent Wood Furniture,
Which has obtained Prize Medals at every Exhibition in Europe since 1851.
It is the Strongest and Cheapest, and at the same time Lightest and most Elegant production of the Cabinetmaker's art ever introduced combining in the highest degree Economy and Utility.
An inspection of his large Stock of this Manufacture is respectfully solicited by
GEORGE DAVENPORT,
20, LUDGATE HILL, LONDON, E.C.
Depôt for the United Kingdom.

GOUT and RHEUMATISM.—The excruciating pain of Gout or Rheumatism is quickly relieved and cured in a few days by that celebrated medicine, BLAIR'S GOUT and RHEUMATIC PILLS.
They require no restraint of diet or confinement during their use, and are certain to prevent the disease attacking any vital part.
Sold by all Medicine Vendors, at 1s. 1½d. and 2s. 9d. per box or obtained through any Chemist.

THE FRESCOES IN THE HOUSES OF PARLIAMENT.—We have heard no new reason for the "bloom" which appears on Maclise's frescoes. Several opinions have been given on the matter. The cause, we believe to be from a damp, in one instance, and from the excessive use of the glass medium, which has thus taken the appearance of semi-opaque varnish. Dr. Hoffman asserts that the bloom which appeared soon after the solution was applied is proof of the indelibility of the picture. If, however, the same effect was produced over the entire picture, it would not deteriorate its value as a work of art, as the use of brown varnishes and glazes in many cases are valuable to pictures.

MEETINGS FOR THE WEEK.

MON.—Society of Engineers.—Discussion on "Safety Valves," by J. Baldwin, 7.30.
Royal United Service Institution.—"On the Rolling of Ships in a Seaway and its Effects on Naval Gunnery," by Captain R. A. E. Scott, 8.30.

TUES.—Royal Institution.—Discussion on Mr. W. H. Barlow's "Description of the Clifton Suspension Bridge"; and paper to be read "On the Working of Steep Gradients and Sharp Curves on Railways," by Captain H. W. Tyler, 8.

WED.—Geological Society, 8.

THURS.—Royal Institution.—"On Vibratory Motion with Special Reference to Sound," by Professor Tyndall, 3.
Chemical Society, 8.
Linnean Society, 8.

FRI.—Royal Institution.—"On New England," by Mr. Moncure D. Conway, 8.

SAT.—Royal Institution.—"On Harmony," by Mr. O. A. Macfarren, 3.

Trade News.

TENDERS.

BOROUGH.—For a warehouse in Southwark-street, Borough, for Mr. R. J. Bates. Mr. E. Bates, architect:—

Hunt	£3,478
Dover	3,399
Lumble	3,367
Johonson	3,150
Thackrah	3,100
Benett	2,993
Mann	2,929
Myers and Sons	2,914
Nightingale	2,865
Hart	2,740

BRIXTON.—For building Fire Brigade Station, for the Board of Works, at Sheppard's-lane, Brixton. Quantities supplied by Mr. Young:—

Johnson	£2,220
Brashier	2,220
Taylor	2,130
Jackson and Shaw	2,080
Eustace	2,049
Sabey	2,046
Piper and Wheeler	2,042
Oliver and Co.	1,987
Nutt and Co.	1,986
Kelly Brothers	1,984
Webb and Son	1,980
Wigmore	1,948
Manley and Rogers	1,944
Eaton and Champman	1,892
Fish	1,890
M'Lachlan	1,873
Nightingale	1,843
Marsland and Sons	1,835
Sawyer	1,789
Rigby	1,714
R. Mann	1,687
Cooper	1,637

CLEWER, BERKS.—For eleven cottages proposed to be built in the village of Clewer, Berks, for Sir Daniel Gooch, Bart., M.P. Mr. William Sim, architect, 1, Danes Inn, Strand:—

		Allowed for old cottages to be taken down.	Nett.
Gray, Windsor	£3,090	£110	£2,940
Kelly, Windsor	2,750	200	2,550
Fish, London	2,700	160	2,540

EDMONDTHORPE PARK.—For entrance lodge, &c., at Edmondthorpe Park. Mr. R. W. Johnson, architect, Melton and Leicester:—

Halliday and Cave	£694 0
Fast	646 10

GLOUCESTER.—For the building of co-operative stores in Brunswick-road, Gloucester. Mr. H. James, 21, College Green, Gloucester, architect. Quantities supplied:—

W. Jones and Sons	£1,838 0
W. Fream and Son	1,760 0
F. Cullis	1,738 0
W. Fream	1,670 0
J. Clutterbuck	1,670 0
J. Hayes	1,646 12
J. Meredith (accepted)	1,567 0

HAMPTON.—(Corrected Tenders.)—For alterations and additions to a villa at Hampton-on-Thames, for Mr. H. E. Knight. Mr. Herbert Ford, architect. No quantities —

	Design No. 1.	Design No. 2.
A. Rawlins	£847 0	£1,073 0
J. Dunkley	708 10	1,056 10
W. Bird	592 0	747 0
J. Wheatley (accepted)	510 0	570 0

IRTHLINBOROUGH.—For cottages and other matters, at Irthlinborough, Northamptonshire. Mr. R. W. Johnson, architect, Melton and Leicester:—

Birkett	£1,429
Wilson	1,385

KETTERING.—For warehouse, at Kettering, Northamptonshire. Mr. R. W. Johnson, architect, Melton and Leicester:—

Watkin	£600
Margetts	546
G. Henson	529
Wilson	519
Hawthorn	510

LEICESTERSHIRE.—For farm premises, at Rothwell Lodge. Mr. R. W. Johnson, architect, Melton and Leicester:—

Watkin	£635 0
Brown	599 12
Henson	598 13
Wilson	513 0

LONDON.—For altering Albion House, St. Paul's-road, Mile End, into a public-house (plate glass, zincwork, and fittings excepted), for Mr. John Easy. Mr. Arthur Harston, architect:—

Hearle	£395
Kilby	365
Curtis	355
Brown	353
Linn	345
Allen	325
Clements (accepted)	295

LONDON.—For the erection of St. John's National Schools, St. George's-in-the-East. Messrs. F. and H. Francis, architects:—

Myers	£2,736
Colls and Son	2,700
Rivett	2,693
Fish	2,675
Keyes and Head	2,655
Hill and Sons	2,640
D. King and Sons	2,440

MANCHESTER.—For building offices, Chancery-lane, Manchester, for Mr. W. Cunliffe Brooks. Mr. Truefitt, architect:—

Healey (Bricklayer)	£1,366 0
Bowden, Edwards, & Co. (Carpenters & Joiners)	2,485 10
Patteson (Mason)	5,888 0
Lomas (Plasterer, Painter, and Paperhanger)	593 0
Ward (Plumber and Glazier)	1,223 10
Bellhouse and Co. (Ironmongery)	2,075 0
Ashcroft (Slater)	75 10

MELTON MOWBRAY.—For two houses, at Melton Mowbray. Mr. R. W. Johnson, architect, Melton and Leicester:—

Winkles	£930
Weaves and Baines	921
Brutnell	899
Fast	838

NEWCASTLE-UPON-TYNE.—Memorial to the late Duke of Northumberland—The Prudhoe Convalescent Home. To be erected at Whitley, Northumberland. Mr. T. Oliver, F.I.B.A., architect, Newcastle-upon-Tyne. Quantities supplied by the architect. List of tenders, exclusive of engineering works, gate-lodges, fence walling, drainage, &c.:—

J. Gibson	£16,400 0 0
J. Simpson	14,523 0 0
J. Welton	14,440 0 0
W. E. Jackson	14,300 0 0
W. Howard	13,587 0 0
H. Hudspith	13,582 16 0
R. Robson	13,400 0 0
W. Scott	13,433 0 0
J. Elliott	13,363 0 0
J. Robinson	13,137 14 4
N. and R. Reed	12,989 0 0
E. Brewis	12,918 0 0
J. Thyle, Newcastle (accept.)	12,746 0 0

NOTE.—Sixty-two tenders in all were received including the above.

NORTHAMPTON.—For the new clock for the Town-hall, Northampton, according to the specifications of Messrs. Moore:—

D. Blunt	£225
Whiteman	225
Jolliffe and Son	225
Renshaw (accepted)	220
Robinson	200

OXFORD.—For the erection of a bank at Oxford, for the London and County Banking Company. Messrs. F. and H. Francis, architects; quantities by Mr. Joseph Robson:—

Castle	£9,840
Symm	8,994
Hill and Sons	8,970
Dove, Brothers	8,895
Dovor	8,598
Jones and Sons	8,250

SOUTHWARK.—For warehouse, Southwark-street, for Mr. Bates. Mr. E. Bates, architect. Quantities supplied by Mr. E. Bates:—

T. Spearing	£9,354
W. Hunt	3,478
Dover	3,399
Lamble	3,367
Eborall	3,219
Johnson	3,150
Thackarah	3,100
J. Bennett	2,993
Myers and Son	2,929
B. Mann	2,914
B. E. Nightingale	2,865
Hart (accepted)	2,740

TAPLOW, BUCKS.—For the erection of villa residence, on the banks of the Thames, for Mr. C. Venables, jun. Mr. C. Cooper, architect, East-street, Maidenhead:—

Silver and Son	£1,045
Mickley	984
Vickery	976
Rutland	929

TUNBRIDGE WELLS.—For pair of cottages, for Mr. Josiah Stapley. Mr. Henry Stapley, architect:—

Hammond (accepted)	£327

STAINES.—For new stores to brewery. Mr. T. Wormacott, architect:—

Dexter	£850
Sabey	711
Surridge	656
Shepherd	615
Colliver	608
Sawyer	591
Johnson	578
Walker	572
Palmer and Son	560
Gibson, Brothers	559
Wilkinson and Co.	555
Simpson	550
Harris	496
Jeffry	487
Jenkins	483
Simonds	465
Oades	465
Warren	420
Poxon	415

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

George Ballard, Fordingbridge, cabinet makers, Feb. 25, at 11—Edward Boyes, Cheriton, Hampshire, blacksmith, Feb. 21, at 11—George Hewitt, Brentwood, blacksmith, Feb. 21, at 11—John Inkpen, Redhill, journeyman blacksmith, Feb. 27, at 2—T. Lawrence, Paragon road, South Hackney, bricklayer, Feb. 28, at 12.

TO SURRENDER IN THE COUNTRY.

Peter Duckworth, late of New Brighton, Cheshire, timber dealer, Feb. 19—George Farmer, jun., Aston, near Birmingham, machinist, Feb. 22—J. H. Gallaher, Liverpool, slater, Feb 12—Thomas Gibbs, Gareham Hants, plasterer, Feb. 21—Eli Howarth, Bolton, Lancashire, joiner, Feb. 20—William Hunter, Aston-Brook, gunmaker, March 8—C. J. B. Jackson, Pontypool, auctioneer, Feb. 18—J. J. Langdale, New Swindown, Wilts, cabinetmaker, Feb. 19—O. Lythgoe, Holme, cabinet maker, Feb. 23—George Maskery, Hanley, colour maker, Feb. 23—Samuel Roe, Leicester, carpenter, Feb. 23—Samuel Smith Leicester, cabinet maker, Feb. 23—G. F. Tildesley, Willenhall, iron merchant, Feb. 22—George Aish, North Fetherton, carpenter, Feb. 27, at 10—G. Craven, Dacre Banks, Yorkshire, journeyman mason, Feb. 25, at 1—William Gilbert, Barnstaple, painter, Feb. 25, at 12—Thomas Greengrass, Norwich, bricklayer, Feb 20, at 11—James Hughes, Llanfairfechan, plumber, March 8, at 10—John Sparrow, Stivichal, Warwickshire, blacksmith, March 5, at 3—Thomas Teegonan, Redruth, carpenter, Feb. 26, at 11—H Wellford Woodford, Northamptonshire, blacksmith, Feb. 27, at 12.

NOTICE OF SITTINGS FOR LAST EXAMINATION.

March 13, J. Hawkins, Stafford, joiner—March 1, C. Hall, Wakefield, joiner—March 21, W. Clewlow, Newbold, Warwickshire, carpenter—Feb. 22, W. Davis, Liverpool, joiner—Feb. 22, W. Duckett, Liverpool, glazier—March 21, T. Dieny, Compton street, Clerkenwell jobbing carpenter, March 26, W. W. Redgrave, Grove street, South Hackney, builder—March 6, J. A. Saunders, Stanley street, Chelsea, carpenter—March 7, J. F. Matthews, Reigate, builder—Feb. 22, P. Hooton, Waterloo, near Liverpool, journeyman joiner.

PARTNERSHIPS DISSOLVED.

T. Gregory & Co., Sheffield, steel manufacturers—The Seacombe Forge, Rivet, and Bolt Company, Seacombe, Cheshire—Bragg and Fowler, Liverpool, plumbers—Medcalf & Fox, Rotherham, builders—J. and M. Gladstone, Whitby, masons—Woodall and Co., Newton le Willows, flint glass manufacturers—Cockersole and Co., Leeds, slater, as far as regards T. Cockersole.

DECLARATIONS OF DIVIDENDS.

J. Upton, Brighton, plumber, second dividend of 7½d.—J. Roberts, Colwyn, near Conway, joiner, first dividend of 5s. 3d.

DIVIDENDS.

March 7, J. Brookes, Birmingham, ironmonger—Feb. 25, B. Haywood, Wallsall, journeyman plumber.

SCOTCH SEQUESTRATION.

John Grieve, Glasgow, metal merchant, Feb. 19, at 12.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak ... load	£9 0	£10 10	Archangel, yellow	£12 0	£13 0
Quebec, red pine	3 5	4 15	St. Petersburg, yel.	10 10	11 10
" yellow pine	2 15	3 10	Finland	8 0	9 10
St. John N.B. yellow	0 0	0 0	Memel	0 0	0 0
Quebec Oak, white	5 10	6 0	Gothenburg, yellow	9 0	10 10
" birch	3 10	4 10	" white	8 0	8 10
" elm	3 10	5 0	Gefle, yellow	9 0	11 0
Dantzic oak	3 10	6 0	Soderhamn	9 0	10 10
" fir	2 0	3 10	Christiania, per C., 12 ft. by 3 by 9 in., yellow	18 0	22 0
Memel fir	3 0	3 10	Deck Plank, Dantzic, per 40 ft. 3 in.	0 14	1 4
Riga	3 0	3 5	PUMICE STONE pr ton	5 0	8 0
Swedish	1 18	2 3	OILS, &c.		
Masts, Quebec red pine	6 0	8 0	Seal, pale ... per tun	46 0	48 0
" yellow pine	5 0	6 0	Sperm body	139 0	140 0
Lathwood, Dantzic, fm	4 10	5 10	Cod	42 0	0 0
" St. Petersburg	8 10	7 10	Whale, Sth. Sea, pale	45 0	0 0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.			Olive, Gallipoli	63 0	64 0
Quebec, white spruce	13 10	21 10	Cocoanut, Cochin, ton	58 0	0 0
St. John, white spruce	13 0	15 0	Palm, fine	40 0	41 0
Yellow pine, per reduced C.			Linseed	36 0	0 0
Canada, 1st quality	17 0	19 10	Rapeseed, Eng. pale	10	
2nd do.	12 0	14 0	Cottonseed		

METALS.

IRON :—							
Welsh Bars in London	per ton	5	15	6	0	0	0
Nail Rod		7	10	0	8	0	0
Hoops	do	8	17	6	9	0	0
Sheets, Single	do	9	17	6	10	0	0
Staffordshire Bars	do	7	17	6	8	10	0
Bars, in Wales	do	5	15	0	6	0	0
Rails	do	6	0	0	0	0	0
Foundry Pigs, at Glasg. No. 1	do	2	14	0	3	7	0
Swedish Bars	do	10	10	0	12	10	0
STEEL :—							
Swedish Keg, hammered	per ton	15	15	0	16	0	0
Swedish Faggot	do	10	10	0	12	10	0
COPPER :—							
Sheet & Sheathing, & Bolts	per ton	87	0	0	91	0	0
Hammered Bottoms	do	98	0	0	101	0	0
Flat Bottoms, not Hammered	do	94	0	0	96	0	0
Cake and Tough Ingot	do	77	0	0	78	0	0
Best Selected	do	85	0	0	89	0	0
Fine Foreign	do	86	0	0	88	0	0
Yel. Metal Sheathing & Rods	per lb	0	0	7½	0	0	8
LEAD :—							
Pig, English	per ton	22	5	0	22	10	0
„ Spanish Soft	do	19	15	0	19	7	6
Shot, Patent	do	23	10	0	24	0	0
Sheet	do	21	0	0	0	0	0
White	do	30	0	0	31	10	0
SPELTER :—							
On the spot	per ton	22	5	0	22	15	0
TIN :—							
English Block	per ton	90	0	0	0	0	0
do Bar	do	91		0	0	0	0
do Refined	do	93	0	0	0	0	
Banca	do	89	0	0	0	0	0
Straits	do	86	0	0	86	10	0
ZINC :—							
English Sheet	per ton	28	0	0	0	0	0
Devaux's V. M. Roofing Zinc	do	27	0	0	0	0	0
Quicksilver	per btl	6	18	0	7	0	0
REGULUS OF ANTIMONY.							
French	per ton	34	0	0	0	0	0

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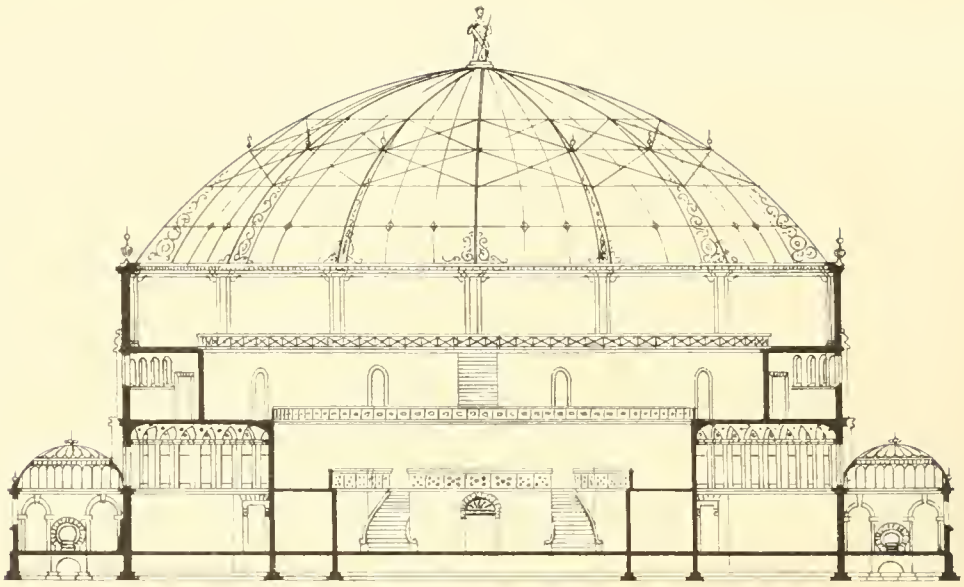
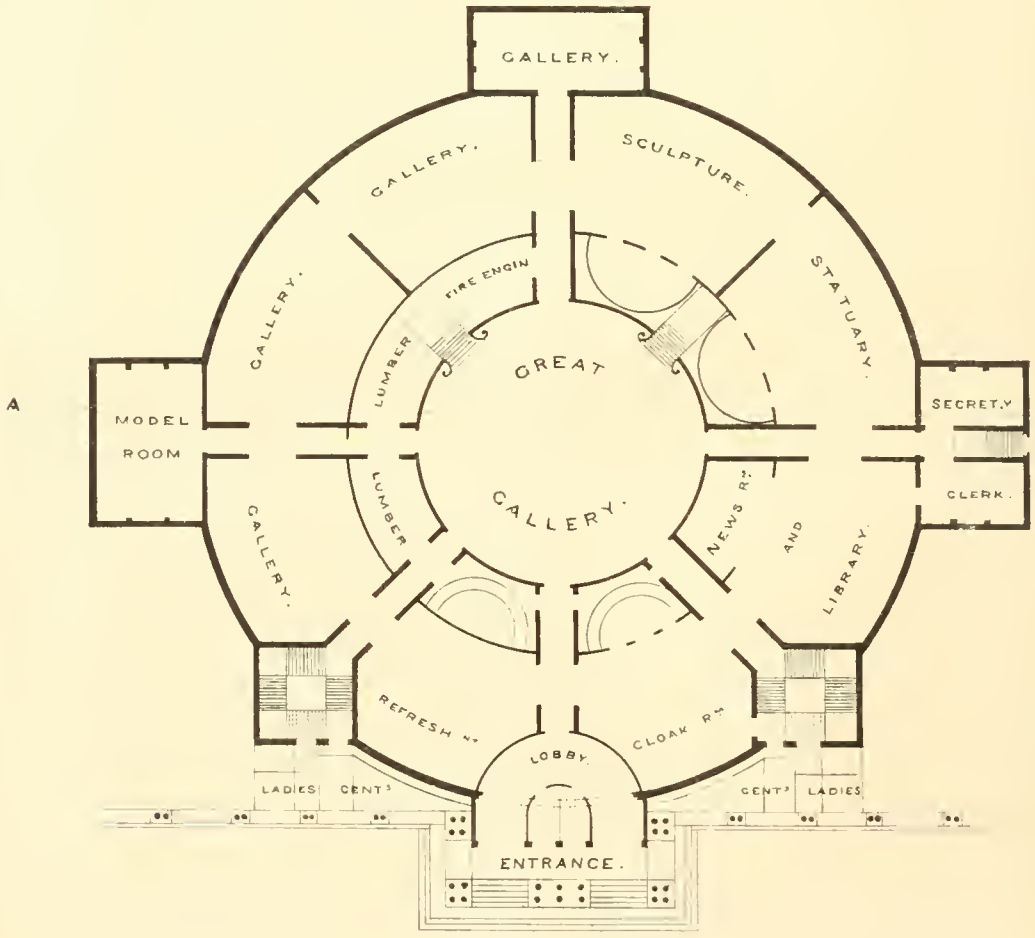


SECTION ON LINE A.B.

Scale of 80 feet to 1 inch



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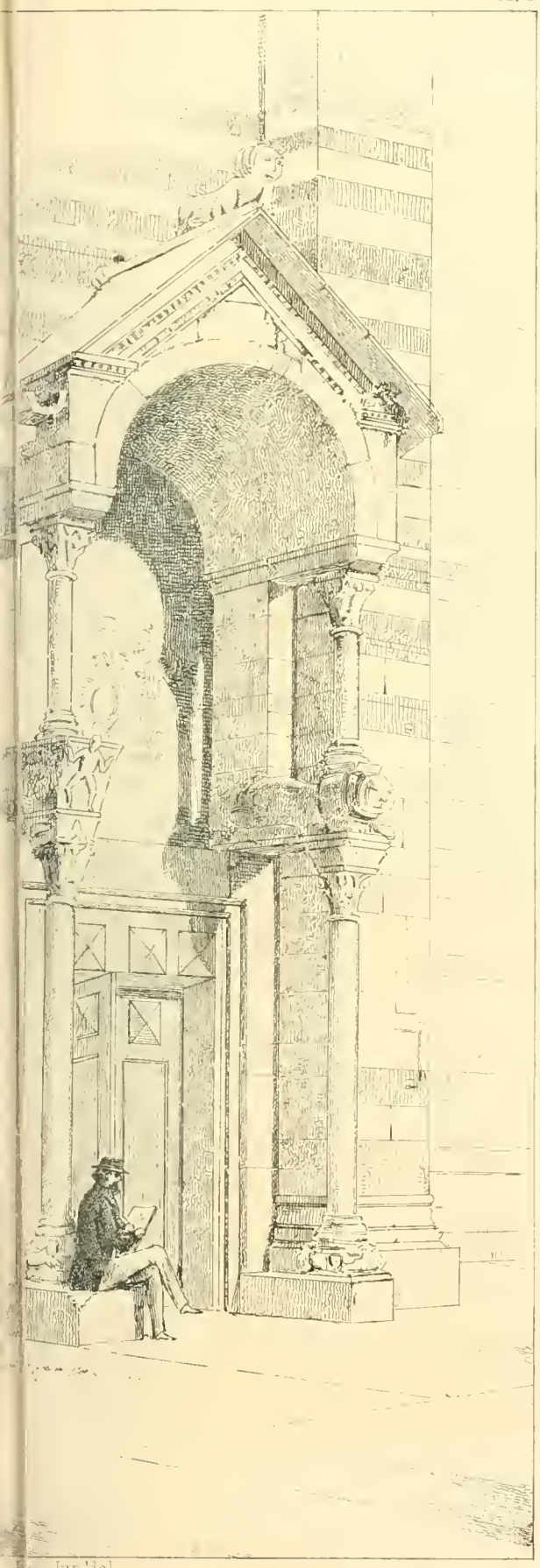

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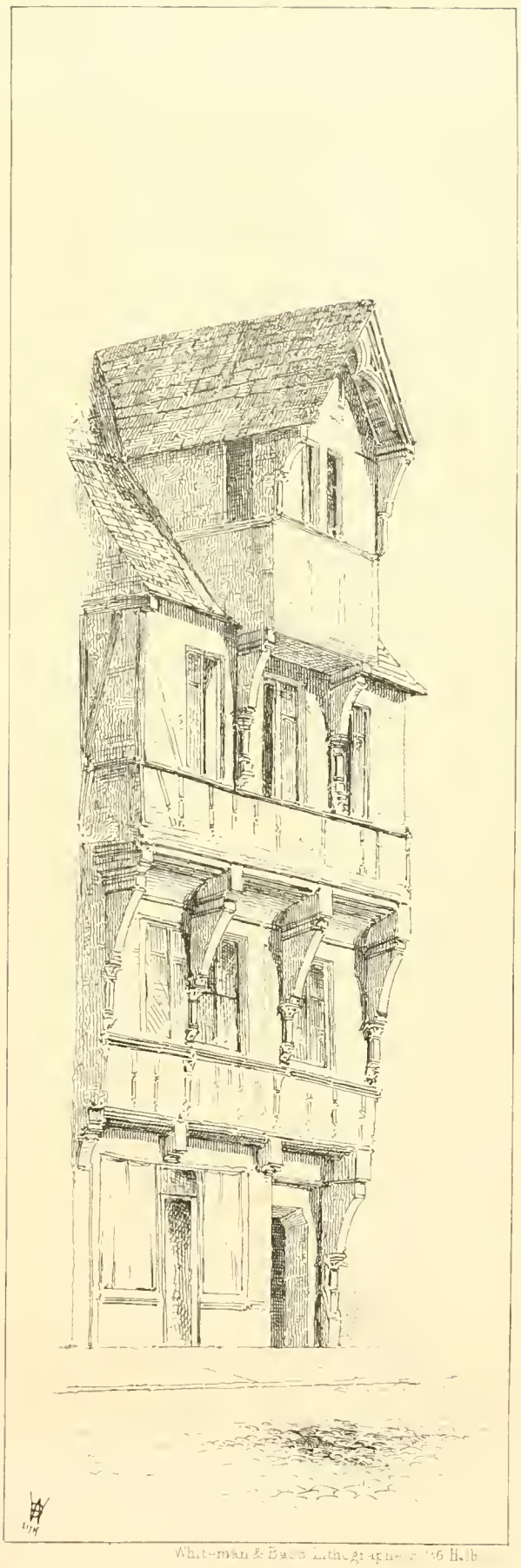

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THE BUILDING NEWS.

LONDON, FRIDAY, FEBRUARY 22, 1867.

THE COURTS OF JUSTICE COMPETITION.

ARTICLE VI.

MR. SEDDON is certainly a very remarkable man. To things which are self-evident to others he appears to be altogether indifferent. We have more than once had occasion to deplore the smallness of the site as compared with the magnitude of the requirements. It is this which has obliged nearly every architect to adopt some contrivance which he must have known was a weakness. Had the site been a trifle larger, we feel certain we should not have had to condemn Mr. Scott's arrangement of bringing the court block of buildings out to the Strand, nor Mr. Waterhouse's plan of getting three courts placed one over the other. And yet, in the face of all the difficulties arising from want of space, Mr. Seddon has the consummate coolness to tell us that not only does he not propose to occupy any part of the permitted western extension, of which Mr. Scott has taken such advantage, but that he positively proposes to give up voluntarily and for no purpose on earth, 75,900 square feet! In other words, the site measures, clear of the western extension, 700ft. in length by 520ft. in width, and Mr. Seddon's building is actually reduced to 670ft. in length by 430ft. in width! But the best is to come. Not content with an exercise of liberality without precedent in the history of competitions, not satisfied by making the Commissioners a present of more than one-fifth of the ground they had provided him, Mr. Seddon's free unfettered spirit revolts at the idea of a limited liberality; so, with a benevolence which has all the grandeur of wildness about it, he rushes into the centre of his building, and with a wizard-like wave of his pencil wand he gives the general public a hall which can only be described, in pantomime language, as "The Hall of the Giants," for its dimensions are no less than 80ft. wide and 65ft. high! This enchanted hall is raised to the height of the court level. Below it is the Refreshment Department, lighted through the floor of the hall, and above it, between its huge stone vault and the roof-covering, is the Library Department. On each side of the hall are the public entrances to the various courts of justice, and many of the arrangements in the general scheme of the hall remind us of Mr. Waterhouse's plan. The barristers, however, will not be inclined, we should think, to look favourably on Mr. Seddon. This is how he disposes of them:—"Barristers can be set down under the westernmost of the three porches in the centre of the Strand façade, and at a special doorway in the centre of the Carey-street front, and, by a staircase reserved to themselves, pass thence on each respective side of the building up to their special octagon hall and corridor, which are situate immediately over that of the Judges; on the same floor as and communicating with which is their general hall, on the north side of the building; their robing rooms on the floor over on both sides; their refreshment room on the floor above on the north side; and their libraries on the highest floor of all. A lift in connection with the above-named staircase is appropriated to the special use of barristers, and can take them from the ground up to the whole of the superior floors. They can also reach all these by means of staircases appropriated to the profession and those engaged in business at the courts from the main, east, and west entrances, under the Probate and water towers, and by all the other staircases leading to the triforium of the great hall; also from the several court street entrances by the court staircases at the back of the courts, from the jury and waiting rooms, up to their own consultation rooms." If there were any chance at all of Mr. Seddon being the successful competitor we might well pause here to pity the poor barristers. After the careful provision made by Mr. Waterhouse for the comfort and convenience of this very important body, Mr. Seddon's arrangement strikes us as eminently acrobatic; but if architects persist in giving up between a quarter and a fifth of their site as useless to them, and take nearly a third of what is left for a place of public resort, they cannot expect even to provide the necessary requirements, apart from any consideration of arrangement, without an amount of "getting-up-stairs" and lift contrivance which must be fatal to that simplicity and convenience of plan so absolutely and, we should have thought, so obviously demanded as the very groundwork of any proper scheme for the concentration of the Courts of Justice. Another great defect in the plan before us is the smallness of the areas between the courts. These areas are only 12ft. wide, and Mr. Seddon has the courage to say that "the limited nature of the site prevents" these spaces from being of greater width. Now really, after giving away his ground, it is too bad in Mr. Seddon to complain about the nature of the site being limited, and thus try to excuse himself for planning areas of 12ft. when he might have had more than 8,000 square yards to have given to these areas if he had liked. Again, the outer shell of building, which is 50ft. wide, is divided from the court block by an area 22ft. wide. It may be all very well to quote Mr. I'Anson, who finds 10ft. or 12ft. areas sufficient for three or four storied buildings, and to state broadly that you are prepared to demonstrate that areas of 9ft. or 10ft., lined with white glazed tiles, afford sufficient light to the basement floors of buildings in the city several stories high; but in a large public building upon which the nation will probably spend at least two millions of money, arrangements which may be forced upon the architects of small city buildings in crowded streets by the really pinched-up nature of the sites, are scarcely the sort of things one would take as precedents for a site which one found already so large that one could afford to dispense with nearly a quarter of it. Nor is 22ft. anything like the dimensions we should expect for the width of a street from which light and air are to be obtained for important offices, when light and air are so indispensable. The chief—we might almost say the only—merit of Mr. Seddon's plan, is what may be called the compartment principle. "The entire structure," says Mr. Seddon, "is divided longitudinally, from east to west, into fifteen compartments of equal width, and in the opposite direction into seven general sections. Each of these spaces might be isolated from the rest in the manner recommended by Captain Shaw to prevent the spreading of fire. Each compartment having its proper entrances, can be separately used; nevertheless, there is free communication throughout. At the several angles of these compartments are placed turrets, which supply stable points of support; from these turrets relieving arches would be thrown at every floor." By this arrangement, the architect claims, as a principal feature of his design, "facility for future alterations;" the weight being thrown on the turrets, as upon the buttresses of King's College Chapel, Cambridge, the walls are so relieved "that other windows or doorways could be inserted, and partitions removed and altered at pleasure without endangering the stability or interfering with the character of the building." It is only fair to Mr. Seddon to add that, in his other great feature (his central hall) he has endeavoured to attain something more than a mere covered walk, and so far deserves our thanks. Mr. Seddon has gone in for a central hall, and no one can doubt that he has given us a central hall. We have already hinted at the possibility of even overdoing grandeur, and we cannot contemplate the proportions and design of this hall for a second without coming to the conclusion that Mr. Seddon has forgotten the scale of the building, and has designed this interior as if its dimensions were half what they are. One huge stone vault, groined with the severe simplicity of the early quadripartite vaulting, would be all very well for Brobdignag, but is out of all scale with everything here. Mr. Seddon justifies himself by saying that he thinks it is "essential to maintain the dignity of a Palace of Justice, and produce *internally*, as well as externally, an impression of awe upon the minds of the *oi polloi*." If we are to have a huge place for the public in the very centre of the building, we certainly should prefer Mr. Seddon's stone vaulted hall, with its gigantic clerestory, to Mr. Waterhouse's glass roofed street, but we differ from both these gentlemen in our opinion, that any such great receptacle for noisy crowds is in every way undesirable. "I believe," says Mr. Seddon, "that no inconvenience need arise from its use, and that it is not necessary that the public entrances to each court should be separate and direct from the street." When the instructions were framed, the Commissioners appear to have been of opinion that considerable inconvenience would arise if the public were brought into the centre of the building, and that a separate entrance from the street to each court was most desirable, in order to keep "mere public spectators" external and altogether detached from the legal public. Neither any plan nor any argument we have yet seen has, in our opinion, justified non-compliance with the sound practical wisdom of this requirement. It may be a very easy way to escape thought to assert dogmatically that such an arrangement is impossible, and it is a scarcely more difficult way of escape to tell the Commissioners that you know better than they do what they require, and that this particular requirement is all moonshine. So long, however, as the instructions remain, then shall we find this particular one about separate entrances very emphatically set forth. And we do sincerely trust that the cool way in which certain of the competitors have set this and other important instructions at nought may meet with the reward it deserves.

Whatever defects of plan may be found in the scheme under consideration, on one thing we may congratulate Mr. Seddon, and that is, the massing or block design. Indeed, we doubt whether any design in the exhibition would surpass Mr. Seddon's if they were to be judged by block models, that is to say, models without doors, windows, details, or decorations of any kind. We call to mind with pleasure, the exhibition of this same quality in Messrs. Pritchard and Seddon's design for the Government offices. The simplicity and breadth of the grouping, the treatment of the central composition in the Strand front (as shown in the model and perspectives), the position of the great Probate Tower in the centre of the west front, and thus at the end of the great hall, and the general balance of parts, all tell the story of another design wrecked for want of time. For it can scarcely be imagined that an architect who can so handle his masses should have failed in the detail of plan and elevation so completely as Mr. Seddon has done unless from want of time. We are told in the report that the architecture of this design is "pure English Gothic." But on this point we give the author the benefit of speaking for himself:—"As regards the style of the architecture of my design it is pure English Gothic; this being treated with simplicity and large in its scale, I have depended for effect upon proportion and skyline, and not upon elaboration and detail. In general effect I have endeavoured to give the building the character of a civil townhall, and to avoid that of an ecclesiastical structure." With the single exception of the libel on "pure English Gothic" published in the first sentence, the whole paragraph is just what we should have

said of the design in question. We will pass by Mr. Seddon's idea of "pure English Gothic," sincerely hoping that he used the words without thinking, but we must protest against any architect who hopes to spend two millions of the public money thinking it sufficient to give us the skeleton of architecture without either muscles or skin. These half measures are not the sort of thing we expected for £800, in a competition limited to twelve men. Mr. Seddon knows as well as most architects what constitutes vigour and life in such all-important details as doors and windows, and when he, therefore, deliberately shirks the consideration of this question and shelters himself under the clause we have quoted, we can only conclude that time failed him to do justice to himself, or that he very much under-estimated the art knowledge of his critics and judges. We do not intend to take up any of our space by pointing out the shortcomings of Mr. Seddon's detail, but we commend to the notice of those of our readers who intend to visit the exhibition the treatment of Temple Bar, with its tortured shrimp, as the dragon on the top of it is disrespectfully called, and the triangular porches to all the main entrances—a form of porch in which Mr. Seddon, for some strange reason or other only known to himself, seems to take an almost childish delight. We have always thought triangularly planned things weak and ugly, and incapable of being anything else. With all due respect for Mr. Seddon, we think so still. As we have before said, Mr. Seddon's great points are in massing his building, and giving it a domestic and yet official look; and had he been content with his sixteenth scale drawings and not obtruded his or his clerks' detail on our notice in such huge overgrown drawings as his perspectives, we should probably have had more to say in praise than blame. As it is, we cannot but regret, with all sincerity, that an architect who on the one hand has steered clear of cathedrals, and has had the sense to remember that a law court is not a church—an effort of memory, by the way, which some of the other competitors have neglected—and who on the other hand has avoided that almost vernacular Gothic into which some architects are fast drifting—a Gothic which is little more than trimming to the hole-in-the-wall style of Harley-street or Baker-street—who has given his building a stateliness of outline and unity of expression, and who in spite of extravagant height and endless gables has managed to make his design express its purpose,—we say, we cannot but regret that one who has started so well should have perilled, if not lost, the position he would undoubtedly have taken in the race by a carelessness about detail for which even a pupil would have been severely reprimanded. One more word, and we have done. At page 27 of the report Mr. Seddon says, "My perspectives being on so large a scale, I have thought it unnecessary to send enlarged drawings, but I *exhibit some photographs from executed w rks* with details of precisely the same character, and which give a better idea of it than any drawing could possibly do." The italics are ours, and we present the statement to our readers without further comment.

THE HISTORY OF ARCHITECTURE.*

We are glad that Mr. Fergusson, in preparing this volume for the press, exchanged the title of his original work on the same subject for that which the present revised and amplified edition bears. Indeed, the word "handbook" has of late been applied to such a slight and sketchy kind of literature in connection with both art and science that it has come to be regarded with contempt by those who really seek solid information on these subjects. It signifies a cheap and ready road to the knowledge of facts more or less authenticated, and to nothing else. But facts without theories, even in science, and *à fortiori* in art, are of little worth, and a crowd of facts soon fill a "handbook" of ordinary size. If, however, we add an analysis of these facts, arguments on their comparative importance, or a dissertation on the inferences to be drawn from them, the work becomes at once of higher literary value. We have no longer a mere handbook, but a history. Such are the additions which Mr. Fergusson has made, and it is a history rather than a handbook of architecture which he has presented to his readers. It is partly owing to this unpremeditated amplification of a smaller volume, partly to our author's apparent indecision as to how it would be most convenient to classify his subject, and partly to his having perhaps changed his mind regarding the form and bulk which his treatise should finally assume, that the third volume on the modern styles of architecture has in point of fact preceded that which is the subject of our present notice. The three volumes, however, are now complete, and in their entirety represent a "History of Architecture in all Countries from the Earliest Times to the Present Day." This title itself implies a gigantic task, and wide though Mr. Fergusson's researches must have been to accomplish what he has done, it is impossible to suppose that there are not many gaps in the narrative which remain yet to be filled up. Indeed, our author frankly confesses as much in his preface, when referring to a matter of great antiquarian interest:—

> In one respect I have to apologise for not keeping a promise made in the preface to the first volume. It was then intimated that the present volume would contain a chapter on Celtic or Megalithic antiquities. When, however, the work came to be re-written, I found it necessary, in order to keep the volume within bounds, to leave unsaid so much I wished to say, and to omit so many illustrations which would have added to the clearness and interest of the whole, that eventually I found myself forced to abandon the attempt. As it is, the volume exceeds the first to the extent of more than one hundred pages, and it would have required at least that number in addition to have treated the promised subject in a manner at all satisfactory. I may, therefore, take this opportunity of saying that nothing I learnt in the investigations made for the purposes of this intended chapter has made me waver in the opinion I have previously expressed with regard to the age of those antiquities. I consider all the stone monuments to be of what antiquaries now style the Iron Age, viz., from one to two centuries before Christ to the time of the introduction of Christianity in the country where they are found. This, however, does not appear to me to affect the question of the age of the Barrows or earthen monuments found sometimes in juxtaposition with them. Some of these we know to be also of the Iron Age, but many are, no doubt, of very remote antiquity. Whatever the age of the Barrows may eventually be determined to be, it seems to me to have only a remote bearing on that of the stone monuments. So far as I have been able to form an opinion the two questions are quite distinct, and the age of the stone and of the earth monuments must be separately examined if we are to arrive at any satisfactory conclusions on the subject.

Under the general head of "Christian Architecture," Mr. Fergusson resumes, in this volume, a consideration of the various types of Gothic, which he began in volume one. The Mediæval schools of France and Germany having been already discussed, he places England first upon his second list, and, somewhat to our surprise, gives her the precedence over other nations in a general estimate of the excellences which the Pointed style attained. This, indeed, was the opinion of many English writers on art at the earliest period of the Gothic revival; but at that period French architecture of the twelfth and thirteenth centuries had been but little explored. The glories of Chartres, of Amiens, and of Laon, the exquisite detail with which the diligent student may now enrich his portfolio at Rheims, Coutances, Auxerre, and Rouen, remained still unrevealed in this country, or reached us only in the form of that vague generalisation of architectural features which was then too frequently adopted by the water-colour painter, and of which the effect was to reduce all sculptured forms, whether good, bad, or indifferent, to one and the same level of picturesque utility. But, at the present time, when we can refer to such illustrations as those which Shaw and Nesfield have supplied, when photography has lent its valuable aid in delineating subtle graces which defy the brush to represent, when an author like Viollet le Duc devotes a life to record not only the pictorial effect but the science, the development, the *rationale*, of his art, we can no longer find excuse for resisting the conviction that there was a time when French architecture assumed a position for which there was no contemporary parallel in Europe. English Gothic, we freely admit, possessed certain elements of rude grandeur and other national characteristics which we fail to find elsewhere; but in fertility of invention, in comprehensiveness of appliance, and, above all, in the *luxe* and elaboration of decorative features, that of France was surely its superior. And, if we remember how the early resources of wealth in this country were consumed by war, how miserably national taste had declined when mercantile prosperity had at length made it rich, we shall find sufficient reason for the fact that the zenith of her art excellence is not worthy of that welfare which has since placed her first among the nations of the world.

Useful and excellent as this section of Mr. Fergusson's book undoubtedly is, we cannot help regretting that he has devoted no more than three brief pages to the consideration of civil and domestic architecture. England, it is true, does not supply many examples of municipal buildings erected during the middle ages, but many conventual buildings and country mansions still exist, to say nothing of the earlier portions of the Tower, Windsor Castle, Hampton Court, and the Welsh Castles, which well deserve illustration at the hands of an author whose aim is so wide in range as that of Mr. Fergusson. After glancing at the peculiarities of Scotch and Irish Gothic, Mr. Fergusson proceeds to describe the Mediæval styles of Spain and Portugal. The introductory remarks which head this chapter are well worth perusal:—

> In the very early ages of their architectural history we do find the inhabitants of the Peninsular making rude attempts to provide themselves with churches. These, however, were so unsuited for their purposes that so soon as returning prosperity put the Spaniards in a position to erect larger edifices they at once fell into the arms of the French architects, who had advanced far beyond them in the adaptation of Classical materials to Christian purposes. When tired of the French styles, they enlisted the Germans to assist them in supplying their wants, and Italy also contributed her influence, though less directly than the other two. In the meantime the Moors were more steadily elaborating their very ornate but rather flimsy style of art in the southern part of the peninsula and occasionally contributed workmen and ideas whose influence may be traced almost to the feet of the Pyrenees. When all this passed away with the middle ages, they borrowed the Renaissance style of the Italians, but used its Doric and Corinthian details more literally and with less adaptation than any other nation. With these Classical materials they erected churches which were larger and more gorgeous than these of the previous styles, and admired them with the same unreasoning devotion they had bestowed on their predecessors. . . . .
>
> The singularity is that, though endowed with the love of architecture, and an intense desire to possess its products, Nature seems to have denied to the Spaniard the inventive faculty necessary to enable him to supply himself with the productions so indispensable to his intellectual nature. We can perfectly understand how, among so Teutonic a people as the Scotch, architecture should be found planted in an uncongenial soil, and perish with the first blast of winter; but what seems unique is that planted where both the soil and climate seem so thoroughly congenial as they do in Spain it should still remain exotic and refuse to be acclimatised.

To the Mediæval architecture of Italy Mr. Fergusson devotes a more lengthy notice, tracing the history of its brief but eventful existence, subject now to northern influence, and now to that which found expression in a Byzantine element during the early stages of

* "A History of Architecture in all Countries, from the Earliest Times to the Present Day." By James Fergusson, F.R.S., M.R.A.S., Fellow of the Royal Institute of British Architects. Three vols. Vol. II. London: Murray.

the Venetian school. But while these conflicting impulses and the sudden revival of Classic literature have each in their turn given a vigour and picturesqueness to Italian architecture which are not to be found elsewhere, they place almost insuperable difficulties in the way of the art historian who endeavours to classify with any approach to chronological sequence the various types of design and the endless modifications of those types with which mediæval Italy abounds. Yet in it a rich wide field lies open to the student who is ready to profit by the teaching of modern writers—writers who no longer regard the noblest of all arts as something of which the excellence may be tested by a sum of decimal fractions, or which can only be illumined by the dull lamp of the antiquary, but as the result of that rare combination of poetic fancy and practical skill which the heart as well as the mind can appreciate and revere. A chapter on Sicily, and another on Palestine, bring us to the end of this section of the book. The next is on Byzantine architecture proper, which our author tersely describes from its rise, with the founding of Constantinople, to its decay after the Hejira. An interesting chapter devoted to a description of the mediæval buildings of Russia next follows, after which, Mr. Fergusson enters on the third great division of his subject, viz., "Pagan Architecture." The Saracenic examples of Syria and Egypt, of Barbary, Spain, and Turkey, range themselves as a first group, which, with a short digression in favour of the "Sassanian" school, is finally complemented by specimens of Persian design.

But the *piece de resistance* in this volume is that portion of it which has been set apart for a description of Indian architecture. Here, it is needless to say, Mr. Fergusson is quite at home with his subject. It is a subject, perhaps, concerning which neither the English artist nor the English amateur will take a very lively interest. Still is it one which the antiquarian will not despise, nor, when we remember how much it is identified with the faith, the social habits, and the familiar traditions of the extraordinary people whom it chiefly concerns, can we be surprised if the general reader should find that its details command his attention. The history of Indian architecture—according to Mr. Fergusson—

commences with the architecture of the Buddhists. Some of their monuments can be dated with certainty as far back as 250 B.C., and we not only know from history that they are the oldest, but they bear on their face the proofs of their primogeniture. Though most of them are carved in the hardest granite, every form and every detail is so essentially *wooden* that we feel in examining them that we are assisting at the birth of a new style, and for three or four centuries afterwards we can gradually trace the progress that was made in getting rid of the wooden forms and in replacing them by others more appropriate to stone architecture. Although it will be wandering somewhat beyond the limits of India proper, the mode best calculated to render this subject intelligible will be to treat Afghanistan as part of India, and then to describe Buddhist art as it existed in Ceylon, and in Burmah, Siam, and Java. By this means a general view may be obtained of a style complete in itself, but very little influenced by external causes, and having as little influence on any style beyond its own pale. The exceptions to the completeness of this mode of treatment are China and Thibet. In the former, however, all the monuments are so modern, and so local in style, that they may fairly stand by themselves, and in the latter they are so little known that our ignorance is a too sufficient cause for their exclusion. It is much more difficult to assign a tangible reason for any classification we may adopt for the Hindu styles. The date of the oldest known monument of this class cannot be carried further back than the sixth or seventh century of our era, and the oldest Jaina monument may be of the tenth century; but in both instances the style, when we first encounter it, is complete and full-grown. There is no hesitation about the design, no wooden clumsiness about the details. The whole is the result of centuries of experience in stone architecture, but when and where we do not know.

Had we space we would willingly follow Mr. Fergusson through his graphic and instructive descriptions of "topes" and "rock temples," Bengal caves and Buddhist monasteries. He has something to tell us of the ruins at Ceylon, at Burmah, at Siam, at Java, at Thibet, and Nepal. He discourses of Indian arches and domes with the authority of a man who is practically acquainted with his subject. He introduces us to the "Dravidian style," with its porches, its gate-pyramids and pillared halls. He discriminates nicely between the various aspects of Hindoo architecture, whether influenced by time or situation. The photographs which he has collected, and his own careful sketches, have enabled him to illustrate this portion of his book with singular fidelity. And if any reader should feel inclined to grudge the pains which Mr. Fergusson has thought fit to bestow on this description and portrayal of Oriental architecture, let him remember that the business of the art historian is to collate as well as to criticise.

FOUNDATIONS UNDER WATER.

ALL works subject to the influence of water present peculiar obstacles to their execution, and hence such works possess a special interest for the engineer and architect. On the 13th inst., at a meeting of the Civil and Mechanical Engineers' Society, Mr. Rutt read a paper on "Foundations under Water," in which he dealt in a comprehensive and able manner with the various modes of executing foundations of bridges, &c., at present in use. We will notice some of the most salient points in this paper, its length being too great to allow of our inserting it in its entirety. The cast-iron dams which have been used in the Thames Embankment possess advantages which render them suitable to works comprising a great length of dam, which does not require to be all up at one time, so that the iron segments can be repeatedly used as the work progresses, but in ordinary cases of isolated bridges, &c., the cost of their use would probably be too great. These piles are elliptical, having a groove down each side, into which timber packing is driven to make a water-tight joint. The ordinary dam, says Mr. Rutt, "cannot be used unless there is an impervious stratum with which to connect it, and there are often other objections to its use. . . . . It is also a slow and tedious process, as the formation of the dam must be completed before the permanent work is commenced, and as a delay in the construction of one large bridge often causes the capital laid out on several miles of railway to remain idle, an extra expense in obtaining a more rapid means of construction will often be a true economy." There can be no doubt of the truth of this latter sentence, and the point it conveys cannot be too carefully studied. If a contractor undertakes to make a section of a line and agrees to pay interest to the shareholders during the execution of the works, it will be to his interest to adopt the most expeditious system of erection, provided it is not exorbitantly expensive; but if he, alone, contracts for the erection of a large railway bridge, then it will behove the company's engineer to see that the works be not unreasonably delayed. After reviewing the *pierre perdue* system, and that of laying stones in regular courses—which latter method was adopted by Mr. Telford at Ardrossan Harbour and elsewhere,—Mr. Rutt passes on to consider the pile and timber platform foundation. This is often used where the depth of water is not very great, the platform being just beneath the level of low water. Sound timber appears to be almost imperishable when constantly immersed in water of tolerably pure quality, but care should be taken not to place it where it will be exposed to the alternate action of water and air, which will ensure its rapid decay. A good example of this method of founding exists in the Dirschau Bridge over the Vistula, the substructure of which was executed in the following manner. A large rectangular space around each pier was enclosed by a continuous wall of piling; the ground within this enclosure, consisting of coarse quartzose sand, was dredged out to a depth of 19ft. below the summer level of the river. The site of the piers was then covered with piles, spaced at a very short distance apart, and driven about 20ft. into the sand; the space between this piling and the outer piling was filled in with loose stones. The piles were then cut off 1ft. above the dredged bottom and covered with 10ft. of concrete, upon which a concrete dam 3ft. thick was raised all round the edge in which the masonry of the pier was commenced after the water had been pumped out. In discussion a question was raised as to the action of concrete upon timber, some engineers present being of opinion that piles surrounded by concrete would rapidly decay. This may be the case where the whole of the lime is not thoroughly slaked, but it is doubtful whether perfectly made concrete will act on organic tissues, and it is unfortunate that experimental data by which we might be guided are very scarce. It is of much importance to know what amount of reliance may be placed on the durability of the timber, because, although in some cases their permanence is not necessary to the stability of the structure, yet in others their failure would ensure the ultimate destruction of the entire fabric. Where the foundations are based upon firm, immobile strata, the decay of the piles is immaterial, but masonry erected upon slippery strata requires piling to prevent any subsequent shifting.

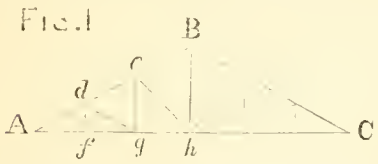
In America, timber being very abundant, a substitute for the ordinary caisson has been found in very thick timber platforms connected together. At Pittsburg a railway crosses the Alleghany River at a point where its width is 1,200ft., its depth varying from 12ft. at low water to 42ft. in floods. The coarse gravel forming the bottom was dredged out to a depth of 13ft. beneath low water, and timber platforms 12ft. thick, each consisting of twelve layers of baulks crossing each other, were floated over the sites of the piers. A few stones were embedded in the timber to lessen its flotation, and as the masonry was erected upon it, it gradually sank, leaving the top surfaces of the timber eventually about 1ft. under the level of low water. The timber, which is pine, is thus perfectly protected, and the only question as to the stability of the bridge is whether the gravel will resist the action of the stream or yield to its scouring influence, as did the soil under the caissons of old Westminster Bridge, which scarcely lasted 100 years, being constructed in 1750.

Not unfrequently iron caissons are employed in the place of cofferdams as in the new Blackfriars-road-bridge. These caissons are sunk by dredging under and weighting them, having placed them side by side so as to cover the whole site of the foundation. When sunk some distance into the clay they become sufficiently tight to allow of the interior being pumped dry, when the work is executed as in an ordinary cofferdam. When the masonry reaches the water level, the cast-iron segments composing the caissons are unbolted by divers and removed. In rivers subject to continual and sudden heavy floods, the bed is often composed of sand or gravel to a great depth of such a shifting character that it is difficult to determine when a sound immovable bottom is reached. There is no stream to which this remark more forcibly applies than the Allier, which drains the tract of country between the mountains of Auvergne and Le Puy. At Moulins four bridges had been swept away by floods, three of them within thirty-five years, nor after this was the reconstruction attempted for forty years. However, in 1750 M. Regemortes undertook the construction of a bridge in masonry. The bed is sand, so hard that piles could not be driven more than 13ft. deep, and so mobile that the obstruction caused by the bridge produced a scouring action to the depth of 20ft., the sand bottom being 50ft. thick. M. Regemortes decided to build on the sand and protect it from scour by a bed of masonry across the bed of the river. Two rows of sheet piling were driven, extending from side to side of the stream; the contained space was divided into small portions, the sand dredged to a depth of 6ft., and then a thin layer of clay put down to stop the infiltration of water; a platform of timber was placed on the clay, the water exhausted, and the masonry proceeded with as usual. More recently a similar system has been employed, but with the substitution of concrete faced with stone for the apron, which affords greater facilities for executing the work, as the infiltration through the bottom is thus prevented. At the present time, probably, tubular foundations might with advantage be applied to such cases, but at the period to which we have alluded, these were unknown, and, in fact, the proper preparation of concrete was but imperfectly understood. The remainder of Mr. Rutt's paper was devoted to the consideration of tubular and iron pile foundations, and the various modes of sinking them, with a careful description of the central pier of the great Albert Bridge at Saltash, probably the largest cylinder ever sunk. This cylinder was 37ft. in diameter and 90ft. long; it was sunk through 12ft. of mud, above which there is, at high tide, 70ft. of water. The pier was built within the tube, which was subsequently taken to pieces and removed.

ELEMENTS OF ENGINEERING.

No. 2.—IRON ROOFS.

HAVING, in a previous article, set forth the general principles to be observed in designing iron roofs, we now proceed to analyse the nature and intensity of the various strains to which these roofs are subject. Fig. 1 is a diagram of a roof constructed on the



principle of the upright common truss. A B C is the primary truss, which contains symmetrical, secondary, and tertiary trusses on each side of the centre tie B *h*. The case merely requires to be treated in one half, and we shall therefore confine our observations to the portion A B *h*. The secondary truss, A *e h*, is sustained by the main or primary truss A B C, the tertiary truss A *d g* being sustained by the secondary A *e h*. In practice, these trusses are not distinct, the one rafter A B serving in three capacities and forming a compression member in the three trusses to which we have alluded. The actual weight upon the roof principal must, for purposes of calculation, be assumed to be concentrated at certain points in the structure, such points in the present case existing at A, *d*, *e*, B, the load between *e* and B being carried at the point *e*, that between *d* and *e* being carried at *d* and *e*, half at each point, and so forth. Let it be required to solve the strains on the various elements in one-half of the principal, using the following notation :—

W = weight to be sustained by A B
A B = L
A *h* = S
B *h* = *d*

The bar or rafter A B being divided into three equal parts by the joints *d* and *e*, so that A *d* = *d e* = *e* B, then the load may be regarded as supported at the four points A *d e* B, the distribution upon these points being

$$= \frac{W}{3}$$

upon each of the points *d* and *e*, and

$$= \frac{W}{6}$$

upon each of the points A and B.

The strain produced upon the rafter at A, due to the load upon that point, will be

$$= \frac{W}{6} \cdot \frac{L}{d}$$

which must be sustained in addition to other strains transmitted from higher points in the rafter, from whence they pass down to the bearing.

The load at *d* will be transmitted half direct to A and half to *g*. The strains thereby produced on *d* A, *d g* being each

$$= \frac{W}{6} \cdot \frac{L}{d}$$

at c there will be the load there accumulated, and in addition the load transmitted through the element *g* c, which together

$$= \frac{W}{3} + \frac{W}{6} = \frac{W}{2}$$

Of this load one-third will be transmitted to A and two-thirds to *d*, the thrusts thereby produced being

$$\text{on } e\,d \text{ a strain} = \frac{W}{2} \cdot \frac{1}{3} \cdot \frac{L}{d} = \frac{W\,L}{6\,d}$$

$$\text{on } e\,h \text{ a strain} = \frac{W}{2} \cdot \frac{2}{3} \cdot \frac{L}{d} = \frac{W\,L}{3\,d}$$

At B there will be a load

$$= \frac{W}{6} + \frac{W}{3} = \frac{W}{2}$$

this last load $\left(\frac{W}{3}\right)$ being transmitted through that half of the bar B *h* which may be regarded as belonging to that half of the truss now under consideration.

The strain produced at B upon B A will be

$$= \frac{W}{2} \cdot \frac{L}{d}$$

Hence summing up the strains upon the rafter A B we find

$$\text{on B c a strain} = \frac{W\,L}{2\,d}$$

$$\text{on } e\,d \text{ a strain} = \frac{W\,L}{2\,d} + \frac{W\,L}{6\,d} = \frac{2\,W\,L}{3\,d}$$

$$\text{on } d\,A \text{ a strain} = \frac{2\,W\,L}{3\,d} + \frac{W\,L}{6\,d} = \frac{5\,W\,L}{6\,d}$$

$$\text{At the point A a strain} = \frac{5\,W\,L}{6\,d} + \frac{W\,L}{6\,d} = \frac{W\,L}{d}$$

The strains upon the struts are already shown from the loads upon the joints, and those upon the vertical ties are equal to these loads, being

$$\text{on } e\,g \text{ a load} = \frac{W}{6}$$

$$\text{and on half } h\text{ B a load} = \frac{W}{3}$$

It yet remains for us to determine the pull upon each part of the main tie, the strains upon which will be as follows :—

$$\text{upon A } g \text{ a strain} = \frac{W\,L}{d} \cdot \frac{S}{L} = \frac{W\,S}{d}$$

$$\text{on } g\,h \text{ a strain} = \frac{W\,S}{d} - \frac{W\,S}{6\,d} = \frac{5\,W\,S}{6\,d}$$

and between the junction of the bar *d e* with its corresponding element on the side of the truss not under consideration. The strains upon each element of the roof being known, the sectional areas of such elements are readily determined according to the strength of the materials employed. Thus for struts we should allow a working resistance of about three tons per sectional square inch, and for ties five tons per sectional square inch of nett area, that is to say, after deducting the loss by rivet holes, &c.

In this article we have set forth the plain practical method of calculating the strains upon roofs designed on the principle of the common upright truss, but it yet remains for us to demonstrate the accuracy of the formula given. This may be done in two ways, algebraically and geometrically ; if the former course is pursued the trigonometrical quantities may be simplified by expressing them in terms of the measurements of the elements of the roof, which simplification obtains the advantage of rendering the theory of trussed structures comprehensible to those who are not accustomed to the higher branches of mathematical investigation.

In our next article on the subject of roofs we shall proceed to demonstrate the principles and resultant formulæ as above enunciated.

No. 2.—ESTIMATION OF QUANTITIES.

Having dealt with the question of estimation of quantities in bridges and roofs, so far as the skeleton is concerned, we have now to consider the covering, which varies with the purposes to which the structure is proposed to be applied. In bridges we find the roadways consisting of timber or asphalte, ballast, gravel, or concrete, according to the circumstances of locality. The timber requires to be estimated in two ways, namely, for weight and for cubic content—for the former to ascertain the effective strength of the work, for the latter in reference to price. Let W = the weight of timber flooring in tons, *w* = the same in pounds, *l* = length in feet, *b* = breadth in feet, *t* = thickness in inches, *c* = a constant factor ; then

$$W = l \times b \times t \times c,$$

the value of c being—

for elm	0·00156	for white fir	0·00132
for yellow fir	0·00153	for dry oak	0·00216

To determine the weight in pounds we have

$$w = l \times b \times t \times c,$$

the value of c being—

for elm	3·50	for white fir	2·97
for yellow fir	3·42	for dry oak .	4·85

The weight of sleepers, joists, &c., may be determined by the following rule :—Let *b* = the breadth in inches, the remaining notations being as above ; then in the first case (W) the value of c will be—

for elm	0·000130	for white fir	0·000110
for yellow fir	0·000127	for dry oak	0·000180

and in the second case (*w*)—

for elm	0·292	for white fir	0·247
for yellow fir	0·285	for dry oak	0·404

The calculation of the cubic contents is exceedingly simple ; thus for flooring C = contents in cubic feet, *l* = length in feet, *b* = breadth in feet, *t* = thickness in inches.

$$C = \frac{l \times b \times t}{12}$$

And in the case of joists, &c., where *b* = breadth in inches,

$$C = \frac{l \times b \times t}{144}$$

It does not always occur that the timber platform entirely covers the roadway, as frequently the planks are spaced apart ; hence in the foregoing formulæ only the actual breadth of timber should be taken.

Where roadways are ballasted the proper course to pursue consists in determining the quantity of material in cubic yards, when the weight will be found from a multiplier, depending upon the nature of the material used, for which no factors can in a small space be given sufficiently comprehensive, on account of the great variety of soils used. Concrete and asphalte are determined in a similar manner. We do not in this place enter upon the subjects of glass and slate coverings for roofs, as these will be treated in another article, but both concrete and sand are used in hot countries as coverings for railway and other roofs, and sometimes in sufficient quantities to throw on the roof a load of upwards of 100lb. per square foot. The estimates of the superstructure being complete, those referring to the foundations must be considered, and it will be necessary to classify the materials of which such foundations are formed. Roofs are usually sustained by walls, columns, or girders ; if by the former the supports are included in the estimate of brickwork ; if by either of the latter their weights are calculated, as already stated. In bridges, however, the supports are more complicated, and the quantities must be arranged to afford facility in estimation of cost. Thus, all the iron should be first determined. This will include cast-iron cylinders, piles, and sheet piles, the weights of which are readily ascertained by multiplying the superficial area of iron in

square feet by the thickness in inches, and by 38 for the weight in pounds, or by multiplying the superficial area in square feet by the thickness in inches, and dividing the product by 59 for the weight in tons. Care is requisite in these calculations to allow for flanges, strengthening brackets, &c., which form a very important item in works of magnitude. Any wrought-iron ties used for bracing piles or columns may be estimated according to the rules already given. For bridge and pier supports the following index will be found convenient :—

Cast Iron.	Wrought Iron.
Hollow cylinders or piles	Horizontal bracing
Solid ,, ,,	Vertical ,,
Plates between piles	Diagonal ,,
Screws to piles (Mitchell's)	Gibs and cotters
Discs to piles (Brunlees')	Bolts and nuts
Caps to piles	

To determine the weight of brass, copper, &c., estimate as for wrought iron and multiply by one of the following factors :—

If the material is steel	multiply by	1·008.
,, cast iron	,,	0·915.
,, brass	,,	1·084.
,, copper	,,	1·150.
,, lead	,,	1·477.

Archæology.

BRITISH REMAINS AT BILLERICAY, ESSEX.

THE parish of Billericay, near Brentwood, in Essex, has long been known to antiquaries as a place where rather extensive Roman remains have from time to time been found, but no remains of the British inhabitants have been observed until the discovery which we have now to describe. On the north-east side of the existing town is a rather extensive wood called Norsey Wood. The southern side of the wood runs along the brow of a hill which slopes towards the south, and discloses a fine view over the southern part of the county, with the Thames in the distance and the Kent hills beyond. Along this brow, just within the margin of the wood, are several lines of artificial embankment, which do not seem adapted to any purpose of modern utility, and at the highest part of the brow is a low hillock, perhaps 20ft. across and 6ft. high, calculated to strengthen the suspicions of an antiquary that these earthworks are traces of the ancient occupiers of the soil. This tumulus was carefully examined two years ago, and we are enabled for the first time to publish an account of the interesting results. First of all in walking over the tumulus a fragment of a small Roman urn was found lying loose on the soil, and on removing a "stool" of underwood which stood in the way of the proposed excavation, near the apex of the mound, several fragments of different Roman urns were found in the soil beneath and about the roots. A trench was dug from the west side straight into the middle of the tumulus. At about the middle of the mound, and 3ft. deep from its apex, the excavators were rewarded by the appearance of a large British urn, about 1½ft. high, and 1ft. in diameter, of the common, badly-burnt ware, and of the commonest shape, with a little ornamentation round the shoulder. It was turned bottom upwards. On examination it was found to contain ashes and calcined bones to about two-thirds of its depth. It seemed then to have been filled in, before it was turned upside down, with clayey loam, of the same kind as the tumulus was composed of. Pursuing the researches, a little to the north-west of the first urn, and about 9in. from it, was found another urn of about the same size, shape, and pattern, also filled in the same manner, two-thirds with ashes and calcined fragments of bone, and one-third with clay, and in the same inverted position. Again, a little north-west of the second urn one of the labourers picked up a small bronze coin. It was undecipherable, but there could be no doubt that it was a late Roman third bronze coin. This is an important piece of evidence, and, in connection with the other contents of the tumulus, forms an archæological puzzle. It is, however, right to say that the manner of the labourer who picked up the coin led to strong suspicions in the mind of the superintendent of the work that he had himself, by way of joke, put the coin into the earth the moment before he called attention to it. In searching the soil turned out of the trench there were also found two thin slices of flint, clearly of artificial formation. About 3ft. west of the first urn, but at a lower level, was found a third urn, of nearly the same shape as the others, but with rather straighter sides, and of a different (redder) ware, filled like the others, and inverted like them. A large hole was then made in the centre of the tumulus, right down to the unmoved soil upon which it had been heaped, but nothing more was found. Also, another trench was carried from the third urn southwards: in taking off the top soil a few more fragments of Roman urns were found, but nothing more of British date. The excavation was carried no further, and it is of course possible that other urns or relics of other kinds may exist in the large part of the tumulus which was left undisturbed. The general result, then, of the excavation is this:—That the tumulus was a British sepulchral barrow, containing in large urns the incremated remains of at least three individuals. The fragments of small Roman vessels were all on the surface of the tumulus, and are accidental, *i.e.*, have no connection with the purpose of the tumulus. They may have found their way here from a Roman burial-place in the western part of the same wood, from which numerous Roman vessels have at various times been disinterred. Another tumulus in the same wood, by the roadside leading from Billericay to Ramsden Belhouse, was examined at the same time, and yielded still more interesting discoveries. A trench was dug into it, as in the former example, from the outside towards the middle, at right angles to the high road, *i.e.*, in a direction about from north-west to south-east. Nothing was found until the middle of the tumulus was reached, and there a careful exploration brought to light a perfect nest of British urns. They were seven in number, and lay within a circle of about two yards diameter, not deposited in any very regular figure, and not all at the same level. Several of the urns were tolerably perfect, but the badly-burnt clay was so friable that they fell to pieces in being got out. One only was in such good condition as to be capable of being taken out quite whole. They were all of British shape and material. Several of them deserve special notice. One, of the usual shape, with a line of rude ornamentstion round the shoulder, was remarkable for this—that the line of ornamentation was formed of a slip of clay put on after the vessel had been formed. In the disintegrated state of the vessel portions of this ornamental slip were easily detached. Another was remarkable for this—that its horizontal section was not circular, but decidedly and intentionally oval, about 9in. diameter in one direction, and 7in. in the other. Another had its bottom concave, like that of a wine bottle. Another was quite straight-sided, like a common flower-pot, and had a little ornamentation, not on the side, but on the very edge of the vessel. There were fragments of several other vessels found, which, if whole, would have made about ten vessels in all. Of all these vessels only one contained ashes and calcined fragments of bone; it was turned upside down as in the other tumulus. All the other urns were inverted, and some had a little charcoal or very dark earth beneath, but nothing in them. It was assumed that this group of urns—one a funereal urn, and the rest subsidiary to it—was the sole deposit over which the tumulus had been raised, and no further research was made.

It will be interesting, after the descriptions of "pit dwellings" and "Dene holes" which have lately appeared in these columns, to state that not far from the first of these tumuli was an excavation, like a small deep gravel-pit, which one of the labourers said his father had told him was a "Dene hole" which had caved in. He had had the curiosity to dig into it here and there to about the depth of 3ft., but found nothing "except a few broken tiles." He also had a vague tradition that "The Grange" (Burstead Grange, about two miles off) "was where the battle was fought."

SOUTHAMPTON AND SOUTH OF ENGLAND LITERARY AND PHILOSOPHICAL SOCIETY.

AT the soirée of this society, held at Southampton on Friday last, an address was delivered by the Rev. E. Kell, giving a summary of the papers read at the monthly meetings of the society during the previous year. Of those which fell within our province, we may put on record a paper read by the Rev. J. H. Austen, "On the Romans in Dorsetshire," in which the traces of their occupation, more particularly in the remains of great high-roads, were described. Mr. Kell himself also read a paper on "Silchester;" in which he stated that Silchester, originally of British origin, had been built upon and fortified by the Romans during the latter part of the Roman occupation of Britain, probably about A.D. 364; and that it was probably destroyed by fire in the fourth century. Some antiquaries have thought that Silchester was of earlier date, and that it was referred to in the Itinerary of Antoninus, as either Vendonum or Calleva. But a site known at the present time as Frinkley Farm, near St. Mary Burne, has been shown by Sir Richard C. Hoare, to correspond better with the description of Vendonum, and Calleva is more probably identical with the modern town of Reading. The excavations of Silchester are still proceeding; and those who are interested in antiquities are recommended not to lose time in visiting them. These Roman villas are now uncovered, but it is probable that the same fate awaits them which has overtaken the first villa which was brought to light, viz., to be re-covered with the soil, and again brought under the plough.

There has been lately some discussion as to the origin of the custom of putting a ducal coronet round the archiepiscopal mitre. We are able to say that an examination of the portraits at Lambeth shows that this combination of the coronet and mitre occurs there for the first time on an engraved portrait of Tillotson.

Mr. E. A. Freeman's new work on "The History of the Norman Conquest of England, its Causes and Results," will be published by Messrs. Macmillan in a few days.

The forthcoming publication of the Camden Society, edited by Canon Robertson, is a work of curious historical interest. One of the Canons of Canterbury, Bargrave by name, in the time of the Commonwealth, when the clergy were driven from their benefices and forbidden to exercise their functions, occupied himself in travelling abroad. In Italy he purchased engraved portraits of many personages of more or less historical celebrity, and on the backs of the engravings he wrote sketches of their lives. It is these biographies, which contain many curious and some important facts, which Canon Robertson is giving to the world.

Whatever polititians may think of the Chancellor of the Exchequer, he is in the very highest favour just now with archæologists, for the promptitude which has secured to England the treasures of ancient art contained in the famous Blacas collection. In asking the House of Commons on Monday night to sanction the purchase, Mr. Disraeli gave some particulars about the collection which we transcribe. In our national collection of ancient art, which, on the whole, may be described as unrivalled, there is one great defect—it is deficient in ancient gems, and these formed the most rare and valuable features of the Blacas collection—the most celebrated, perhaps, to be found in any private cabinet in Europe, unless we except that at Blenheim Palace. It was, therefore, of great consequence that this collection of gems should be obtained for us; and the reason it was so urgent was, that probably no such opportunity would ever occur again, and certainly not in this generation. All the celebrated gems of antiquity are now well known; most of them are possessed in Royal and Imperial collections at St. Petersburg, at Berlin, and at Paris; and England, notwithstanding the celebrity of its British Museum, is almost entirely without specimens of those works which are among the most exquisite and rarest works of art.

The quantity of water supplied by the whole of the aqueducts in ancient Rome is calculated to have amounted to the enormous quantity of 50,000,000 cubic feet daily.

THE THEATRES.

UNDER this heading we propose from time to time to give critical notices of such things as improvements in theatre construction, stage scenery, and indeed of all that border country of the dramatic art which skirts so to speak the boundaries of those kindred arts with whose progress we are more immediately concerned. It is mainly because we think it impossible to fix, and impolitic to attempt even to fix, the boundaries of any art study, that we propose to touch upon subjects which though not directly connected with the object of our journal, have nevertheless an indirect influence on, and are influenced by the position of those great arts which are involved in all noble building. For we feel convinced it would be better for architects if their studies were a little more catholic than they usually are; and we are quite sure that it would be better for the English drama if those who have to do with our theatres were a little less narrow in their views, and not quite so much given to stage cliqueism. Besides which, there are branches of study, such, for instance, as archæology, which are or should be common to every art. The theatrical manager who knows nothing about it, and is too fond of his ease to care to know anything, may be inclined to pooh-pooh all archæological research; but believing as we most thoroughly do, that the art dramatic was never in such a deplorable condition as it is at the present time, we should not be surprised at this or any other evidence of ignorance. To any one at all familiar with the modern stage and its manners and customs, it is almost unnecessary to say that it is impossible for it to occupy a lower position than it now does. And the wonder is, not that we so soon get tired of it, but that it should possess anything which should be sufficiently attractive to give it the chance of tiring us. In other words, there is certainly evidence of talent somewhere or other behind the curtain, but it is always more or less swamped by the vulgar coarseness or the foolish freak of some stupid conventionalism. Take, for instance, the transformation scene at Covent Garden Theatre—a vale of ferns out of which rise six figures, three on each side, one behind the other, and well separated, so that the tender colours of their drapery are seen to advantage; at the back of these, spanning the entire stage, an inhabited rainbow, with all the drapery arranged both as to form and colour, with a wonderful sense of art refinement. No sooner, however, had this unusual loveliness been reached than it was lost—literally *lost*—in an avalanche of coarse and vulgar tinsel, which was poured in on each side of the stage to tickle the eyes of the groundlings, much as low comedy men use vulgar gags to tickle their ears. For the sake of the designer of this scene, who was called, and deservedly called, before the curtain, we hope that the gold tinsel was forced upon him. This faith in glitter is one of the very coarsest conventionalities of the stage, and in such scenes as that to which we have just referred, there is often unfortunately very little else but glitter. It is because the colour and arrangement of the scene at Covent Garden are so near perfection in themselves that we ask the manager to break himself free of the fetters of a convention so destructive to art. We would also take this opportunity of congratulating the designer on the success he has achieved, and advise those of our readers who have not yet seen to take the earliest opportunity of doing so.

CITY OFFICES, OLD BROAD-STREET, AND BISHOPSGATE-STREET.

THE block of buildings just completed for the City Offices Company, called "Palmerston Buildings," is, we believe, the largest in extent of any recently erected. The greater part of the land was formerly occupied by the celebrated "Bull Inn," one of those quaint old hostelries, with courtyards and balconies, which flourished in other days, when coaches were the only means for adventurous travellers. The entrance was from Bishopsgate-street, and the stable yard and sheds formed a vast area at the back. Other property adjoining was acquired by the company both in Bishopsgate-street and Old Broad-street, making the total area occupied by the new buildings nearly 30,000 superficial feet. The site, as will be seen from the plan, is irregular in shape, and extends from Bishopsgate-street opposite St. Helen's Place, right through to Old Broad-street, a distance of about 350ft., the frontage being in Bishopsgate-street 74ft., and in Old Broad-street 62ft. wide. Both fronts are in the Italian style, the former being somewhat more enriched and ornate than the latter.

The Bishopsgate-street façade consists of seven bays, the centre being occupied by the entrance doorway leading to the main corridor, traversing the entire building, and having its exit in Old Broad-street. The ground story is enriched with polished granite shafts and pilasters supporting Doric caps and a full entablature, carrying a similar arrangement of columns and pilasters on the first floor in Corinthian, the upper stories being relieved by rusticks and panels. The carving throughout has been treated in a somewhat free style, the capitals being in no case strictly classic in detail.

The Broad-street front (a drawing of which is given) has four bays, one being devoted to the entrance and one to large windows, the spaces between being enriched with three-quarter columns in polished granite, with composite columns on the upper story with rusticated and panelled spaces above. The material used for both fronts is Portland stone. As regards the internal arrangement and plan, the task presented to the architects was to obtain the largest amount of available space for offices, consistently with a due amount of light and ventilation. This has been accomplished by large and spacious open courts, and by so arranging the courts as to get the largest amount of light from east to west. The building adjoins on the west the large block of offices known as Gresham House, and the architects have continued the courts of the building in question in a line with the courts of that building, so as to improve the light and air of both buildings.

The nature of the levels induced the building of a sub-basement. This is intended to be used for wine and other cellars, and is of great extent, having entrances at both ends of the building. The upper basement will partly be used for cellars, offices, and silk warehouses, as also for strong rooms, refreshment-rooms, &c. The ground floor will contain fifty commodious offices of varying capacity, the remaining space being taken by staircases, corridors, passages, and lighting wells. The main building has, besides, first, second, and third stories, similarly arranged, the attics being confined to the street fronts at either end of the building. The main corridor, which as we have said, runs through the building, is 12ft. wide, except the cross corridor, lighted by a skylight which is 14ft. wide. The cost of the building will be about £80,000. The works have been carried out with great ability and expedition by Messrs. David King and Sons, of Aldgate, the carving being undertaken by Mr. F. G. Anstey, of St. John's Wood. The architects are Messrs. F. and H. Francis, of London.

We may state that in addition to the ordinary purposes for which slate is used, such as roofing, shelving, flooring, &c., it has been here introduced to great advantage for chimneypieces, beautifully enamelled in imitation of the more choice description of marbles. Amongst others we noticed malachite, serpentine, St. Ann's, and Russian green, so rendered that it would be difficult for a practised eye to distinguish them from the natural productions, while the polish is much superior to that usually produced on marble. The whole of these have been executed by Mr. A. A. Robinson, of Fenchurch-street and Stratford.

ASPHALTE.

THE discovery and use of the bitumen now so extensively used for foot pavements, &c., dates from the highest antiquity. According to a positive text in Genesis, it was used as a cement by Noah in building his ark, and numerous vestiges of it have been found in the crypts of Egypt and Babylon. But, whether from neglect or some other cause, certain it is the Romans never used it, any more than their successors of the middle ages, and it was not until the first years of the eighteenth century that Dr. Eyrini d'Eyrinis, a professor of Greek, while on a tour, discovered a bed of this substance in the Val de Travers. As it appeared to him of the same quality as that used in the East, he subjected it to various experiments, from which it appeared that it was a sort of lime-stone impregnated with bitumen, and which, by exposure to heat, yielded an adhesive substance similar to the Babylonian cement. Overjoyed at his discovery, Dr. D'Eyrinis in 1721 published a book in honour of it, and in which he greatly exaggerated the part this bitumen had played in the Egyptian and Assyrian monuments. He did not notice the circumstance that this substance, which melts at a very low temperature, could only have been used in those latitudes for mere foundations, or, at best, subterranean floors. But, apart from his hyperboles, Dr. D'Eyrinis's book contains the indication of the principal appliances of asphalte we at present witness, except the very one which is most frequent, viz., foot pavements. The bed of Val de Travers continued to provide Europe with the article until the discovery of that of Seyssel, for the working of which a company was formed, whose shares experienced the strangest fluctuations possible. In less than a year, the shares emitted at the value of 500f. rose above 16,000f., and fell again to 25f. These sudden freaks of speculation for a moment brought the article into discredit, but it has since rallied, and is now extensively exported to all the capitals of Europe. The municipality of Paris uses it exclusively for all the foot pavements of their metropolis, and it is even beginning to be employed on a large scale in lieu of road-metal.

BLOCK PLAN OF MR. STREET'S DESIGN FOR THE COURTS OF JUSTICE.

LAST week we gave a general criticism of Mr. Street's designs. We now give on another page a lithographic drawing of his key plan, of which the following is an explanation:—

a. All the rooms for the Bar are under central hall, close to all the courts. The Bar require the inner line of communication, having to practice in all the courts. There is a continuous passage for Bar through all the courts at the end nearest Bar rooms, under public galleries.

b 1 to *b* 23. The courts, all on the same level. *b* 1 to *b* 7 Equity Courts, *b* 8 to *b* 10 Courts of Queen's Bench, *b* 11 to *b* 13 Courts of Common Pleas, *b* 14 to *b* 16 Courts of Exchequer, *b* 17 Exchequer Chamber, *b* 18 spare court, *b* 19 extra court, *b* 20 Probate and Divorce Court, *b* 21 Admiralty Court, *b* 22 Ecclesiastical Court, *b* 23 Appellate Court, *b* 24 Bankruptcy Court and offices.

c c c. The Judges' Corridors, continuous throughout, and accessible only to Judges.

d d. Judges' rooms, level with Bench in all the courts. Each set opposite its own court.

e f g. Principal entrances for Judges.

h. Entrance in Strand for jurors, witnesses, and parties to suits. Principal stairs here lead to a second hall on first floor, and from thence by a bridge and flight of stairs to central hall. There are separate entrances and stairs for witnesses and jurors who wish to go at once to their rooms without ascending to central hall.

k k. Corridors for general public, each 175ft. by 15ft., reached by four public staircases. From these access is gained to the lobbies behind the galleries in courts. The central hall is not used by the general public, but it and these corridors are level, and persons can pass by permission from one to the other by means of doors in the iron screens which separate them.

l l. Carriage quadrangles, with arched entrances from Strand and Carey-street. These are for the Judges' access to their porches.

Below *c c* is a corridor for the use of the Bar and attorneys only. It opens to the consultation rooms, which are under *d d* all round.

Below this is another corridor, for jurors and witnesses only. The jury rooms are under the consultation rooms *d d*, and the witness rooms are all under the courts.

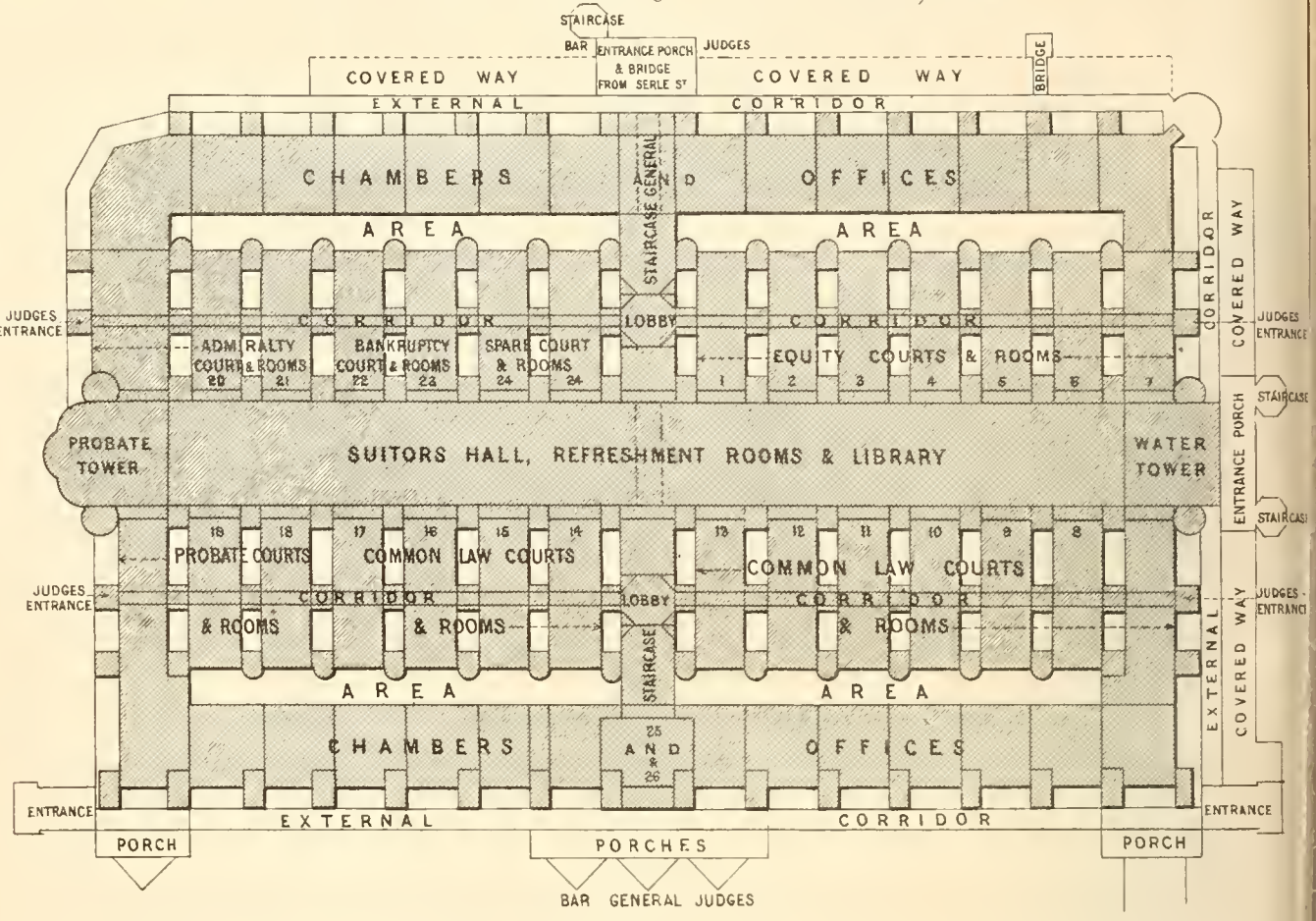
m m m m. Enclosing block of law offices, all of them perfectly lighted, and most of them very quiet.

GAS LAMPS.

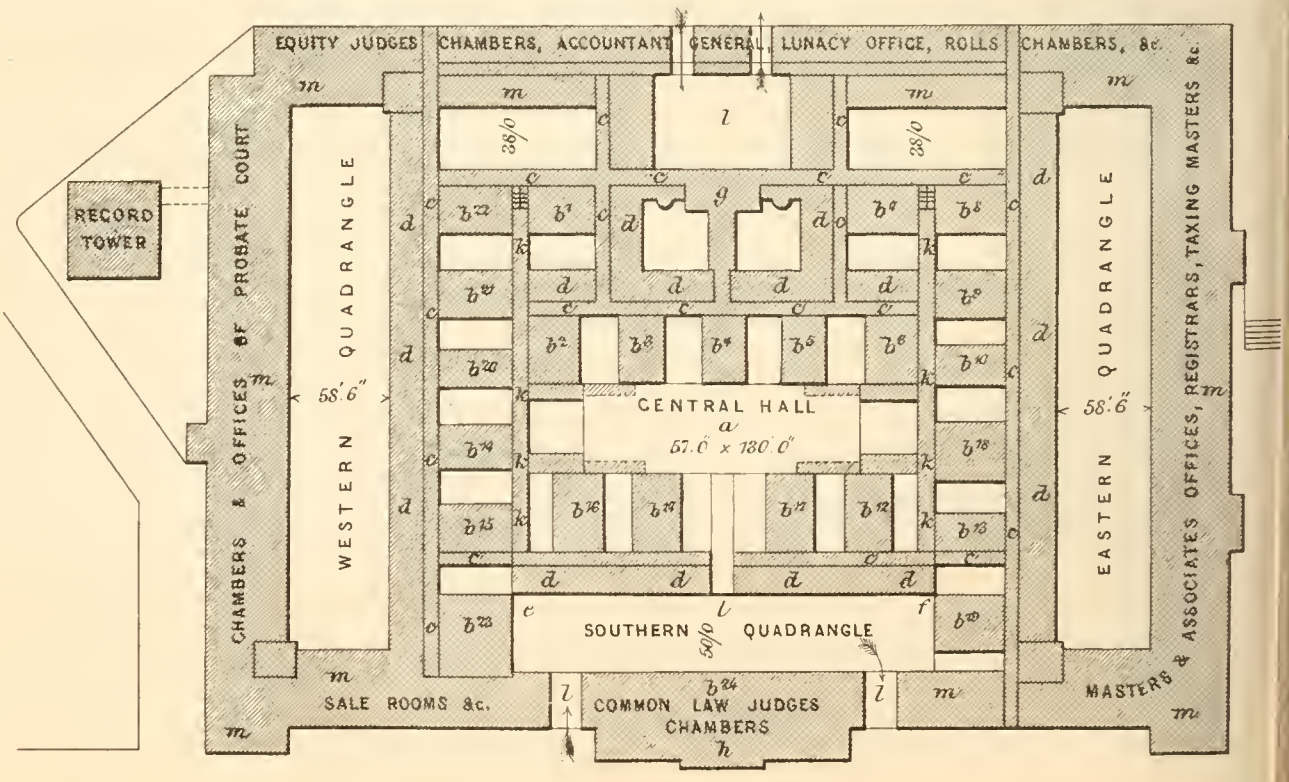
A WRITER in the *Pall Mall Gazette* says:—Our gas is universally recognised as bad. We know whom we may blame for that. But who constructed, who placed *in situ* our lamps? Who had the bright idea of allowing half the light to be wasted on the desert air, instead of being reflected? If when walking home at night you observe the lamps, you will find the burners in some close to the bottom; in others, half-way up; in others, near the top of the lamp. Surely there must be some rule! If furthermore you step the distance between the lamps you will find some placed at 30, some at 33, 35, 40, paces from one another. Again, you will sometimes observe that the lamps on the opposite side are directly in front of those on yours, instead of being halfway between the two on yours. Now I am sure that even with our badly constructed lamp we might obtain a great increase of reflected light by simply painting the upper glasses white, so as to turn them into mirrors. According to my notion the upper portion of a street lamp, instead of being as at present at an acute angle or rounded, which is ugly, costly, and troublesome to clean, ought to be a rectangle, formed either of metallic reflectors, or glass painted externally. Now in such a lamp, with a diameter of (say) 10in., the height between apex and base might be 12in., and with a burner at 7in. from base the reflected light would be considerable. The height above the ground must be estimated according to the lighting power. The distance from lamp to lamp likewise.

DESIGNS FOR NEW LAW COURTS.

Block Plan of Building. J. P. Seddon, Arch^t.



Block Plan of Building. G. E. Street, A.R.A. Arch^t.



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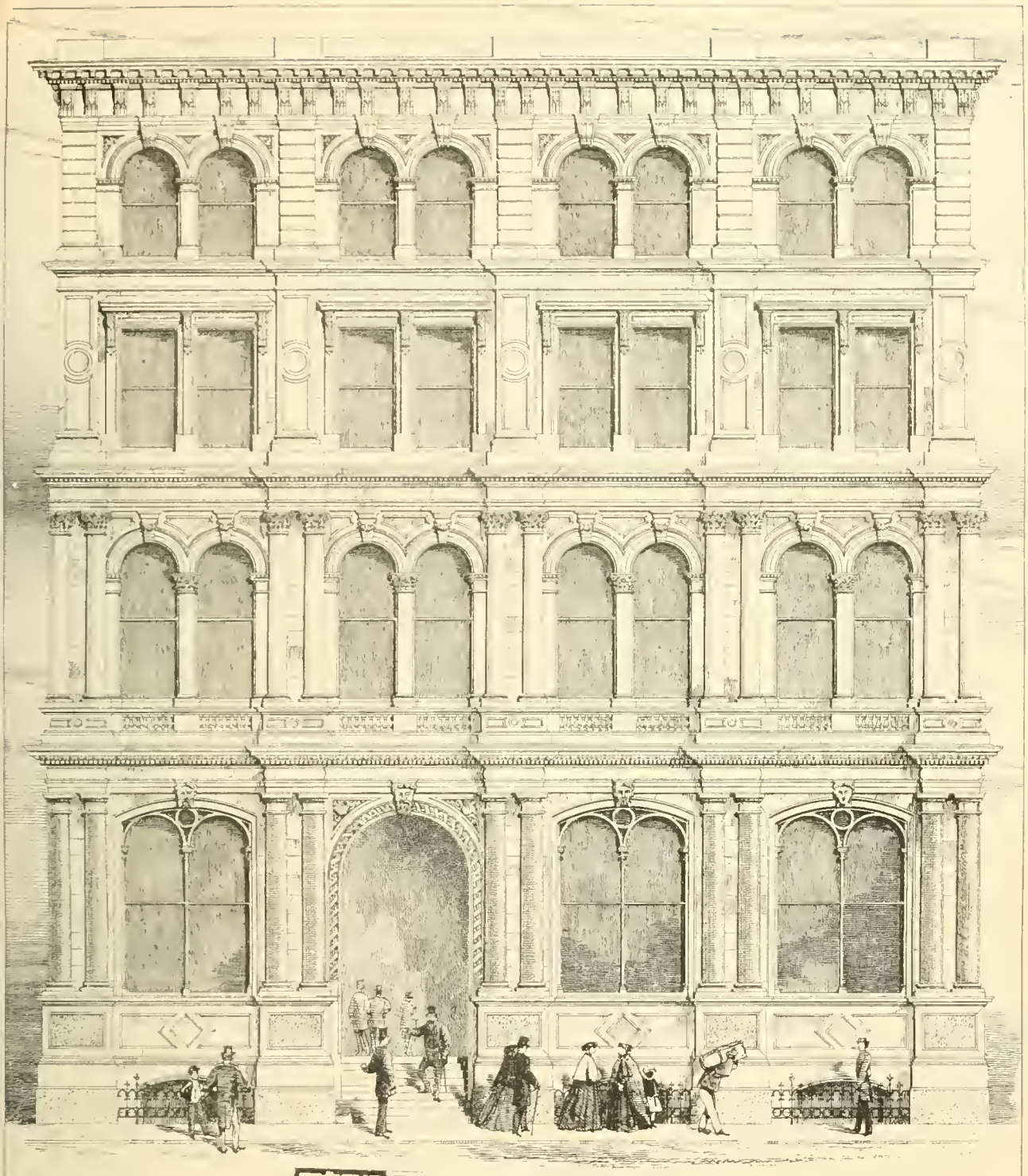
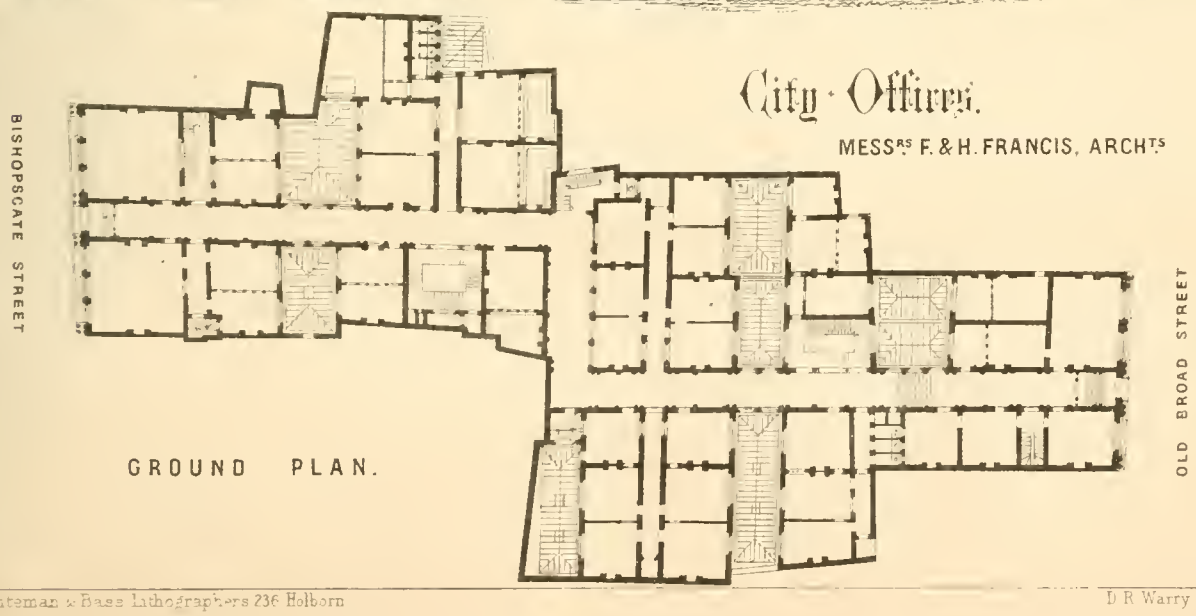




City Offices.

MESSRS F. & H. FRANCIS, ARCHTS

Whiteman & Bass Lithographers 236 Holborn

D R Warry lith

THE NEW COURTS OF JUSTICE.

To the Editor of the Building News.

Sir,—A few brief comments, by one who is no stranger to the art, upon the designs for the proposed new Law Courts may be acceptable to your readers. They do not pretend to enter into the important question of the merits of the plans, but simply into the æsthetic qualities of the designs. Taking them seriatim, I begin with that of

Mr. Scott,

and it is not without compunction and regret that I feel compelled to take an unfavourable view of the designs of one who has so long and ably upheld the character of the profession. But his world-wide reputation makes him our representative man; and as such, I lemur to his designs, which a few years back might have been considered magnificent, but now lack that quality and fine feeling liscernible in the works of some few of his juniors. In the present instance there is an unpleasant cramped expression pervading all the façades, attributable, I believe, to the aarrow proportions of his arches, and an undue elongation of columns, with a crying want of wall surface throughout. The treatment of his turrets, pinnacles, and parapets is not felicitous, and that of his towers is worse. What can be more abrupt or inelegant than the termination of his Record towers? And what more feeble than the lanterns of those flanking the central block of the Strand façade? We miss the grandeur of a stately, broadly treated building, as well as the picturesqueness which so often characterises portions of Mr. Street's works. Nevertheless, to those who are content with a moderate standard, this must be considered a work of undoubted ability, and it is impossible to surpass the conscientious manner in which it has been worked out and rendered.

Mr. Waterhouse.

Considering the rapid growth of this gentleman's reputation, one is struck with amazement, at a first glance, by the total absence of the true spirit of Gothic architecture which his design exhibits. Whether we look at its composition and outline, or at the separate features and details, we find the same sad want of character and tone. The thin slice-like quasi towers of the Strand front have little of that grandeur of mass of which the style is capable, and such an important position demands. The actual towers, too, with their attenuated forms and uncouth terminations, injure, where they should aid, the general outline. His Crystal Palace-like hall in the interior affords additional evidence of his want of feeling for real Gothic. But some may say that that is development. If that be so, "rest and be thankful," say I, or leave it to abler hands. Possibly business-like habits and a power of organization and planning may account for the hold he has on the public mind. These are essential qualities no doubt, but something much rarer is demanded of him who is expected to produce a really grand work.

Mr. Street.

With what pleasure and relief the eye rests on Mr. Street's truly mediæval conception after the last. Many of the parts are strikingly beautiful, being full of character, and showing a thorough appreciation of the value of wall surface, with that of the proper concentration of enrichment. Yet, notwithstanding many happy bits of composition, this, like most of Mr. Street's designs for large works, betrays a want of power to compose a grand and stately pile, well balanced in its entirety. With the exception of his admirable detached tower there is not a grand mass to be met with; for, excellent as his central hall is, from its position it could be seen but from a balloon, and, therefore, is of no use to his group. The capricious manner in which he mingles traceried with other windows has a tricky look unworthy of him, and goes far to destroy the rhythm of his work. Despite such faults as these one fondly lingers over the many beauties which characterise all his designs.

Mr. Seddon.

To appreciate the value of Mr. Seddon's stately design requires some effort. And this may account for the erroneous ideas of the *Times* reviewer. For, instead of employing to the same extent as the others numerous highly finished drawings, he has preferred to be judged by a model and photographs of actual details elsewhere employed. His well-balanced composition, which contrasts favourably with the two last in this respect, when read by this light, really becomes a fine conception ill-represented by his overgrown perspective view. Altitude unquestionably is an element which conduces to dignity and grandeur. But I am inclined to think that this author has run somewhat into excess in this respect, although allowance must be made for the foreshortening effect which would be produced by the beautiful projecting corridor, which is an unique feature in his design. If the surface of his gables were more simply treated, and the intervening chimneys otherwise disposed of, greater value would, I think, be given to his fine centre block towards the Strand. Pretty as the central tower is, it might well be spared, and his prodigious Record tower might be somewhat modified with advantage.

Mr. Lockwood.

Some credit is due to this gentleman for having conceived a well-massed group, not without dignity, but so utterly devoid of true Gothic feeling that it is a pity he should have employed a style of which his knowledge seems to be on a par with that of the late Mr. Hopper. But *de mortuis nihil.*

Mr. Garling.

Clearly this gentleman's beau-ideal of a building must be the Tuileries, for not only does his "alternative" plan on this occasion reveal its birth and parentage, but if my memory serves me, his premiated design for the Government offices had a strong family likeness. But there is no denying that Mr. Garling is good at the arrangement of plans, and can produce a well-balanced symmetrical design, although his details are not of the highest order. But why he should have ventured so far out of his depth as to have favoured us with his crude notions of Gothic, it is difficult to conjecture. It is strange so sensible a man should have committed himself to so suicidal an act.

Mr. Deane.

This is a rational and somewhat picturesque design, but a lover of true Gothic must readily perceive that his attempts at development are anything but improvements upon our fine old models. He would seem to have much to learn before he could be safely entrusted with so important a work.

Mr. Burges.

This is a truly magnificent design. Up to its cornice line it is hard to conceive anything more beautiful, so grandly simple is its treatment; and yet there is such a glaring discrepancy of proportion between this and many of his towers, so overwrought and missal-like in their treatment, that one cannot but wonder so accomplished a designer should jeopardise in this way his prospect, otherwise so fair, of carrying off the coveted blue riband. Where there is so much to command admiration, one is loth, but from a sense of fairness, to notice small blemishes which offend a fastidious eye. I refer to the unworthy manner in which he attempts to reconcile the square bases with his circular towers, and to the angular abruptness of his dormer treatment. But his Temple Bar Bridge is of itself sufficient to atone for little flaws like these.

Mr. Brandon.

This is a meritorious design, most elaborately and conscientiously worked out, replete with many excellent features and good detail. It is, therefore, all the more to be regretted that he should so far have mistaken his type, and given his design so ecclesiastical an air, as to have suggested universally the idea of a cathedral, and, indeed, to a wag, the quaint conceit that the "pleadings" should be "intoned."

Mr. Barry.

Looking on Mr. Barry's schools in Holborn as a work of much hopeful promise, one cannot but feel disappointed to find that, on this great occasion, his performance falls short even of his father's great work at Westminster, in the early days of our resuscitation. And though, with the best intentions, he has adopted an earlier and purer type, yet it is to be regretted that he has lost the spirit of it by too close an approximation to the later period.

Mr. Abraham.

Looking at this design, one can discover in it no one merit to justify those in authority in selecting its author for so honourable a distinction as a place in such a competition. It is to be hoped that there must be some excellence of plan to countervail such woful shortcomings.

I think, Sir, creditable as this exhibition may, on the whole, be considered, allowing for its limitation to but eleven, that there can be no question, as a matter of fact, that more than as many again might be found outside this magic circle who have executed works of such acknowledged merit as to lead to the belief that a result more honourable to the profession, and to our country, might have been obtained, had there been a little less favouritism, and a little more discernment, employed in the choice of the competitors.

I am, &c.,

Verax.

THE PHOTOGRAPHS OF THE ARCHITECTURAL PHOTOGRAPHIC ASSOCIATION FOR 1867.*

When our honorary secretary, Mr. Seddon, asked me to give to this Institute a paper on the "Photographs" which have just been issued by the Architectural Photographic Association I assented more readily than my fitness for the task warranted; first, because it would enable me to observe the rule, that every fellow should contribute some work, original or otherwise, on his election; second, because it would afford me an opportunity of offering my testimony to the very valuable labours of this association; and third, because, knowing too well the difficulties honorary secretaries have to contend with, it would have been very hard for me to have refused compliance with Mr. Seddon's request, even had he not made it impossible for me to do so by the very courteous terms in which he expressed it. The work which our Photographic Association does annually is one of great interest, and it is of the utmost importance that it should be rightly understood and appreciated by those for whose special benefit it is intended. It is scarcely necessary to say that I mean the architectural profession and the students who are preparing to enter it; nor should I omit to mention the art workmen, for it is manifest that their ability must be in proportion to their knowledge. But as it is impossible that they should visit a tithe of the places where the best examples of ancient art are to be seen, they must be for the most part dependent upon the copies which are brought to them; and if these are not accurate, embodying the spirit as well as the form, it will be small wonder if their work, whilst pretending to be founded on the past, is utterly lifeless and at fault in nearly every particular. Of course it would be better if art workmen could study from the originals; the benefit from such a course is very remarkable. I remember taking a carver over to Chartres for one day only, and pointing out to him the delicate work of the north and south

* A paper by Edward William Godwin; read before the Royal Institute of Architects, February 11, 1867.

portals, with a special reference to the excellent way in which figures and foliage are there combined. The man had never before been out of England; and it was extraordinary how, in the few hours spent in merely looking at the treatment, without making a single sketch, he managed to extract sufficient of the spirit of the old workers to produce a very creditable series of foliage decorations in a building I had then in progress; but, of course, this is not always practicable. It is, therefore, of the last importance that we should have transcripts of the closest accuracy to place in the hands of artisans as well as for our own purposes, and I know no means of obtaining these which can for an instant compare with those offered us by the Architectural Photographic Association.

Believing that the labours of the association have not as yet been appreciated at anything like their proper value, I have thought that it might not be altogether unpardonable, before attempting to make any comments on the photographs now before us, if I trespassed a little on your patience by reviewing briefly what the association has already done. At first, the photographs issued to subscribers were merely selected from the trade stock of photographers, and consequently there was nothing very special or very difficult in the work; but in 1862, the real distinctive character of the association was set forth for the first time in a series of thirty-five photographs from the sculptures of Wells Cathedral, taken specially for the association. These photographs, with the exception of a general view of the west front, gave us to a large scale the small groups which occupy the quatrefoils and half quatrefoils over the lower arcade, and thus studies of very great value were offered to that host of so-called art workmen who have the audacity to attempt figure subjects before they have given one thought worthy the name of study to the human figure in nature or art. The money consideration was next to nothing; for the price of one of those spiritless capitals we see everywhere would have been amply sufficient to have made its carver the happy possessor of the entire series. What advantage the "architectural sculptors," as they are called, took of this first offer of the association I cannot tell, but judging from their latest works I should say the value of these photographs had certainly not diminished, and that the best of our art workmen may still humbly reverence the marvellous skill and exquisite feeling manifested in such a figure as that of Eve labouring, and may yet study to his advantage the carver's art as exhibited in every group. Since the issue of the Wells series, sixty-four photographs have been specially taken for the association, and but for the loss we all suffered in the death of William Lightly, fellow of this Institute, no doubt this number would have been increased by one-third more. As it is, we have a blank year in 1865, which must ever remain a melancholy void, as we look at the results of his brief but indefatigable labours. Under his management in 1863 and 1864 twenty-two places were visited; the 1863 series, which included Arles, Auxerre, Bourges, St. Gilles, Lyons, Sens, Tarascon, and Vezelay, was essentially a "portal" series, eighteen out of twenty-two photographs being devoted to doorways and one or two details of doorways. In the selection for 1864, sixteen out of twenty are general views, and although those of Nogent les Vierges, Mogneville, Agincourt, and the Château of Pierre-fonds are among the most interesting of the whole collection, still I cannot help thinking that it was scarcely worth while to obtain two views of such a church as Cires les Mello, or any view at all of such a weak piece of architecture as Luzarches, and yet it almost seems ungracious to take exception to anything in that series which possesses the two splendid photographs of the sculptured choir screen at Amiens.

I have said that 1865 was a blank with regard to the issue of photographs; but the association was not altogether idle, for it accomplished that very important work known in trade as "taking stock;" the result of this stock-taking showed that the three years' labours of the society were not what may be called financial successes. The great body of architectural students and the art workmen were either ignorant of the existence of the society or indifferent to the good things which it offered them. Possessing only a few hundred subscribers, instead of at least a thousand, it was not surprising that the association found itself in debt, with no property beyond a stock of photographs that might have been quoted in the market as very much the reverse of "lively." It was at this juncture of affairs that Messrs. Cundall and Fleming, photographic publishers, came forward and kindly offered to relieve the society of the old stock, its debts, and all trade responsibilities for the future—the society reserving only its power of direction as to the choice of subjects. There can be very little doubt, I should think, that this arrangement was a judicious one for both sides; at the same time the work of the committee, being now limited entirely to the all-important question of selection, subscribers will very naturally expect that this department will be managed in such a way that the confidence of the art public may be firmly established and criticism disarmed.

At the risk of being thought hypercritical, I must ask leave to point out where I think the work of selection has failed in the photographs for 1866, which are now before us. We have had in 1863 a group of portals, and in 1864 a collection of general views, and now we have a half-and-half series made up of general views and portals, with here and there a detail to anything but a large scale. In each of the selections for 1863 and 1864 we had two capital examples of domestic architecture (a half-timbered street house, a castle, an archbishop's palace, and a *salle synodale*). I was not alone in accepting these as earnest of future labours in a like direction, and I confess I was not a little disappointed in finding domestic art entirely absent from the selection for 1866. Again, west fronts, general views, and portals are not the only things worth studying. It is quite true that a collection of good photographs of all the chief portals or west fronts would enable the art critic at a glance to compare one with another, and save him from falling into those egregious errors into which he is not unfrequently led by treacherous memory and equally treacherous sketches and engravings. But the work of the association is primarily, I take it, not for the gratification of the art critic, nor the archæologist, nor the amateur, but for the help of the working art student; and, therefore, until a mania for cathedral building sets in it may be possible to select subjects of greater practical utility for present needs than those grand, richly storied portals, any—even the faintest—approach to which it would be absolute nonsense to anticipate in an age like the present. Then, too, although such west fronts as those of Civray and Notre Dame de Poitiers are exceedingly valuable to the practising architect as well as to the archæological student, still it may be open to question whether it was worth while to give two views of the same front when so much remains to be photographed and the mania for restoration is so strong. Here, as an antiquary, I am almost tempted to bring my fault-finding to an end, but as an architect and in spite of the historical value of having faithful representations of dated buildings, the selection of such a church as St. George de Bocherville seems to me altogether unworthy the Architectural Photographic Association. Especially, too, when in the same series we get only general views of the west-end and interior of St. Pierre Lisieux, and think what we might have had if the camera had remained at Lisieux instead of being taken to Bocherville.

Putting this last-mentioned church then out of the question, the series now exhibited may be divided into three historical groups. 1st, Romanesque; 2nd, the First Pointed; and 3rd, the Flamboyant. In the first group we have (10 and 13) a south-west view and the façade of Notre Dame de Poitiers; (14, 15, and 16) the west doorway with details of St. Ours Loches; (5, 6, and 22), west views with details of Civray; (17 and 18), south doorway with details of Le Mans Cathedral; and (4 and 11), the western doorways of Chartres Cathedral. Certainly the admirers of French Romanesque, and what I may perhaps be excused for calling the muscular architects, have every cause this year to be grateful to the association. Taking this group first, perhaps the most important contributions are the two photographs of Civray (numbered 6 and 22 in the list); the third view of Civray (No. 5), as I have already hinted, is of very little use, and is moreover a cloudy photograph. It is almost superfluous to say that the chief point of interest in such a façade as that of Civray is the iconography. Apart from its sculptured detail the work is remarkably simple; the general composition consisting merely of an arcade of three arches, a strongly marked corbelled stringcourse or cornice, another arcade of three arches, a repetition of the stringcourse, and a plain parapet. In this architectural framework it will be observed that the central arch in each arcade is the narrowest, or just what it ought not to be, and this irregularity is made all the more prominent by the addition of a moulding to the upper arch, and two complete orders to the lower one. It should be remarked that, whilst the lower arcade is considerably strengthened, and as it were bound together by extending wherever practicable the bold abacus of its clustered shafts, the upper arcade is lightened through having its abacus interrupted at each pier by a large projecting shaft, which by being continued to the parapet further enforces the vertical principle, and relieves to a considerable extent the stunted proportions of the upper half of the façade. In the north or left-hand arch, the depth of shadow under it being so much greater than that under the others is owing not only to the wall being further recessed, but also to the arch itself being in advance of the line of the front. The photographs show very clearly the differences in plan of pier, capital, and archivolt between this compartment and the others, and the evidence of its later date is very manifest. The great charm of Civray, however, is neither its construction nor its history, but its decoration. Now the sculptured work on the doorway and the centre and right-hand arches of the upper arcade are very different from the work on the other three arches. From certain fragments in the doorway there can be very little doubt, I think, that the whole of the original work was executed, or intended to be executed, in the square low relief Byzantine fashion of the side arches of the lower arcade, the complete development of which we see in the church of Notre Dame de Poitiers (Nos. 10 and 13).*

THE ARCHITECTURAL MUSEUM.

THE view which this body has always taken of an architectural museum has been that of a collection of specimens, each of them possessing individual merit, and therefore worthy of being acquired and retained for the use of the student. South Kensington, on the other hand, preferred only as many casts as would be typal of the various styles of ornamentation. The council immediately perceived that very many specimens possessing much beauty and great value for study would not find a place in the newly-arranged Museum of Architecture. After an interchange of correspondence between the department and the President of the Architectural Museum, it was finally agreed amicably to terminate the connection which has now existed, more or less intimately, for upwards of ten years, on the simple ground that the views of the two bodies were not identical. The separation will be of the most friendly character, and will, the council have reason to hope, be followed by a renewal, as far as may be convenient to both sides, of relationship between the two bodies.

The first step which the council took on terminating the alliance was to search after premises central in locality, large enough for their extensive collection and yet within the resources of the Institution; and Messrs. Poole and Sons, of Tufton-street, Westminster, who rank among the oldest supporters of the museum, made an offer comprising the three essential conditions of centricality, spaciousness, and moderate rental. This offer was accepted. The site of the future museum (between Bowling-street and Great Smith-street, Westminster, with the prospect of an entrance in Great Smith street, the main thoroughfare) leaves nothing to be desired; the ground rent will be that which Messrs. Poole and Sons will themselves pay to the Dean and Chapter of Westminster, while the total area of floor space is of 11,391 superficial feet, affording by means of upper galleries, screens, &c., a total wall space of about 13,730 superficial feet. The old museum in Cannon-row contained about 4,050 superficial feet of floor space, incapable of increase by extra flooring, and having but comparatively scanty wall space. In order to secure the advantages of such a site, a building fund of at least £2,000 will be necessary. In aid of this fund, most of the members of the council have voluntarily promised £10, and offers of further assistance, if needed, have not been wanting. More than half the required amount has been raised. In aid of the balance, the council hope that those lovers of art who have not yet responded to the appeal recently issued, will have the great kindness to do so with the least possible delay. *Bis dat qui cito dat* is trite but true.

* To be continued.

Pledged as they are to carry out a work of national interest, the council have no scruple in appealing to persons beyond the circle of their own members—they invite funds from all friends of architectural progress, and welcome contributions of any amount. With the task of reorganisation in their hands, and the prospect of providing for the increased annual expenditure consequent upon assuming independent action, the council are assured that they will not in vain appeal to all who can realise the value of their matchless collection in so accessible a locality. The plans of the new building are being prepared by Mr. Joseph Clarke, the hon. sec., who acts with Mr. Ewan Christian as honorary architect.

The following statement shows the result of the prize competitions of 1865-6:—

STONE CARVING.—Prize 1, £20: Arthur N. Harris, Cowes, Isle of Wight. Prize 2, £5: John Seymour, Tower Lane, Taunton. Prize 3, £2: Henry Harrison, 82, Upper Berkeley Street, London. Extra Prize, £1 1s.: T. Sharp, 9, Connaught Terrace, Edgware Road.

WOOD CARVING.—Supplementary Prize, £10: W. Cormeleighton, at Mr. Roddis's, 19, St. James's Street, Birmingham.

SILVER WORK.—Prize 1, £15: W. Holliday, 14, Nailor Street, Islington. Prize 2, £5: A. G. Frantzen, 20, Spring Square, Clerkenwell.

TRANSPARENT ENAMELS.—Prize 1, £10: Frederick Lowe, 13, Wilderness Row, London. Extra Prize, £1 1s.: A. D. Koninghi, 69, Dean Street, Soho.

OPAQUE ENAMELS.—Prize £10: Frederick Lowe, 13, Wilderness Row, London.

MARBLE MOSAIC.—Prize £10: George Rooke, 27, Bywater Street, King's Road, Chelsea.

MODELLING IN CLAY.—Prize 1, £5: R. W. Martin, 3, St. John's Terrace, Olney Street, Walworth Road. Prize 2, £2: J. W. Gould, 33, Bayham Place, Camden Town.

ON THE PLANNING OF LUNATIC ASYLUMS.*

TO a benevolent and courageous Frenchman named Pinel is due the distinguished honour of having first, in the year 1792, introduced compassion and kindness into the treatment of the insane. His efforts, which commenced with the patients of the Bicêhe, a large lunatic asylum or prison for males near Paris, deserve to be ranked with the noblest deeds of those who have benefited the human race. In England, long after the example which Pinel had set, though there were isolated attempts to introduce a humane system to lunatic asylums, they were the exceptions only. Cruelties of the most revolting kind continued to be practised by sordid, unprincipled men. The law afforded no protection to the insane; their sufferings, when known, were unheeded because they were supposed to be unavoidable. It was believed that the insane could only be ruled by brute force, and therefore brute force continued to be the rule, and enlightened humanity the exception. At length, however, the march of improvement commenced, and by slow degrees a better system of treatment came into use. The labours of Sir William and Lady Ellis, of Dr. Conolly, and others, often undertaken against determined opposition, have issued in the present improved condition of the lunatic, and in the consequent greater success with which mental disease is now treated. It is not to be supposed, however, that there is not still room for improvement, and that still greater results may not be anticipated. Recent horrible revelations show the necessity that still exists for strict inquiry and supervision in all that relates to this subject.

The first and greatest benefit conferred on the insane pauper was the act of the 9th George IV., c. 40, which was intended to promote the erection of county lunatic asylums for the poor. From that time forth in all those counties that solely took the benefit of the act, the friends of the insane pauper could be assured of at least protection against cruelty and security against neglect. Further legislation has since required asylums to be provided for every county and borough throughout the kingdom, two or more counties or boroughs being sometimes united into a district, for which one asylum is made to answer, but the tendency being to require that eventually every county at least shall have its own asylum. The provision of a suitable building is, in fact, a first essential condition to any judicious form of treatment. The treatment of the lunatic is to be accomplished not merely *in* but *by* the asylum, which may be looked upon as a great therapeutic instrument itself, without which the efforts of the physician could accomplish little. To review the various plans that have been adopted for buildings of this class, would occupy more time than is just now at command, but it may suffice to remark that the buildings have commonly borne very much relation to the mode of treatment employed. Hence, the older asylums have very much the character of prisons, and even in many of later date, high and gloomy walls, narrow or inaccessible windows, and other accessories, indicate the prevalence of mistaken and limited views. Many of the recent ones, however, exhibit great advances, and teach useful lessons. The buildings of Hanwell and Colney Hatch mark important epochs in the history of asylum building, adapted as they have been to such vast numbers of patients. It is to be observed that the experience of these institutions is, that no asylum should be constructed, if possible, for a greater number of patients than 400.

The battle of the styles has also been waged unremittingly by architects with reference to these buildings, and the question is as yet undetermined, whether Gothic or Italian is the most suitable. While my own predilections are in favour of the Italian, I must observe that successes have been attained and failures have occurred in the use of both styles.

It may not be amiss to notice some of the principal asylums that have been erected in this country, Ireland, as illustrating what may be best adapted to its wants and resources. The first important series was erected under the authority of a board, which, having completed the work assigned to it, was dissolved in 1835. Nine asylums, those of Armagh, Limerick, Belfast, Derry, Carlow, Maryborough, Connaught, Waterford, and Clonmel, were erected at this time, from the designs of one architect, and, as far as I have seen them, on one general plan, a centre block with four radiating arms. There was a large proportion of single rooms, and very few day rooms. The construction was generally of very substantial character, cut stone being largely used, and the cells and corridors vaulted to a great extent, the latter having also stone floors. The cost of these asylums, for buildings only, averaged £183 per patient, the English asylums erected about the same time ranging from £150 to £200. The chief defect of this plan is the limited size of the airing grounds or yards, which are also enclosed to a great extent by the building, and the general deficiency of light and air, consequent on such close concentration. Many adjuncts now deemed indispensable were not thought of at the time these were erected, such as separate infirmaries, day or dining-rooms, and chapels. When it is considered how much gloomy and mistaken notions of religion have to do with insanity, the importance of a place for religious worship and instruction must be manifest, and there is surely no reason why the sufferer from mental disease should be denied the consolations which are so precious to those who are otherwise afflicted. This defect has been remedied by the erection of chapels at different periods to some of these asylums. Day rooms also have been added. The cost of these asylums, compared with what is now considered a fair estimate, appears enormous. This is partly to be accounted for by the vaulted stone floors, and the fact that the buildings were generally but two stories in height; adopted with a view of rendering them to a great extent fire-proof, precautions which subsequent experience of similar buildings has shown to be unnecessary. It is also to be ascribed to the large proportion of single rooms.

The second series of lunatic asylums in Ireland was erected under the Board of Works between the years 1847 and 1849, and, with one other exception, by private architects selected by the board; they were as follows:—Cork, Sligo, Killarney, Kilkenny, Mullingar, Omagh and Dublin, and the Criminal Lunatic Asylum at Dundrum. The instructions issued by the board seem to have aimed at a superior class of building to any before erected in Ireland. The architects were to bear in mind that they were designing hospitals, not prisons, and the appearance of restraint to be avoided as much as possible. The Gothic style was recommended, and external plastering prohibited, one third of the sleeping accommodation to be in single rooms. A portion of the corridor was recommended to be made capable of being shut off by folding doors, to answer as a day or dining-room, and various other improvements suggested, as resulting from the experience of the English commissioners. The plan adopted by most of the architects employed on this occasion was a centre building containing the official residences and public rooms; two wings for the patients extending to right and left in one line, and two return or projecting wings at the ends; the kitchen and its offices to the rear, and also the airing grounds. The corridor plan was generally adopted for the interior, the corridors being made about 10ft. wide, with the single rooms opening off them, and a few day rooms besides. Large dining-halls and chapels were generally provided. The corridors, being used as day-rooms, were commonly placed facing the south. Average cost, £140. There is scarcely any plan in more general use than such as the above, and, subject to some qualifications, it is certainly one of the best that can be adopted. The Cork Asylum was the largest of the series, being for 500 patients; the rest were generally for about 250. The site at Cork was peculiar, the ground sloping very much from front to rear, and the architect was obliged to extend his building along in one line without return wings. It was divided, however, into three distinct blocks, connected by corridors; which mode was adopted as a precaution against fire. In consequence of the abrupt rise of the ground behind the building, there are scarcely any enclosed airing grounds; and such as there are, are greatly confined by the building in front and high ground behind. As the scenery around is of the most charming description, the site commanding a fine view of the River Lee, this is much to be deplored for the sake of those patients who cannot be allowed to make use of the general grounds.

On the completion of these asylums much dissatisfaction was expressed in various counties at the expenditure with which they were about to be charged (the money in this, and in all other cases herein referred to being advanced by Government, to be repaid in instalments by the counties without interest), and sundry other complaints having been preferred, a commission was appointed by the Government in 1855 to inquire into and report upon the subject. The commissioners in their report recommended sundry additional works to be done without charge to the counties, and remitted portions of the original charges in some cases. It would appear that several of the asylums had suffered much from the effects of driving rains on the uncoursed rubble masonry, causing damp walls and rot in the timbers, though whether the remedy recommended by the commissioners of building the walls 4in. from the face in Portland cement would have answered its purpose is not clear. The cast-iron sashes used in most cases caused great trouble, and proved scarcely capable of being rendered staunch. Two of these asylums having been originally built of cut stone and neatly finished uncoursed rubble masonry, have been recently washed over with some species of distemper, which if it improves their power of resisting wet, certainly does not improve the architectural effect. The buildings were generally in the Gothic style, and of picturesque character.

* From paper read at the Royal Institute of the Architects of Ireland, by Mr. William Fogerty, Fellow.

BRISTOL ARCHITECTURAL SOCIETY.

A VERY important meeting of the professional committee of this society was held on the 15th inst., to which all the architects in Bath and Bristol not members were also invited. The chair was taken by Mr. Hansom, one of the vice-presidents. The honorary secretary, Mr. C. J. Phipps, of Bath, read letters from the Architectural Associations of London, Liverpool, Birmingham, Newcastle, Nottingham, Manchester, and Glasgow, and from a number of architects who could not attend, but who sent their opinions in writing upon the subject for which the meeting was called, viz., "To discuss a circular issued by the General Builders' Association, addressed to the architects of Great Britain, upon the subject of building contracts." The circular was signed by the representatives of fifty-two builders' associations in England (including those of Bristol and Bath), but it was a matter of remark that none of the London builders had signed it. The gist of the circular is that the builders suggest the following alterations in contracts:—

1. To omit all indefinite clauses.
2. To make the bills of quantities a part of the contract, subject, in case of inaccuracy, to the measurement of the work during progress or at completion, with provision for arbitration.
3. Allowances for time in case of lock-outs or strikes.
4. Provision for settling all disputes during the progress of the works (hitherto in every case referred to the architect) by arbitration.

A long discussion ensued, during which a very admirable form of contract, suggested by Mr Ple-

vins, of Birmingham, with explanatory remarks, was read, it having been drawn up specially with a view of setting the matter upon a proper footing; it had been also discussed at the annual meeting of the Architectural Alliance in London, and had been sent with the agenda to every member of the profession. It was felt that in these days of cheap estimating it was absolutely necessary for the architect to have considerable power in dealing with builders, but no architect of any standing or position would use that power in an arbitrary way; if so, builders could refuse to tender under him, and it appeared unfair to urge conditions upon architects as a body which were only applicable to persons calling themselves architects with no pretensions to the honours or responsibilities of the properly qualified practitioner. Eventually resolutions were unanimously agreed upon to the following effect:—

"That a building contract being an engagement between an employer and contractor, it being open to one or the other to make special conditions to meet the special requirements which arise in nearly every case, it being also open to contractors to decline any contract where the conditions are not such as they can afford to, it is the opinion of this meeting that the conference between a committee of architects and the General Builders' Association, as suggested by the latter, would be perfectly useless, and lead to no satisfactory result.

"The system of quantities being taken out by architects for their own buildings is deprecated by the rules of the Royal Institute of British Architects, and it is considered by this meeting objectionable to make the quantities a part of the contract; but it suggests that the plan adopted in Government works, and by a large section of the profession, should be generally adopted, viz., to allow the builder whose tender is accepted sufficient time to prove the accuracy of the quantities as representing the measurement of work contained in the drawings and specifications, after which no question as to their accuracy to be raised.

"The form of arbitration suggested by clause 4 was considered objectionable in the highest degree, as opening the way for endless disputes and complications, it being generally agreed that, as heretofore, the architect during the progress of the works should be the sole referee upon all questions of payments due, quality of materials, and workmanship, in fact, the carrying into effect his designs; and that the arbitration clause should be confined to all matters arising after the completion of the contract as to any amount due to the contractor, &c., &c., according to clauses 15, 16, in Mr. Plevins's suggested contract."

WAGES MOVEMENT.

The operative house painters of Birmingham have sent a circular to their masters asking a reduction of their working hours from 59 to 54 per week, and to increase their wages 1d. per hour after the 1st of April next.

THE EIGHT HOURS MOVEMENT.—An official circular has just been issued relative to the eight hours' movement in Lancashire, Cheshire, Yorkshire, and Derbyshire. It states that the principles adopted as a fundamental basis of an association to be called "The Lancashire, Yorkshire, Cheshire, and Derbyshire Factory Workers' Short-time and Arbitration Association," are the following:—That in consequence of the increased speed of machinery, and the great addition to the number of factories, &c., a further limitation of the hours of factory labour has become indispensably necessary; that there should be an agitation for a measure to secure an eight hours' bill for factories, such time to be worked, exclusive of mill hours, for adult males and females, as well as young persons, with an equal restriction upon the moving power; and that there ought to be boards of arbitration or conciliation for the settlement of disputes between employer and employed.

LEGAL INTELLIGENCE.

COURT OF COMMON PLEAS, FEB. 16.—BUCKLAND V. THOMPSON.—This was an action by plaintiff, a land surveyor, residing at Clapham, to recover £58 16s. for commission for letting land at Nelson-row, Clapham, on building leases. Witnesses proved the practice of auctioneers and surveyors to charge the first year's ground rent for their remuneration. Verdict for the plaintiff for £45.

INJURY TO HOUSES BY RAILWAYS.—A case is given in the recent "Law Reports" which deserves more attention than it has yet received. Two judges of the Queen's Bench, Mr. Justice Mellor and Mr. Justice Lush, decided in November, 1865, that the owner of a house, none of whose lands had been taken for the purposes of the railway, cannot under the Land Clauses' Consolidation Acts of 1845 recover compensation for the depreciated value of his house, caused by working the line in the ordinary manner. It did not appear that structural injury was, or would be, caused to the house by the construction of the railway. On the other hand, it was admitted that by the running of locomotives and trains the house was, and would be, subjected to vibration, noise, and smoke, and was, and would be, always depreciated and lessened in value; but the court held that this was one of the frequent cases of *damnum absque injuria*—a loss for which there could be no remedy. This decision has now been reversed by the Exchequer Chamber. Three judges there—Mr. Baron Bramwell, Mr. Justice Keating, and Mr. Justice Smith—held that the plaintiff could recover compensation, but as Mr. Baron Channsl dissented, we have simply three puisne judges opposed in opinion to three others. The point is one of great public importance, and the railway company will probably carry the case to the House of Lords; for if compensation be allowed in such a case, where is the line to be drawn? This case also suggests some reflection as to the working of the Exchequer Chamber as a court of appeal. Under the present system, three judges in Error, forming the majority of the Exchequer Chamber, may reverse the judgment of the four judges in the court below. Hence, the law as laid down by three judges of equal rank may thus prevail over the law laid down by six. This is not satisfactory. Six judges should be the minimum number who can sit in error, and at least one of those should be a chief.

COMPENSATION CASES.

RIDGWAY V. THE ROYAL COMMISSIONERS, FEB. 13.—This was a claim for £2,000 for certain freehold houses in Lower Serle's-place, Temple Bar. The jury returned a verdict for £1,350.

The first compensation case connected with the railway under the Thames, Hedges and another v. the Waterloo and Whitehall Railway Company, was heard on Saturday last, at the Sheriff's Court, Red Lion-square. The property consists of a coach house and stables which had been let to Sir John Rennie, and attached to the house 15, Whitehall-place, now rented by the Geographical Society. The property was required as part of the station for the railway under the Thames from Great Scotland-yard to the Waterloo station. £1,400 was claimed, but the jury assessed the compensation at £1,205.

TURNER AND REEVES V. THE ROYAL COMMISSIONERS OF THE NEW LAW COURTS.—The claimants were booksellers, and this was a claim for £6,000 for leasehold premises, No. 253, Strand, and loss of business consequent on removing. The jury returned a verdict for £3,000.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the EDITOR, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—D. and Son.—W. and C.—T. L.—H. and N—A. C.—A. H. H.—J. H., jun.—W. T.—W. T. F.—M. J. L.—H. G. and Co.—W. H.—G. H. G.—E. W. G.—H. P.—J. L.—R. H. S.—J. T. H.—H. H. V.—J. B.—J. N.

A. B.—Consult our advertising columns for the names of Portland cement manufacturers. We ought not to be asked such a question.

E. T.—The National Gallery designs have been done to death. The public, in fact, are sick of them. Otherwise your long letter might have been inserted.

J. J. C.—Your article has been received.

Correspondence.

NUTFIELD HOUSE.

To the Editor of the BUILDING NEWS.

SIR,—My attention has been called to a letter in your issue of the 15th inst., from Mr. Phipson, of Norwich, in which he charges me with the serious offence of appropriating to myself the credit of a design of his. As this is a question that cannot possibly interest your readers, I will reply as briefly as possible. In 1858, Mr. Gurney requested me to submit, in competition with another architect (I believe Mr. Penning on), a scheme for remodelling and enlarging his house. My proposal having been accepted, it was mutually agreed that, although the existing house was built in the very worst taste of modern pseudo-Gothic, still there was so much that was solid about it that it was advisable to add and remodel, instead of pulling down. Your correspondent implies that I only added a few rooms, &c.; my answer to which is that I find the cost of my works came to £14,000. I can assure Mr. Phipson, in all sincerity, that, instead of being obliged to him for leaving me a type to follow, the only source of regret I experienced in the work was the obligation laid upon me to conform the new works, in some measure, to the Batty-Langley kind of type I was asked to improve upon. Mr. Phipson may rest assured, that when I become amenable to his charge, I shall make it worth my while to appropriate something that may do me credit, and that is not thirty years in arrear of our present knowledge.—I am, &c.,

JOHN NORTON.

24, Old Bond-street, W.

Intercommunication.

QUESTIONS.

[257.]—FOUNDATIONS.—Will any of your numerous readers kindly inform me how I may make good foundations for some heavy buildings on Oxford clay subsoil? The stratum of clay has a slight inclination, and exhibits a tendency to slip. A. N.

[258.]—FLOW OF GAS.—Will you inform me, through the medium of your Intercommunication, how I can calculate the flow of gas? I wish to know how much gas of specific gravity 0·42 will be discharged through a 3in. pipe two miles long per minute. TYRO.

[259.]—HEATED SPINDLES.—The spindle of my 3ft. saw band becomes greatly heated, and I have not been able to remedy the evil by any lubricator I have tried. I wish to know if any of your readers can inform me how to remedy this? I may say the spindle revolves at the sate of 850 revolutions per minute. J. G. P.

[260.]—PATENTED ORNAMENTATION.—Would the mere application of an old method of ornamentation to an article to which it has never before been applied be made the subject of a valid patent? N. H. B.

[A patent would be granted, but its validity would be exceedingly doubtful.]

[261.]—PRESSURE ON STEAM BOILERS.—Can you inform me if a cylindrical boiler of 3ft. diameter and 18ft. long has an extension attached, the inside dimensions of which are 18in. long, 6in. wide, and 1·64 high, will the pressure to the square inch of surface to this contracted appendage equal that to the square inch on the boiler? ZENO.

[The pressure will be the same, whatever the form and dimensions of the vessel, the only difficulty being to preserve the same temperature in the thin projection from the boiler as in the boiler itself. A thin film of steam at any noted pressure will exert the same force as a thicker stratum of one or more inches in depth.]

[262.]—MATERIALS FOR PAINTING.—Would you or any of your readers kindly inform me what quantities of white lead, oil, and turpentine are required to repaint 300 superficial yards of wood or iron one coat, and also what proportions of these materials are required for the second coat? M. P. N.

[263.]—ZINCING IRON.—I should esteem it a great favour if you will allow me to ask any of your readers how I can coat iron with zinc? P. W.

[264.]—FLOORING.—Will you kindly inform me what weight per square foot is usually assumed by builders for ordinary dwelling-house floors, inclusive of the weight of the materials? In some books it is given as 1½cwt. per foot super, but I think this is surely excessive for an ordinary floor of single joists. Also, perhaps, you will say what is usually allowed for office floors. X. Y. Z.

[265.]—STAINING MARBLE.—Can any of your numerous readers inform me how I can stain marble in various colours? J. M'D.

[266.]—COATING IRON PATTERNS.—I wish to coat some iron patterns with copper. Can you inform me which way I should go about it? W. CHICKEN.

[267.]—TILE MACHINERY.—Will any of your correspondents kindly inform me whether coloured tiles can be made by machinery, and if so, where such machines may be obtained? J. V.

[268.]—UNDERPINNING CEMENT.—I am making some drains under the foundation of an old building, and am desirous to know what is the most efficient cement to use for the purpose of underpinning these foundations. BUILDER.

[269.]—GIRDERS IN BUILDINGS.—Will you kindly inform me whether it is necessary to allow for contraction and expansion of warehouse girders under the following circumstances:—The girders are 60ft. in length, each built into the walls of the building at each end, and intermediately supported by two cast-iron columns, dividing the length of the girder into three equal spans. The depth of the girder is 21in., the breadth of the flange 22in., their thickness ⅝in., the web being ½in. thick, and attached to the flanges by angle-irons 3in. × 3in. × ⅜in. ARCHITECT.

[270.]—WALLS FOR FRESCOES.—The failure of modern frescoes, as illustrated by the series in Westminster Palace, seems certain, no matter in which of the various processes they are painted. The bloom which has made its appearance on Maclise's large picture of the "Meeting of Wellington and Blucher" has already spoiled many others in the same building. This bloom is doubtless caused through the walls not being of sufficient thickness to exclude the damp, at least that is its cause in most modern buildings; the ancients seldom failed on that account. I would suggest that all wall surfaces intended to be painted upon as frescoes should be insulated from the influences of the weather by being built hollow. Would any of your readers inform me, through your columns, how the mediæval men burned their lime? Did they use coal? It may be that our modern practice in this respect, as compared with the ancient, may have something to do with our failure.—E. H. HORNE, Broad-street Station.

REPLIES.

[220.]—CUTTINGS AND EMBANKMENTS.—In answer to "Surveyor" I beg to inform him that the general method of calculating the contents of cuttings and embankments is by tables constructed for that purpose from the "True Prismoidal Formula," viz., Sir J. Macneill's or Mr. Bidder's tables. The following for-

ula may be useful to him, the proofs of which are too l g for insertion :—

rue prismoidal contents in cubic yards, where $\frac{L}{27}$

cting has equal bases and unequal heights =

$$B\frac{(H + H^1)}{2} + \frac{R}{3}(H^2 + HH^1 + H^{1\,2})\}$$

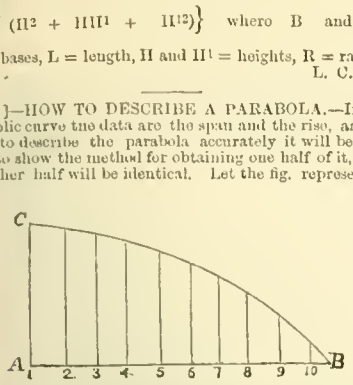
Unequal bases. Volume =

$$\frac{L}{27}\left\{\frac{(2H + H^1)\,B + B\,(2H^1 + H)}{6}\right.$$

$$\left. - \frac{R}{3}(H^2 + HH^1 + H^{12})\right\}$$ where B and B^1

= he bases, L = length, H and H^1 = heights, R = ratio of ses. L. C. E.

229.]—HOW TO DESCRIBE A PARABOLA.—In any abolic curve the data are the span and the rise, and in or to describe the parabola accurately it will be suffi- it to show the method for obtaining one half of it, since other half will be identical. Let the fig. represent an



ation of one-half a parabolic curve, in which A B is half span or chord, and A C the rise or maximum issa. Divide A B into ten parts as shown, erect perpen- ilars commencing with 1, that is with A C, and multi- its given value consecutively by the following numbers, , 1, 0·99, 0·96, 0·91, 0·84, 0·75, 0·64, 0·51, 0·36, 0·19. product will give the correct lengths of the ten perpen- ilars. As A C is multiplied by 1, of course its given ie remains unaltered. Having found the points of the ve on the perpendiculars, the curve must be evenly ruled between them by means of a French curve. DESIGNER.

230.]—STRENGTH OF ROPES.—The following is a d rule for finding the strength of ropes, as also their ght:—

$$\frac{\text{The square of the circumference in inches}}{10}$$

practical strength in tons = about half their breaking ght.

$$\frac{\text{The square of the circumference}}{4} = \text{weight}$$

lbs. per fathom. In answer to whether two ropes of same area as a large one are stronger than the large I beg to state that they are of equal strength.

L. C. E.

233.]—COLOURING PLANS.—The answers given to question of "Ignoramus" by "G. W. F." and "raughtsman," although sufficient for very small plans the best kind of parchment, will be found deficient en colouring large surfaces upon any quality of vellum parchment. The method which I invariably adopt (d which I have always found to answer remarkably ll) is, first of all, to remove all pencil marks and dirt m the surface with india-rubber, then wash over with an water in a full brush, the whole part to be coloured; ow it to remain until nearly dry, and then colour in the ual way, adding a little ox-gall in the wash. In this nner the colour runs freely and lies evenly upon the face of the vellum or parchment, and satisfactory work obtained. I must add that it is better to keep the ink les on the plan rather light, and thus prevent the ink ning, which is sure to occur if the lines are black.

A CANTAB.

233.]—If "Ignoramus" will crush and dissolve in a all bottle full of water as much alum as the water will o up, and mix his colour with that, instead of pure ter, he will find the colour run evenly and without mak- those unsightly blotches on parchment.

REDJACKET.

239.]—SPARKS AND SCINTILLATIONS FROM ON AND STEEL.—Allow me to explain to "Inqui- ive" the cause of the phenomena to which his question ers. The concussion of iron or steel with another hard bstance causes a portion to be struck off, and at the e time the compression produced generates heat suffi- nt to ignite the particles of metal, so the spark is a burn- atom of iron. That iron is very combustible is proved the common experiment of preparing it atomically in es hermetically sealed, and subsequently breaking m, when the contained metal ignites on contact with atmosphere. W. A.

239.]—This is an interesting subject, and we thank nquisitive" for introducing it. Scintillations from iron re in very early ages applied to practical use. Indeed, are indebted to sparks emitted from steel for the second liest mode of obtaining light. Horseshoes and wheels of riages frequently "strike light," as boys say, on the high d, simply from their friction against flint—another form "flint and steel." In these cases it is the friction ich detaches small particles of steel or iron at a high nperature, and these combine with, or burn, the oxygen the neighbouring atmosphere, and hence the scintilla- ns or sparks. If wrought iron be highly heated on arcoal by the oxyhydrogen blowpipe it presently boils, to speak, and little sparks fly from it. These sparks, wever, are simply ignited globules of metal which do scintillate. If, again, cast iron be heated on charcoal the same way, it also boils, and that much more rapidly an wrought iron would, and throws up little globules of ated metal. In this instance, the substance thus given is a mixture of iron and charcoal, both having a strong inity for oxygen, and which latter combines with the n and the charcoal, and the globules literally catch fire the air. If the spent sparks could be collected they uld be found to be composed of iron in every form of oxidation, and globules still containing minute undercrusts of oxide metallic iron, unburned. The sparks or scintillations fail to burn the skin if they touch it, because the law which regulates the spheroidal state of matter comes into action and prevents their doing so. If the experiment be tried of heating cast-iron on charcoal by the agency of the oxyhydrogen blowpipe the results will be fascinatingly beautiful, and they would illustrate exactly the scintillations from molten iron seen after tapping a furnace—in fact, the action is in both cases identical.

[240.]—SPONTANEOUS COMBUSTION.—With your permission I will inform "Nauticus" that the only safeguard against spontaneous combustion is watchfulness. Spontaneous combustion may arise either from conditions of stowage, or from the chemical properties of the materials stored, but as a rise of the temperature must occur before ignition the impending calamity may be detected by the frequent use of a thermometer. PHYSICUS.

[240.]—This arises from various causes, and it would require a long chemical dissertation to explain the different phenomena attending spontaneous ignition among various materials. With respect, however, to the spontaneous combustion of coals in the holds of vessels, to which "Nauticus" has more especially referred, the causes of the evil may be placed under two main heads—the composition of the coal and the degree of ventilation present. Some kinds of coal are naturally prone to heating, being, in fact, saturated with gas, and this should in all cases be determined by examination or analysis. It is chiefly fine coal which is dangerous. Steam coal, for example, does not often heat. The large and irregular lumps make large spaces through which the air freely circulates and keep the temperature low. Small coal, on the contrary, lies close, like grain or seed, and the air cannot penetrate the mass. Unfortunately it is this latter which is most wanted—mainly for smelting purposes—on the western coasts of South America, and which has constantly to be shipped for those places. The only things to prevent spontaneous combustion occurring sometimes in these cases are a careful testing of the coal before shipping, and a complete exclusion of moisture from them before and after they are put on board. No doubt artificial ventilation of the holds of vessels is an excellent preventive of spontaneous combustion, and pipes may be so arranged as to convey fresh air below deck and foul air into the chimney of the galley or caboose. If a current can thus be established—somewhat after the manner of ventilating certain coal-pits—good would inevitably result. The occasional pushing down of a test rod into a mass of coal on board ship affords a simple means of ascertaining the existence of undue heat; but, in spite of all, what are called accidents will occasionally happen. J. H.

[242.]—PUMPS.—"Sussex Farmer" will find the following rule useful to determine the power necessary to work pumps:—

Let H P represent the horse power required, G the number of gallons of water to be raised per minute, h the height of lift; then allowing 5 per cent for friction of pump the power absorbed will be

$$H\ P = \frac{G \times h}{3143}.$$

The size of pump will depend in some degree on the speed of the engine by which it is to be worked, and also will be affected by the kind of pump used. These points I shall be happy to explain if "Sussex Farmer" will give further particulars. ENGINEER.

[242.]—Your correspondent "Sussex Farmer" may calculate as follows to find the horse power requisite to raise the quantity of water he wants:—

Put G to equal the number of gallons to be raised in twenty-four hours.

H the height in feet it is to be raised; then

$$H\ P = \frac{G \times H}{4752000}.$$

In the example given G = 500 × 60 × 24 = 72000, and

$$H\ P = \frac{720000 \times 43}{4752000} = 6{\cdot}5\text{ft.},$$

This is the theoretical horse power, which must be nearly doubled to allow for friction, loss of power and other contingencies. About 12-horse power will answer perfectly well. The diameter of the pump may be thus found:—

Let G equal the number of gallons to be raised per minute, in this instance 500.

N equal number of strokes per minute, and

L the length of stroke in feet and decimals of a foot.

Making D = the diameter in inches of the pump, we have

$$D = \sqrt{\frac{G}{0{\cdot}03403 \times L \times N}}.$$

The value of D must be increased about 30 per cent to allow for leakage. There are so many varieties of valves in use that it would be impossible to single out any particular one as the best. "Sussex Farmer" had better apply to a good maker. AGRICULTURER.

[243.]—SIZE OF BRICKS.—I beg to inform "Architect" that I have erected some buildings in the neighbourhood of Scarborough in which the bricks were (including joints) 9 in. long, the other dimensions being the same as usual.

BUILDER.

[244.]—TUNNELS.—"Young Engineer" should make his tunnel oval in form. The thickness of the brickwork can only be determined on inspection of the soil; probably if the rock is decomposing he will have to use six rings of brickwork. CONTRACTOR.

[244.]—Allow me to inform "Young Engineer" that the form of his tunnel should be obtained by using four centers, one for the soffit, two for the side walls, and one for the invert. Five half brick rings will do for the thickness of the arch, although it would be going on the safe side to make it six. TUNNEL.

[245.]—HARBOUR SURVEYS.—"A Beginner in surveying harbours, &c., must fix range rods on the coast in pairs, so that he may determine his position when taking a sounding by angles taken between the said posts with a box sextant. MARINER.

[245.]—With your permission I can give "A Beginner" the information he desires. All observations in maritime surveying intended to be laid down upon a chart are made with reference to points previously ascertained on shore, and determined in position with great accuracy. It is easy to perceive that when these points have been fixed the relative positions of all prominent objects, such as lighthouses, large rocks &c., can be ascertained by triangulation. Similarly, these other data being determined, a series of small surveys can be based upon them by taking observations and soundings, and the whole united into one survey and plotted in a chart. Tide gauges, the level of which is accurately taken by a spirit level are set up at intervals as data from which to make the soundings. "A Beginner" should read "Williams's Practical Geodesy," where he will find a full account of the whole subject.

MARINE SURVEYOR.

[246.]—ANTI-FRICTION PISTONS.—Will you allow me to inform "A Workman" that Mr. Molyneux's pistons have no springs behind the packing rings, but, in place of the springs, steam pressure is used, so that when the steam is shut off the rings contract, thus avoiding unnecessary friction between the piston and cylinder. GUARD.

[249.]—ARCHITECTS' ASSISTANTS.—There is a place in London where architects' assistants can hear of engagements, viz., the Architectural Association, 9, Conduit-street, W. "The register of the association is kept up as a confidential medium of communication between architects and assistants requiring engagements. Particulars may be had upon application to the registrar. During the past session this register has been found to be of greatly increasing use to both parties." Vide Syllabus, session 1866-7. I do not know whether this register can be usen by anyone beside members of the association, but information on the point can be obtained from J. Douglass Mathews, hon. secretary, 10, Cloak-lane, City, C.E. The subscription to the association is only 10s. 6d per annum, and if "Provincial Assistant" intends to come up to town I should advise him to get a syllabus and think seriously about joining, for, besides the advantage of the register, when he visits town he will have the benefit of the library, lectures, sketch class, &c., *ad lib.* If he wishes to join I shall be most willing to propose or second him if he knows no other member.—J. W. ALEXANDER, 6, Duke-street, Adelphi.

[250.]—TILING FOR GARDEN BEDS.—In reply to your inquirer of last week's paper in reference to garden edging tiles, I can inform him that edging of good and various designs may be procured of almost any wholesale dealer in materials for building, or from the manufacturers, of whom I may mention Mr. Thomas Peake, Tunstall, Staffordshire. The price varies from 8d. to 4d. or 5d. per yard, according to quality and design, and whether buff coloured or blue; the latter for out-door work is far preferable, the buff invariably turning green. For a small quantity only the cost would be rather more. C. B.

Suggestions.

VARNISH FOR PATTERNS, &c.

A very good black varnish for patterns for castings is made by dissolving rough shellac in methylated spirits of wine, and colouring with vegetable black. This varnish is waterproof, and lasts well. For other purposes, such as varnishing plans (not intended to be rolled up) white shellac dissolved in pure spirit will be found convenient. J. V.

CEMENT FOR GLASS, &c.

The most enduring cement for glass, porcelain, &c., may be thus prepared—Wash soft cheese with boiling water until the water comes away colourless, then a waxy substance, in soluble in water, will remain; this should be carefully dried and powdered, and then mixed with its own bulk of quick lime, and put in an air-tight bottle. When required for use moisten with water and apply immediately; this cement set s in about fifteen minutes, and resists the action of heat and wet. F. V.

BRONZING METAL.

Metal may be bronzed as follows:—Two parts verdigris, one part sal ammoniac are dissolved in vinegar; the solution is to be boiled, skimmed, and diluted with water till it has only a weak metallic taste, and upon further dilution lets fall no white precipitate. The solution is now boiled and applied hot to the articles to be bronzed, which have been previously made perfectly clean. L. G.

BROWNING IRON AND STEEL.

To brown gun barrels and other similar articles the following course may conveniently be followed:—Dissolve two parts of crystallised chloride of iron, two parts chloride of antimony, and one part gallic acid in about four parts of water; with this solution moisten a cloth or sponge and rub the object to be browned. S. P.

WATER-TIGHT WALLS.

In order to render brick walls water-tight so as to resist the action of storms, they should be externally coated with a cement composed of hydraulic cement and boiled linseed oil mixed to the consistency of paint and laid on with a brush. PLASTERER.

Mr. William Peters, of Wouldham, near Kent, died at the age of 74, on the 24th ult. He was known as the Medway grey stone lime burner, and the father of that trade, he having in the year 1820 burnt the first flare kiln on the Medway. His extensive works have passed into the hands of his sons, who will carry on the business at Wouldham and Burnham, as heretofore.

Building Intelligence.

CHURCHES AND CHAPELS.

A new place of worship for the Chinese, which is generally known amongst Europeans as the "Joss House," has lately been opened in Melbourne, Australia. The building, which cost about £4,000, is partly in the European and Chinese styles of architecture. It consists of a centre hall and two wings, the central hall being the main place of worship, the door of which opens directly into the sanctum of their peculiarities. A few feet from the door are two pillars, with doors so attached as to be capable of making a partition or not as may be desired. There are pillars ranging right across the hall, and dividing it into three parts, the centre being devoted to the priests, the outside to the worshippers.

BUILDING AND ENLARGING OF CHURCHES AND CHAPELS.—The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels, held its usual monthly meeting at the society's house, No. 7, Whitehall, S.W., on Tuesday last, his Grace the Archbishop of Canterbury in the chair. Grants of money amounting to £1,020 were made in aid of the following objects, viz.:—Building new churches: At Babbicombe, in the parish of St. Mary Church, near Torquay; St. Silas, Bristol; Caldecott, in the parish of Northill, near Biggleswade; Cornforth, in the parish of Middleham, near Ferry-hill; and Firtree, in the parish of Wittou-le-Wear, near Darlington, Durham; and Headly, in the parish of Kingsclere, near Newbury, Berkshire. Rebuilding the churches at East Aclam, near York; and Edern, near Pwllhili, Carnarvon. Enlarging or otherwise increasing the accommodation in the churches at Batheaston, near Bath; St Mary-at-Arches, Exeter; Christchurch, Herne Bay, Kent; Legbourne, near Louth; Llandyfaelog, near Kidwelly, Carmarthen; Llys-y vran, near Haverford-west; St. Sennen, near Penzance; and Stottesden, near Bewdly. The additional sittings (3,739) to be provided in the above-named churches, excepting 244, are all to be free and unappropriated. The society also accepted the trust of a sum of money as a repair fund for St. John's Church, Potters Bar, near Barnet. Urgent as the above cases were, the board could only aid them according to the present limited scale of grants. The following resolution was also unanimously agreed to and acted on:—"That, considering that the jubilee of the institution of the society will occur in 1868, it is expedient that measures be taken in the present session to prepare for its celebration; and that, with this view, a sub-committee be appointed to consider and report to the board their opinion in what way its success as an opportunity of collecting further funds to enable the society to carry on its important work may be best promoted.

HANLEY.—On Thursday week last St. Mark's Church was re-opened after being closed for eight months. A new chancel 35ft. long by 29ft. wide, semi-decagon in form, has been erected at an expense of £1,600, and other alterations have cost £1,500. Messrs. Scrivener and Sons were the architects, and Mr. Steele the builder.

TAUNTON.—The West of England and South Wales Bank, which is being erected by Messrs. Wood, architects, of Park-street, Bristol, is now nearly completed. The building is of the Italian style of architecture. The wood and stone carving has been executed by Mr. E. White, of Bristol. The cost of the building will be about £3,000.

TUNBRIDGE WELLS.—A new church is to be erected in this town. The design will be furnished by Messrs. Wimble and Taylor, of 2, Wallbrook, City, and is to be carried out by Mr. Anscomb, Maidstone, at a cost of £3,886.

BUILDINGS.

BRADFORD.—A new building, to be called the Victoria Hotel, is now in course of erection in this town, and will be opened on the 13th March next. It is 170ft. long and five stories in height, and is treated with projecting pavilions at each end, surmounted by lofty roofs and iron cresting. The hotel contain 95 bedrooms, and will cost about £120,000, and a further sum of £10,000 will be required to furnish it. Messrs. Lockwood and Mawson are the architects.

DORKING.—MODEL DWELLINGS.—With his usual consideration for the welfare of his poorer neighbours, G. Cubitt Esq., M.P., is building a range of model dwellings on his estate in the town of Dorking, similar to the Peabody buildings at Islington and elsewhere. The first block is nearly completed and contains twenty tenements of various sizes, suitable for smaller or larger families, or single men. Each tenement is well ventilated, and has a good cellar and plot of garden ground, use of laundries and drying floor, wringing machines, men's and women's baths, lavatories, &c. H.A. Darhishire, Esq., of London, is the architect. Mr. Pearson is clerk of the works, the whole of which have been executed in a very tradesmanlike and substantial manner by Messrs. Patman and Fotheringham, of Theobald's-road, London. Mr. Rowland is their foreman of the works. It is the intention to erect a similar block facing the main street, having shops on the ground floor, and also large rooms for library, reading rooms, &c., above.

EVERTON (NEAR LIVERPOOL)—On Friday last a new church was opened in this place by the Bishop of Chester. The church is magnificently fitted up, and is thoroughly complete in every respect. The entire cost, £14,000, has been borne by Mr. T. D. Anderson.

MAIDSTONE.—On Wednesday week last new schools were opened here. There will be accommodation for upwards of 200 students; Mr. E. W. Stephens was the architect, and Messrs. Wallis and Clements the builders.

General Items.

Two of the four lions which were ordered some time since to complete the façade of the Leeds Townhall, were uncovered on Friday last. They are 5ft. 6in. in height, and 11ft. in length, and are of Portland stone. Mr. Brodrick was the architect, and Mr. W. Day Keyworth, jun., the sculptor.

General Morin has just submitted to the French Academy an ingenious electric anemometer, which shows with great accuracy the state of ventilation in hospital wards, theatres, &c.

A tablet noting the place where Byron was born, has just been attached to the house, No. 24, Holles-street, Cavendish square, by permission of the occupiers, Messrs. Boosey and Co. The tablet is of terra cotta with a deep blue face, the inscription upon it being in white letters.

The Dutch Government is said to have declared its readiness to give every facility to the three engineers appointed by England, France, and Prussia, to carry on separately their investigation with reference to the question of the barring of the Scheldt.

On Tuesday week last, at Montmirail, in the Marne, a monument was inaugurated to perpetuate the memory of the combat headed by Napoleon on February 11, 1814. It consists of a Corinthian column, on the top of which is a large eagle with outspread wings, and the names of the victories won by the French in the campaign of February, 1814, Champaubert, Montmirail, Chateau, Thierry, and Vauxchamp, inscribed upon the pedestal. M. Morsaline, was the architect.

On Saturday evening last, the members of the London Association of Foremen Engineers enjoyed their annual dinner, and this time at the Freemasons Tavern, under the presidency of Mr. E. J. Reed, Chief Constructor of the Navy. Upwards of 200 gentlemen did justice to the good things provided them. It is most satisfactory to say that; though engineering is under a cloud in the metropolis, if not in a state of decay, this association makes progress. One gentleman, who responded to the toast of the press, began his speech by saying that he was "glad to see that the members of the association were increasing, its funds enlarging, its dinners getting more sumptuous, and its spirit growing more enthusiastic."

The Liverpool Town Council have resolved to petition both Houses of Parliament to suspend the standing orders with regard to the bill for authorising the construction of street railways in different parts of the town, so that the bill may be considered on its merits. A similar course has also been followed by the Liverpool Chamber of Commerce; and still further, as an evidence of the favour in which the project is held, petitions, each signed by upwards of 23,000 of the inhabitants of Liverpool, have also been forwarded to both Houses of Parliament. So extensive and so favourable a testimony has seldom been accorded to any public improvement, and it cannot fail to have due weight with the Legislature.

Mr. W. F. Cross, of Exeter, an architect who was rising in his profession, died at the early age of 30 years last week. From his designs, and under his superintendence, the handsome Queen-street Chambers, belonging to Mr. Gard, were erected; Scotland house on Fore-street-hill, was built from his plans; and of the extensive Asylum at Wonford he was the architect. These edifices, and several others in course of construction, were under his personal supervision until within ten days before his decease. Mr. Cross was formerly second master of the Exeter School of Art, and was a pupil of the late David Mackintosh, Esq., of that city. He was very highly respected by an extensive circle of friends and acquaintances, and his untimely removal is much deplored.

The Royal Commissioners on Trades' Unions are directed to inquire and report on the organisation and rules of trades' unions and other associations, whether of workmen or employers, and to inquire into and report on the effect produced by such trades' unions' and associations on the workmen and employers respectively, and on the relation between workmen and employers, and on the trade and industry of the country, with power to investigate any recent acts of intimidation, outrage, or wrong alleged to have been promoted, encouraged, or connived at by such trades' unions or other associations, and also to suggest any improvements to be made in the law with respect to the matters aforesaid, or with respect to the relation between workmen and their employers, for the mutual benefit of both.

A contract has been entered into by the Paris Church Committee with Messrs. Cox and Son, of Nos. 28 and 29, Southampton-street, Strand, London, to supply on hire for the English Church service, an iron church to hold 500 persons, to be erected close to the Exhibition building. The nave of the church will be seated with chairs, but we understand it is the intention of this firm to fit up the chancel very handsomely with carved oak pulpit, desk, table, stalls, and brass altar rails, illuminated reredos, and other appropriate fittings, so as to show our foreign friends how an English church should be fitted, many of our Continental churches being anything but first-rate specimens of the ecclesiastical art of this country.

On the question of fire-damp we have received the following from an esteemed correspondent:—In the mines of the giant mountains which divide Bohemia from Silesia, the miners were and are still superstitious, They believe that two lots of gnomes extensively occupy the workings underground—one, a joyous, brisk, and merry race, were more inclined, in their intercourse with the mortals of upper earth, to play pranks with and teaze them rather than to do them any harm; the other, spiteful, malevolent, and melancholy. When, therefore, any sudden lucky find of a rich lode of mineral took place, it was ascribed to the beneficent or white elves; any misfortune or disaster was put down to the envy or malevolence of the cruel or black spirit, and thus when in 1621 twelve miners were killed by fire-damp in a Silesian mine not far from the hot wells of Warontrubne, the fact is very seriously accounted for in a respectable typographical description of the neighbourhood, that the fire-king had breathed upon them and thus brought about the catastrophe.—W. H. P. D.

Mr. Bazalgette, engineer of the Metropolitan Board of Works, has just made a report to the Tunbridge Wells Local Board, in which he states that after an examination of the northern and southern valleys he concurs in the views expressed by Mr. Lawson, engineer to the board, that the lands in the southern valley are best suited for irrigation with sewage. He suggests that, before designing works for such distribution of sewage, it would of course be prudent to treat for suitable lands for its reception. The lands which are available and can be irrigated by gravitation are known to the board, and whether they should purchase and lease such lands and farm themselves, or sub-let them, or lease the sewage to any of the present occupiers after conveying it to them, could be best determined by the board upon negociations instituted by some land surveyor on their behalf. In selecting the position of such lands, it might be roughly estimated that the cost of conveying the sewage to a distance in a covered channel would possibly be at a rate of about £5,000 per mile. Mr. Bazalgette agrees with Mr. Lawson that about 200 acres will be required, and says that when available lands have been selected, the plans and estimates of the cost of conveying the sewage thither can be more definitely determined.

A conference of gentlemen representing various Chambers of Commerce throughout the United Kingdom, and some of the Consular authorities in London, took place on Tuesday evening at the Society of Arts, as to the advisability of establishing in this country uniformity of measures, weight and coins. Sir J. Bowring, who presided, declared that the question had assumed so much public importance, and the value of the metric system had become so generally acknowledged, that the time had arrived when the representatives of the various countries interested should confer together for the purpose of having the system universally adopted. After an interesting discussion, resolutions were passed testifying to the great value of the metric system, and adopting measures calculated to have it generally established in the United Kingdom.

MEETINGS FOR THE WEEK.

MON.—Royal United Service Institution.—"On Manning the Navy," by Mr. J. Reddie, 8.30.

TUES.—Royal Institution.—"On Vibratory Motion with Special Reference to Sound," by Professor Tyndall, 3.

THURS.—Royal Institution.—"On Vibratory Motion with Special Reference to Sound," by Professor Tyndall, 3.

FRI.—Royal Institution.—"Breech-loading Small-arms," by Capt. Magendie, 8.
Architectural Association.—Members Soirée, 8.

SAT.—Royal Institution.—"On Harmony," by Mr. G. A. Macfarren, 3.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

1846 A. PRINCE. *Improvements in the means of preserving timber from decay.* (A communication.) Dated July 1, 1866.

The patentee claims the application of crude petroleum either alone or mixed with mineral paint or pigments, for the purpose of preserving wood or timber of any kind from decomposition or decay, and from the attacks of insects. *Patent completed.*

1859 L. MIGNOT. *Improvements in the preparation of soluble alkaline silicates to render them suitable for being used for preserving stone, wood, and other materials, and for manufacturing artificial stone, and for other purposes.* Dated July 16, 1866.

In preparing soluble alkaline silicates according to this invention the inventor combines them with mucilaginous matters. The liquid alkaline silicate is concentrated to about 30 deg. or 35 deg. Beaumé, and is mixed with the mucilaginous liquid in various proportions, according to the purpose for which the prepared silicate is to be employed. The matters capable of rendering the silicates mucilaginous are very numerous, and, according to the purpose for which the prepared silicate is to be employed, so may different substances be employed. Soluble silicates thus prepared become unctuous, they dry much more rapidly, and when dry their surface does not crack or scale off. They can also readily be spread by any material with which it may be desirous to apply them. *Patent abandoned.*

1865 W. B. SHORLAND. *Improvements in or applicable to handles for actuating locks, bars, bolts, or latches.* Dated July 17, 1866.

This invention relates to a mode of securing handles to the shaft or spindle connected with the lock, bar, bolt, or latch, and so that such handles may be adjusted on the shaft to suit different thicknesses of doors or gates, and consists in making the shafts square, and screwing one or both ends with a screw thread, the screw thread taking off the corners of the square shaft, but leaving sufficiently flat sides to the square hole in the handle to take hold of, and by fitting a screw nut to one or both handles, so that when the handles are placed upon the shaft the screw nuts may be rotated in or upon the handles. This is done by making a recess in the handle for the screw nut, or in making the screw nut to grasp a dovetail part upon the handle upon which it can turn. The screw nut is prevented from rotating when the handle is adjusted by a set screw, or by a key placed in a groove formed in the square shaft which enters a notch in the screw nut. *Patent abandoned.*

1866 W. F. GEDGE. *An improved gas burner.* (A communication.) Dated July 17, 1866.

This invention consists in a novel construction of gas burner, by which the illuminating power of the gas is greatly increased and its consumption more economically regulated than by ordinary burners. The gas is conducted by an ordinary burner to a closed tube or chamber of a larger size, from which it passes through a second burner of superior capacity, placed above the said chamber. The size of the apertures of these two burners will be regulated by the quality of the gas, but the lower or inlet apertures should always be smaller than the upper or burning aperture. To diminish the length of the flame, which is extraordinary, and in some cases inconvenient, the gas is conducted through a layer of asbestos, cotton, filmes, or other suitable materials, which will check the pressure of the gas. Under this arrangement the supply of gas is not greater than required for complete combustion, and the gas is mixed with neither more nor less air than is requisite to produce the greatest illuminating power. *Patent abandoned.*

1893 W. S. DAVIS. *The improvement in the construction of roller for window blinds, maps, and almanacs.* Dated July 21, 1866.

This invention consists of a roller divided into two longitudinal sections, extending the whole length thereof, each section having a rabbit groove throughout the whole length made on the inner or flat surface, and on one edge. The sections, constructed as before mentioned, are connected together at their extreme ends, at one end by means of the cord wheel, and at the other end by means of a ring or ferrule, or a plain wheel, or by any other convenient manner; it will then form a roller through it and a plough groove on the top the whole length of the roller. The blind having a hem at the top is passed through the slit in the roller, and is supported in the ploughed groove by passing a rod, slip, or tongue through the hem of the blind; by pulling the blind at the bottom the rod, slip, or tongue will fit into the ploughed groove on the top of the roller. *Patent abandoned.*

Trade News.

TENDERS.

ACTON.—For public-house, at Acton, for Mr. J. J. Sterne. Mr. M. C. W. Horne, architect. Quantities supplied by Mr. Sidney Young:—

G. Butt	£1,725
Langmead and Way	1,697
C. O. Robson	1,697
R. Mann	1,645
R. Salter	1,550
B. E. Nightingale	1,533
J. Eborall	1,486

BROMPTON-ROAD.—For constructing brick sewer in Old Brompton-road, for the Kensington Vestry. Mr. J. Broadbridge, surveyor:—

Williams	£2,380 0
Goodair	2,302 0
Thirsk	2,219 0
Whittick	2,096 0
Wigmore (accepted)	1,998 10
Moxon and Mutton	1,950 0

EDINBURGH.—For the erection of the new poorhouse, at Craiglockhart:—

R. Hutchison, Edinburgh, mason work, drainage, and excavation	£19,000 1 8
R. Hutchison, Edinburgh, brickwork	1,100 1 4
J. Dickson, Leith, joiner work	7,892 8 6
W. M'Calman, Edinburgh, plumber work	2 110 9 10
Miller, M'Neuy, and Co., Lothian-road, plaster work	1,125 17 10
W. Anderson, Edinburgh, slater work	1,280 3 10
A. Cunningham, jun., Edinburgh, glazier work	290 6 8
J. Young and Co., Edinburgh, ironwork	490 14 0
Kemp, Murray, and Nicolson, lathing	484 0 0
	£34,077 10 0

FAIRFIELD (KENT).—For house for Captain Fearon. Mr. John Newton, architect:—

Field	£5,220
Keeble	4,500
Bracher and Son	4,492
Piper	4,485
Wilson	4,272
Dove	4,255
Till	3,718

LONDON.—For works at Cambridge House, Ladbrooke Grove, Kensington Park, for Mr. J. T. Thomas. Mr. C. E. Davis, F.S.A., architect:—

M. Jenkins	£1,082
Piper and Wheeler	1,063
B. Colley	1,044
W. Richards	999
W. Johnson	898
G. Butt	868
B. F. Nightingale	815
G. A. Neale	783
J. Eborall (accepted)	748
Norton Brothers	598

LONDON.—For alterations, &c., to the Crown and Shears public-house, Minories. Messrs. Humphrey and Son, architects:—

Stephens	£975
Sparks	739
Scrivener and White	738
D. King and Sons	688
Ennor	613

LONDON.—For five villas, at Hornsey, for Mr. T. Mawes. Messrs. Bacon and Bell, architects. Quantities by Mr. J. Gaudy:—

J. Emery and Co.	£7,601 7 6
Carter and Sons	7,325 0 0
Killby	7,280 0 0
E. J. Francis	7,143 0 0
Anley	6,961 0 0
J. B. Borter, jun.	6,265 0 0
Spearing and Condys	4,500 0 0

POPLAR.—For warehouse, Brunswick-road, Poplar, for Mr. Cole. Mr. W. R. Kinniple, architect:—

Heiser	£1,776
Finch	1,550
Killby	1,430
Curtis	1,425
Harris	1,415
Watts	1,301
Tanner	1,279
Sheffield	1,239
J. Sheffield	1,229
Golding	1,150

SOUTHAMPTON.—For erecting new relief offices and dispensary for Southampton Incorporation. Mr. T. A. Skelton, architect. Quantities supplied by Mr. H. Pether, Trigon-road, Kennington, London:—

		Allowed for old buildings to be taken down.	Nett.
Stevens	£1,298	£76	£1,222
Sanders	—	—	1,198
Conway	1,230	90	1,140
Martin	1,250	150	1,100
Adams	1,178	150	1,028
Gambling	1,128	130	998
Phillips	1,090	120	970
Bull & Sons (accepted)	1,115	236	879

WIMBLEDON.—For two houses. Mr. H. W. Broadbridge, architect:—

Surridge	£987
Sawyer	983
Kemp	919
Wilkinson and Co.	899
Collirer	820

TYNEMOUTH.—For new congregational church, exclusive of foundations. Mr Thomas Oliver, F.I.B.A., architect, Newcastle. Quantities supplied by the architect:—

Henderson, Newcastle	£4,470
Scott, Newcastle	4,393
Welton, Newcastle	4,345
Elliott, North Shields	4,137
Jackson, Newcastle	3,900
Robinson, Tynemouth (accepted)	3,880
*Hardwick, Newcastle	3,769

* Tender incomplete.

ST. GEORGE'S-IN-THE-EAST.—For the erection of St. John's national schools, St. George's-in-the-East. Messrs. F. and H. Francis, architects. Quantities by Mr. Robson:—

Myers	£2,736
Colls and Son	2,700
Rivett	2,693
Fish	2,675
Keys and Head	2,655
Hill and Sons	2,640
King and Sons	2,440

WALTON-ON-THAMES.—For building three villas for the Walton-on-Thames Villa Company. Mr. R. Kinnipple, architect. Quantities supplied:—

Curtiss	£4,785
Herratage	4,427
Stevenson	4,206
W. W. Johnson	4,400
G. A. Neale	4,030
Warne and Company	3,875
B. E. Nightingale	3,670
W. Harriss	3,589
W. M. Hunt	3,364

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Thomas Allen, Great Smith street, builder, March 6, at 11—Sydney Dyne, Norwood, carpenter, Feb. 27, at 1—C. Flaxman, Ebury street, carpenter, Feb. 21, at 1—George Hampton Johnson, Richmond, Surrey, plumber, Feb. 28, at 12—W. and E. Trayt, St. Paul's road, Highbury, carpenter, Feb. 28—G. Payne, Bromley, journeyman carpenter, March 13, at 1—John Roberts, Gloucester street, Camden town, builder, March 6, at 1—James Williams, Andover road, Hornsey, builder, March 4, at 12.

TO SURRENDER IN THE COUNTRY.

John Barnes, Bromfield, Cumberland, stonemason—John Bell, Penrith, plumber—B. Duerden, Great and Little Marsden, mason—Thomas Flamson, Nottingham, builder Richard Phillips, Linkinhorne, Cornwall, carpenter J. Taylor, Wasbro Dale, near Barnsley, builder—Joseph Pugh, Tipton, plumber—William Taylor, Tamworth, carpenter.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9 0	£10 10		Archangel, yellow ..	£12 0	£13 0	
Quebec, red pine	3 5	4 15		St. Petersburg, yel..	10 10	11 10	
,, yellow pine..	2 15	3 10		Finland	8 0	9 10	
St. John N.B. yellow	0 0	0 0		Memel	0 0	0 0	
Quebec Oak, white ..	6 10	6 0		Gothenburg, yellow	9 0	10 10	
,, birch	3 10	4 10		,, white	8 0	8 10	
,, elm	3 10	6 0		Gefle, yellow	9 0	11 0	
Dantzic oak	3 10	6 0		Soderhamn	9 0	10 10	
,, fir	2 0	3 10		Christiania, per C., 12 ft. by 3 by 9 in.			
Memel fir	3 0	3 10		yellow	18 0	22 0	
Riga	3 0	3 5		Deck Plank, Dantzic, per 40 ft. 3 in.	0 14	1 4	
Swedish	1 18	2 3		PUMICE STONE pr ton	6 0	8 0	
Masts, Quebec red pine	6 0	8 0		OILS, &c.			
,, yellow pine..	5 0	6 0		Seal, pale.... per tun	46 0	48 0	
Lathwood, Dantzic, fm	4 10	5 10		Sperm body	140 0	120 0	
,, St. Petersburg	6 10	7 10		Cod	42 0	0 0	
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.				Whale, Sth. Sea, pale	45 0	0 0	
Quebec, white spruce	13 10	21 10		Olive, Gallipoli.....	63 0	64 0	
St. John, white spruce	13 0	15 0		Cocoanut, Cochin, ton	58 0	0 0	
Yellow pine, per reduced C.				Palm, fine	40 10	41 0	
Canada, 1st quality.	17 0	19 10		Linseed	35 10	39 0	
2nd do.....	12 0	14 0		Rapeseed, Eng. pale..	39 0	53 0	
				Cottonseed.....	30 0	32 1	

METALS.

IRON:—							
Welsh Bars in London .. ..per ton	6 15 0	0 0 0	3
Nail Rod	7 10 0	8 0 0	2½
Hoops ..... do	8 17 6	9 0 0	
Sheets, Single ..... do	9 17 6	10 0 0	
Staffordshire Bars . ..... do	7 17 6	8 10 0	
Bars, in Wales ..... do	5 15 0	6 0 0	3½
Rails ..... do	6 0 0	0 0 0	nett
Foundry Pigs, at Glasg. No 1 .. do	2 15 6	3 7 0	
Swedish Bars ..... do	10 10 0	12 10 0	2½
STEEL:—			
Swedish Keg, hammered .....per ton	15 15 0	16 0 0	
Swedish Faggot ..... do	10 10 0.	12 10 0	
COPPER:—			
Sheet & Sheathing, & Bolts ....per ton	86 0 0	91 0 0	3
Hammered Bottoms ..... do	96 0 0	101 0 0	
Flat Bottoms, not Hammered .. do	91 0 0	96 0 0	
Cake and Tough Ingot ..... do	76 0 0	0 0 0	
Best Selected ..... do	84 0 0	89 0 0	
Fine Foreign ..... do	86 0 0	88 0 0	
Yel. Metal Sheathing & Rods ....per lb	0 0 7½	0 0 8	
LEAD:—			
Pig, English .....per ton	22 5 0	22 10 0	2½
,, Spanish Soft ..... do	19 15 0	0 0	
Shot, Patent ..... do	23 10 0	24 0	
Sheet ..... do	21 0 0	0 0 0	
White ..... do	30 0 0	31 10 0	

choly sign of the ignorance of modern architects than when men who have done so much for us and for architecture as Mr. Ruskin has done should be so misunderstood and read in such a slight way as he has been. Had Mr. Ruskin thought that his work on behalf of modern architects would ever have resulted in such grievous parodies of Gothic architecture as those which Mr. Lockwood, Mr. Deane, and others indulge in, it would, we believe, have saddened him more than the corrupt state of things he found and has ever sought to correct. We shall not attempt to go into the detail of any of Mr. Lockwood's elevations or perspectives. We have tried hard to find some one feature or other which we could honestly praise, but we have failed to do so. Spotty, and frizzy, and thorny to a degree, with nothing to commend them to anyone except to ladies, their only value is to point out to young architects the gross error which they may be led into by reading authors they do not understand and by taking meat which is too strong for them.

We have said that the design of which we are writing has a large amount of popular favour. Some of this is no doubt due; but much of it is also due to the meretricious ornament and the unconstructional application of Gothic forms; for by a pretty free use of cusped circles, spires, pointed arches, and crocketted pediments, not neglecting party coloured voussoirs, the unprofessional public, and ladies especially, who of course know nothing about the real nature of Gothic, its construction, or its detail, may easily be taken in.

A PHILOSOPHICAL VIEW OF ART.

No. 2.—Conceptions of Art.

HAVING preliminarily considered the possibility of rationally explaining the means and method by which the development of art can be brought within the sphere of general laws, we will, in the present article, devote our attention to the investigation of the historical view of our subject. It is from the light thrown upon our view by the past history of art, and its conformity to the principles of our inquiry, that we can fairly conclude it to be a rational one. It has been shown that influences, physical and intellectual, have considerably predisposed and modified the ideas of mankind, but that those ideas have partaken of a regular order of growth. In our last article we indicated this order; and we can now pass in review those well-marked phases in the history of art which have reflected those ideas. For our present purpose we will arrange them as the developments of the—

1. The Corporeal or anthropomorphic idea;
2. The Religious idea;
3. The Positive or Secular idea;

and these three ideas I think visibly underlie more or less distinctly every period or standard of taste. Art has at different epochs become the exponent of one or other of these ideas—at one period it was the expression of the material idea, at another of the religious sentiment, and, lastly, of the secular or industrial idea. A materiality of idea pervaded all primitive nations partaking more or less of the anthropomorphic character. Thus, the Egyptians and the Assyrians, though they first deified nature, soon introduced human and symbolical representations, these soon becoming the objects of worship. The ancient Persians were nature-worshippers, but did not employ representations; while the Greek mythology became entirely anthropomorphic, the human form becoming deified, and a distinguishing character being given to each deity. The Greeks, indeed, in adopting the human ideal carried the idea and its material embodiment to the highest degree that has been reached; and the intellect may be said to have arrived at that transitional point when a philosophical separation of the two became inevitable.

I have preferred to treat the subject under this general succession of ideas, because it is a law which pervades every stage of civilisation; for, however much external conditions and great social changes have modified the course of history, they have all been subject to an internal law of growth—in other words, the ideas and sentiments of humanity. With a few illustrious exceptions, among which the works of Guizot, Buckle, and Lecky are conspicuous, history has been treated too often as mere records of facts. Of course, history cannot be separated from facts; but, as Guizot, in his "History of Civilisation," points out, there are moral facts none the less real because they do not appear on the surface. Such are religious creeds, the arts and sciences; and he thus shows that civilisation is the product of two facts closely related—viz., the development of society, and the development of humanity; and he proves from history and from the convictions of mankind that these elements are so closely connected that they reciprocally produce one another, though sometimes centuries may interpose between them. And not only does Guizot prove this fact, but he indicates another and more important one, that the social condition is the means and not the end; that the amelioration of the social life is the *mobile* of the development of the individual, his faculties and sentiments. These two leading features of civilisation may then be studied apart.

One fundamental fact that must not be lost sight of strikes one in glancing at the earliest civilisations—namely, their unity. A dominant idea characterised all of them, and this was stamped upon their art; whereas, in later phases of civilisation—those of the European nations for example—various powers, principles, and ideas rise, increase, mingle, and influence each other. A primeval civilisation, like the instinctive faculty of childhood, could only conceive simple ideas, and these were readily converted into tangible forms. As I have before observed, there was a confusion of the material with the immaterial; but this confusion became a settled notion, and a simple faith sprang out of it. In this manner the fetiche became the representative of a particular phenomenon; and a symbol, or the human form, embodied the conception, as it did in Greece. The rapid development of the earliest nations must be ascribed to the instinctive faculty of mankind. But this reign of simplicity of imagination, though highly favourable to art, gradually yielded under the dominion of reason. A diversity of elements takes the place of a dominant idea, and the material and immaterial, instead of becoming fused, are continually in conflict. The consequence of this is a confusion and want of unity in modern ideas, which as Schlegel* says, exercises a powerful influence on modern works of art and genius. There is now a continuous struggle between nature and mankind—the reason and the imagination—in place of that blending of the two that prevailed among primitive nations. Our materials more numerous and diversified, the more difficult it becomes to reduce them to a simple form. This early simplicity, or, more strictly, this assimilation or personification of ideas, is strikingly discoverable in the civilisations of Egypt, Assyria, India, and other primitive nations, wherever the theocratic principle prevailed. In different countries it assumed different social aspects; sometimes the domination of a single caste; elsewhere, as along the coasts of Asia Minor, a democratic complexion.

Having indicated the outline of our view, and noted its principal features, let us now, more in detail, examine those typical nations and periods which show how the conceptions stated above have been impressed upon art. Egypt, the most typical of the nations of antiquity, presents a striking example of the principles above noticed. The rapid development of its civilisation, indeed, must be assigned to that unity of idea so characteristic of the cradle of human knowledge. Nor was it this alone. It is natural to suppose that the germs of civilisation took root first in a climate favourable to the growth of the intellect. We now look with rapt amazement on the ruins of Memphis, Karnac, and Luxor, and ask ourselves how such a progress could have been reached when races which now figure foremost in the march of nations had not yet passed through the first stage of social life? Without committing ourselves to any of the hypotheses by which civilisation and art reached the valley of the Nile, it is sufficient to premise that the knowledge of Asia accompanied the stream of commerce along the shores of the Red Sea, and eastward to the peninsula of Hindostan; the great rivers, the Euphrates, Nile, and Indus, becoming the channels of that civilising stream which afterwards took a westerly direction. This geographical distribution of civilisation conduced much to that similarity in the ideas and art-expression of the surrounding nations, as instanced in the rock-hewn caves and monolithic temples of Nubia and India. But the most salient feature that is embodied and impresses us in Egyptian art, is its massiveness, a characteristic of that conception which attributes to corporeal nature divine attributes.

Egypt shows us a more material and objective religion than perhaps that of any other nation of antiquity. The primitive science of the Egyptians, invested with a magical import, became assimilated with their religious conceptions; nor can we wonder at this when we bear in mind the confused notion entertained of the proper spheres to be assigned to the material and the immaterial. Such a confused idea of the corporeal and spiritual natures, common to all remote ages, was pre-eminently typified in the Egyptian notion of the transmigration of souls through the bodies of animals and other forms of nature, a doctrine which found embodiment in the magnitude and durability of the sepulchral cist. The vast conception of the Pyramids, and the megalithic grandeur of the temples and obelisks, powerfully attest the ruling idea of the ancient Egyptian mind, no less emphatically than their notion on the metempsychosis, though hieroglyphic science has scarcely revealed that with any precision. Religion and science blended into a system of sensual idolatry and mysticism could not fail to produce an ideal of material sublimity which soon found a suitable embodiment in art. How more impressively could this idea have been realised than in the gigantic pyramids, propylous, huge monoliths, and colossal sphinxes? The Hypostyle Hall or temple at Karnac seems, indeed, to be the type of all that was impressive and grand in architecture during the Theban monarchy, the second and culminating period of Egyptian art, though I cannot go so far as Mr. Fergusson to call it the "greatest of man's architectural works." Whatever the gradations of refinement discoverable in Egyptian art, the three great features of it are—size, solidity, and mysticism. And it is impossible to conceive a more significant expression of the dominant conception of the Egyptian creed—the lasting connection of the body with the soul—than that stamp of perpetuity and durability so symbolically expressed in the pyramidal outline that marked all their works of art.

Assyria, and, indeed, all nations in their first stage of civilised life, resemble in conceptions the corporeal character just sketched. In Assyria, though a distinct style is noticed, little if at all influenced by its great contemporary rival, there is the same general conception stamped upon art. A palatial rather than a sepulchral character is noticed; a more elaborated and conventional ornamentation takes the place of the simple and more natural ornament of the Egyptians, which confined itself chiefly to the papyrus, palm leaves, and lotus forms, and a profusion of hieroglyphical cha-

* In his Æsthetic works.

acters; and these differences are ascribable to that more spiritual and symbolised form of nature-worship held by the ancient Assyrians, and found in the Persian Zendavesta. The deep reverence for the elements was the essential principle in the Persian theology, and, invested as it was with all the rich colouring of Eastern imagination, tended in some degree to make art more varied, and less the expression of a coarse materialism. Even Greek theogony and art were in this respect inferior; for, although intellectually more beautiful, they were certainly not so pure and spiritual, the simple essence of nature being lost by a material covering and symbols.

I have stated that a connection existed between Egyptian and Indian art. India resembled Egypt both in its institutions and fundamental belief, and yet there were just those points of difference between the two nations that can be accounted for physically and intellectually. Like the Persians, the Indians are under the influence of an imagination which prevented them falling so low into a material idolatry as the Egyptians. Oriental discoveries have established the fact that India was foremost in the development of human intelligence; and it is interesting to mark the steps of that gradual transition of the Oriental mind which began by a simple nature-worship, degenerated into an idolatry, and subsequently passed into a form of Pantheism. The doctrines of emanation and the metempsychosis are considered to be of Indian origin; they naturally sprang from a poetical and arbitrary idea of cosmogony; and, however degrading in their practical tendency, they exhibited a purer ideal of excellence than was conceived by the Egyptians. The attributes of the Deity and His relation to the world were more defined; and the doctrine of emanation, though its principle was a belief in a law of constant deterioration of both body and soul by a sense of guilt, yet, viewed as a system of reunion with the divine essence, it was singularly calculated to inculcate the higher duties of man and to stimulate him to look on his reincorporation with Divinity as the chief destiny of his existence.

Springing from this doctrine the Indian idea on the metempsychosis arose, and here a more spiritual discernment is noticed than the Egyptian treatment of the dead body suggested, viz., the belief that the natural world had become dimmed of its original light and purity. I have rather fully sketched this conception of the Indian mythology, because it faithfully represents the predominance of the imaginative faculty at a period when the material embodiment of thought was almost universal, and when a struggle between the two had scarcely arrived, for the simple reason that the logical faculty of man had not yet curbed the wildness of his imagination. Thus it was that the Indian belief thought of something less coarse than the Egyptian; worshipped light and the sun as the ideal elements of a supreme essence; believed in the absorption of all thought in God, and carried to an extreme of philosophic mysticism all notions of religion. Probably, unguided imagination never attained to that purity of conception before or since.

How these conceptions were impressed upon Indian art is the point that chiefly concerns our inquiry. Though a resemblance can be traced between the rock-cut temples of Egypt and India, the architecture of the latter country shows a far more versatile character; it is infinitely richer in constructive ingenuity and variety, though the same mystic idea is discoverable. Art, indeed seems to breathe a more exalted spirit; and the comparatively lifeless forms of Egypt are infused with an expressive power. These forms of art, often prolific of exuberant fancy, have been so ably delineated and described by Mr. Fergusson that it would be superfluous here to detail them. He shows the striking points of similarity between the temples of India and Egypt. The gate-pyramids or *gopuras* in form and purpose correspond to the Egyptian propylons; the *mautapa* or porch is analogous to the hypostyle hall; but the detail and imagery of the Indian examples—as the temple at Tanjore, and the rock-cut temple at Ellora, remarkably contrast with the ponderous majesty of the Egyptian structures, and show at a glance the preponderance of an imaginative and inventive genius. This last element is strikingly indicated in the clever expedients of horizontal doming and bracketting exhibited in the Jaina and other temples of Indian construction.

Having thus reviewed the unity and character of Asiatic civilisation and the impression it left upon art, we will next glance at that stage in the progress of human development which so conspicuously displayed itself in ancient Greece—a period of intellectual growth when a conflict between the imagination and reason had commenced.

THE DRAINAGE OF OXFORD.

THIS vexed question has advanced a stage by the report of Mr. Bateman having been laid before the Local Board and ordered to be printed. The original idea of Sir William Cubitt was to convey the sewage and water of Oxford to Sandford in sewers 6ft. in diameter; the plan was approved by Mr. Bazalgette; but the surveyor strongly urged the desirability of separating the storm water, and so reducing the dimensions of the main sewer to 4ft. 6in. The board determined to send the rainfall to the river—the sewage to the soil; and Mr. Galpin has been co-operating with the eminent water-engineer first mentioned to secure this result. All previous plans have included the carrying of the sewerage system beneath the bed of the river, to reach the Berkshire shore; and it was formerly intended to discharge the sewage of about 30,000 persons into the stream at Sandford.

Mr. Bateman proposes to provide for 45,000 inhabitants, on the principle of applying the sewage to land, and the leading features of his report are these:—He agrees with Mr. Galpin as to the separation of water and sewage, as well as the lines the sewers should generally take. He, however, departs from all previous proposals by taking the sewage under the river by inverted siphons. It appears that a similar *modus operandi* has been adopted successfully in the city of Hamburg, and is also being applied at Barking Creek. By this means all the difficulties of sewering beneath the river would be avoided. An egg-shaped sewer, 4ft. 6in. by 3ft. 6in., was the most suitable shape, and would carry off ten million gallons a day. With a fall of 2ft. 3in. per mile, a pumping power of from 60 to 100 horses, and proper arrangements for flushing the sewers from reservoirs constructed on purpose, there would be perfect scouring and velocity of outfall, so that all deposit would be prevented; in some parts the main sewer would be a considerable depth below the surface, and there would be man-holes to allow examination. The reservoirs would entail an expenditure of £18,000. Ventilation and the escape of noxious gases can be secured by openings in non residential neighbourhoods, and in others by proper shafts with burning charcoal trays, or lofty ones clearing the highest dwellings. Under the head of "sewers," Mr. Bateman estimates a cost of £57,000. The land to which the sewage is applied must not be water-logged, but of a friable, absorbent nature, and the quantity must be strictly regulated to the limits of fertilisation, in order to ensure the greatest possible utilisation of the sewage. The cost of pumping the sewage would be £35,000. The quantity of sewage on which Mr. Bateman's figures depend is several million gallons a day. In Edinburgh and London, the sewage is undiluted, and there 600 acres of ground would be the limits which that quantity would fertilise. In Oxford, with a smaller fall, and the necessary flushing required, it would be diluted, and more land would be required, but he cannot say exactly how much. Authority is not agreed as to the proportion of sewage per acre; but the balance of testimony being in favour of 5,000 tons, for a four-fold increase of crops, he based his calculations on that amount. Assuming this to be the proportion employed, he had the authority of Mr. Morton's statistics that profit would be realised by the adoption of irrigation. This would leave a handsome balance in hand, after payment of every possible expense, if the farmers took the sewage. If they did not, and the corporation became their own farmers, the profit would be considerably greater. For an outlay of about £100,000, Mr. Bateman thinks the irrigation scheme may be carried out with pecuniry advantage. At a low estimate of its value, even below that of Mr. Morton, the sewage would be worth ½d. per ton for sale to the farmer. The quantity in Oxford will be, say 4,000,000 gallons a day, but being diluted with water for flushing, its value is reckoned at 2,500,000 gallons of the rich fertilising elements when not diluted. This will realise £8,386 10s. per annum, showing a surplus of £4,000 after paying interest and working expenses, should the co-operation of the agriculturists be secured. If the corporation have to apply the sewage themselves, and become as it were their own farmers, there will be a further outlay, but the sewage may then be made, it is said, worth 1d. per ton, or £16,972 per annum, when of course the profit would be double.

CARTMEL PRIORY CHURCH, LANCASHIRE.

THIS large monastic church, the original fabric of which dates from 1188, and the greater part of the present pile from early in the fifteenth century, has, during the last seventeen years, been undergoing a gradual restoration, which will leave it one of the most interesting churches in the county. Its oldest proportions, of transition Norman; its fifteenth century transepts and windows, its older low square lantern tower, and its later square stage, set diagonally on the square of the lantern, all conspire to attract the eye, as it is first seen from any of the surrounding hills, its broad gray pile dominating a cluster of houses as gray as itself. In 1850, the large arches supporting the tower were stripped of sundry coats of whitewash, and their fair proportions made manifest. In 1856, the walls of the chancel and transepts underwent a similar purification, and were covered with new slate roofs; a plaster ceiling giving way to an open roof of oak. In 1864, the rubble walls of the fifteenth century nave were stone-finished, to harmonise with the chancel, &c. About Christmas last, another judicious improvement was commenced, by removing the unsightly galleries from the nave arches, and all the heavy boxed pews in the body of the church. An old organ filled a gallery over the chancel screen; both organ and gallery are removed. A new organ is to be placed in a more fitting situation; a new pulpit and reading desk of stone are to occupy the place of the old wooden tubs; and the church is to be amply provided with open seats of oak, with carved ends. The old clock, which only showed one face to the valley, is to be succeeded by a timekeeper on more modern principles, and having two dials facing east and west. The whole cost of these extensive improvements—indeed this thorough restoration (which is expected to be completed during next summer)—has so far been, and to the end is to be, defrayed by voluntary subscriptions and contributions. His grace the Duke of Devonshire and the Rev. T. B. Holgate, late the vicar of Bishopton, County Durham, and now of Cartmel, are the two most munificent contributors. It is pleasant to have to record such things of a church, where, some thirty years ago, two masons, having got themselves appointed churchwardens, filled up "slack times" in their trade by carving out "jobs" for themselves in and about the sacred edifice, and, amongst other Gothic labours, managed to recut and reface a fine old octagonal font, which now stands a monument of churchwardenly taste and judgment!

The report of the trustees of Mr. Peabody's gift to the poor of London shows that the original fund has been increased by the earnings of interest and rents to the extent of £15,416 8s. 11d., making the sum total of the trust at the end of December, 1866, £165,416 8s. 11d. The buildings at Spitalfields and Islington continue to be fully occupied; good order and contentment prevail, and the tenants, in the full enjoyment of new social comforts, and exempted from any interference with their independence and freedom of action, show no disposition to change. The ample playgrounds, being exclusively for the tenants, are a source of much satisfaction to the parents, and conduce to the health and morality of the children. The sanitary condition of the buildings continue highly satisfactory.

ELEMENTS OF ENGINEERING.

Docks.—No. 1.

TO provide havens for its ocean fleets—to construct places of refuge and security where its vessels may lie on their return from their wanderings on the deep, where they may unload and reload, where they can be examined, repaired, and finally restored to a condition enabling them to once more encounter the dangers of the fickle element, is a duty imperative upon every maritime nation. Notwithstanding the self-evident nature of our remark, it is scarcely to be believed that London, but half a century ago, possessed nothing in respect to the accommodation we have mentioned deserving the name of docks. For years the West Indian fleet had no other shelter than the open river, and loaded and unloaded in the very current of its muddy waters. In addition to the danger and inconvenience arising from such a method, the loss to the merchants by peculation and robbery was something enormous. At that time there was no such thing as the Thames Police, and smuggling and domestic piracy were carried on to an extent and with an impunity only equalled by the opportunities unavoidably afforded to them. What the stable is to the horse, what the engine shed is to the locomotive, so is the dock to the ship. Docks may be classed under two general heads—wet docks and dry docks. The former, or floating docks as they are also termed, are for the purpose of retaining the water inside them, the latter for keeping it out. Dry docks, also called building or graving docks, are for the purpose of building and repairing vessels. We shall for the present confine our attention to the construction and details of the former description. The Liverpool Docks were those first constructed; and it was not until nearly a century after, that London imitated her example. From the year 1660 until the commencement of the present century, the whole accommodation afforded by the port of London for loading and unloading foreign produce was a single quay called the "Legal Quay," which extended down the river from London Bridge and was barely 1,500ft. in length.

As is usual with the Anglo-Saxon he takes a long time to make up his mind before starting a new undertaking, but when once he has determined upon the step there is no further delay. So soon as the absolute necessity for providing better accommodation for the mercantile navy was forced upon the attention of those concerned in the question, and the ice once broken, the construction of docks on the Thames commenced and proceeded in earnest. The West India, the London, and the East India docks were all commenced within four years of each other. The wet docks at Cherbourg, which are constantly undergoing improvements and additions, rank in point of size and convenience with any in the world. Those at Sheerness are also admirable specimens, and are remarkable not only as docks, but for the complete and efficient manner in which all the various accessories so indispensable to their utility and accommodation have been provided and arranged. All docks being situated either near the sea or close to a tidal river, their depth of water is liable to variation. They are therefore provided with locks at the entrance to enable vessels to pass in and out at other times than at that of high water. A distinction must be made between wet docks, and basins, which have no locks at the entrance nor gates of any kind unless they form an adjunct to the docks themselves, in which case they are provided with these appendages. When docks are situated upon the banks of a river, similarly to the London Docks, in order that vessels should pass with facility in and out, the entrance should be on an incline sloping in the direction of the up stream. Owing to the influence of the weather upon tides a depth of 30ft. of water sometimes exists in the docks on the banks of the Thames, but such an occurrence happens rarely. There is one popular error respecting the waters of a tidal river which deserves allusion to. It is commonly supposed that in tidal waters the water always rises while it runs one way and falls while it runs the other. This idea is erroneous. The highest water mark has been known to be reached while the current was in the opposite direction. In our next article we shall give a general plan illustrating the position of wet docks, and proceed to describe the details connected with their construction.

ANCIENT ART.

MR. STUART MILL, in his admirable speech at Glasgow, made some felicitous observations on the character of ancient art. He said:—In purely literary excellence—in perfection of form—the pre-eminence of the ancients is not disputed. In every department which they attempted, and they attempted almost all, their composition, like their sculpture, has been to the greatest modern artists an example to be looked up to with hopeless admiration, but of inappreciable value as a light on high, guiding their own endeavours. In prose and in poetry, in epic, lyric, or dramatic, as in historical, philosophical, and oratorical art, the pinnacle on which they stand is equally eminent. I am now speaking of the form, the artistic perfection of treatment; for, as regards substance, I consider modern poetry to be superior to ancient, in the same manner, though in a less degree, as modern science: it enters deeper into nature. The feelings of the modern mind are more various, more complex and manifold, than those of the ancients ever were. The modern mind is, what the ancient mind was not, brooding and self-conscious; and its meditative self-consciousness has discovered depths in the human soul which the Greeks and Romans did not dream of, and would not have understood. But what they had to express, they expressed in a manner which few even of the greatest moderns have seriously attempted to rival. It must be remembered that they had more time, and that they wrote chiefly for a select class, possessed of leisure. To us who write in a hurry for people who read in a hurry, the attempt to give an equal degree of finish would be loss of time. But to be familiar with perfect models is not the less important to us, because the element in which we work precludes even the effort to equal them. They show us at least what excellence is, and make us desire it, and strive to get as near to it as is within our reach. And this is the value to us of the ancient writers, all the more emphatically because their excellence does not admit of being copied or directly imitated. It does not consist in a trick which can be learnt, but in the perfect adaptation of means to ends. The secret of the style of the great Greek and Roman authors is that it is the perfection of good sense. In the first place, they never use a word without a meaning, or a word which adds nothing to the meaning. They always (to begin with) had a meaning; they knew what they wanted to say; and their whole purpose was to say it with the highest degree of exactness and completeness, and bring it home to the mind with the greatest possible clearness and vividness. It never entered into their thoughts to conceive of a piece of writing as beautiful in itself, abstractedly from what it had to express; its beauty must all be subservient to the most perfect expression of the sense. The *curiosa felicitas* which their critics ascribed in a pre-eminent degree to Horace, expresses the standard at which they all aimed. Their style is exactly described by Swift's definition, "the right words in the right places." Look at an oration of Demosthenes; there is nothing in it which calls attention to itself as style at all; it is only after a close examination we perceive that every word is what it should be, and where it should be, to lead the hearer smoothly and imperceptibly into the state of mind which the orator wishes to produce. The perfection of the workmanship is only visible in the total absence of any blemish or fault, and of anything which checks the flow of thought and feeling, anything which even momentarily distracts the mind from the main purpose. But then (as has been well said) it was not the object of Demosthenes to make the Athenians cry out "What a splendid speaker!" but to make them say "Let us march against Philip!" It was only in the decline of ancient literature that ornament began to be cultivated merely as ornament. In the time of its maturity not the merest epithet was put in because it was thought beautiful in itself; nor even for a merely descriptive purpose, for epithets purely descriptive were one of the corruptions of style which abound in Lucan, for example; the word had no business there unless it brought out some feature which was wanted, and helped to place the object in the light which the purpose of the composition required. These conditions being complied with, then indeed the intrinsic beauty of the means used was a source of additional effect, of which it behoved them to avail themselves, like rhythm and melody of versification. But these great writers knew that ornament for the sake of ornament, ornament which attracts attention to itself, and shines by its own beauties, only does so by calling off the mind from the main object, and thus not only interferes with the higher purpose of human discourse, which ought, and generally professes to have some matter to communicate, apart from the mere excitement of the moment, but also spoils the perfection of the composition as a piece of fine art by destroying the unity of effect. For all these reasons I think it important to retain these two languages and literatures in the place they occupy, as a part of liberal education, that is, of the education of all who are not obliged by their circumstances to discontinue their scholastic duties at a very early age. But the same reasons which vindicate the place of classical studies in general education show also the proper limitation of them. They should be carried as far as is sufficient to enable the pupil in after life to read the great works of ancient literature with ease. Those who have leisure and inclination to make scholarship, or ancient history, or general philology their pursuit, of course require much more, but there is no room for more in general education. The laborious idleness in which the school-time is wasted away in the English classical schools deserves the severest reprehension.

TEMPERANCE PERMANENT LAND AND BUILDING SOCIETY.

THE thirteenth annual meeting of the members of this society was held on Wednesday night at the London Coffee-house, Mr W. Tweedie in the chair. The report of the directors stated that the subscriptions received on investing shares during the year amounted to £94,000. The subscriptions on account of advanced shares were £86,000. The sums received in the deposit department exceeded £62,000. The cash received for interest and premiums on the investments of the society reached £28,000; and the year's receipts from all sources exceeded those of the previous year by about £55,000, and amounted to £312,000. The withdrawals of subscriptions and deposits during the year amounted to £88,000. The advances on mortgage of house property were £122,000; £15,000 were paid to members and depositors for profit and interest, and at the close of the year there was available for advances £36,000. Notwithstanding that during a portion of the year financial matters were in a disorganised condition, and trade in a depressed state, the directors were able to appropriate the same rate of profit as heretofore, viz., 7½ per cent. per annum, upon the subscriptions in respect of shares in force; and on uncompleted shares, withdrawing during the year, 4 per cent. per annum, on the subscriptions at credit, during the year of withdrawal (in addition to the amount paid at the time the shares were withdrawn), as well as to proportionately increase the reserve fund. A review of the whole of the society's operations showed that the shares issued numbered 52,944; and the assets exceeded £469,000. The profit and interest paid to members and depositors was £56,000. The sums advanced on house property exceeded £670,000. The sums remaining upon mortgages of house property exceed £381,000. The number of members interested in the society, either as investors or borrowers, is about 7,500, and the number of houses erected, completed, or purchased by members, with the assistance of the society, exceeds 3,500. The reserve fund amounts to £48 900, and the total receipts from all sources to £1,240,000. On the motion of the chairman, the report was unanimously adopted. After transacting the usual yearly business, the meeting was brought to a close by a vote of thanks to the chairman.

Mr. Munro, the Scotch sculptor, took a cast from the face of M. Cousin after death. The Emperor has charged the artist to execute a bust in marble for the French Academy.

Archæology.

WALL PAINTING.

IN the recent restoration of Cowley Church, Oxford, a very complete and valuable set of wall paintings has been brought to light, and was fortunately drawn by a very competent observer, who, we hope, will shortly publish his drawings. In the meantime we are able to give a few general notes of the interesting discovery.

The church has a Norman nave, with an Early English chancel added; and the paintings, which seem to be of late thirteenth century or early fourteenth century date, extend over the whole of the walls except the west end. On the north and south walls of the nave the painting was merely decorative and of simple character. There was a broad horizontal band (about 8in. broad) of geometrical ornament carried at about 6ft. from the floor. Beneath this the wall was plain; above, it was divided into masonry-pattern by red lines, with a red cinquefoil, "voided," as the heralds call it, in the middle of each compartment of the pattern. The chancel arch has an equilateral Early English arch, added upon the original Norman imposts, which are ornamented with shafts, capped and based. These shafts have ornamental patterns painted upon them, and their enrichment is further increased by a broad vertical band of ornament on the wall itself. The wall space, on each side of the chancel arch, has traces of a powdering of a dotted cinquefoil, and within a rectangular frame on the right-hand spandrel is a picture of a lady offering a church to a female—possibly, the founder of the chancel offering it to the patron saint. The chancel painting is of more elaborate character. The voussoirs of the containing arch, over the eastern triplet, are picked out in yellow paint, with red double lines. The eastern wall is divided horizontally by two bands of ornament—one a little above the window sill, the other at about half the height of the window jamb. Beneath the lower horizontal line the wall is left plain. The spaces on each side of the window, between the lower and upper line, and between the upper line and the spring of the arch, are occupied by paintings. The upper painting, on the south side, is a rather fine figure of the Saviour, crowned and nimbed, in the attitude of blessing. The corresponding picture on the north side was much injured, but seemed to have been a Blessed Virgin Mary and Child. The lower picture on this (north) side seemed to have been a Presentation in the Temple. The corresponding lower picture on the south side had been entirely defaced in the erection of a modern monument. Over the window, occupying the whole upper part of the east wall, was a large painting of the Holy Trinity, in the common conventional form of the Father seated, holding before him the crucified Son; and on each side of this central group was an angel kneeling and censing. This recovery of the whole plan of the painting of an east end of a church is very rare, and proportionally valuable. The side windows of the chancel are a little remarkable for being square-headed, though certainly of the thirteenth century. Each is surrounded by a framework of ornamental painting of more elaborate pattern than usual, though only in the usual colours, yellow, red, and white, and has a kind of label pattern, terminating at each end in a leaf. A horizontal band of painting ran along the chancel walls, level with the window sills, and above this string-course there seems to have been a line of figure paintings. Between the two windows, on the north side, is a row of saints; in the corresponding wall-space, on the south side, a Taking down from the Cross; and there are traces of paintings of similar character on the wall spaces east and west of the windows, on both sides of the chancel. The paintings are in the usual style of wall paintings of this period, executed in distemper with bold red outlines, and occasional flat tints of red and yellow, with considerable merit in the design and drawing. The ornamental patterns which are used to enrich the architectural features of the church are of unusual elaboration and excellence. The whole series affords a valuable addition to our knowledge of the general plan upon which the mediæval artists used colour in their buildings.

"DENE HOLES."

SIR,—I have so high an opinion of Mr. C. Roach Smith's archæological learning and experience, and of the care and caution with which he forms and puts forth an opinion, that I am strongly inclined to defer to his authority on the question of the origin of the so-called Dene holes and pit dwellings, expressed in his letter on the 8th inst. in the BUILDING NEWS. But I venture to think that some of the facts are not accounted for by his theory, and I should be glad if he would return to the subject, and, if possible, clear up my difficulties. First, the theory that these excavations are mere chalk pits does not account for the quantity and variety of British remains found in the pits at Fisherton. Secondly, the chalk-pit theory altogether fails to account for the Dene hole described as having existed in Norsey Wood, Billericay, in close proximity to British remains. In your account you likened the place to a "gravel pit," but did not expressly say that it was not, like others which have been noticed, excavated in a chalk substratum. I happen to know something of the country thereabout, and believe that I am correct in stating that there is no chalk there. The name "Dene hole" seems to be familiar to the Essex rustics; I should like to know if it is also known in other counties; for example, is it applied to the similar excavations in Kent and in Wilts? and is it applied to the modern chalk pits which are dug for agricultural purposes? and lastly, will the philologists tell us, what does the word mean? I venture to think that the theory that these excavations were at least sometimes used as storehouses for corn is a very plausible one. We have had the evidence of Tacitus that the Britains did use pits as storehouses for their corn; and one of your correspondents has reminded us that those which are still so used in Spain answer to the description of these dene holes. I believe a good deal of evidence might also be adduced to show that pits were anciently used as places of confinement for prisoners, and of safe custody for slaves. Can any of your readers supply us with the evidence on that side of the question? Moreover, there is a theory that pits were sometimes used as burial-places. In Dr. Macpherson's handsome book on his antiquarian discoveries in the Crimea there is an account of a pit which gave access to subterranean sepulchres, in which articles of Saxon fashion were found. Since the question of the origin of these excavations has been raised, it seems desirable that we should hear all that can be said on all sides.—I am, &c., E.

On the 20th inst., the annual meeting of the Northumberland and Durham Architectural and Archæological Society was held in Durham; the Rev. Wm. Greenwell in the chair. That gentleman was unanimously re-elected president, and Mr. Rowlandson treasurer for the ensuing year. After some discussion on the excursions for the year the following arrangements were made:—The excursion in May to be to Hexham and Langley Castle; that in June to Dalton, Seaham, &c.; that in July or August to Bothal; and that in September to Haughton-le-Skerne. After a speech from the chairman, a conversation arose respecting the restoration of the tower and lantern of St. Nicholas' Church, Newcastle, and Mr. Longstaffe expressed a wish that the will of Rhodes, the builder of the tower, could be got, as it was most probable that an endowment of land was left to provide for the repairs of the building, which land was likely now enjoyed by the Corporation, who, however, refused to make the repairs to the building. The question of the editing of the transactions of the society, which had fallen into arrears since 1863, was discussed at length, and eventually Mr. Barnes and the chairman agreed to undertake the work jointly; Mr. Longstaffe promising aid in reference to the particulars of the Monkwearmouth discoveries, and Captain Thompson promising to present some plates of the objects there discovered.

At Westhall, near Halesowen, in Suffolk, is an object of architectural interest which is not mentioned by Suckling in his "Suffolk Papers," nor by Parker in his Ecclesiastical Topography of the county, and which seems to be unknown to those who are specially interested in such things, and which may therefore be almost claimed as an antiquarian discovery. On a cursory examination the church appears to have a Decorated nave, with south aisle of the same date, and a Perpendicular tower built at the end of the aisle. A more careful examination, however, reveals the fact that the aisle is really the original Norman church, which was retained and converted into an aisle when the church was enlarged in the fourteenth century. The original western façade still remains untouched, but so completely masked by the Perpendicular tower that it has escaped observation. It is, however, well worth notice as a good example of a Norman western façade. It has a central doorway deeply recessed and enriched with various characteristic mouldings, and over the door a triple arcade, of which the centre arch is pierced for a window.

ETHNOLOGICAL SOCIETY.

AT the ordinary fortnightly meeting of the above society, on Tuesday last, a paper was read by Mr. H. H. Howarth, "On the Archæology of Bronze in connection with Ethnology." The subject is one which has been well fought, and on which few antiquaries are agreed; it is closely wedded to some great ethnological facts, and it is fruitful in promise of clearing up some very ancient riddles. Objects of bronze are found distributed over a wide area of the earth's surface, and through a long cycle of years. Its composition, its chronology, and the form and ornamentation of the objects made of it were some of the subjects treated of. First, of its composition. Copper is a metal of wide distribution; but objects made of it in a pure state are found only in exceptional localities. Tin is a metal of much more limited distribution, and much less accessible. Its chief sources now are Cornwall, the Malayan peninsula and islands, Germany, and Australia. That these have always been its chief sources the author considered had been too readily admitted. Attempting to trace the amber trade of the ancient Etruscans, he went on to consider their connection with the manufacture of bronze. Noting that they were the most skilful of the workers in that metallic compound, he thought they were not likely to have overlooked the materials for making the alloy if they were readily obtainable in their neighbourhood. And what is the fact? Bohemia and Saxony abound in rich deposits of tin, which have long been worked, certainly, by historic accounts, as early as the twelfth or thirteenth centuries. If this conjecture prove correct, it may throw considerable light on a long obscure page of European ethnology. Sweden, it was thought, might have supplied the tin for the Danish bronzes. Proceeding to another portion of the ancient history of tin, the author dwelt on the trade of Tyre. It was the Tyrean merchants, he urged, who sold the toys to the heroines of Homer, and carried the world's gossip to Thebes and Babylon, who monopolised the tin trade. Whence this tin came to Tarshish is a question which has exercised much ingenuity and imagination. An occasional coasting vessel may have got round; but even in Roman times the chief track was from the ports of the Veneti to the south coast of England opposite. Granting this, the tin must have come over land to Tartessus, or some one of the Tyrean or Sidonean ports on the coast of Andalusia. The condition of the interior of Spain was then vastly different to what is generally supposed. Apparently very thickly peopled, apparently studded with colonies, and traversed with roads, looking to the antiquities found everywhere in the mining districts, Mr. Howarth regarded Spain as the great smelting house of the old world in remote primitive times. Mr. Howarth treated at length upon the so-called bronze age, and various other subjects; as also upon the trade of the Phœnicians, and the distribution and imitation of Phœnician art; and to the Phœnicians he attributed the introduction of bronze.

THE WATER SUPPLY OF LONDON.

THIS question, which has been so long under discussion, and which is so immensely important, seems now to have been taken up with an earnestness that promises the best results. The Commission lately appointed is working most diligently, and there are many efforts making elsewhere and independently of each other, all tending to arouse public attention. There have been three papers read to different scientific societies within a few weeks, all full of information and suggestion as to the future supply of water to London. At the Inventors' Institute, Mr. Hemans read a paper, but this, although a valuable and instructive one, was only in explanation of the scheme for bringing a supply from the lakes in Cumberland, which has been proposed by himself and his partner, Mr. Hassard. Mr. Bateman contributed a paper to the health department of the Social Science Association, in which he gave the results of his own large and varied experience, proving the practicability and economy of a constant supply. Mr. Bateman has condensed into a short space a mass of facts which we should be glad to hear had found their way to every ratepayer in the metropolis. They are not the facts of yesterday, nor has he given us the record of experiments carried out within a few months or even within a few years, over a limited field of operation, but he supplies us with the experience of thirty years, and shows also that what he has accomplished in many large as well as small towns has been accomplished by other engineers, and with like results. No body of facts can be more concurrent or conclusive. They show that a constant supply of water is attended with less waste than an intermittent supply, and no one can doubt its efficiency in all other respects who will carefully weigh the facts given in Mr. Bateman's paper. It is right to say that he has in no way referred to his own scheme for bringing a supply of water from the Plinlimmon Hills. He has confined himself most strictly to the one question before him—that of a constant supply of water for London, without any reference to the sources from which the supply was to be obtained.

A third paper has been read by Mr. Thomas Beggs at the Society of Arts, on the evening of February 20, Lord Robert Montagu in the chair, and in that paper the writer has taken much wider ground. He has taken it up as a consumer's question, and has entered upon the very important inquiry as to the administration of the future water supply. He insists quite as strongly as Mr. Bateman does upon the necessity, efficiency, and economy of a constant supply, both for public purposes and for domestic use. Mr. Beggs does not enter into the merits of any particular scheme for supplying London, but otherwise he takes a comprehensive view of the whole subject, admitting and fairly meeting all the difficulties with which it is surrounded. There are probably very few who will agree with all his conclusions, but none who have read the paper will deny that it deals in a candid spirit with the question as a whole.

What, then, is the case to which these papers introduce us? It is an acknowledged fact that the poorer classes of London are subject to privations from an imperfect supply of water, from which the same classes in many of our manufacturing towns are exempt, and that the evil is so great as to demand immediate remedy. At the same time London does not possess the same facilities for public purposes, especially in the case of appliances for extinguishing fires, that are possessed by towns of a third and fourth class. Why is the metropolis so much behind in a machinery for the supply of an article so essential to comfort, health, and the preservation of decent habits? At the time we are complaining of a scanty supply we find that the nine water companies bring into London 108,000,000 gallons per day, or about 36 gallons per head for its 3,000,000 inhabitants; while in Nottingham, Derby, Manchester, and many other places, the quantity has been reduced to about 18 gallons per day on the average. This is a proof of the prodigious waste which is going on, and also a proof that our present resources are sufficient if that waste could be checked. A deficiency in quantity is always assumed, but these figures show that there is no real deficiency. This raises a question of vast importance, for why should the London public be invited to go so far as the Plinlimmon Hills or the Lakes of Cumberland, if they have already a supply equal to their wants, and which can be secured to them by careful and prudential management? It would be well to economise the present supply before we go in search of others, and this is really the first question to be solved. Is there any insurmountable difficulty in checking the waste? and if so, why should it arise in London more than in other places? The difficulties in this case are purely constructional and mechanical, and if by the introduction of superior contrivances, waste can be saved in the city of Norwich, so as to reduce the average quantity to 15 gallons per head per day, why should it not be practicable in London? It may be said that the quality of the water is bad, but that is altogether another question. If it can be shown that such is the case, then there are good and substantial reasons for going to a distance to fetch water; but the fact that 36 gallons per head per day is brought into London by the existing water companies is a sufficient answer to any application for a large expenditure on the ground of deficiency in quantity, and will show the importance of the inquiry which is now under the conduct of the Royal Commission, and the necessity of the consumers making their own case fully heard.

THE THEATRES.

LAST week we took occasion to note how a very beautiful design, both in form and colour, was marred, not to say destroyed, by the introduction of glitter and tinsel. The full effect of what we endeavour to point out may be seen by going from Covent Garden Pantomime, whilst its transformation scene is fresh in the memory, to the Alhambra. At the latter place, everything has been sacrificed to glitter; the central feature, as at Covent Garden, is, as it should be, the key-note to the whole design; but whereas in Covent Garden this central object is not only quiet in form, but is bathed in a most delicious and quiet mist of lovely greys, here at the Alhambra, we have not only the glitter of the reflections of a huge glass bowl, but, added thereto, the moving wearying glitter of gigantic gold and silver fish. At the former, a brilliant and artistic contrast to the inhabited rainbow which spans the back of the stage was secured by the statuesque which occupied the middle distance; no such contrast exists at the Alhambra, the globe being intensified to a painful degree by figures placed so as to appear in concentric circles; these figures, however, have the merit, if such it can be called, of being taken from Blake's Angels, that is to say, their lower extremities are prolonged to such an extent as to suggest the appearance of a trail of light and colour left behind them by their rapid motion. Such an idea is very praiseworthy, and in the hands of the designer at Covent Garden might have resulted in a *perfect* success; as it is, there is a certain hardness both of colour and outline, which just leaves it open to doubt whether Blake's Angels, or fairy babies in long clothes, furnished the artist with the idea.

The other night we went to the "Prince of Wales," to see the classic burlesque called, "Pandora's Box." We have always thought that this sort of burlesque is just the thing for the age. We have very pleasant recollections of Endymion, Ixion, Perseus, and Andromeda, and above all Mr. Charles Matthews as Chorus; and had it not been for certain vulgarities of costume, which seem as indispensable to the stage as broughams are to actresses, we do not know that there would have been much room for fault-finding. The great and almost only drawbacks in all these burlesques of Greek story, are the incompleteness and inaccuracy of the scenery and costume. It would not be worth our mentioning were it not for the very important part which these things play in the education of the habitual theatre goer. These art accessories are nearly always sufficiently near the mark to take in the unwary, and sufficiently wide of it to disgust the educated. Many of our readers will, no doubt, remember what we may call the one-leg trick, which the goddesses were always very strong in. We are pleased to see that this coarse and indecent fixed rendering of a momentary effect in the flow of the Greek tunic has been abolished at Miss Wilton's theatre. Good burlesque of costume can only be obtained by bringing sound archæological knowledge to bear upon the question. Thus, for instance, such points as the carpet-bag and umbrella of Mercury are only valuable in a burlesque point of view when contrasted with the delicacy and refined art portrayed in the texture, cut, and colour of Greek costume. It is true, Miss Hodson (Prometheus), Mr. Montgomery, and the studio scene gave a certain amount of Greek character to the piece, which otherwise had nothing special to connect it with its story. If this were a question of historical costume, wherein the subtle differences and fashions of a few years might be involved, we should have no right to grumble; but when it is a question of Greek fable, there is no reason in the world why the managers and scene-painters of our very smallest theatres should not produce the leading features, at least, of the people to whom the fable belonged, by doing which educated people would derive some satisfaction, uneducated people would be taught, and both would be more amused, inasmuch as the introduction of some one or more modernisms would intensify the extravaganza by stronger contrasts than those which are at present familiar to theatre-goers. There can be no possible excuse upon the ground of not knowing how to do these things; the British Museum, or even the Crystal Palace, to say nothing of the many books which relate to the subject, would tell the scene-painter and the manager everything they wanted to know; and, therefore, neglect of these things at a time when archæological studies are becoming every day more general shows an indifference to the public mind deserving the utmost blame. If "Pandora's Box" was worth doing at all, it was worth better doing than anything we saw of it at the "Prince of Wales'." The writing is smart and clever, the acting is heavy and dull, the story is extravagantly but truthfully told, but the mounting of the piece is neither extravagant nor true, and it is certainly no fault of the author's, nor of the fable which he has selected, that the curtain falls before an audience which, to put it mildly, is not inclined to be enthusiastic.

GRAND PIANO.

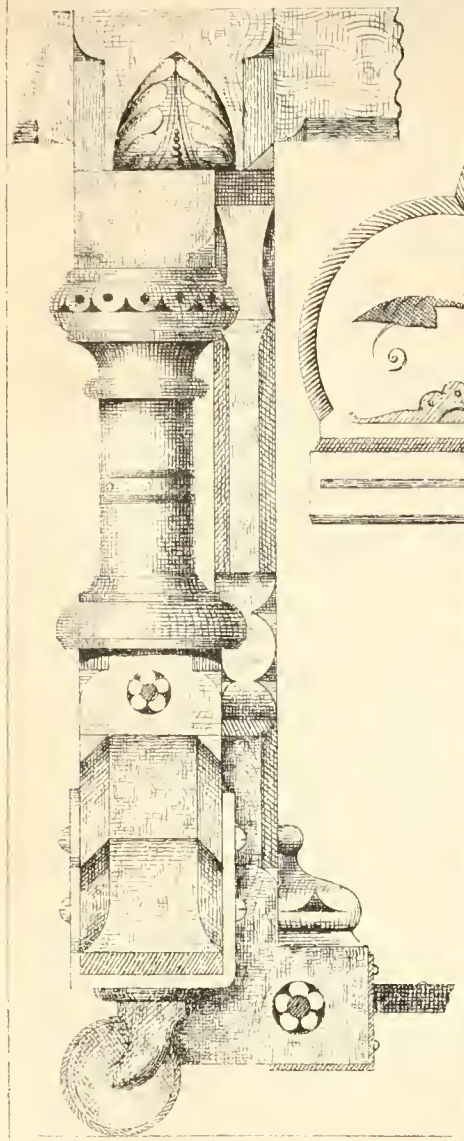
WE give this week an illustration of a grand piano, by Messrs. S. and P. Erard. The case was made by Messrs. Marsh and Jones, Leeds, and was designed for Mr. Titus Salt, jun., of Saltaire, by Mr. Charles Bevan, 66, Margaret street, Cavendish-square, London. The groundwork is of satin wood; the inlays, of amboina, purpleheart, orange wood, black and hare wood, &c., are cut by Mr. Vert. The mouldings round the panels are relieved with gold. On the same sheet will be seen a canterbury and duet ottoman, designed to match. The whole of Mr. Salt's furniture is designed by the same artist. We select the piano to show the successful manner in which it has been treated. On the opposite sheet will be seen some of the details, one-fourth the real size. The lower framing of the piano together with the arrangement of the pedal possesses considerable merit.

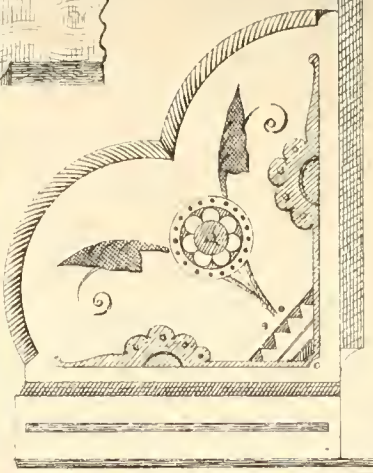
COMPETITIONS.

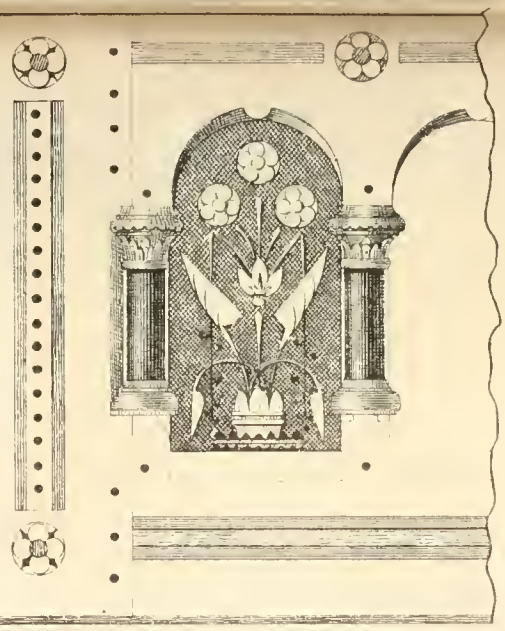
Some time since several English architects, in obedience to an invitation, prepared designs for the new markets which are to be erected in Bombay, but they were all found to be unsuited to the requirements of the natives and the Indian climate. A fresh competition was invited in India, and consequently all the imported designs from this country were mere waste paper. The successful competitor in the second competition was Mr. W. Emerson, of 4, Rampart-row, Bombay. The foundation stone of the new building will be laid by Mr. Seymour Fitzgerald, almost immediately after his arrival in Bombay.

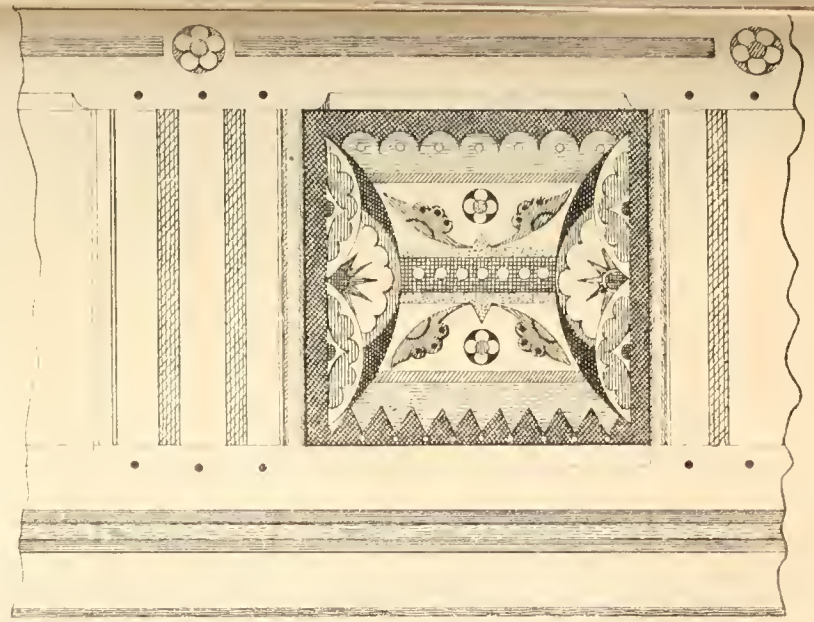
Wath Cemetery.—The plans submitted by Mr. J. D. Webster, of Sheffield, architect, have been unanimously adopted by the Burial Board, and the buildings will be commenced forthwith. The cost will be about £1,300.

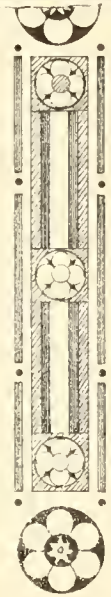
DETAILS OF
GRAND PIANOFORTE.

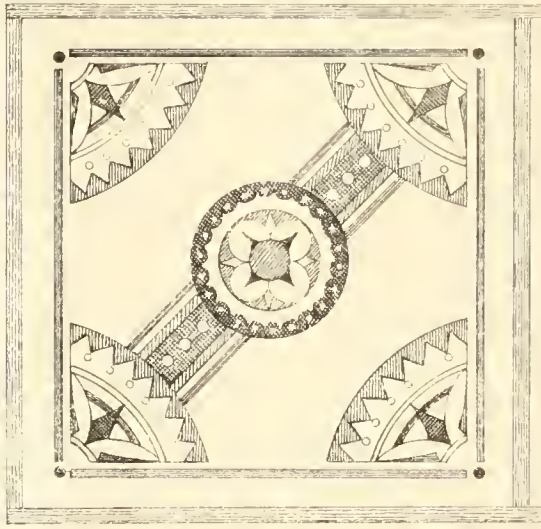


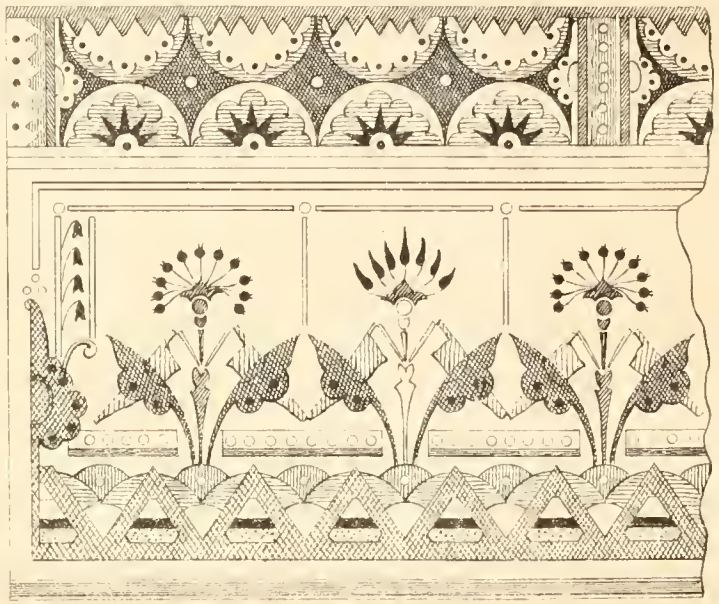






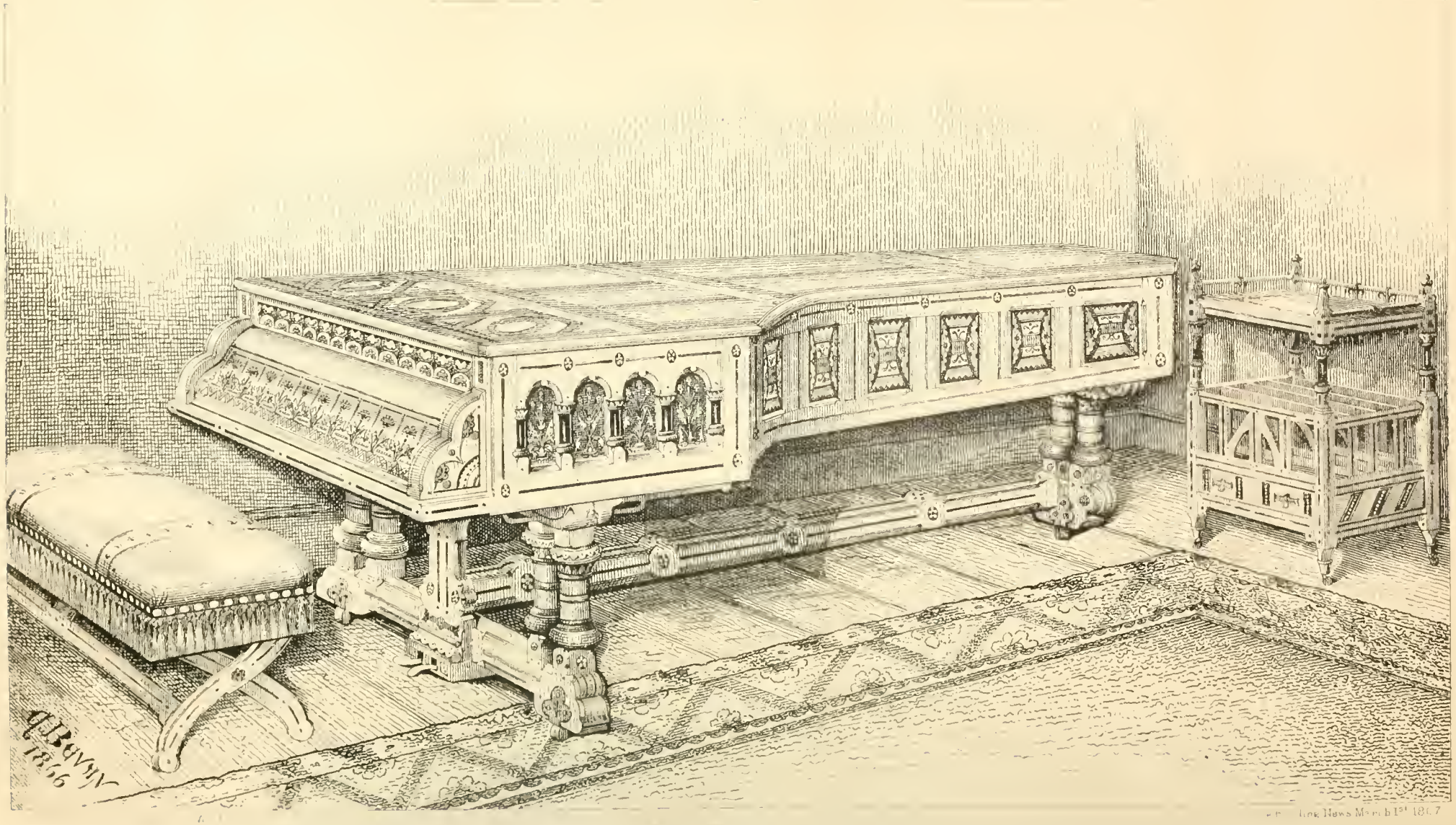






DESIGNED BY C. BEVAN.

MEDIÆVAL FURNITURE.



Building News March 1st 1867

DESIGNED BY C. BEVAN.

THE DESIGNS FOR THE LAW COURTS.

THE first question that occurred to us after viewing these twelve designs was, Upon what principle was the selection of architects founded? As a matter of course Mr. Scott was invited, his large civil works, town halls, being as well known as his ecclesiastical buildings. But what were the particular qualifications which recommended the others to the notice of the Commissioners? Mr. Waterhouse is a Manchester man; he has built the Manchester Assize Courts, and is on intimate terms with the ex-Chancellor of the Exchequer—all three cogent reasons for his being selected. Mr. Seddon is the senior Honorary Secretary of the Institute of British Architects; he competed and won a prize for the Government offices, and has built a great part of a large straggling hotel at Aberystwith. We suppose he was therefore selected as the representative of the Institute. Mr. Street is an A.R.A.; he also competed for the Government offices, and won a prize, and is, moreover, one of the most deserving sons of the Church, his life having been devoted to the development of orthodoxy in parish church and national school. As the representative of the High Church party, backed up by the magical letters A.R.A., no one will grumble much at this selection. Mr. Abrahams is a brother-in-law or some relation or other to ex-Chancellor Westbury, and has had a great deal of trouble, to say nothing of disappointment, through his relationship before the competition was decided on; so he may be considered to represent the forlorn hope of the noble army of architects. Mr. E. M. Barry, like Mr. Street, is an A.R.A., but here the likeness stops; he is a younger son of the late Sir Charles Barry, R.A., has built some monster hotels, and is what is called in trade a pushing young man. He is evidently either the representative of the Royal Academy or the licensed victuallers. Mr. Brandon built the Irvingite Church in Gordon-square. He may have other recommendations, but we know not of them. Mr. Burges is the gamecock of the profession. He has beaten Mr. Street in two great church competitions (Constantinople and Lille), he is building Cork Cathedral (which he also won in competition), he is the spoilt child of Arkwright House, and he has made himself otherwise notorious by lecturing and writing on art. If he represents anything it is the young blood of the profession. Mr. Deane is the son of Sir Thomas Deane, through whose influence, helped by the talent and earnestness of his late partner (Mr. Woodward), the younger Deane has been brought into a light which is rather too strong for him. We can only account for his election on the supposition that he was chosen as the representative of the Emerald Isle. Mr. Garling competed for the Government offices, and won a prize. He has been considerably puffed-up by certain papers, and is what they call a 'cute man of business. Could he have been selected as the representative of the daily press? Mr. Lockwood has built the Inns of Court Hotel, and comes from Yorkshire; so he is a fit representative of the north country—poor qualifications, some may think, but it would be a hard matter to find that the chosen few possessed any better.

Who is to be the lucky man? is the next question which naturally occurs to the casual visitor. Mr. Scott, Mr. Waterhouse, and Mr. Burges are evidently in the first group. Mr. Scott represents the small-hall party, Mr. Waterhouse the large-hall party, and Mr. Burges the no-hall party. Mr. Street follows Mr. Scott; Mr. Seddon and Mr. Brandon come after Mr. Waterhouse, and the rest are a long way behind, poor Mr. Abrahams bringing up the rear. People we have met in Lincoln's Inn say that it will be a neck-and-neck race between Messrs. Scott and Waterhouse, and that should the latter come up first to the winning-post it is by no means sure that the other will not have some share in the stakes. As far as numbers go Mr. Scott is hitherto the popular man. The people flock to his drawings just like they do in the Royal Academy to a Frith or a Landseer, whilst the far greater art depicted in Mr. Burges's design, like a painting by Moore or Whistler, attracts only the few. It is amusing to hear the criticisms which one competitor passes on a brother competitor. Each says no one's plan is so simple as his own, and assures you solemnly that he has tried in vain to understand them—a statement containing perhaps more truth than they would like to confess if put in another form. It is very clear that the favourites are Messrs. Scott and Waterhouse. Indeed, the odds are so heavy in their favour that it is generally believed nothing short of a Kilkenny fight could prevent one or other of them from winning the race. Should, however, the Kilkenny business come off, there are not wanting those who would bet heavily on Mr. Burges, whose drawings everyone admits are by far the best in the room. It is curious to see how the competitors differ in their sympathies. Mr. Waterhouse, for instance, is all with the barristers. Perhaps he has a dear brother-in-law who has or is to be called to the bar. Mr. Burges is full of kindly consideration for the judges, and seems to think that, as they have been worthy of seats on the Bench, their comfort and convenience are points of the first importance. Mr. Seddon's sympathies are with the multitude, and he makes everything secondary to their enjoyment. And so with all the rest. Every man devotes himself more or less particularly to one class of the many classes of people which have to be provided for, one gentleman being tenderly careful for the comfort of respondents and co-respondents, and another being cruelly indifferent in his plan, or naughtily funny in his report. If the mere convenience of the barristers attending the Courts were paramount Mr. Scott's plan is far the best, much better, indeed, than the long corridors of Mr. Waterhouse's arrangement. Moreover, Mr. Scott's judges are kept closer together than Mr. Waterhouse's, and have not so far to travel in order to consult with one another. But then, unfortunately, Mr. Scott does not keep his judges entirely to themselves; and these worthies, many of whom suffer from those infirmities which not unfrequently accompany old age, do not care to be jostled in their corridors by young and larky barristers and comic Q.C.'s. Mr. Scott's juvenile buoyancy and youthful vigour have evidently led him to imagine that all the elder members of the liberal professions were as active and as bonny as himself. We only wish they were.

By the way, talking of vigour, we should like to know why the temperature of the shed where the plans are exhibited is kept up to such a high pitch; whenever we have visited the place the heat has been almost unbearable, and when a crowd of visitors is added to the artificial warmth there is something more than heat to suffer from. The building is exceedingly low—much too low for even the comfort of half a dozen in winter. The very thought of what it will be in June, crammed full of steaming, puffing, sight-seeing visitors, makes us ill. Surely something might be done in the way of ventilation and efficient shades before the warm sunshine of spring turns to the blazing heat of summer, and makes the place even more objectionable than it is with its artificial heat.

GREAT YARMOUTH TERRACE AND VILLAS COMPETITION.

THE drawings which have been entered for this competition have been very properly exhibited to the public in the Townhall at Great Yarmouth, and have given very general satisfaction. Over 80 competitors have produced about 150 sets of designs; and notwithstanding that the chance of a prize for work so simple and straightforward as plans for middle-class villas has induced many young members of the profession to try their hand, besides causing a few old sets to be dished up afresh for the occasion, yet on the whole the results are most creditable. There are obviously peculiar requirements for sea-side houses—plenty of bay windows, rooms overlooking the sea, and for villas, at least, a small observatory tower or turret is desirable. The complacency with which these and other conditions have been ignored by many of the candidates for honours rather amuses us as we pass through the room, *e.g.*, square-Grecian, looking structures, without bays, verandahs, balconies, or turrets (of which we see some specimens), are scarcely suitable—but there are a few sets equal to the occasion. The premium for the terrace lies between "Alpha" and "Comme il faut;" the former set being better got up, though in a rather debased French villa style, while the latter is a superior class of house and more suited to its position and circumstances. There are no other designs in this class with which sufficient pains have been taken to render them worthy of notice. Of the semi-detached villas, "Ecce A." and "Ecce B." are undoubtedly the best, both as to beauty of design and convenience of plan, while the style of drawing is perhaps the most effective in the room. After this we may mention "Palmam qui meruit ferat," "Este Direite" (pretty good), "Suspense," and "Valentine." Among the single villas, "Fiat," seems to shine pre-eminent, for the plan fulfils all the conditions of the case, and the free Italian elevations are very pleasing. "Apex" makes a pretty little pointed design; then might come "Comfort, convenience, and compactness well considered," "Circumspice," "Alpha" again, and after these we begin to descend again into the commonplace. It has given us much pleasure to walk through the room where these drawings are hung; and we are glad to be able to say that the general opinion seems to be that the drawings themselves and the public exhibition of them reflect great credit on all parties concerned.

PARLIAMENT AND IMPROVED DWELLINGS FOR THE PEOPLE.

THE Bill for the Improvement of the Dwellings of Artisans and Labourers, proposed this year by Mr. M'Cullagh Torrens, contains several improvements upon the measure proposed by him last year. But, despite the statement of Lord Derby, that the question was one to be treated quite irrespective of party considerations; despite the assertion of Mr. Goschen, as a member of the same deputation, that the late Government had intended to support the bill, and the declaration of Mr. Walpole, upon its introduction to the House, that the present Government would support the principle of the bill and endeavour to improve its details, we cannot help entertaining a very strong feeling that there is much that is objectionable both in the principle and in the details of the measure which should prevent its passing into law without great and radical alteration. Duty imperatively requires that the truth should be spoken, and should be spoken moreover in such a manner that it may be heard. In this matter, we wish to say most emphatically that every mistake becomes an actual bar to real improvement, and it is precisely because we do not wish to see legislative errors added to the series of mistaken efforts of other kinds that we desire very earnestly to call attention to the principles and to some of the details of Mr. Torrens' bill. The general scope of the provisions of the bill is to the effect that, upon the officer of health reporting to the local authority upon the unsanitary condition of any street or premises, such report shall be considered by the grand jury at quarter sessions, who may also view the premises, and upon their presentment or order the owner may either execute the prescribed works himself, or require the local authority to purchase the buildings

from him out of the public moneys, in the manner prescribed by the Land Clauses' Consolidation Act. The premises shall then be altered, rebuilt, or demolished, so as to leave increased open space for ventilation, as the circumstances may require. The local authority may hold the property for seven years after its acquisition, but if not sold or otherwise disposed of within that time, it is to be escheated to the Crown. The expense of all this is to be provided for by a rate not exceeding three pence in the pound in any one year, supplemented by Government loans secured upon mortgage of the buildings and the local rates. A great improvement upon the bill of last year is, that the local authority within the metropolis is defined to be, not the vestries and district boards, but the Metropolitan Board of Works. On the other hand, whereas by the former bill it was provided that the local authority in the City of London should be the Corporation of the City, in this act it is defined to be the Commissioners of Sewers of the City.

Now this has all the appearance of being what many earnest persons have long professed to desire, a strong legislative measure, and it is this appearance of strength that constitutes its danger. We will suppose the bill to have passed and to be likely to come into operation in any particular neighbourhood. Let us inquire what would be the immediate result as regards the owners and the unfortunate occupiers of the class of property liable to be affected. As we have actually heard from the owner of some small property who had an idea that it was likely to be required for public improvements, we cannot do better than state his hypothetical view of the subject. This gentleman reasoned that, inasmuch as his property was to be taken from him, it was his interest to do as little as possible in the way of repairs, and to expend nothing more than actual necessity compelled for the comfort and health of his tenants; moreover, if it was at all possible to screw up the rents a fraction higher, it was his interest to do so, for the reason that the higher the rental, the greater price he would be likely to obtain as compensation under the Land Clauses' Consolidation Act. Would not a similar course of action be suggested to every owner of small property as an immediate effect of the passing of this bill? Let it be borne in mind that by the bill the owner may refuse to carry out the requirements of the local authorities. He may compel them to purchase the entire property, and take it off his hands; and it must also not be forgotten that the compensation to be awarded to him could be computed upon no other basis than the exorbitant rents wrung out of the wretched occupants, with the additional premium of 15 per cent. usually given for compulsory sale. Every practical man of business knows very well that the fact of a railway requiring compulsory possession of such houses is regarded by the owners as an exceedingly lucky windfall, but in this instance the price obtained under compulsory sale would in practice amount to the same thing as a reward offered by Parliament to the owners of bad property for allowing that property to become so bad that the public interest required its removal as a nuisance. The very fact of the premises becoming a nuisance would entitle the owner, who in nine cases out of ten is morally accountable for their condition, to claim a reward for his breach of one of the duties which attach to property. We cannot, by the utmost stretch of charity, suppose that such landlords will not do all in their power to enhance the amount of the reward they will some day or other be entitled to expect. We could not for a moment suppose that of their own accord they would put their premises into such a state of salubriousness as would disentitle them to claim the compensation offered. Thus the passing of the bill would offer to landlords, already too much in the habit of neglecting their property and wringing the utmost farthing of rental from poor and miserable occupiers, an inducement to neglect it still more, and, if possible, to squeeze still higher rents from their poor tenants.

In place of legislation of this nature we would suggest that a law should be contrived which would fix a stigma upon such owners of property who, by neglect, or by greediness, had allowed it to become prejudicial to health. It should be entirely closed to occupants while in such a state. That work should not be done at the public expense which the owner ought long ago to have done at his own expense. Some such law would, we conceive, effectually prevent any man from deriving a profit out of unwholesomeness or immorality, and would compel him either to put his property in proper order himself, or to sell it, not at the extravagant prices he may legally claim upon compulsory sale, but at a reasonable price to some other person, who would of course be subject to the same sanitary requirements.

Again, all these things are to be provided for by means of local rates, which may be—and, doubtless, will actually be—specially increased for the purpose. The owners of unhealthy property are to be "compensated" for allowing them to become unhealthy; the new places are to be built, the value of open spaces to be left unoccupied, the expenses of management, and all other things are to be provided for by a tax levied upon the other property of the district. Now, before any arrangement is made whereby one class of the community is taxed for the benefit of another class, it should be made clear that the benefit can be gained by no other method, either in the ordinary way of trade, in which all our material wants are supplied, or by the exertions of the benefited class themselves; on no other grounds can the State be justified in demanding that one portion of its citizens should contribute to the support of another portion. We might add likewise that it ought also to be proved that the taxation is really likely to be beneficial to the other party. Such grounds are admitted in the case of the rates for relief of the poor, and we believe that, of all the rates which the British ratepayer has to provide, there is none paid with more cheerfulness and less grumbling than that which goes to support the aged, the helpless, and the sick. We very much question whether a like cheerfulness would be shown in the case of a rate for erecting artisans' and labourers' dwellings. It has been by no means proved that dwellings of a sanitary character can be provided in no other way than by direct expenditure of public money, and yet some such foregone conclusion must underlie the very principle of this bill. On every building which has been erected by philanthropists a profit of some kind has been made, and this in despite of over-profuse expenditure in many cases, and a system of letting below the fair ordinary rental in all cases. It was admitted by Mr. Locke, who is associated with Mr. Torrens in this measure, that recently-erected buildings have paid as much as 10 per cent. on the expenditure. And if such be the fact, with what show of reason can the same honourable gentleman propose to tax the already sufficiently burdened ratepayer for the purpose of doing a work which ordinary traders would do if only the legislature would remove certain obstructions which hinder the flow of capital in this direction? The bill is entirely silent as to the disposal of any profit rental that may accrue during the seven years the local authorities are permitted to hold the property, or after it comes into possession of the Crown, and it would thence appear that its authors expect none. We should be glad to know upon what scale the rents are to be regulated, whether they are to bear a certain proportion to the expenditure, whether they are to be valued at a rate regulated by that of neighbouring property, or whether there is to be a fixed assize, like the ancient assize of bread and other necessaries, regulating the amount which the authorities consider the occupants can afford to pay. In either of the two first cases we fancy the object of the bill would be defeated.

We will, however, say that were the necessity for such a bill once clearly established, we should accept it, and be willing to tolerate the evils and defects we have pointed out, for the sake of the much greater good to be obtained in the healthy and decent housing of our working people; but, being convinced that such is not the case, except with respect to that portion of the bill which empowers the authorities to clear away bad buildings so as to provide open ventilating spaces, we think that legislation, the necessity of which we readily admit, should take quite another direction, and that this bill is but a hindrance in the way of other and more reasonable proposals. We have no doubt that, if some such plan as we have indicated were adopted, a vast amount of private capital, both of the wealthier classes and of workmen themselves, would be attracted, and would effect a far greater amount of good than can be expected from compulsory and direct action, which is sure to be exceedingly unpopular to the taxpayers, not only in Finsbury and Southwark, but wherever it might be applied and whose aim and object no efforts would be spared to defeat.

THE PHOTOGRAPHS OF THE ARCHITECTURAL PHOTOGRAPHIC ASSOCIATION FOR 1867.*

THE photographs are sufficiently clear to show us at a glance the later date and finer feeling of the figure sculpture in the archivolts, as compared with the rest of the work. The subjects are somewhat interesting; in the central compartment of the upper stage we have six virtues triumphant over their opposing vices. The virtues are represented as knights, possibly Templars, for they wear long flowing mantles, and have upon their pear-shaped shields the Templars' cross; there is no sameness about the group, and each figure is marked by a grandeur of action which is well worth the modern sculptor's study—note especially the upper figure to the left. In the right-hand compartment the figures of the twelve apostles are placed diagonally on the archivolt, and the artist has consequently been able to get them larger than he could have by any other arrangement; but even with the advantage thus gained and the greater span of the arch, one cannot help feeling that the difference of scale between the two sets of figures is a mistake. This difference, however, would not have been so marked had the figures been arranged as in the angelic choir of the left-hand arch, where demi-figures of angels issue from circular medallions. In the sculptures of the doorway we have, beginning at the outer order: 1. The signs of the Zodiac and the months. 2. Six angels—the disposition of the wings and heads very lovely. 3. Ten figures, five on each side of a demi figure of Christ. 4. Four angels censing below a demi-figure of the first person of the blessed Trinity; and finally, in the tympanum, Christ as Judge, in an aureole, surrounded by the evangelistic emblems, this last being an exceedingly bad "restoration."

Notre Dame de Poitiers is one of the pe churches of the admirers of Romanesque architecture, and not without good cause, for there are few buildings which show more completely the full development of a style which however much it may lack, has at least a manly breadth and vigour about it—barbaric, if you like but a barbarism which is far more attractive and refreshing than the light and elegant productions of later times, spoilt as they so often are by a namby-pamby shirt-frill kind of frittered detail. Viewed as a piece of iconography, thi front is less interesting than that of Civray, bu as a piece of architectural composition it is fa more important. The clustered shaft buttresse of Civray at the angles are also found here, bu with bolder proportions and corbelled out at th top so as to form circular turrets, good in them selves but exceedingly awkward, if not positivel ugly in the general composition. As high as th first stringcourse the design is very free fro defect, if we except what may be regarded as a excess of strength. Above this string course th design, even when we allow for the restoratio of the circular window, and the completion

* A paper by Edward William Godwin; read before th Royal Institute of Architects, February 11, 1867. Conclud from page 148.

the smaller arcade is manifestly out of all proportion with the lower part. The limits of this paper will not allow me to speak at any length of the mass of carved work with which the façade is encrusted; there is scarcely a corner which does not possess a detail worth study. Among these, I may call special attention to the animals in the capitals, those on the tympana of the small arches each side of the doorway, and also those under the stringcourse.

In the examples from St. Ours Loches, the animal carving is very coarse and barbarous, and unworthy the amount of attention which the association has thought fit to bestow on them. The foliage work seen in photograph No. 15 is, however, just as good as the animals are bad; and it is very interesting to compare the almost classic refinement of the capitals of the doorway with the coarse conventional treatment of the animals in the same series of caps, and the foliage in the capitals of the vaulting shafts.

Classical tradition is also strongly preserved in the capitals of the south doorway of Le Mans Cathedral, shown in Nos. 17 and 18, where not merely the foliage but the construction of the capital is essentially Corinthian. Some of the bacci are, however, carved with a coarseness which is very discordant. The dragon work of the abacus to the extreme left is a noteworthy exception. Particular notice should be taken of the reveal of the doorway, as it is a specimen of strong pure Romanesque conventional carving. It has been illustrated more than once, but it was reserved for Messrs. Cundall and Fleming to give us the best possible representation of it, both as regards point of view and photographic clearness. All the figure work, save only the central one to the right of the doorway, are below the mark (those in the arch very much below); not only are they bad in themselves, but they are badly grouped, and the only satisfaction is, that the photograph is happily dark and does not bring out their defects too prominently.

The photographs Nos. 4 and 11, which so well illustrate the western portals of Chartres, bring us to the end of the Romanesque group, and lead us by an easy transition to the First Pointed series. Simple in motive, well proportioned in their mass, and rich in their sculptured decoration, these doorways stand unrivalled amongst all the works of the age to which they belong. Had the upper horizontal line of the side tympana been continued through the central one so as to preserve the horizontal principle, and at the same time reduce the scale of the central subject, which appears to me just a trifle too large for the rest of the work, there would be little left to find fault with, unless, indeed, we objected to the whole principle of the decoration. I shall not now pause to inquire what may be said for or against the unequal distribution of the figures on the jambs; the way in which they are, so to speak, struck against the shafts; the application of figures to the curve of an arch, thus bringing them into all kinds of angles with the horizon; or the use of figures in the same composition of such widely different scales as those here employed. For myself, I must confess that nearly all the great foreign portals seem to me spoilt by an excess of figure sculpture, and, although such an objection is rather like grumbling at the fruit of Christmas pudding, yet from my experience both of puddings and buildings, I should be inclined to say that it was quite possible to spoil both the one and the other by too many plums. And again, although I may run the risk of being told that I lack reverence, yet in behalf of what Mr. Ruskin calls temperance in art, I certainly think these doorways would have gained by the omission of the diminutive figures in the capitals, which, stuck round the bell with their feet on the neck moulding, always remind me of the dolls stuck round the hat of the successful player at Aunt Sally.

We now come to three of the finest, if not the best, photographs yet issued by the association, Nos. 1, 2, and 3. 1 and 2 illustrate the north, and the south portal of Chartres. The transparency of the shadows, the wonderful clearness of the detail, and above all the grandeur of the subjects are almost sufficient to paralyse criticism and make us pause in silent reverence and astonishment. There are three or four dates in the history of this noble church which are valuable as explanatory of certain irregularities and differences about these portals. In the year 1194 the church was destroyed by fire; it was rebuilt in the First Pointed style, and consecrated in the year 1260. Twenty years later, the sculpture of the transept porches was in an incomplete state; later still, in the fourteenth century, the artist was still busy with his chisel, and to this day the work remains in an unfinished condition. The south portal is at once the earliest and the most complete of the two; the inner arches in both are much the same in point of date and design, but in the outer arches, although the general composition is pretty much alike, there is a very noticeable divergence in construction and detail. Thus in the south portal the shafts rise from quasi-classic pedestals; in the north they rest on a boldly moulded base or plinth course. In the south the piers themselves are simple in plan, and systematic in arrangement; in the north they are larger, more complex, and of a compound character, carved and canopied, the lower part of the shafts at the entrances to the portals being wrought in elaborate and somewhat remarkable pedestals sustaining statues arranged sufficiently in advance to appear independent of the shafts behind them. Again, the piers which support the side south portals are of solid square masonry, relieved by angle shafts and six tiers of small groups of sculpture under canopies. In the north the piers which answer to these are pierced so that there are three groups of shafts instead of one group and a square pier. In the north there are two rings of statues to the outer arches, the inner ones seated, the outer standing; whilst in the south there is only one ring, and that in the proportion of five to the side, and seven to the centre arch, instead of seven and nine. In the north vaults the ribs are enriched by figure sculpture, whilst in the south the figure decoration is in the vaulting space between the outer arch and the first rib. And finally, not that I have by any means exhausted the differences, the carving to the south is of the most delicate and lovely conventional type, but that to the north is partly conventional and partly natural. Altogether, then, it seems to me that the north portal shows not only the latest work, but a desire on the part of its builders to improve on the south. How far they succeeded will of course be a mere matter of opinion, but I think the double order of the outer arches and the hood moulding give a certain strength and emphasis to the work which is sadly wanted by the southern arches, whilst, owing to the very incomplete state of the north portals, the south composition has the advantage by reason of the imposing canopies which crown the summit of the piers. Of the design and execution of the details of both porches it is almost impossible to speak too highly. Taken together they furnish a perfect museum for the architectural sculptor, and it is much to be hoped that the association will not be satisfied with giving us only the three photographs in this year's issue, but that they mean them as an instalment of further labours in the same glorious field. Tempting, however, as these details are, I must pass on to the photographs which remain to be described. Nos. 7 and 8 give a west view and interior of the church of St. Pierre Lisieux. No doubt this church has many admirers; to myself I must own it is somewhat disappointing; there is an awkward junction between the second and third stages of the towers, and a certain slight and reed-like quality about the elongated shafts which is anything but pleasant. Lisieux, however, possesses a gem with which most people are familiar, the praises of which, too, Mr. Ruskin has so ably set forth in the "Seven Lamps of Architecture." I mean the doorway of the south-west tower. It is true, the view just shows this doorway, but only enough of it to make us long for more; and I for one would gladly have spared the interior of the church for a full-size photograph of this small but exquisitely lovely portal. I am not in the confidence of Messrs. Cundall and Fleming so as to be able to state whether their photographer has had the consideration to secure a negative of it: but whether he has or not, it is much to be desired that many years will not pass by before we shall be put in possession of one or more illustrations of this marvellous specimen of fully developed thirteenth century art.

We come now to the last group, wherein is set forth in four photographs the wonders of the Flamboyant style. In No. 20 we have a general view, and in No. 9 a nearer view of the west end of the Abbey Church of St. Riquier. What I have already said about the extra view of Civray applies equally to St. Riquier. No. 20 really gives us nothing that we do not possess in a much better form in No. 9, except the top of a tower, very bad in composition, and utterly deficient in finish. It will be observed that the greater part of the west front of St. Riquier is made up of a shallow porch, which rises to the base of the belfry, or, in other words, the whole height of the church. The top of this quasi-porch is finished by a horizontal parapet in line with that of the nave; and if this principle of construction had been attended to throughout, some unity would have been secured in the new disjointed mass, and there would have been less opportunity for such wild riot of ornament and such intemperance of line as are displayed in this remarkable façade. But as in all riot and intemperance there are times of comparative calm which only tend to bring into greater relief the ungovernable excesses, so here in the wrought stonework of this Abbey Church the turrets and the upper stage of the porch, though scored all over with long lines of wearisome mullion, are yet so quiet and unassuming in character that they give to the rest of the work a prominence it by no means deserves, and thus by this irregular and unequal disposition of ornament are made more patent the weaknesses of the style. It is surely unnecessary for me to point out these weaknesses, or call attention to the pie-crust cusping placed at an angle with the face of the work, the thorny foliage, the pinched-up tracery, the lumpy and overwrought figure sculpture, or to those strange and awkward panels formed by the hood mouldings over the doorways; and yet, patent as all this may be, and in spite of all the excesses and vagaries which this strained style must possess in the eyes of all sober-minded critics, there are, nevertheless, features of such elegance and such lovely proportions that the most muscular architect and the warmest advocate of Romanesque art must perforce admire them. Take, for example, the delicate gradation of the turrets and the porch buttresses, on which the tower buttresses rest, the exquisite grace of the canopies in the porch buttresses, and last, though not least, the general proportions of the central doorway.

Very different in its ordered sobriety and careful distribution of ornament from both the other examples of Flamboyant work is the powerful and well-proportioned composition of the western portals of the Cathedral at Tours, shown in No. 19. In detail this is one of the least interesting of the photographs yet issued, besides which the great statues have disappeared, and a general restoration has set in frost-like upon the whole. All this, however, deplorable as it may be, has its bright side, for it enables us to give our undivided attention to the general design. Here it will be observed we have the horizontal and the vertical principles happily combined. The pedestals to the chief niches, the broad decorated band of the chief canopies continued round the buttresses and through the jambs of the doorways; above these the strong stringcourse of the buttresses where the square changes to the octagon with its advanced open pinnacle work, and finally the parapets with their cornices passing through the gables, bind the portals together, and give emphasis where emphasis is needed. On the other hand, the vertical principle asserts itself with all temperance in lovely gradation of strength and delicacy combined where the four great buttress piers give, without any appearance of effort, their support both constructionally and artistically. The one great defect of the general design, at least to my mind, is the filling in of the tympana by masses of window tracery, a fashion, however, so completely belonging to the style that the architect of Tours can scarcely be blamed for it, when he has avoided so many other errors and exhibited so much real excellence.

The last photograph (No. 12) represents the western portals of the Church of St. Wolfran, Abbeville. Ill-proportioned in its general mass, weak in its lines, crowded to excess with meretricious and over-laboured work, having thin reedy mouldings and sprawling tracery, showing a restlessness in the disordered variety of its panelled patterns, and full of harsh contrasts, it is chiefly valuable as a danger-signal to warn young architects from running into the error of supposing that buildings can be treated like pastry and cut up and down like an Elizabethan apple-tart.

And now, having said my worst, it will not, I hope, be considered a mere matter-of-course compliment if I take this opportunity of offering to the association my hearty congratulations for the work which they have accomplished during the past year. We know how much remains for them to do; and knowing this, we are brought face to face with their one great difficulty—the difficulty of selection. On this point I would only

[266.]—COATING IRON PATTERNS.—In reply to "W. Chicken," I beg to inform him that iron patterns may be coated with copper, and oxidation prevented, by first cleaning them perfectly, coating them with asphalte, then preparing the surface with plumbago, and afterwards submitting them to the galvanic battery in a trough containing the sulphate of copper in solution. The process is very troublesome, and too expensive to practice on a few things only. W. G. P.

[267.]—TILE MACHINERY.—"J. V." can obtain information on this subject from Mr. Wm. Boulton, Providence Works, Burslem, Staffordshire. W. B.

Suggestions.

TRUEING GRINDSTONES.

A correspondent in an American paper suggests the following method for trueing grindstones when first hung, and also when irregularly worn:—In the same frame with the stone to be used suspend another—a nearly worn-out stone will do—so that the faces shall run together. The small stone has a cam on one end of the shaft, and journals longer than the boxes, so that it has a traverse across the face of the larger stone. The faces of the stones are adjusted by right and left screws for setting up the boxes of the razing stone.

PAINT FOR IRON.

Iron may be effectually prevented from rusting by coating it with asphalte varnish, then baking it in an oven, but such an application cannot conveniently be made to the iron plates of ships, and such large masses of iron. Red lead is a good paint for iron, but it requires to be applied with care in order to render it durable. The first coat should be put on thin, then allowed to dry, and the iron should then receive two subsequent coats.

HARD CEMENTS.

The following cement has been used with success in covering terraces, lining cisterns, and uniting stone flagging:—Take 90 parts by weight of well-burned brick reduced to powder, and 7 parts of litharge, mix them together and render them plastic with linseed oil. It is then applied in the manner of plaster; the body that is to be covered being always previously wetted on the outside with a sponge. When the cement is extended over a large surface it sometimes dries with flaws in it, which must be filled up with a fresh quantity. In three or four days it becomes firm.

TURKISH CEMENTS.

The Turks use common red earthenware pipes with socket-joints, to convey water from springs to reservoirs and fountains. They make and use mortar and cement as follows:—Mortar: fresh-slaked hydraulic lime, 1 part, by measure; chopped tow, sufficient to mix into the consistency of ordinary hair mortar. The ingredients are mixed dry, then well incorporated by the aid of water; this mortar is used fresh. Cement: fresh-slaked hydraulic lime, 1 part, by measure; pounded brick finely sifted, half a part by measure; chopped tow as above. The whole is mixed with oil, in place of water. The earthenware pipe-joints are made watertight with this cement.

Building Intelligence.

CHURCHES AND CHAPELS.

The site for the new church of St. Matthew, Newington, in the New Kent-road, is being rapidly prepared. The new edifice, from the design of Mr. Jarvis, architect, of Trinity-square, will cost some £7,000, exclusive of the ground, and when finished will give accommodation to about 1,000.

A new church, dedicated to St. Vincent de Paul, is now being erected at Marseilles at a cost of 3,000,000f. The stained glass alone will be of the value of 150,000f. The Abbé Pouguet, of Avignon, is the architect.

The foundation stone of the new Barbican Congregational Chapel, New North-road, was laid on Monday week last. The chapel is in substitution of the one in Barbican, the site of which was taken by the Metropolitan Railway Company. The building will be of Gothic design. The chapel will accommodate 900 persons, viz., 427 on the ground floor and 473 in the galleries. There will be two vestries. The basement floor will contain a lecture-room, or school-room for 600 children, two class-rooms for 40 scholars, and two infant class-rooms for 100 infants. Messrs. Lander and Bedells are the architects, and the builders are Messrs. Browne and Robinson.

Hereford.—On Thursday week last Brinsop Church was reopened, after undergoing a thorough renovation by Messrs. Welsh and Son, under the architectural supervision of Mr. W. Chick. The church is of the thirteenth century, and the total cost of the restoration was about £960.

Liverpool.—A new Welsh Congregational Chapel was opened last week here. The chapel affords room for 880 persons, is in the Byzantine style of architecture, and is constructed of Yorkshire shoddies, with white stone dressings. The architect is Mr. C. O. Ellison, and the contractor Mr. Evan Evans. The total cost of the building and land is about £6,000.

BUILDINGS.

At a meeting of the Liverpool Water and Baths Committee, held on Monday last, the borough engineer recommended an extension of the bath accommodation and an enlargement of the washhouses at Paul-street, at an estimated cost of £9,600; an extension of the Margaret-street baths, at an estimated cost of £5,440; the erection of new baths in Chatsworth-street or Stanhope-street, at an estimated cost of £16,000; and the erection of new baths of similar extent in Toxteth-park, and at the north end, at an estimated cost, including land, of £19,400 each establishment; total estimated cost of the whole of the works being £69,840. To provide for the repayment of this sum in 30 years the committee would require £5,484 a year, and a rate of ¾d. in the pound would produce £6,000 a year.

Exeter. — Some new chambers have been erected in Queen-street, Exeter, of which Mr. W. Cross is the architect. They are of the Italian style. The carving has been done by Mr. Boulton, of Worcester.

Gateshead.—New ragged and industrial schools are to be erected in this town, at an expense of between £2,000 and 3,000, by Mrs. Abbot, as a memorial to her late husband and her father-in-law, both of whom were large employers of labour in that town.

Liverpool.—The English Presbyterian Church and Schools, Vauxhall-road, are erected in the Gothic style, treated freely with brick bands and relieving arches of blue, white, and red bricks, the whole faced with pressed bricks tuck pointed, and having stone dressings to doors and windows. The ground floor contains schools for accommodating 350 children, allowing 80 cubic feet for the boys and girls, and a little less for infants. These schools are divided by movable wood framings, so that the whole can be thrown into one room for meetings or school parties, leaving a clear space of 68ft. 9in. by 31ft. 6in. Above the schools is a church 68ft. 6in. by 27ft. and 20ft. in height, with gallery at one end, the whole capable of seating comfortably 430 people. The whole has been built by Messrs. Nicholson and Ayre, of Toxteth Park, under the superintendence of Mr. James N. Crofts, architect. The total cost, including gas-fittings, &c., is about £1,900.

Whitby.—A new Congress Hall has just been opened here; it is a large wooden building containing seats for 2,500 persons. Externally it has no claim to architectural beauty, although in its new site it is somewhat improved in this respect by the addition of carving and ornamental work to the front. The hall was erected under the auspices of a joint stock company.

STAINED GLASS.

A stained glass window, to the memory of the five children of Mr. Heathcote, churchwarden of St. Nicholas' Church, Warwick, is to be erected in the north aisle of this church. The subject is Christ blessing little children. The work is by Mr. Dury, and is to be completed by April next.

Dudley.—Four memorial windows have lately been placed in the Catholic Church in this town. Two have been placed to the memory of the Hon. and Rev. G. Spencer, one to the Rev. T. A. Moore, and one to the Rev. J. Sullivan. They consist of one lancet-light each, and have been designed, drawn, and coloured, in accordance with the period of the architecture—the thirteenth century. The objects chosen for illustration are St. George, St. James, St. Ignatius, and St. Thomas; and the inscriptions appear at the base of the lights. The figures are on a white grisaille ground; and the work has been executed by Messrs. Hardman and Co., of Birmingham.

General Items.

The exhibition of the designs for the new Courts of Justice will, from the present time and until further notice, be open to the public on Thursdays only, and to members of both Houses of Parliament and other special visitors on Saturdays only; the remaining days being required for the work of the commission.

Mr. Kessler has for many years been very successful in engraving on flint glass (crystal) by the agency of alkaline fluorides and acids. He has now succeeded in preparing an ink with hydrofluate of ammonia and hydrochloric acid, properly thickened, with which, using any pen, ineffaceable characters can be traced on glass.

A company has been formed for supplying the town of Folkestone with hot or cold water, vapour, shower, and swimming baths. Mr. Joseph Gardner will be the architect.

It is contemplated to erect an ornamental foot-bridge below Apsley Gate, which will enable pedestrians to cross over the roads and so avoid the danger of being ridden or driven over.

A magnificent impression on Japanese paper of "Christ healing the sick," by Rembrandt, was sold after a very animated competition to J. C. Palmer Esq., of Bedford-row, at the enormous sum of £1,180, the print being put up at the price of £200.

A mural brass has recently been placed in the parish church of Carnbrooke, Newport, Isle of Wight, to the memory of Colonel Sir F. Fortiscue. He was a distinguished Royalist officer, in the time of Charles II., and was buried in this parish, on May 29, 1676. The tablet was placed in its position by his eldest male representative, Lord Clermont.

On Friday last, Mr. Gabrielli, the contractor for the construction of the new docks and basins at Chatham Dockyard, commenced the excavations for two of the new docks and one of the basins. Each of the new docks will be 420ft. in length, with a depth of water of 30ft. above the dock sills. The basin will have a water area of 20 acres. Both the basin and docks are to be completed within four years from the present time.

Forty years ago, the United States had but 3 miles of railroad in operation. They now have 35,341 miles in operation, and 15,943 miles building. The value of the completed roads is 1,502,464,085 dollars, an average of 40,723 dollars a mile. On an average, 4 miles of road per day are now built in the United States.

A test of the dampness of rooms is suggested by Dr. Coffee. Place 500 grammes of quicklime on a plate, leave it in the apartment, and if at the end of twenty-four hours, this substance, which absorbs moisture very greedily, has not increased in weight by more than 1-40th or 1-50th, the apartment may be considered fit to live in. In a damp or newly built room it will increase in weight as much as 5 per cent.

In lately making some repairs in the church of Caelvoet, in Belgium, a magnificent painting of St. Cecilia, by Van Dyck, was discovered covered over with boards. Many artists and connoisseurs have seen the picture and declare it to be one of the finest works of that master. It is in an admirable state of preservation.

It is understood that the trustees of the British Museum have at length resolved to recommend the extension of the institution by the purchase from the Duke of Bedford of the site now occupied by portions of Montague street, Montague-place, Bedford-square, and Caroline-street.

On Wednesday evening last Mr. John Phillip, R.A., expired, at the comparatively early age of fifty. Mr. Phillip was born in Aberdeen, and, like many other painters, he commenced his career as a house painter, and during his apprenticeship he painted some studies of heads in his leisure hours, which attracted the attention of the late Lord Paumure, by whose liberality he was enabled to come to London and pursue his studies and enter the Royal Academy as a student, in 1837. He was made an associate in 1857, and two years after attained the full honour.

The death of the veteran organist and composer, Sir George Smart, took place on Saturday last, at the advanced age of eighty-nine. His health had been in a declining state for some time, and his demise was, therefore, not unexpected. His name has been honourably connected with the musical history of the country for many years. Sir George was knighted in 1811, at Dublin, by the Duke of Richmond, then Lord Lieutenant of Ireland.

A very curious statue of the god Vishnoo has just arrived at Bordeaux, brought from India by Captain Tailhades, of the Gnipuzooano. The image is a monolith in granite of fine grain, and measures more than 8½ft. in length. It is in perfect preservation and of a remarkable finish in the smallest details. The Indian god is represented erect, with all his appropriate insignia, viz., the tiara, the cordon of Brahma, and the four arms, two of which bear a lotus flower. The Hindoo Trinity is composed of three gods—Brahma, the creator; Vishnoo, the preserver; and Siva, the destroyer. The second personage is represented under more than twenty different forms, but the most common is that of a handsome youth with four hands.

'he suspension bridge over the Ohio River at Cinnati, which is 2,252ft. long, was opened lately I is the longest single span bridge in the world, cting 2,000,000 dollars. The railway tracks are l over its span from centre to centre of towers 157ft.

t is calculated that the value of the modern a. antique paintings and sculptures which last r were sent abroad from Rome, was equal to 00,940. This amount has been left in Rome by eigners, not alone among artists, but generally he hands of the population. Nor does it in- de the 20 per cent. paid to the Treasury on the s of antiquities, which are always estimated be- their real value. Last year exceeded the pre- ing in this traffic, as it produced £23,364 re.

During the past week, several experiments have n made at the Swaithe Main Colliery, near nsley, as to the power and efficacy of blasting h gun-cotton instead of gunpowder. The re- s have been of the most satisfactory character, l have elucidated a very important fact, that cotton, on exploding, will not send out any e; therefore, as a matter of safety, as well as n economical point of view, gun-cotton has ved to be in every respect superior to gunpow- and will doubtless come into general use now t its value has become known.

Ve are accustomed to hear of lead poisoning ough the medium of water, but not so fre- ntly through that of fire. M. Marmise, vever, has recently referred to a novel source lead poisoning which exists in the painted odwork obtained from the demolition of old ses. On being used for fuel it gives off smoke rged with lead; which, says M. Marmise, may disseminated and taken in with the breath. e out of ten dealers in old panellings in the of Bordeaux are stated to have suffered more less from lead colic; and in some instances metal has been found deposited in the chim- s of those fire-places in which old woodwork been burnt. It is also said that the handling freshly printed journals, inasmuch as the ink tains litharge, may also account for the exist- e of symptoms clearly referable to the inju- s influence of lead.

DISCOVERY OF THE SITE OF A LOST VILLAGE ON E YORKSHIRE WOLDS.—The site of one of the nesday villages, to which the traditional name Torndale has attached, has recently been singu- lly brought to light. Mr. R. Mortimer, of Fim- , a well known antiquary, has examined the ce now known as "Thorndale," and has found traces of numerous foundations of the lost age. This examination was made consequent the finding of an ancient well in one of the ds in Mr. J. Hopper's farm, near Wetwang. ere was a tradition also that this well had been nd some eighty years ago, but its position was in lost. In ploughing, however, the covering k timber) gave way under the horses' feet, and the narrowest chance only the team was saved m going headlong to the bottom. The well is horough wonder for the chalk wolds. For some tance it is beautifully walled, and is 43 yards p, and has at the present time 16 yards depth pure water. The discovery, in a country so lly watered as the Wolds, will prove of very at value, independently of the antiquarian in- est which attaches to it.

MEETINGS FOR THE WEEK.

ON.—Society of Engineers.—"On Certain Methods of Applying Screw Piles in the Construction of a Wrought-iron Girder Bridge at Verona," by Mr. J. J. Horner, 7.30.
Royal United Service Institution. — "The Atlantic Telegraph Cables of 1857-58; also those of 1865-66," by Commander H. A. Moriarty. 2. Discussion "On Manning the Navy," by Mr. J. Reddie, 8.30.
Royal Institution.—Monthly Meeting, 2.

UES.—Institution of Civil Engineers.—"On the Working of Steep Gradients and Sharp Curves on Railways," by Captain Tyler, 8.
Royal Institution.—"On the Practical Study of Botany," by Rev. G. Henslow, 3.

URS.—Geological Society, 8.
Royal Institution.—"On Coal Gas," by Professor Frankland, 3.
Linnean Society, 8.
Chemical Society, 8.

RI.—Royal Institution.—"On the Yorkshire Wold Tumuli," by Rev. W. Greenwell, 8.

SAT.—Royal Institution.—"On Coal Gas," by Professor Frankland, 3.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

1889 F. J. ROWLEY. *Improvements in gas pendants, gaseliers, and gas brackets.* Dated July 30, 1866.

The first object of this invention is to permit, intercept, and regulate the flow of gas to the burners of pendants. For this purpose the inventor fits at the top part of the pendant a hollow valve, plug, or thimble, which he prefers to make conical, and which works in a seat or socket, in which is or are formed one or more orifices, a corresponding orifice or orifices being made in the valve or plug; through these orifices gas is admitted to the body of or passage through the pendant when the valve or plug is turned in such manner as to bring its orifices opposite those in the seat or socket, so as to open them; and the gas will be shut off when the plug or valve is turned so as to close the orifices in the seat or socket. The valve or plug is worked or turned by a rod or stem, which passes down through the pendant, and is actuated by a key or other turning contrivance applied at its lower end, which end may be concealed by a knob on the pendant, made of a material which is a bad or nonconductor of heat, and having an aperture in it through which the rod is attained. To prevent the escape of gas, the rod may work in a stuffing-box or packing. Instead of constructing the valve or plug to turn, it may be raised and depressed by the rod, by means of a screw or otherwise, so as to open and close the orifices in the seat or socket. *Patent abandoned.*

1894 T. H. LUCAS. *Improvements in machinery for the manufacture of nails.* Dated July 21, 1866.

The object of this invention is to manufacture by machinery nails which, for all practical purposes, shall be as good as hand made nails, and which can be produced at a very much lower cost. The invention is adapted for the manufacture of all kinds of square-sided nails, whether having flat, round, countersunk, or other kind of heads. The machinery for which the inventor seeks protection consists of two side slides, which are actuated by cams; one front side actuated also by a cam or other mechanical equivalent. The necessary motion is given to these by means of spur and bevel wheels suitably placed. *Patent abandoned*

1970 J. J. BODMER. *Improvements in the manufacture of cements, concretes, and artificial stone.* Dated July 31, 1866.

This invention relates, firstly, to and consists in the use of slag, cinder, or scoria from blast furnaces, copper smelting and other furnaces, for the manufacture of a certain class of cements, by mixing, amalgamating, and incorporating such slag, cinder, or scoria with lime, and without subjecting the mixed slag and lime to heat in kilns or furnaces. The invention consists, secondly, in producing a cement which the patentee calls "concrete cement," and which is made of the same materials as the cement above described, with this difference, that the lime is used in its caustic state. The manipulation in preparing the cement is precisely as above described. This class of cement is principally intended for forming concrete The invention consists, thirdly, in the manufacture and use of an artificial slag to be mixed and incorporated with lime, as above named, instead of or as a substitute for slag, cinder, or scoria The invention consists, fourthly, in the manufacture of a cement by adding to slag, cinder, or scoria as it flows from a furnace (as for instance from a blast furnace), lime or calcareous matter, with or without alumina, in certain proportions, as the nature of the slag, cinder, or scoria may require The invention consists, fifthly, in certain processes for treating the slag, cinder, or scoria, whereby the silica and other component parts therein become liberated from their bases and free to enter into new combinations. *Patent completed.*

1984 J. PARRY and R MORRIS. *Improved machinery for sharpening saws.* Dated August 1, 1866.

This invention relates to improved machinery for effecting the sharpening of circular saws automatically, by the aid of a reciprocating file or cutter. The file is held in a clamping frame, which slides in vertical guides in standards of the main framing of the machine. *Patent abandoned.*

1986 S. CHATWOOD and J. and T. STURGEON. *Improvements in hammers and in mechanism used therewith.* Dated August 1, 1866.

This invention relates to improvements in a certain class of steam hammers which are of the lever form, and are generally known by the name of steam olivers, and which consist essentially of a lever having a hammer head attached to one end thereof, and to which an up and down movement through an arc of a circle is imparted by means of a steam cylinder. The invention consists in arranging lever steam hammers in such a way as to be enabled to turn the lever so as to strike a blow in any direction, from vertical to horizontal, without altering the position of the cylinder which actuates the hammer. For this purpose, the cylinder being a fixture, the patentees carry the axis bearings of the lever upon a bracket capable of being turned round concentrically with the cylinder, so that the lever arm, segment, or other contrivance may, whatever position the lever may be in, be always in the same relative position with regard to the piston rod which is connected therewith. The capacity of giving an inclined or side blow will enable a workman to make a great many forgings which it would be inconvenient to make under a hammer giving only a vertical blow. *Patent completed.*

2001 S. T. ARMSTRONG. *Improvements in machinery for cutting dove-tail joints.* (A communication.) Dated August 2, 1866.

This invention consists, chiefly, in the employment of spiral saw blades or cutters attached to rotary cutting heads, caused by suitable gearing to work together in the required direction and at the required angle to produce the dovetailed mortises and tenons in wood, metal, or other material, which is supported upon an adjustable platform or table, and brought into the required contact with the said cutters by an adjustable sliding gauge. The said invention further consists in the employment in combination with the said cutter heads and spiral saws of other saws, which are arranged in relation to the first-named saws at the proper angle to cut the bottoms of the dovetails. *Patent completed.*

Trade News.

TENDERS.

ASCOT.—For the erection of a new station hotel, at Ascot, for Messrs. Langton, Burrows, and Co. Messrs. Wm. and J T. Brown, architects:—Davies, £1,400; Pither (accepted), £1,190.

BIRMINGHAM.—For the erection of the new Union Clubhouse:—Barnsley and Sons, £12,500.

BIRMINGHAM.—For works at Broomsgrove Station, for the Midland Railway Company:—Humphries, Derby, £5,500.

BLACKHEATH.—For villa residence, for Mr. A. W. Gibbs. Mr. C. Courtney, architect:—Hart, £1,295; Welby, £1,994; Prince, £1,983; Webb and Sons, £1,926; Green, £1,874; Bland, £1,834.

CITY.—For new warehouses, Oat-lane, City, for Mr. C. Beckwith. Mr. G. Elkington, architect:—Gammon and Sons, £2,731; Browne and Robinson, £2,706; Killby and Co., £2,538; Brass and Co., £2,464; Piper and Wheeler, £2,398; Coleman, £2,378; Henshaw, £2,848; Wells (accepted), £2,295.

CLIFTON.—For the extension of the lunatic ward:—Wilkins and Son, £1,950; Hatherley, £1,949 0s.; Harding and Vowles, £1,946; Lawrence, £1,937; Davis and Son, £1,840; Eastabrook and Son, £1,807; Kingston (accepted), £1,796.

DURHAM.—For building new church at Cassop-cum-Quarrington, Durham. Mr. Withers, architect:—Bell, Coxhoe, £2,380; Readshaw, Durham, £1,610; Lowes, Durham, £1,512; Simpson and Co., Stockton (accepted), £1,450.

DURHAM.—For building a new church, at Coxhoe, Durham. Mr. Withers, architect:—Bell, Coxhoe, £2,926; Foster, Durham, £2,599; Gradon, £2,448; Robson and Son, £2,298; Lowes, £2,270; Spencer and Co., £1,890; Simpson and Co., Stockton (accepted), £1,785.

HANLEY.—For the erection of an earthenware manufactory, at Hanley, for Mr. Thos. Worthington. Messrs. R. Scrivener and Son, architects. Quantities supplied:—Wooldridge, £3,250; Bailey, £3,234; Collis and Hudson, £3,215; Steele, £3,167; Matthews, £2,997.

LINCOLN.—For the erection of a new clubhouse, St. Mary-street, Lincoln:—Huddleston, £2,665.

LOUGHTON.—For villa residence. Messrs. Lander and Bedells, architects:—Manley and Rogers, £1,475; Williams and Co., £1,469; Dobbs, 1,443; Dove Brothers, £1,335; Webb and Sons, £1,283; Grover, £1,271; Mann, £1,219; Egan, £1,201.

MINORIES.—For alterations to the Crown and Shears. Messrs. Humphreys and Son, architects:—Stephens and Watson, £875; Sparks, £739; Scrivener and White, £738; King and Sons, £688: Ennor (accepted), £613.

NORWOOD.—For building four houses for Mr. Allen, at Norwood. A. Bridgman, architect:—Warne, £1,720; Wallis, £1,245; Johnson, £1,120; Nightingale, £1,103.

NORWOOD.—For building two houses for Mr. Nightingale. A. Bridgman, architect:—Warne, £600; Wallis, £580; Johnson, £580; Nightingale, £513.

READING.—For the erection of two cottages, at Reading, for Mr. R. Attenborough. Messrs Wm. and J. T. Brown, architects:—Belcher (accepted), £460.

STANHOPE (DURHAM).—For restoration of parish church, at Stanhope. Mr. E. Christian London, architect:—Scott, £4,575; Robinson, £2,971; Routledge, £2,795; Nelson, £2,786; Gradon (accepted), £2,533.

ST. LEONARDS.—For completing convent church, Magdalen-road, St. Leonards-on Sea, Sussex, for the Rev. Superioress. Mr. G. Gouldie, architect. Quantities supplied by Jas. Schofield:—Contract A—Hunt, £4,100; Nightingale, £4,100; Simms and Marten, £3,785; Roberts, £3,325; King and Son, 3,232; Frittcher, £3,090; Simpson, £2,882. Contract B—Hunt, £1,191; Nightingale, £1,043; Simms and Marten, £996; Roberts, £925; King and Son, £891; Frittcher, £807; Simpson, £718.

WORCESTERSHIRE.—For alterations at Longdon Vicarage, Worcestershire. Mr. Withers, architect:—Halford and Genge, Upton, £498; Griffiths, Eldersfield, £491 10s.; Bell, Upton, £475; Osborne and Co., Malvern, £418; Meddings, Evesham (accepted), £398 15s.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

PROPERTY SALES.

FEBRUARY 21.

AT THE MART.—By Messrs. C. C. and T. Moore—Freehold estates, comprising 119 houses, cottages, beer-house, two houses and shops, and two plots of building land, situate near Kennington Park, and producing about £1,700 per annum.

Lot 1—sold for £315; 2, £335; 3, £155; 4, £230; 5, £355; 6, £345; 7, £365; 8, £200; 9, £160; 10, £355; 11, £225; 12, £345; 13, £510; 14, £385; 15, £505; 16, £550; 17, £630; 18, £250; 18a, £130; 19, £215; 20, £215; 21, £810; 22, £790; 23, £315; 24, £420; 25, £420; 26, £350; 27, £280; 28, £425; 29, £305; 30, £560; 31, £335; 32, £160; 33, £420; 34, £290; 35, £205; 36, £260; 37, £260; 38, £355; 39, £400; 40, £530; 41, £390; 42, £510; 43, £370; 44, £290; 45, £290; 46, £290; 47, £315; 48, £730; 49, £245; 50, £490; 51, £400; 52, £170; 53, £345; 54, £450; 55, £350.

By Messrs. Fitzmaurice and Suffolk.—Leasehold two houses, Nos. 69 and 70, Reform-street, Andover-road, Seven Sisters'-road, Upper Holloway, term 80 years from 1865, at £9 per annum—£440.

By Mr. James Beal.—Leasehold residence, known as Glasslyn Cottagn, Leigham-court-road, Streatham, term 79 years unexpired, at £4 per annum—£1,410.

AT THE GUILDHALL HOTEL.—By Mr. Briant.—Leasehold residence, No. New 3, Dorset-place, Clapham-road, let at £55 per annum, term 28 years unexpired, at £7 7s. per annum—£510.

Leasehold residence, No. 13, New Dorset-place, let at £52 10s. per annum, term similar to above, at £6 6s. per annum—£505.

Leasehold residence, known as Hampshire Cottage, Clapham Rise, let at £50 per annum, term 62 years unexpired, at £10 10s. per annum—£495.

By Mr. Whittingham.—Freehold building land, fronting Maynard-road, Walthamstow, Essex—sold from £45 to £64 per plot.

Freehold building land, fronting Washingtom-road, Cheam, Surrey—£24 to £54 per plot.

FEBRUARY 26.

AT THE MART.—Ry Messrs. Crawter and Death.—Fifty £10 shares in the City of London and Tower Hamlets Cemetery Company—£6 10s. share.

By Messrs. Ventom, Clarke, and Bull.—Leasehold five houses, Nos. 3, 4, 7, 9, and 10, Earl's-court Gardens, Kensington, producing £210 per annum, term 96 years from 1855, at £25 per annum—£2,290.

AT THE GUILDHALL HOTEL.—By Messrs. E. and H. Lumley.—Leasehold four dwellings, Nos. 49, 51, 53, and 55, James-street, Camberwell New-road, term 99 years from 1862, at £18 per annum—£650.

Leasehold house, No. 15, James-street aforesaid, let at £26 per annum, term similar to above, at £4 per annum—£165.

Leasehold house, No. 24, Lothian-road, Camberwell, let at £27 12s. per annum, term 99 years from 1861, at £4 10s. per annum—£165.

Leasehold house, No. 26, Lothian-road, let at £26 per annum, term 99 years from 1862, at £4 10s. per annum—£165.

By Messrs. Broad, Pritchard, and Wiltshire.—Leasehold improved ground rents, amounting to £32 12s. per annum (for 72 years), arising from stabling, &c., in Porchester-mews, Leinster-street, Paddington—£560.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Edward Andrews, South grove, Peckham, smith, March 7, at 1—George Dorrell, Slough, carpenter, March 7, at 2—George Foster, Evans street, Poplar, builder, March 7, at 2—Frederick Honour, Wilmot street, Russell square, builder, March 11, at 11—Thomas Kelson, Canterbury, builder, March 7, at 1—Bomanjee Muncherjee Mody, Portland place North, Lower Clapton, varnish manufacturer, March 7, at 1—Elijah Moor, Bow Common, timber merchant, March 11, at 11—Thomas Tourney, Canterbury, builder, March 6, at 12—E. Ashbee, Albany street, Regent s Park, granite merchant, March 11, at 1—Pearcey Castleton, Tottenham, mason, March 11, at 11—Charles Geary, Old Ford, builder, March 11, at 2—W. J. Marsh, Queen's terrace, Isle of Dogs, blacksmith, March 11, at 12—Hermon Symons, Aldersgate-street, ironmonger, March 11, at 2—Joseph Winch, Avenue road, Hackney, builder, March 11, at 1.

TO SURRENDER IN THE COUNTRY.

W. Bradstreet, Bardney, Lincolnshire, railway collector, March 7—J. Cope, jun., Birmingham, journeyman brass caster, March 8, at 10—Samuel Hope, Birmingham, blacksmith, March 20, at 10—Thomas Low, Bilborough, Notts, engineer, March 6, at 11—William Myerscough, Preston, bricksetter, March 9, at 12—Cornelius Mytton, Llangollen, artist, March 7, at 11—John Robinson, Aldridge, Staffordshire, blacksmith, March 9, at 11—William Statham, Birmingham, builder, March 8, at 10—William Heaword Wood, Lower Broughton, engineer, March 9—Peter Duckworth, New Brighton, timber dealer, March 22, at 10—John Onslow, Derby End, near Dudley, limeburner, March 13, at 12—Thomas Powell, Brynmawr, contractor, March 15, at 11—Daniel Simpson, Aldershot, carpenter, March 6, at 12—Alfred Wilson, Gainsborough, plumber, March 5, at 10—George Blackburn, South Stockton, joiner, March 6, at 11.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9	0	£10	10	Archangel, yellow ..	£12	0	£13	0
Quebec, red pine	3	5	4	15	St. Petersburg, yel...	10	10	11	10
,, yellow pine..	2	15	3	10	Finland	8	0	9	10
St. John N.B. yellow	0	0	0	0	Memel.....	0	0	0	0
Quebec Oak, white ..	5	10	6	6	Gothenburg, yellow	9	0	10	10
,, birch.....	3	10	4	10	,, white	8	0	8	10
,, elm	3	10	5	0	Gefle, yellow.....	9	0	11	0
Dantzic oak	3	10	6	0	Soderhamn	9	0	10	10
,, fir	2	0	3	10	Christiania, per C., 12 ft. by 3 by 9 in. yellow	18	0	22	0
Memel fir	3	0	3	10					
Riga.....	3	0	3	5					
Swedish	1	18	2	3	Deck Plank, Dantzic, per 40 ft. 3 in.	0	14	1	4
Masts, Quebec red pine	6	0	8	0	PUMICE STONE pr ton	5	0	8	0
,, yellow pine..	5	0	6	0	OILS, &c.				
Lathwood, Dantzic, fm	4	10	5	10	Seal, pale....per tun	46	0	48	
,, St. Petersburg	6	10	7	10	Sperm body	140	0	120	
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Cod	42	0	0	
					Whale, Sth. Sea, pale	45	0	0	
Quebec, white spruce	13	10	21	10	Olive, Gallipoli.....	63	0	64	
St. John, white spruce	13	0	15	0	Cocoanut, Cochin, ton	68	0	0	
Yellow pine, per reduced C.					Palm, fine	40	10	41	
					Linseed	35	10	39	
Canada, 1st quality.	17	0	19	10	Rapeseed, Eng. pale..	39	0	53	
2nd do.....	12	0	14	0	Cottonseed.....	30	0	32	1

METALS.

IRON:—								
Welsh Bars in London .. ..per ton	6	15	0	0	0	0	3½	
Nail Rod .....do	7	10	0	8	0	0	2	
Hoops ..... do	8	17	6	9	0	0		
Sheets, Single ..... do	9	17	6	10	0	0		
Staffordshire Bars ..... do	7	17	6	8	10	0		
ars, in Wales ..... do	5	15	0	6	0	0	3	
Rails ..... do	6	0	0	0	0	0	nett	
Foundry Pigs, at Glasg. No 1 .. do	2	13	0	3	7	0		
Swedish Bars ..... do	10	10	0	12	10	0	2½	
:—								
Swedish Keg, hammered .....per ton	15	16	0	16	0	0		
Swedish Faggot ..... do	10	10	0	12	10	0		
COPPER:—								
Sheet & Sheathing, & Bolts ....per ton	86	0	0	91	0	0	3	
Hammered Bottoms ..... do	96	0	0	101	0	0		
Flat Bottoms, not Hammered .. do	91	0	0	96	0	0		
Cake and Tough Ingot ..... do	76	0	0	0	0	0		
Best Selected ..... do	84	0	0	89	0	0		
Fine Foreign ..... do	86	0	0	88	0	0		
Yel. Metal Sheathing & Rods ....per lb	0	0	7½	0	0	8		
TIN:—								
English Block .....per ton	90	0	0	0	0	0	2½	
do Bar ..... do	91	0	0	0	0	0		
do Refined ..... do	93	0	0	0	0	0		
Banca ..... do	88	10	0	89	0	0	nett	
Strait ..... do	85	10	0	86	0	0		
LEAD:—								
Pig, English .....per ton	22	5	0	22	10	0	2½	
,, Spanish Soft ..... do	19	15	0	0	0	0		
Shot, Patent ..... do	23	10	0	24	0			
Sheet ..... do	21	0	0	0	0	0		
White ..... do	30	0	0	31	10	0		
SPELTER:—								
On the spot .....per ton	22	5	0	22	15	0	net	
ZINC:—								
English Sheet .....per ton	28	0	0	0	0	0		
Devaux's V. M. Roofing Zinc .... do	27	0	0	0	0	0	*	
QUICKSILVER .....per btl	6	18	0	7	0	0		
REGULUS OF ANTIMONY.								
French .....per ton	34	0	0	0	0	0		

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PARIS EXHIBITION, 1867.—The First Part of the Illustrated Catalogue, published in the "Art Journal," will appear in the April Number.

THE ART JOURNAL for March (price 2s 6d) contains: Line Engravings—"Autolycus," after C. R. Leslie, R.A.; "Art Critics in Brittany," after A. Solomon; "The Fish-Market," after R. P. Bonington. Literary Contributions—"The Knights of the Middle Ages," by the Rev. E. L. Cutts, B.A. (illustrated); "Sculptors' Quarries—the Oolites: Bath and Caen Stone," by Professor Ansted; "Modern Painters of Belgium—A Dillens, P. Van Schendel, Madame Geefs," by James Dafforne (illustrated); "Physiology of Binocular Vision," by A. Claudet, F.R.S., with Diagrams; "Historic Devices and Badges," by Mrs. Bury Palliser (illustrated); "Textile Fabrics of India," by Colonel Taylor, &c., &c.
London: VIRTUE and Co., 26, Ivy-lane, Paternoster-row.

NEW COURTS OF LAW DESIGNS.—An Important Descriptive and Critical Article upon these Designs, by an eminent Writer on Architecture, appears in the March number of BELGRAVIA, a London magazine, conducted by M. E. Braddon. Now ready, Price 1s.—Office: Warwick House, Paternoster-row.

SHORTHAND. — PITMAN'S PHONOGRAPHY.—Phonography is taught in class at 10s 6d, or private instruction given, personally or by post, for £1 1s, the perfect course of Lessons. Pitman's Shorthand Teacher, post free 7d. London: 20, Paternoster-row, E.C.

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THE BUILDING NEWS.

LONDON, FRIDAY, MARCH 8, 1867.

THE COURTS OF JUSTICE COMPETITION.

ARTICLE VIII.

AFTER going through five Central Hall schemes it is really quite refreshing to turn to Mr. Garling's plans. Like Mr. Seddon, Mr. Garling seems to think that the site is unnecessarily large, and so he proposes to cut off 35ft. on the Strand side for the purpose of meeting "the additional traffic resulting from the erection of the Courts and Chambers of Law." Of course the difficulty of treating Picket-street had nothing to do with Mr. Garling's line of Strand front, any more than it had to do with the frontage line adopted by either of the site-sacrificing artists. And it is quite as much a matter of course that the genius which could arrange matters so as to return us 17,500 superficial feet of a site supposed by ordinary mortals to be cramped—not to say quite insufficient for its purpose—must be fully equal to the task of covering this area with buildings which should follow the very irregular line of the site frontage, and yet preserve all those characteristics of dignity and unity and lovely change which are essential in order to secure the success of any extensive façade. Such a task would, however, be quite a work of supererogation if, as Mr. Garling and some of his co-competitors say, the site is larger than is wanted. Should it so happen that the judges take a different view, and adopt the opinion that even the utmost limits of the site allowed are manifestly too narrow to permit any architect to perfect his scheme, then we can only regret, for Mr. Garling's sake, that he has not chosen to show his mastery of irregular frontages under a Renaissance aspect rather than his incompetency to deal with Gothic art as exhibited in the alternative design he has submitted. The general arrangement of the court plan may be described as consisting of two pavilion-treated wings, east and west, devoted to the Record and other offices. Between these wings are three blocks of buildings running east and west, deriving light and air from two long but narrow areas, which divide the blocks, as also from sundry small courts, averaging about 16ft. or 17ft. square. In the centre of the central block, and on the street or noisy side of the external blocks, are wide ground-floor corridors of two stories, connected by a cross or transeptal corridor; these corridors open into separate staircases for the legal public and spectators to each court. But on the court floor the whole block is cut up into various rooms, the corridors of communication for judges, barristers, and attorneys, being in a mezzanine floor below. "The Common Law courts are placed *dos-a-dos* on the Strand side of the central corridor, and the Equity and remaining courts *dos-a-dos* on the Carey-street side." "It will therefore be seen that the plan adopted is that of effecting communications by wide corridors rather than by a central hall, as the former system, viz., that of wide corridors, while it affords abundant space for passage and less inducement for loiterers, possesses the most important advantage of all others, viz., that of allowing a far greater space to be devoted to the courts themselves, with their appendages and communications, than could possibly be given by the Central Hall plan, which, however tempting for gaining architectural effect, is useless for business, abstracts from the general plan space which can be more usefully appropriated, cramps and confines the business departments, and affords a place for the assembly of people for simple curiosity and lounging. A central hall, in fact, would be scarcely used, except by loungers and that class whose exclusion from the building is especially aimed at in the instructions; witness the comparatively few people of those actually engaged in business in the courts who are to be seen in Westminster Hall. As a rule, they remain as close as possible to the courts, and my plan gives them the kind of accommodation they particularly require in the recesses attached thereto, which afford ease, light, space, and seclusion from the public. A central hall would be simply a show place for people from the country and foreigners to visit and admire as one of the lions of the metropolis. And, once admit people on any other pretence but business, and a building like this would be overrun with idlers. My corridors provide ample opportunity, being 26ft. and 30ft. wide, for those who wish to walk about; they are also provided with shallow recesses for seats and tables against the windows."

By this plan the public engaged on business in any one court can only get to the other courts by descending to the corridors on the ground floor, whilst the general public or mere spectators in one court have to descend to the basement and go outside the building before they can enter another court. Mr. Garling's plan shows, therefore, that it is not impossible to separate the *oi polloi* altogether from those who have business within the building. As to the method of doing this, there may be difference of opinion, but Mr. Garling has shown that the thing can be done, and, so far, deserves considerable praise. And this is almost the only praise we can conscientiously render him. In nearly all other important points Mr. Garling has signally failed, as, for instance, in the areas between the courts, some of which are less than 20ft. square; in the narrow lanes between the long rows of judges' rooms, where the maximum of light is required, the Common Law lane being about 12ft. wide; in the arrangement of the private corridors, that for the use of the judges being under their rooms, reached by dark staircases, whilst that for the use of the barristers and attorneys is behind the judges' corridor, from which it borrows its light through a "glazed slate partition" (!) Behind this again, and partly under the court, is a hall or vestibule through which barristers, attorneys, and witnesses have to pass to reach the court by their staircases, and in which, also, are placed the telegraph, and lifts for coal and dust. This hall is "lighted" from the barristers' corridor, which, as we have already said, derives its light from the judges' corridor that looks into a narrow lane, and has two stories of buildings above it (!!) It would be waste of time to dwell any longer upon planning like this, the utter badness of which must be self-evident to everyone. In the elevations we confess we recognise more dignity than in some of the other designs. This is especially the case in the western portion of the building, where the two Record towers flank the central group of the façade. But we think the single central tower in the Strand front far from being a happy thought; when we turn to the sections, the *un*architectural nature of the plan becomes very manifest. "The central corridor," says Mr. Garling, "is 30ft. wide and 380ft. long, and upwards of 50ft. in height, dimensions quite sufficient, with its arrangement of arcaded galleries and octagon lantern lights, to produce a striking architectural effect,"—being "striking" no doubt, but the striking effect produced by such proportions is scarcely the sort of effect we look for in architecture, nor under any circumstances could such dimensions be forced into any happier result than an architectural extravaganza.

One word in conclusion to Mr. Garling and architects who, like him, flatter themselves that the fine art we call architecture is only a skin-deep affair, a kind of decorative plastering which may be made to assume the forms of any style, and laid on any system of arrangement or construction. It is so very easy not to know, and requires such an amount of earnest and thoroughly hard work in order to know, that the temptation to deprecate the artistic element and reduce architecture to a second-rate science or to a mere middle-man business, as some do, is naturally very strong to those whose chance in life would be but miserably small were they compelled to follow architecture as artists instead of as Building Act surveyors. There are happily some architects amongst us, who, whatever they may lack, have at least a fixity of purpose in all they think and do, who stick to their colours such as they are, and who, whatever their weaknesses, have at any rate some faith in their mistress, some love of art for art's sake, and some hope for a brighter future. From these men something may be expected; from their earnestness some good outcome is certain; their thought will not be barren in its results. However delicate and weakly the offspring may be at first, offspring there will be; but from men who can flirt like Mr. Garling and others we wot of, who can be so peculiarly minded as to plight their troths to the dark-haired Southerner on Monday and go on their knees to the fair Goldylocks on Tuesday—who can swear fidelity to the Classic Renaissance, and yet allow themselves to be seduced, from commercial or popular considerations, by a mistress to whom they know right well they will not be faithful—from such as these the architecture of the future will never be enriched.

HOME-MADE BRICKS.

SINCE the repeal of the duty on bricks in 1850, the manufacture of bricks and tiles has annually increased until it has become one of the most flourishing industries. Prior to the entire repeal of the duty, the number of bricks manufactured in this country was much smaller than it is at present. The duty was of the most oppressive character; and our Legislature was by no means anxious to give an impetus to the trade by repealing the obnoxious impost. An act passed in the reign of George III. ordered that bricks made for sale must be 8½in. long, 2½in. thick, and 4in. wide, and the penalty in case of departure from this enactment was the fine of £1 for every thousand bricks produced, and proportionably for a greater or less number. The act also provided that the size of the sieves or screens for sifting or screening sea coal ashes, to be mixed with brick earth in making bricks, should not exceed ¼in. between the meshes. In 1821 the number of bricks for which duty was paid was not quite 900,000,000. Year by year the numbers gradually increased, until in 1847 they reached 2,193,829,491. In 1849 there was a remarkable difference in the number for which duty was paid. In that year the repeal of the tax was strongly urged, and the agitation promised such success that the erection of a number of large buildings was delayed, and as a result the quantities of bricks manufactured was about one-half of those made in 1847. In 1857 we find that the returns of bricks, tiles, pipes, &c., manufactured in England, Scotland, and Jersey, show that over 2,500,000,000 of bricks were made, the estimated market value of which was £2,911,980. 55,000,000 of these bricks were made in Scotland, and about 5,500,000 in Jersey. Manchester and London seem to compete with each other in the manufacture of this building material; but, as is well known, bricks are sent to the metropolis from a circuit of at least one hundred miles. We are not able to state the number of bricks now manufactured, nor do we know that any computations have been made of late years. In Professor Hunt's mining statistics, published in 1860, in the volume entitled "Memoir of the Geological Survey of Great Britain and the Museum of Practical Geology," it was estimated that the annual mineral produce of the kingdom was £39,221,007, of which £7,954,075 was placed to the account of the value of the earthy minerals. The value of the unmanufactured

clay, including only the superior kinds of clay, and embracing china stone, was £285,846, and

Bricks, tiles, &c. (estimated at the cost of production)	£2,911,980
Building and other stones	4,622,924
Sands	10,250
Coprolites	65,500

Of course this estimate, as the compiler acknowledged, can only afford an approximation to the truth; but it is valuable evidence, as it was computed from extensive, and, as far as could be, accurate facts received from all parts of the kingdom. From these tables we gather that the highest returns of bricks made are from Lancashire, which is computed at 108,000,000, valued at £129,000. Middlesex follows in the number of bricks produced, then Yorkshire, then Northumberland and Durham combined, then North Wales, South Wales being not far behind, while all the other returns were in value below £100,000 each. A paper read at one of the meetings of the Society of Arts a few years ago stated that, taking bricks at the low average of three tons per thousand, the average make exceeds in weight 5,400,000 tons, and the capital employed must be upward of £2,000,000 sterling. This, however, is probably considerably under the mark.

Brick clays are widely spread, and are consequently very available for use. There are three kinds of this earth—loams, or sandy clay, which is the best material for this purpose; plastic clay, composed of alumina and silica in different proportions, and containing a certain small percentage of other salts, as of iron, lime, soda, and magnesia; and marls, of which there are three kinds, clayey, sandy, and calcareous, according to the proportions of the earths of which they are composed, viz., alumina, silica, and lime. The less lime contained in the clay the more useful it becomes to the brickmaker. Marls are exceedingly suitable for common bricks. It is not possible to give a trustworthy generalisation of the constituents of clays, because they vary from each other considerably. Mr. Humphrey Chamberlain has given the following as a fair notion of what should be the proportions of the ingredients of a good brick—viz., silica, three-fifths; alumina, one-fifth; iron, lime, magnesia, manganese, soda, and potash forming the other one-fifth. Professor Ansted states that there should not be more than 2 per cent. of lime or potash. The admixture with sand is necessary, but the proportions of each admit of great variety. The valuable essay, written, we believe, by Mr. Tredgold, in the "Encyclopædia Britannica," tells us that no mixture of alumina and silica, in any proportions whatever, can be fused by the strongest heat which can be raised in our furnaces. "Hence such mixtures are best adapted for making fire-bricks, crucibles, and glass house pots. Stourbridge clay is such a mixture, blackened by coaly matter." Indeed, Stourbridge clay is a slate clay belonging to the coal formation, and contains coaly ingredients. "Neither can a mixture of lime and alumina be fused, in whatever proportions the ingredients be mixed." But, as we have intimated, a mixture of the three ingredients is very fusible. Of course the clay must be free from large stones, and it is found that the mealy state of the silica is injurious to the quality of clay used in the manufacture of bricks. Professor Ansted observes that a sensible quantity of iron, lime, and potash would not be a good sign in a brick clay, "for too much of any of these substances would cause the brick to run into glass when left in the kiln to burn. By this burning process the clay loses some of its properties, amongst others the capacity of mixing with water and its plasticity. It becomes permanently hard, not softening in water, though absorbing it readily." Common clay and limestone or chalk is considered to be a durable mixture, and the best proportions are three parts of clay and one of calcareous earth in powder. Fire-clays and marls shrink in drying and burning at least 1 to 15 per cent.; this is corrected by adding sand, loam, or chalk; the London brickmakers using for this purpose ashes or breeze. In working a bed of clay it is necessary first to ascertain its contraction in drying and burning, then to arrange what will be the least expensive mode of correcting the excess. All clays, observes Mr. Chamberlain, burning red contain oxides of iron, and those having from 8 to 10 per cent. burn of a blue or almost black colour. Hence certain bricks, those especially from Staffordshire, are coated by a metallic substance given to them in the kilns. Such bricks, however, are particularly suited to heavy engineering works, for docks, canals, railway bridges, and viaducts.

An interesting history might be written of the chemical investigations that have been made into the nature of clay, and the opinions which have been held on this subject. Hellot, Pott, Baume, Macquer, Margraaf, were among the earliest experimenters; but it has been reserved to modern chemists to not only complete their facts, but also to place the whole subject before us in a more satisfactory state. The number of patents that have been taken out for improvements in the manufacture of bricks cannot be fewer than 300, and the machines are too numerous for us to describe. They are principally pug-mills, wash-mills, and rolling-mills. The pug-mill cuts the clay with knives as the mill is being worked, mixing it so that it may present a homogeneous mass. A very recent improvement in this mill—patented by Mr. G. Johnson—places the knives on the same axis as that which carries the screw employed for forcing forward the stream of clay through the moulding dies. It is arranged that the portion of the outer casing in which the screw works shall be of smaller diameter than that part of the casing in which the blades of the pugmill work. According to the patentee's statement, the exit end of this contracted portion of the mill is enlarged into a bell, the end of which is closed by a fixed plate which carries a bearing to receive the end of the shaft of the pug-mill; on one side of the bearings of this shaft is placed the moulding die through which the clay is expressed. The benefit arising from this part of the improvement is, that the stream of clay is not divided by the bearing of the pug-mill shaft as it is when the moulding orifice is placed opposite to the centre of the shaft, as is the case with other machines. The pug-mill should be worked in combination with the rollers, without which stones and gritty matter cannot be extracted or crushed. In Mr. Johnson's machine two rollers are placed at the top of the mill, which rollers are driven from a wheel on the pug-mill shaft. Unless the stones are extracted or crushed, the clay will crack, and thus the brick will be faulty, and be liable to great waste from breakage.

Professor Thomson has recently called attention to the great loss of heat which occurs in the ordinary modes of burning bricks in common kilns. This loss he explains to be two-fold. "First, during the burning of the bricks, the air which has passed through the fuel, or among the heated bricks and the smoke, including gaseous products generally, passes away from the kiln to waste at a very high temperature, even at a red heat, during a considerable part of the process. Secondly, when the bricks are raised to the high temperature required to burn them, and render them permanently hard, the great store of heat which they contain is entirely thrown to waste while they are left to cool." Two German patentees have improved upon the existing kilns, and these improvements have been adopted with considerable success by Mr. Moore in a brickfield near Belfast. A description of this new kiln appeared in the Building News of last year, p. 189.

An acre of land, if we include the ashes which are mixed with the earth, will yield about one million bricks for every foot in depth. A clamp contains from 100,000 to 500,000 bricks. The late Mr. C. H. Smith, who was one of the best-informed writers on practical subjects, once stated at the Institute of British Architects that he did not consider any machine could make good bricks unless it had some fit and proper method of putting a sufficient quantity of good hard sand on the surface of the article while the clay was in a plastic state. Mr. Smith believed, for the following reasons, that the sand, being quartz or siliceous grains, performs a more important part in the manufacture of bricks than that of merely preventing the clay from adhering to the mould. "First," he says (in a letter addressed to one of the secretaries of the Institute), "in the process of burning, the flinty sand forms a chemical union with the potash or soda of the clay, for all clay contains more or less of alkaline matter in its natural state. This vitreous connection fixes the sand firmly to the surface of the brick. Second, in a building the lime attaches itself securely to the sand, which is already fastened to the brick in the same manner that good sharp, siliceous sand, mixed with a certain quantity of quick lime, after a lengthened period, will become hard, solid mortar." From these facts Mr. Smith concluded that if brickmakers did not put a coating of sand on the bricks there would be no cohesion between the bricks and the mortar. When an accident does occur, however, it is invariably the fault of the mortar, and not of the bricks, although, as Mr. Smith pointed out, it was difficult to speak of bricks without speaking of mortar, since the one was of no use without the other. Mortar will not sometimes adhere to the bricks because the latter are used in too dry a state, while such is the imperfect way in which bricks are frequently made that they will absorb large quantities of water. They therefore swell within a short time, and unfortunately the walls will sometimes fall down. A case occurred a few years ago in which the foundations, after the accident, were found to be in perfect order, but the bricks having expanded the wall fell. Of course brickmakers should produce bricks that are non-absorbent, and which, at the same time, will adhere to good mortar. Mr. Dines once stated that he knew a case of expansion to the extent of ⅝in. in 90ft.

Mr. T. Mellard Reade, in a letter written to a contemporary, states as the result of his experience that dense non-absorbent materials create cold, damp, and uncomfortable dwellings. Even best Staffordshire blue brick is not so dry as ordinary bricks. One reason for this is that mortar is a very absorbent material, and the brick having but small capacity for moisture the joints soon get saturated after rain, and communicate their dampness to the internal plastering. But with common bricks this is not the case, since they absorb the superfluous moisture that may come through the joints; and the same amount of water being distributed through a larger area of material it is not so appreciable. The air, when it begins to act on the external surface, dries up the moisture far more rapidly than in the case of a dense, non-absorbent material. "I know from experience," observes Mr. Reade, "that in a wall built of Penmaenmawr stone it is next to impossible to prevent the water striking through after a driving shower of rain, however good the mortar and pointing may be. I have seen a 2ft. 6in. wall, one side of which was protected by an open shed, after a heavy day's rain, literally as wet on the inside as on the out. The water appears to travel and spread itself over the entire surface of the stone, irrespective of pointing, even if done with oil putty. Very likely the smooth surface and imperfect combination of the mortar and stone facilitate this by capillary attraction, and the same result must follow, in a greater or less degree, the employment of any smooth, non-absorbent material." Density, Mr. Reade further states, is no proof of non-absorbency, since cork and india-rubber, though light substances, are least absorbent. Pressed brick is denser than common

hard-burned brick, and yet is far more absorbent, "and anyone may trace the headers in a 9in. wall faced with them by the damp in the plaster around them." Then again, sandstone, though denser than brick, nevertheless absorbs water more rapidly. A through stone in a brick wall will soon conduct the damp to the inside of a house. We have some more information for our readers on bricks.

SCREW PILES IN THE CONSTRUCTION OF A WROUGHT-IRON GIRDER BRIDGE AT VERONA.*

BEFORE proceeding with the subject given in the above title the writer begs to apologise for the imperfect manner in which it has been treated, on account of the limited time at his disposal and the want of various diagrams and other data which were left with the owner of the property. The present is therefore simply a report of certain peculiarities in the mode of driving screw piles called forth by the exigencies of the situation, and not a scientific discussion of the principle; although, from its importance in modern engineering, this subject would well deserve a careful treatise, which the writer hopes to see brought before this society at some future time by abler hands. In the latter part of the year 1862, the writer was engaged by an enterprising English gentleman, residing in Italy, to erect an iron girder bridge across the River Adige, at Verona, a town of about 60,000 inhabitants, in Northern Italy. The bridge was built by the gentleman in question at his own expense, and as a speculation, the corporation of the town guaranteeing him the tolls for a certain number of years. In order to render the subsequent descriptions sufficiently intelligible it may be advisable to give a short account of the nature of that river and the general features of the surrounding country.

Description of the River.—The Adige takes its rise in the snow-clad mountains of the Tyrol, and flowing down their southern slopes, waters the Venetian territory, emptying itself into the Adriatic Sea. The town of Verona is situated at the foot of these mountains, which, so far, are steep and precipitous, but run out immediately above the town into a wide and fertile plain. From its geographical position, Verona was already under the Roman empire an important strategical point, as being the key which opened one of the few then practical Alpine passes into Italy, as many magnificent ruins, amongst which is also an ancient Roman bridge of three arches, testify.

Within the memory of man the steep slopes of these mountains were clothed with luxuriant forests of oak and larch timber, whereas now they present only rugged, naked rocks, destitute of soil. The great demand in modern times for this valuable timber for shipbuilding and still more for railway purposes, and the short-sighted cupidity of the proprietors, unchecked by an efficient forest police, have been the cause of incalculable devastations through floods, which tax all the engineering skill of the country to repair their damages, though often in vain; and the writer has been assured by residents in the place that they remembered the time when floods would take a couple of days to arrive in the plains which now reach them in as many hours.

Choice of Piers.—There are in all engineering operations two important elements, which, if they happen to be in abundance, render even the most difficult works comparatively easy; these are time and money. Both these commodities, however, especially that of time, were in the present case of a most limited character, in as far as the general designs of the bridge had been approved by the corporation, and the abutment walls actually built, before anything was decided as to the description and dimensions of the piers, which, if of stone or brickwork, ought to have been commenced in winter time, when the water was low. In this emergency the writer, when applied to by the proprietor, turned his thoughts to screw piles, as being both the readiest, cheapest, and, in the present case, also safest, substitute. The bridge itself is 246ft. long between the abutments, and is divided into three equal spans of 82ft. each. There is a carriage way 19ft. 8in. wide in the middle between the two longitudinal main girders (which are constructed on the Warren principle), with two outside footpaths 5ft. 6in. wide, protected by an ornamental hand railing. The screws and piles were furnished by Mr. George Wells, well known in the profession as having a most extensive practice and experience in this branch of engineering.

It may easily be imagined that, in order to ensure success, the nature of the ground would be previously examined, so as to determine the diameter and pitch of the screw accordingly. This was done, but in an imperfect manner only, and only one trial boring was made close in shore, where a quantity of rubbish had covered the real bed of the river to a considerable depth. The report from the town engineer ran therefore as follows:—"The borings have been made near the city quay, but, according to all appearances, there is no doubt that they would give the same result over the whole section of the river, the greatest being calcareous gravel, compact and containing porphyritic stones (boulders), which vary in thickness from 1½ft. to 2ft., and is all one may wish for a foundation."

Whether the porphyritic stones were all one might wish for a foundation for sinking screw piles may well be questioned.

Description of Screw.—In anticipation of meeting with said boulders, the writer applied to Mr. Wells for advice, which that gentleman gave in the following injunction:—"Should the screw happen to come on one of the boulders, the pile must be drawn over to a sufficient angle to clear the stone, and when so cleared it is screwed down a foot or two, and drawn over at a similar angle in the opposite direction, again screwed down a foot or two and then drawn vertical; and it will be found that the pile is in the same position as when first pitched."

Mr. Wells proposed that the screw should be made 2ft. in diameter, but the proprietor, who possessed no engineering knowledge, and from his residence at Venice was accustomed to the soft mud of the lagoons, could not be persuaded that this would offer sufficient bearing surface, and insisted upon a diameter of 4ft. They were accordingly sent out of this size, with pitch 6½in. Each pier consisted only of two piles, each under the centre of its main girder. The weight on each screw amounted to about 80 tons, including the test load, viz., one span with platform and all the ironwork complete weighed 80 tons, and the test load on the same span amounted to 80 tons more, being, according to the requirements of the Austrian military engineers, at the rate of 96lb. per square foot, distributed equally over the whole surface. This made a total of 160 tons on one span, and half that, or 80 tons, upon each screw.

Description of Piles.—The piles were at first proposed to be hollow pipes of cast iron, 18in. outside diameter, and as they were exposed to the danger of trunks of trees, barges broken loose, and other heavy substances being dashed against them in time of floods, they were to be protected by timber raking piles or struts in front. But as it was not unjustly considered that a structure entirely of iron, protected by timber, would not only be unsightly, but also an incongruity, Mr. Wells proposed solid forged wrought-iron piles 8in. in diameter, in one piece, viz., 37ft. long. This alternative was at once accepted, and Messrs. Hawks, Crawshay, and Sons, of Gateshead, were entrusted with their execution. As specimens of beautiful forging they might have challenged anything of a similar description, being perfectly straight, smooth, and without a flaw. Each pair of piles was braced together by horizontal and diagonal cross bracing of T-iron 5in. × 5in. × ⅝in., these being bolted to clasps going round the piles. On the top came cast-iron caps carrying the base plates on which the girders rested.

As a pillar 8in. thick with a length of over fifty diameters supporting a weight of 20 tons was never seen before in that country, the incredulity about their ability of sustaining the superincumbent weight was universal, and, in fact, the eye is so much accustomed to the proportions derived from the ancient architect of columns of from 10 to 12 diameters in height, that any deviation from this standard appears preposterous. Nevertheless it will be seen, when Professor Hodgkinson's formula upon the resistance to crushing in pillars is applied, that there is an ample margin between the actual and the breaking weight. If we denote the diameter of the pillar in inches by d, its length in feet by l, and take his co-efficient for solid cast-iron pillars as 84·16, the formula is $14{\cdot}16\left(\frac{d^{3\cdot6}}{l^{1\cdot7}}\right)$ and in this we have therefore $14{\cdot}16\left(\frac{8^{\cdot31}}{27^{1\cdot7}}\right)=$ 87·5. This multiplied by 1·745 for solid wrought iron we obtain 152½ tons for the breaking weight. We have, however, assumed here that that part of the pillar which is held in the ground may safely be taken as so much support, and as the lowest depth to which the piles were screwed was nowhere less than 10ft. in hard ground, this height was deducted in the calculation from the total length of 37ft., reducing it to 27ft. equal to 40 diameters. That this assumption was not incorrect is proved by the result, the piles having supported, without failing, not only the total load of 80 tons during three days, but the constant passage of regiments of soldiers and trains of artillery, and, according to the last accounts the writer received, no change has taken place after rather more than three years' wear.

It has to be borne in mind, moreover, that the diagonal and horizontal bracing of the two piles connects both so firmly as to increase their bearing power considerably, although experiments are wanting to determine this addition. Nevertheless, it may be safely assumed that the two piles connected will bear more than the load borne by each pile independently.*

* Read by Mr. J. J. HORNER, before the Society of Engineers, March 4, 1867.

* To be concluded in our next.

ROYAL ARCHÆOLOGICAL INSTITUTE.

AT a meeting of this society held on Monday last, the Hon. W. Owen Stanley, M.P., and V.P., in the chair, a paper by Mr. Edward Blore was read, relating to Wattlesborough Castle, Shropshire, and the surrounding earthworks. With the exception of the tower, which has all the characteristics of a Norman keep, there are but small remains of the original building. These were described in detail by the writer, and their extent and character shown by drawings. They were the subject of many comments.

An article on "Stone Roof Tiles of Roman Date," by Professor J. Buckman, F.G.S., was then read. This was accompanied by a fine example, split from one of the lias beds of the county of Somerset, in the form of an irregular pentagon, and weighing 10lb. The writer referred to the tiles found in Corinium and in several of the western counties, and treated of their geological structure and adaptability for roofing purposes. Mr. Octavius Morgan, M.P., referred to the tiles found at Caerwent: the specimen shown was of peculiar form. Mr. J. Yates spoke generally upon the forms of Roman tiles and roofs, and of the Bodini, who inhabited the western counties, and were tilers.

Some remarks upon the effigies at Fontevrault, by Mr. Albert Way, were then read. They referred to a portion of the *Times'* French correspondent's letter describing the agitation existing throughout Anjou at a proposal to deliver up to the English Government the effigies in question. Mr. Way suggested the consideration of the propriety of ascertaining if such a request had really been made by our Government, and of expressing some opinion upon such a course. Upon this Mr. Morgan, M.P., Sir Thos. Winnington, Bart, M.P., and other gentlemen, strongly condemned such a proceeding as subversive of all the right principles for the conservation of historical monuments. In this opinion the chairman concurred, and the meeting assented cordially to a resolution to that effect.

Mr. J. Death furnished an account of an examination of the drainage of the Abbey of Waltham, undertaken by him in consequence of the reported existence of a subterranean building concealing images and statuary. These, of course, were not found, but some peculiarities in the construction of the drains were observed and noted during an hour's subterranean ramble.

Upon the tables were exhibited by the Rev. J. Beck two fine specimens of German camp kettles. They are of Nuremburg work, and one was the spoil of the Thirty Years' War carried into Sweden by Gustavus Adolphus. They are replete with ingenious arrangements for cooking various articles of food, and are coarsely ornamented.

The Chairman gave an account of the discovery of a remarkable urn of the British period, at Heriri Mons (Merioneth). It enclosed human bones and a wooden bodkin of singular form, with which the cloth enveloping the body had, perhaps, been fastened. Also a Roman lamp and ring, found with objects of a later period at Carnarvon (Segontium).

ELEMENTS OF ENGINEERING.

Docks.—No. 2.

In order to determine upon the site of proposed docks there are a variety of considerations to be taken into account. The nature and position of the trade to be accommodated fixes its locality, but at the same time affords an ample range for selecting either a good or bad site. The character of the ground and the nature of the subsoil is of paramount importance, as of all other works a dock requires a firm and substantial foundation. Owing to the great length of its side walls and their comparatively excessive weight, the slightest settlement is at once apparent, and produces at the least an amount of distortion which completely spoils the line of the wall, if it does nothing worse. While it is a duty to select that site offering the greatest advantages for erecting the walls of the dock upon, yet it is not so much a question of the actual character of the ground as of the best means of building upon that ground, supposing it were impossible to obtain any but of an indifferent or bad description. In selecting the site for a dock, the means of obtaining entrance to it and the position of the entrances must be carefully ascertained with respect to the winds prevailing at the locality chosen. When the question of building docks at Sunderland, which now ranks as the fifth port in the kingdom, basing its claims upon the average tonnage of the ships frequenting it, was first agitated, several smaller docks were established. In one of these, by some error or oversight of the designer, the entrance was so much exposed to the violence of the sea during easterly gales that it was dangerous to open the gates and allow vessels to pass in and out. One of the first steps is to have accurate soundings taken in the vicinity of the proposed docks, and to examine carefully the bottom with respect to the existence of shoals or any impediment to the free action of the waterway. Borings must also be made at frequent intervals, especially where the foundations are to be placed. The character of the anchorage or holding ground must be accurately ascertained, and if there is any doubt on this subject, its holding power had better be tested by actual experiment, which can be readily effected by a small steamer. A dock should, if possible, be so situated as to command not merely the greatest possible amount of water traffic, but should also possess every facility for inland communication on a large and rapid scale. If there are no roads or railways to its proposed site, the engineer should take care to be well assured that such indispensable accessories to it should be capable of being added at a moderate outlay. There is generally some kind of a road in the vicinity of every spot where a dock can be built, since the traffic there is the cause of a dock being constructed, and there must therefore have been some means of communication before with the more inland portion of the country. But in nine cases out of ten, large improvements, alterations, and extensions, amounting virtually to new constructions, are always necessary to establish a proper route for the traffic to and from newly-built docks. The question of railway accommodation may be safely left to the company possessing a line nearest to the proposed works, as they will speedily discover whether it is to their interest or otherwise to make a branch to accommodate the ship traffic. The great point to aim at in laying out docks is, that the entrances—for there are often more than one—should be easy of access, affording every convenience for the ingress and egress of vessels, and yet at the same time well protected from external influences. The rise of the tide and strength of current must be duly found and registered.

As all docks, whether wet or dry, are intended to constitute a shelter for ships, where they may be secure from all the dangers and hazards that attend them in the open river or sea, they are necessarily situated in close proximity to the open sea or navigable rivers. The general disposition of wet docks and their relative position are well shown in fig. 1, which represents a plan of the manner

FIG 1.

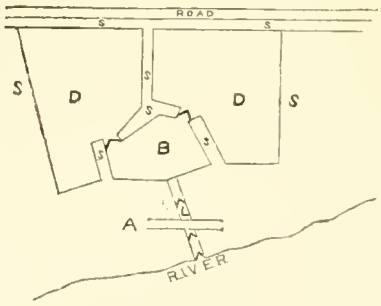
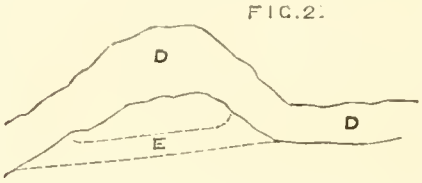


FIG. 2.



in which docks are usually laid out with respect to the avenues of communication surrounding them, and, in fact, indispensable to their success. Towards the top of the plan is the road or main artery of connection with the inland territory. D D are the wet docks, which are frequently divided into import and export docks, the relative size of which depends upon the preponderance of either description of commerce. The basin B communicates with the locks by gates opening inwards, as shown in the plan, and also by the same means with L the entrance lock, which, in its turn, communicates with the river. A bridge A takes the road running down to the river side over the lock L, and is either constructed on the swing principle, or made to draw horizontally backwards and forwards, to allow ships to pass in and out. The stores, sheds, shops for carrying out small repairs, and other buildings always attached to a dockside, are designated by S, and completely encircle the docks on every side. Besides the gates, wet docks are connected together by sluices or culverts, built in their walls near the bottom, for the purpose of scouring and cleaning them out, as in some situations mud and silt accumulate rapidly. Dredging machines and dredging boats are also used for the same purpose. Lock gates that open seawards must be protected from its action by breakwaters of rough stone or rubble work. Tidal docks, such as exist at Dundee, have no gates, and are left dry by the tide. The consequence is, that a dredge is incessantly at work removing the accumulating deposit of mud and marine *débris*, which never appears to decrease, in spite of all the efforts made to reduce its quantity. There are instances where the bed of a river has been made available for the erection of docks at a considerable saving in excavation, and the course of the river diverted into another channel. The advantage of this method, which, however, is not often feasible, will be seen on an inspection of fig. 2. The original course of the river is shown by D D, but by cutting a new channel E, represented by the dotted lines, the old bed can be used for building docks in. The new channel need never be more than a third or fourth of the width of the old part utilised, so that the economy of turning this opportunity to account, when it does occur, is at once manifest. As an instance in point, it may be mentioned that the new docks at Bristol were situated upon a site obtained in a somewhat similar manner. The course of the River Avon was diverted into another channel, and the old bed rendered available for the purpose required. It is not absolutely necessary for wet docks to have an entrance basin between them and the river to which they are attached. The Commercial Docks, London, have no basins, but as a rule they form an appendage to the construction.

The site of the proposed works being finally determined upon, the necessary plans and estimates lodged at St. Stephen's, and the act obtained, there is nothing further to retard their execution, provided always the real obstacle is conquered—viz., the money difficulty. The funds being adequate and available, the work may be commenced in earnest. More frequently than otherwise, it happens that the time for preparing the preliminary Parliamentary plans and sections is barely sufficient for procuring the amount of information required to pass the bill, much less for obtaining that thorough and full knowledge of all the bearings of the case which, although not absolutely necessary for proving the feasibility, utility, and value of the proposed work, yet is absolutely indispensable when the work comes to be constructed. As with railways, so with docks and all other similar works carried on under the sanction of Government, there is a great difference between the Parliamentary and working plans. Moreover, during the passing of a bill many new opinions are brought to light and fresh suggestions offered, which deserve consideration, especially if the bill be opposed; and the whole concern wears a different aspect. Again, alterations are constantly, and in fact must be, introduced during the progress of the work, as a variety of contingencies arise which could not be foreseen, and must be dealt with specially according to the particular circumstances of each individual case. It is, therefore, incumbent upon the engineer, after his Parliamentary triumph—and it is a fair cause for professional gratification to pass a bill through Parliament in the face of a vigorous and bitter opposition—to carefully re-examine the ground, to give all due consideration to opinions that have been expressed on this or that point, even if at variance with his own, and to neglect no precautions to ensure the success of the work he is engaged upon. For this purpose, fresh borings should be made and carried down deeper than before, the strata tested geologically, and a careful search instituted for the appearance of any faults or landslips, evils which if not discovered at the commencement are next to impossible to cure afterwards, except at an enormous cost. The watertight nature of the under soil must be investigated, and the average depth to which the foundations, whether piles or otherwise, must be carried down carefully ascertained. All these points duly attended to, the working drawings and estimates can be commenced, the contract let, and the excavation, which is one of the first steps, begun. Previously to undertaking the excavation, however, a cofferdam must be generally made to keep out the tidal waters. If the dock be far from the river, so that a mass of watertight earth lies between it and the river, the dam is not needed, except when making the entrances. As, however, in many instances a dam is needed, we shall give in our next article a description of a few of the best examples of dams for the purpose, although it would be foreign to our intention to describe these constructions at length. Still, as our subject embraces cofferdams, which are in fact an essential temporary element in the erection of docks, our articles would not be complete without some notice of them.

At the meeting of the Society of Engineers held on Monday, the 4th inst., W. H. Le Feuvre, president, in the chair, the following gentlemen were balloted for, and duly elected:—Members: G. Thorneloe, D. D. Sutherland, W. Waring, C. Comes, F. Rummens, F. S. Gilbert, J. Walker, A. Louch, H. M'Colley. Associates: J. S. Nightingale, J. Holmes, F. Brickwell, A. Maclure, jun., S. Flavel, jun., G. W. Harris, J. Waddell, E. Parry, R. Jacques, L. D. Burn, T. K. Holmes, W. Featherstonhaugh, J. C. Rees.

Archæology.

ENGLISH MERCHANTS.

"English Merchants" is a title very likely be passed over by archæological readers, unss their attention is specially called to it. We sh, therefore, to call special attention to Mr. R. Fox Bourne's book, under this title,* and say that it enters at some length into the ediæval history of English commerce and glish merchants. It is a subject full of erest to the archæologist and of importce to the historian. It includes the history the mediæval towns, such as London, istol, Exeter, Norwich, Lynn, Hull, Lin-n, York, and a hundred others, which were tely cities when Manchester and Liverpool, d Leeds and Sheffield, were hamlets amidst e northern moors or insignificant fishing lages. Parker's "History of Architecture" es us some general idea of the architectural uty of these mediæval towns, their streets ed with the houses of wealthy citizens, th ample gardens at the back, with numeis guild halls, and still more numerous urches and chapels, and, it must be adtted, with a good deal of poverty and alor, enclosed within the embattled walls d gate towers. The subject includes the tory of the mediæval guilds and corporatns, and the whole commercial legislature the middle ages. It includes the history l rise of the commercial middle class in gland into wealth and political importe; and it involves also the system of ional finance in the days of the Plantagenets d Tudors. Mr. Bourne has bestowed conerable research upon the subject, and rds us a very interesting sketch of it; but most interesting part of his work consists his biographical sketches and anecdotes of inent mediæval merchants. It will be new many people to know that commerce was ld in such high reputation as it was in the ry palmiest days of mediæval chivalry; that lets of good families entered into it even ener than in these days; and that individal merchants commonly attained such alth and power and political importance as ey did. Sir John Crosby's house still reins in Bishopsgate, to show what kind of yn house a great merchant of the fourteenth ntury lived in; and his history in the first mber of the Middlesex Society's Transacns will tell how he was the friend of alty, and intermarried with one of the blest houses in the land. Mr. Bourne tells how the De la Poles created Hull, and roduced there in their extensive works for e beautification and fortification of the town e Low Countries' fashion of building in ick. His lives of Miles and Colston of istol, and of the Greshams of London, and others, give us very interesting information out a branch of our history of which little popularly known, but whose knowledge is least as important to a comprehension of e history of the English people as that of e wars and alliances of its kings and bles. The biographical sketches are brought wn to the Couttses and Hoares of modern ys; and the whole series will be found full information and interest.

FOLK-LORE OF THE NORTH OF ENGLAND.

ITIL the present generation the North of Engd was in a much more primitive social condin than the South. The language was an older m of English; accent, words, modes of expresn, proverbial sayings, long obsolete in the south, re still in use there; old sports and customs re still in common use there which had long en unknown here; social habits and the whole manner of life were of an older fashion. The rise of the commercial importance and consequent wealth of the north, the influx of population from all quarters to the great manufacturing districts, the increased facilities of locomotion, have tended to sweep away the old fashionedness and provincialism of the north, and in the process much that was of antiquarian interest has been necessarily swept away also. We should be foolish to regret it; but we may rejoice that, before these interesting traces of the past life of the people have altogether disappeared, more than one antiquary has set himself to the task of collecting and recording all that was of real value. Two of these collections are now before us. We will notice first, as taking the wider scope, Mr. Henderson's "Notes on the Folk-lore of the Northern Counties of England and the Borders," to which Mr. Baring Gould has added an appendix, "On Household Stories."* The book is an interesting and pleasant *melange*, which we can recommend to our readers. Some idea of its contents will be gathered from an enumeration of the subjects which occupy its eleven chapters:—1. The life and death of man; 2. Days and seasons; 3. Spells and divinations; 4. Portents and auguries; 5. Charms and spells; 6. Witchcraft; 7. Local sprites; 8. Worms and dragons; 9. Occult powers and sympathies; 10. Haunted spots; 11. Dreams. The book abounds in facts and anecdotes full of general as well as archæological interest.

The second collection before us is an interesting little volume entitled "Lancashire Folk-lore: illustrative of the Superstitious Beliefs and Practices, Local Customs and Usages of the People of the County Palatine," compiled and edited by John Harland, F.S.A., and T. T. Wilkinson, F.R.A.S., has just been published. It is valuable as the first collection of the folk-lore of a county rich in this material. A mere enumeration of the titles under which its varied contents are classified will show its character better than an elaborate notice. The first part—Superstitions, &c.—includes Alchemy, Astrology, Bells, Bellane Fires, Boggarts (*i.e.*, ghosts or goblins), Charms and Spells, the Devil, Demons, Demoniacal Possession, &c., Divinations, Elves and Fairies, Magic and Magicians, Raising the Dead, Miracles, Omens and Predications, Relics, Wells and Springs, Witches and Witchcraft. The second part comprises numerous local customs and usages at various seasons, as the great festivals of the church and others, at Easter, Whitsuntide, Mayday, and Christmas, with sundry peculiar eating and drinking customs; as well as those marking the three great events of human life—Birth and Baptismal, Betrothal and Bridal, and Dying Death-bed and Funeral Customs. To these are added Feudal Customs of Manors in Lancashire, Farm Celebrations, &c. Of course there are various traditions connected with the building of churches, in which angels, goblins, &c., seemed to have turned masons or iconoclasts.

The excavations in Smithfield continue to turn up a quantity of broken Roman pottery, but nothing of importance has been found since the pavement whose discovery we recorded three weeks ago.

At the works in connection with the pulling down of the ancient parish church of Stanhope in Weardale, several stone coffins have been discovered. The Rev. Canon Greenwell, the celebrated archæologist, of Durham, visited the place on Friday last, and inspected these relics of a former age—the thirteenth or fourteenth century, the period named by Mr. Greenwell as the probable date of interment.

Archæologists will learn with pleasure that the well-known antiquary Mr. Trollope, the Secretary of the Lincoln Society, has just been promoted to the archdeaconry of Stowe. It is only a short time since his friends presented to Lincoln Cathedral, as a testimonial of respect of him, a pulpit, which is probably the finest and most sumptuous in England.

A very interesting discovery of a large monumental stone was made in the burial-ground of Abbey Holme, Cultram, while digging for a grave the other day. The stone in question was struck about 2½ft. below the surface, being the basement of the south side of the old chancel. The place where it lay has remained undisturbed for hundreds of years, except by the fall of the old tower on January 1, 1600, and it is believed that to this is owing the fracture of one end, the whole weight of it falling in that direction. It consists of a solid block of freestone 6½ft. by 3½ft., smoothed and carved, with an elaborate border and a floriated cross, surmounted with an abbot's crozier and rosary. On the left-hand side is the cross of the abbey, and on the right the lion-rampant of Scotland, thus pointing to the connection of Cumberland with Scotland in the reign of Stephen, the abbey having been founded by the Scotch Prince Henry in the year 1100. Round the border is a Latin, inscription in the contracted monkish form and old letters of the period, which can be traced as follows:—"Gulius Vyckar, Abbass * * (here follows a number) de Holme Coltran, cujus an: propietur Deus. Amen," which may be rendered, "William Vyckar, * * Abbot of Holme Cultram, to whose soul God show mercy. Amen."

At the meeting of the Cork Archæological Society on the 13th ult., Mr. Robert Day, jun. exhibited a wedge-shaped pierced stone hammer weighing 6¼lb., which was found by James Walsh at Ballynamaddy, near Ballymena, from whom it was purchased; it measures 6in. in length, 4½in. wide, and is 3½in. thick, is made of hard sandstone, and is well preserved. A much smaller hammer of the same type made of hornblende. This was found at Clough Castle, County Antrim; has a polished surface, and great care must have been bestowed on its manufacture, as both in form and finish it is equal to any which have hitherto come before the society. Another of similar material, round at both ends, from Kilrea, County Antrim; and a curious diamond-shaped stone implement not pierced but similar in outline to a hammer figured in the *Ulster Journal of Archæology*, vol ix., p. 236. This is also from the county Antrim, and was found in Ballybeg bog, near Bellaghy. An implement resembling it, found at Ardnahue, near Carlow, is now in the collection of Mr. Spong, of that town—*Vide* "Transactions of the Kilkenny Society," vol. v., new series, p. 119, where it is figured.

It often happens that the valuable archæological material, whose accumulation has occupied the leisure of half a lifetime, is dispersed or locked up and forgotten at the collector's death. A better fate has awaited the collection of the late M. W. Boyle, Esq., secretary to the London Joint Stock Bank. It consists of a vast volume entitled "Ancient Sepulchral Remains," and contains between 300 and 400 original drawings of sepulchral stones and monumental effigies, with notes and descriptions, chiefly from printed sources, and a large correspondence with clergymen in all parts of England, descriptive of objects of interest in their churches. Mr. Boyle's widow, with great liberality and judgment, made inquiry for some antiquary who would know how to value and use the collection, and was induced to offer it to H. W. King, Esq., the secretary of the Essex Archæological Society. It could not have been put into more competent and careful hands.

COMPETITIONS.

The Guardians of the Burnley Union Workhouse have accepted the plans and awarded the first prize of £100 to Mr. H. Lesley, of Middlesboro', for his designs of a new workhouse. Mr. J. P. Bracey, of Bishopsgate-street, City, obtained the second prize of £50.

Schools, Ashford, near Staines.—The committee received eighteen designs in reply to their advertisement, and ultimately selected that sent by Mr. John M. Hooker, of 5, Arundel-street, Strand.

For two years past there has been in course of construction a tidal basin, intended to relieve the existing pressure of shipping in Glasgow Harbour. The basin is situated on the south side of the Clyde, about half a mile below Broomielaw Bridge. It occupies an area of 5½ acres, and affords 830 yds. of commodious quays, on which sheds will be erected for the reception of merchandise; and on Monday last for the first time the tide was allowed to flow in. A dredger will be forthwith introduced, and the basin scooped out to a depth of 22ft. below high water of spring tides, being the present average depth of the Glasgow Harbour. It is expected that in eight months from the present date the basin will be in a state to receive shipping.

"English Merchants. Memoirs in Illustration of the Progress of British Commerce." 2 vols London: Bentley. 1867.

* Longman and Co., London.

RECENT AMERICAN INVENTIONS.

YANKEE ingenuity has passed into a proverb. Fertility of resource and invention are unquestionably among the most prominent traits of the American mind. Perhaps no more conclusive proof and striking illustration of this fact could be found than is furnished by the returns of the Patent Office at Washington. A glance at these returns for the year 1866, which are now before us, will show how far Brother Jonathan has shot ahead of all his contemporaries, not excepting his friends in the old country, in this direction. We find that during the year ending September 30th, 1866, 8,716 patents for inventions and designs were issued in the United States, and at that date the balance in the treasury to the credit of the patent fund was 228,297 dollars. This shows a very large increase as compared with former years. In 1860, for example, 5,638 patents were applied for, and 846 caveats were registered; 3,896 patents were issued, and 28 extended for seven years from the expiration of the first term. In this country about 2,000 patents only were granted last year, or about one-fourth the number issued in the United States. England, however, stands next to America as regards the number of its patents; France coming third. The Englishman, as has been observed, has a large inventive genius, but at the same time a tendency to stick by the old ways. The American assumes at once that whatever is old is wrong, and never rests until he has hit upon something new. Ingenious and convenient contrivances for saving time, trouble, and expense, as well as promoting comfort, abound everywhere in the United States. This inventive spirit is encouraged by the easy terms on which patents may be secured, and since it would appear that those countries in which the largest number of patents are granted are commercially the most prosperous, and *vice versa*, the fact is one well worthy the attention of our legislature.* We shall confine ourselves to the American patents granted during the latter six months of the year. The list is both curious and interesting. It would be lifficult to say what field has proved the most fruitful, though, perhaps, agricultural and farming implements open up the widest range for the ingenuity of inventors. Patents were issued during the six months for sixty-three "cultivators," fifty-two ploughs, fifty churns, forty-eight washing machines, thirty-three varieties of "harvesters," thirty-two pumps, twenty-five corn planters, twenty-four hay forks, twenty horse-rakes, fifteen "evaporators," fences of forty-seven patterns, and forty-three gates, twenty-two beehives, and an equal number of bridles, and brick machines. We note "a new colouring matter for butter," and even the homely implement known as a potato digger has been the subject or object of as many as eleven patents. The improvements in domestic utensils and household appliances have been very varied and numerous. These have included twenty-eight broom heads, eighteen bed bottoms; patent springs, baskets, baking pans, buttons, and apple parers, of each fifteen; eleven bottle-stoppers, eight wringers, seven sprinklers, and clothes dryers; pea shellers and fruit cans, stoves and sad-irons, together with five new contrivances for improving umbrellas, fourteen lamps, and twenty lanterns. Twenty-five patents were taken out in connection with travelling carriages and carriage furniture. Railway travelling, on the other hand, is likely to be more safe and comfortable by new car trucks, and bridges, safety switches, and car brakes and couplings, for which last there were issued no fewer than thirty patents. For the greater security of property, twenty-five new locks and padlocks were patented, while the housebreaker's chances of success are rendered still more doubtful by nine new burglar-alarms, which are warranted to detect and expose the intruder. The improved musical instruments of all kinds, from the cornet to the piano, and the banjo to the harmonium; and the artificial legs, arms, hands, eyes, and teeth, for which patents have been granted, are too numerous to mention. One would have thought that there had been enough of "patent medicines" already in the world. Our American cousins appear not to think so, since they have added twenty new nostrums to the stock. The extent as well as the heterogeneous character of this collection is apparent; but, as we have already remarked, the inventive faculty is fostered and encouraged in America as it is in no other country. The Patent Office in Washington is one of the greatest wonders not only in "the city of magnificent distances," but in the United States. It is a huge building, consisting of four sides, having a court within, similar in size to Somerset House. It is in the Doric style, and is built chiefly of white marble. The staff of officials includes a commissioner of patents with a salary of 3,000 dollars per annum, several principal examiners, each having a salary of 2,500 dollars, and assistant examiners having 1,500 dollars; a draughtsman and a machinist similarly paid, and a large staff of clerks. Each of the chief officials has charge of some particular class of invention. In the Patent Office are deposited specimens of every patent taken out. It contains besides, a variety of antiquities, curiosities, and other objects of interest; as the press at which Benjamin Franklin worked while in London, the coat worn by General Jackson at the battle of New Orleans, the coat worn by Washington when he resigned his commission at Annapolis, a copy of the Declaration of Independence, &c. As to the patents deposited, the collection, we are told, is overwhelming. Even the list we have enumerated might almost be taken as giving some countenance to the well-known story that, if a Yankee were cast upon an uninhabited island, he would be found next morning trying to sell maps of the country. In the fertility of his genius, at any rate, it cannot be denied that Brother Jonathan "whips all creation." If this inventive spirit continues, and the population goes on increasing as hitherto, ere long, as a recent traveller remarked, all Washington will hardly suffice for a patent office. Supposing, by the way, that it were possible for our friend to find himself in any dilemma of that kind, we believe that this very faculty of his would soon get him out of the difficulty. He would design another patent office—probably on the "boundless prairie."

* An article on the subject of patents generally appeared in the Building News some months ago.

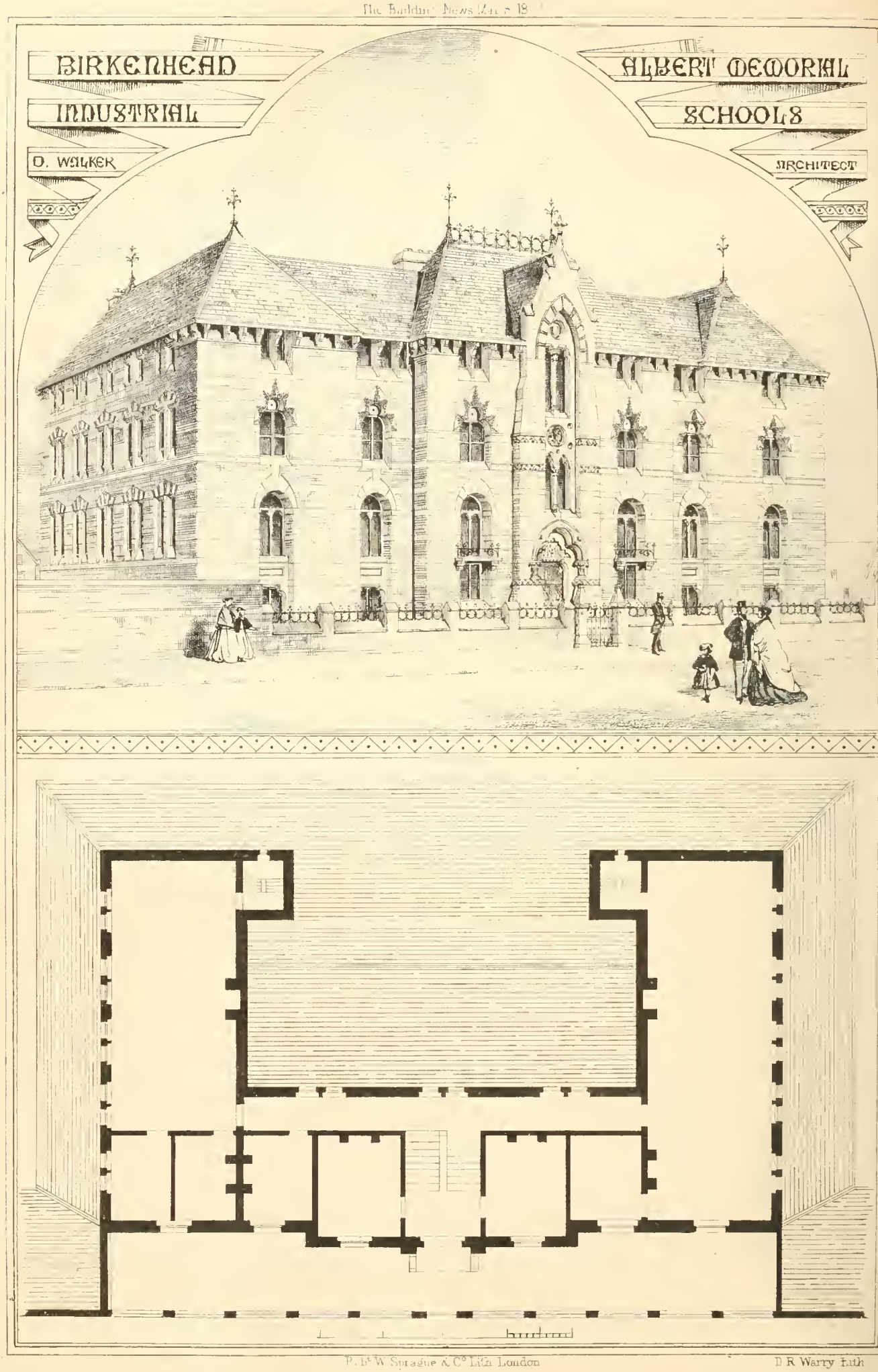
ALBERT MEMORIAL INDUSTRIAL SCHOOLS, BIRKENHEAD.

ON another page is an illustration, with plan, of the Birkenhead Albert Memorial Industrial Schools, presented to the town by Mr. Wm. Jackson, M.P. The building is situated in Corporation-road North, Birkenhead. The design erected was selected from a number sent in competition, and in plan resembles the letter E, having a frontage to Corporation-road 108ft. in length, by a depth of 60ft. The principal entrance, and the superintendent's residence, board-room and offices, &c., occupy the front centre, whilst the right side of the building is devoted to boys and the left to girls, proper classification of sexes being strictly maintained throughout. On either side of the entrance-hall is the board-room and office, and descending a few steps on to the basement floor the dining hall is reached, an apartment 40ft. by 35ft., having an open timber roof and lighted therefrom by clerestory lights; direct communication is obtained with the kitchen and other offices from this apartment, as well as separate entrances for both sexes from the schoolrooms and play grounds. The workrooms for industrial pursuits are also arranged on this floor, immediately under the schoolroom on the right, and are properly heated, lighted, and ventilated; whilst the girls have kitchens, laundry, &c., on the opposite side, having lavatories, bath-rooms, &c., attached to each, with a large plunge bath for the common use of both. Stone staircases are provided for each wing from this floor the full height of the building, the superintendent's and matron's apartments being approached by the principal stair from the front. The ground floor is approached by a wide, well lighted corridor from the entrance hall right and left, leading to the boys' schoolroom 57ft. long by 20ft. wide, and girls' schoolroom 43ft. by 20ft. of proportionate height, amply lighted, and perfectly ventilated, with class and sewing rooms attached. The entresol floor, over office and board-room, contains the sitting and bedrooms of the superintendent and matron, which point being equi-distant from all parts of the building perfect supervision is obtained throughout. The dormitories are arranged on the first-floor wings, ranges of separate beds being provided on each side, with a wide avenue down the centre, the teachers having bedrooms overlooking the whole, bath-rooms and other conveniences being attached. The second floor has dormitories the same size as the floor below, in addition to which it is provided with isolated sick wards, store-rooms, &c., and all requisite conveniences. Large play-grounds are attached to the schools, and a covered playshed is provided round three sides of the building leading direct to the out-offices, bakehouse, &c. The building externally has a bold and commanding appearance, indicative of the purpose it fulfils, whilst its deep reveals and well broken skyline give it a picturesque appearance; the material used is local brick interspersed with bands of black, the window arches having bricks of three colours, and roofs slated in parti-coloured slating. The style of the building, for want of a more defined term, may be called "Victorian," being a free adaptation of brick to modern requirements, and is dependent for its effect rather upon breadth of treatment than the elaboration of parts. The principal entrance door is deeply recessed and richly carved and moulded, supported upon dwarf columns of polished black limestone—the tympanum of this door contains a relievo specially designed by the architect, the subject of which being Charity interceding with Education for the improvement of the Ragged Poor, the idea of which has been well carried out by the late Mr. Sterling, sculptor, who also executed the medallion bust. Internally the whole of the walls of the schoolrooms, dormitories, and offices are finished in brick, painted a warm tint, all the corridors being tiled. In the plan and arrangement of the building no effort has been spared to make it one of the most perfect of its class in the kingdom The entire cost of the building, with the furnishing, was about £6,000, the whole of which was defrayed by Mr. Wm. Jackson, M.P., as a gift to the town, who likewise gave the site. The works have been executed in a very satisfactory manner by Mr. T. W. Neill, contractor, from the excellent designs and under the superintendence of Mr. David Walker, of Birkenhead, and Lord-street, Liverpool.

THE CHURCH OF ST. PHILIP, SYDENHAM.

THIS church was erected in 1865 from the designs of Mr. Edwin Nash, architect, and has been built with some variations and improvements upon what is shown in the engraving, the transepts and apsidal end having been retained, but the box-like projections in the angles have been omitted, and proper aisles, with columnar arcades, have been carried along nave and transepts instead. The stone used was lower green sand Kentish rag and upper green-sand Reigate, with which latter the walls are mainly built and faced, both externally and internally; the columns, window tracery, &c., are of Bath, and the arches of the same, alternating with brown Speldhurst stone. It seats 700 and the cost has been £5,000. The contractor was Mr. Carruthers, and a small amount of decoration has been painted by Mr. Fisher. The font is circular and of alabaster, and with four marble shafts, cinctured, extending the whole height, the upper half being attached to the outer circumference, and the lower half being disengaged. It was executed by Mr. Jaquet from Mr. Nash's drawings. It has the inscription "All my fresh springs shall be in Thee." The site is that which was occupied by some medicinal springs that had some repute more than a century ago, and were named by Evelyn in his Diary.

Mr. Boulton, sculptor, of Worcester, has just finished four statues, life-size, and four sitting statues, and two angels, 5ft. high, for Barton Church, near Manchester. This church is being built at the expense of Sir Humphrey de Trafford, from the designs of Mr. Welby Pugin.



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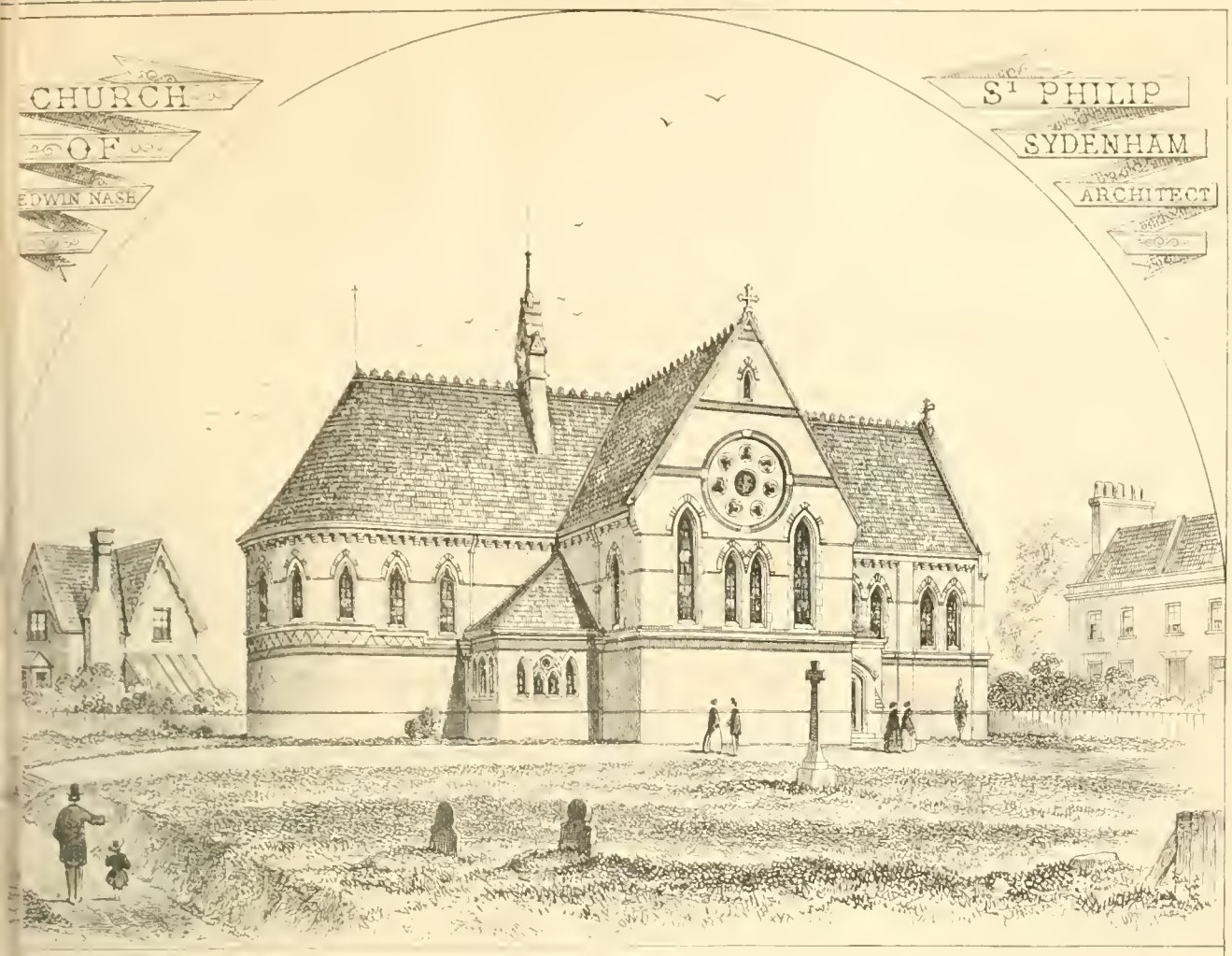
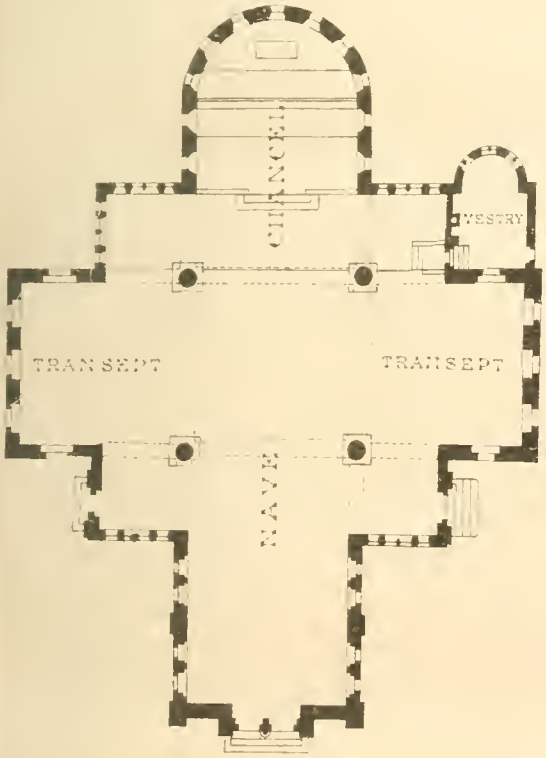

CHURCH
OF
EDWIN NASH
St PHILIP
SYDENHAM
ARCHITECT



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PURIFYING WATER.

THE question of water supply is at the present time engrossing public attention to a considerable extent, both with regard to quantity and quality. It is with the latter point—its purity—that we now have to deal, and here we are met by many difficulties. These arise not so much from those who supply the water as those who use it. Water perfectly free from impurities may be delivered to the consumer, but with him it rests that it shall be preserved pure, and he it is who is the most indifferent in this respect. It must, however, be admitted that the means for effecting the purification of water are somewhat limited, only a moderate amount of care having been bestowed upon the subject. We need not stay here to urge the necessity of pure water in a sanitary point of view; that is indisputable. But we may observe that the metropolitan water consumers number nearly four millions, and to these the various companies issue above eighty-seven million gallons of water per month. About half of this quantity is derived from sources other than the river, whilst the remaining half, of course, comes contaminated with the sewage of sundry towns and villages, diluted with hard water. It flows thick and turbid, is positively unwholesome, and probably injurious. There are two main elements of impurity in water which render it both unwholesome and inconvenient to use. These elements are organic impurities, and metallic salts producing hardness. River water exhibits organic impregnation, whilst spring water affords an illustration of hardness. Dr. Clarke some years since succeeded in rendering hard waters soft by a process now well known, which consists in the simple addition of lime. Experiment has further proved that in abstracting the hardness by this process the organic portion is also precipitated. The soluble carbonate of lime is rendered insoluble, and carries down with it the principal portion of the organic matter, whilst the beneficial salts remain undisturbed. It is true that sulphate of lime when present hardens the water to a certain extent, but then it acts as a preservative against lead poisoning, and hence becomes invaluable.

It follows, then, that as Dr. Clarke's process softens and purifies the water submitted to its action, it is eminently adapted for use where those two qualities are desirable—and where are they not? But hitherto difficulties have presented themselves which have hindered the practical application of the process. The reduction of water from 16 deg. of hardness to 5 or 6 deg., if economically effected, would prove a great boon to our manufacturers, and all using steam power would find an economy in fuel and plant. So in culinary and laundry operations would the benefit be appreciated; everyone knows the difficulty of extracting essences or making tea with hard water, whilst in washing with similar water the waste of soap is enormous in the aggregate. To utilise this process, then, Mr. T. W. Tobin, of 8, Old Jewry, E.C., has effected an arrangement which we have recently inspected, and which promises to give the public the long-sought boon of soft and pure water. The apparatus, which has been patented, is very simple in construction, consisting of nothing more than a galvanised iron cylinder about 4ft. high by 1ft. in diameter. Through this the water is made to pass; and while so doing is brought in contact with a small quantity of prepared lime, which only requires replenishing about once a fortnight. The cost of purifying by this method is stated to be about one farthing for two thousand gallons; whilst, with regard to the effectiveness of the apparatus, the water after treatment appears to possess the softness of rain water and the clearness of spring water, with greater purity than either. When the details are completed we hope to give our readers full particulars of the apparatus. If it realises the expectations of the inventor—and there is every reason to believe it will—it must certainly prove of incalculable benefit to manufacturers and to every household, whilst in a sanitary point of view it will undoubtedly be of even greater importance.

THE ADMINISTRATION OF THE PEABODY TRUST.

IT would be so much more pleasant to believe that the noble donation of Mr. George Peabody is being well expended that it is with great regret we find ourselves unable to agree in the satisfactory conclusions to which the trustees would fain lead us in the report they have just issued. The expressed intention of the donor was that his generous gift should be applied "To promote the comfort and happiness of the poor and needy of this great metropolis" "in such a way as would be appreciated not only by the present, but by future generations of the people of London." The interpretation very properly put upon this latter requirement by the public and by the trustees themselves was that the fund was to be so employed as to be remunerative and "to bear within itself the germ of future extension and perpetuity." The most feasible way of effecting this was admitted to be the erection of healthful homes for the humbler classes of London working people. We now propose, avoiding many minor questions which might fairly be considered, to inquire how far the objects of perpetuity and extension are likely to be fulfilled by the scale of expenditure and general policy which the trustees have been advised to adopt. The report for 1866, just issued, states broadly that "The original fund has been increased by the earnings of interest and rents to the extent of £15,416 8s. 11d." A comparison with the report for 1865 will show that this increase is made up of the following items:—

Interest earned		£12,541 4 3	
Rents from Spitalfields buildings (less expenses), February 29, 1864, to December 31, 1865 (1 year and 9 months)	£764 8 8		
Rents from Spitalfields buildings (less expenses), December 31, 1865, to December 31, 1866 (1 year)	703 3 9*		
	£1,467 12 5		
Rents from Islington (less expenses), September to December 31, 1865 (3 months)	£179 8 6		
Rents from Islington (less expenses), December 31, 1865, to December 31, 1666 (1 year)	1228 8 9*		
	£1407 12 3		
		2,875 4 8	
Total increase of the fund from 1862 to December, 1866		£15,416 8 11	

For the first of these items, forming more than four-fifths of the whole amount, the administration will, of course, claim no credit. That the fund should have gained £12,500 simply by laying at interest is in one sense very gratifying, but we cannot forget that meanwhile it has not been employed in benefiting the poor of London. The remaining one-fifth is the only sum that has been earned by the legitimate application of a portion of the funds, and the question arises whether this amount of £2,875 represents the proper earnings, taking all the circumstances into consideration, that should have been made during the particular period by the amount of the fund employed. We are of opinion that it does not, and for the following reasons:—In the case of the buildings at Spitalfields the cost of land and buildings has amounted to £27,215 11s. 3d., while the receipts for a period of two years and nine months are £1,467. This is no more than about 5·4 per cent. for the whole period, or only 1·8 per annum. Could we believe that this small return was to be accounted for by the low rate at which the premises are let, we could understand, and, in consideration of the immediate advantages allowed the occupants, we might, perhaps, excuse the error. But the trustees themselves forbid any such supposition. They refer over and over again to their intention to make the buildings remunerative, and congratulate themselves on the fact that every tenant's "sense of independence is preserved by the consciousness that he pays for what he enjoys." The rents charged are for one room, 2s 6d.; for two rooms, 4s.; and for three rooms, 5s. per week, and, though these rents are lower than the exorbitant amounts charged in the ordinary houses, yet, taking the increased size of rooms and other advantages into account, they can hardly be considered lower than those of the Metropolitan Association or Mr. Alderman Waterlow's Company. Nevertheless, the former of these, which is an association having the same benevolent object as the Peabody Trust, clears a rental averaging quite 5 per cent. from similar property, while Mr. Alderman Waterlow's Company makes as much as from 7 to 9 per cent. But, moreover, in the Spitalfields-buildings "there are nine shops on the ground floor, respecting which the trustees say that the rents, amounting to nearly £500 per annum, go to increase the general fund, and thus contribute to the reproductive character which it is the desire of the trustees to impart to it." It being no part of the object of the trust to provide shops, these certainly ought to produce something like a reasonable return upon their proportion of cost, and the expectation of the trustees was a perfectly fair and reasonable one. Why, then, is it not fulfilled? Why is it that a building upon which others can make as much as 9 per cent. produces to the trust no more than something below 2 per cent? The reason will not be far to seek if we consider the prime cost. This is returned as follows:—

	£	s.	d.
Cost of Land	3,300	0	0
„ Buildings . .	23,915	11	3
	£27,215	11	3

As the shops may probably occupy rather less than one-third of the cubic contents of the building, we shall be making a very ample allowance for their cost if we deduct from this amount one-third of the cost of the building (say £8,000) as their proportion. The nett cost of the dwellings will thus be found to be (£27,215. — £8,000 =) £19,215. For this amount the architect has provided fifty-seven tenements of one, two, and three rooms each, containing in all 119 living rooms. The accessories of lavatories, wash-houses, &c., are provided for common use (not separately appropriated to each tenant, as in most of the other improved or "model" dwellings) on the staircases and in the attic floor. We are free to admit that the structure may be well and solidly built, and that it is handsome enough as far as the exterior goes, though from an æsthetic point of view the less said the better about the whitewashed brick walls of the living rooms and the whole interior. The same merits, without the disadvantages, may be claimed for the structures with which it is our duty to compare it. But the cost is no less than £337 per tenement! or £161 per room! This is equal to the cost of a good house in the suburbs. Now the Metropolitan Association, which, as we have said, has not a more mercenary object than the Peabody Trust, has always done the same kind of thing—we believe, better, but at least quite as well as the trustees—at a cost ranging from £48 to £56 per room. Nay, during the very time that this Spitalfields building was in course of erection, another association was actually building in different parts of London houses excelling these in nearly every respect, at a cost of no more than from £40 to £46 per room. The cost of the Peabody buildings thus appears to be no less than three or four times the amount it ought properly to have been, as proved by the actual expenditure of other parties. Who is accountable for this reck-

* A small discrepancy will appear between these figures and those given in the body of the trustees' report. Our figures are derived, however, from a comparison of the balance-sheets appended to the reports of 1865 and 1866, and they give a result more favourable to the management than those in the body of the report of 1866.

less and extravagant expenditure of the funds so generously given for the benefit of the "poor and needy?" We should be glad if we could acquit the trustees themselves entirely of blame in the matter, but we cannot forget that at the very time this expenditure was incurred one of them was actually chairman of the very company which was erecting buildings, as we have shown, at one-fourth of the cost of these. The difference is so great that it can hardly be supposed to be accounted for by any variation of prices of labour or materials, and we cannot help wondering how any architect could possibly have advised the payment of such an enormous amount.

The expenditure on the buildings at Islington has not been quite so extravagant, but it is again very much higher than the amount expended on similar buildings elsewhere, being for 155 tenements, £40,397 2s. 1d. This shows £260 per tenement. These tenements are some of them of only one room, others of two rooms, and none more than three. The accounts for the Shadwell buildings are not made up, but they appear likely to cost a nearly equal amount.

It will be needless to say much more. It is very evident that, unless a different policy be adopted in the expenditure of the balance now invested in railway debentures, and of the £100,000, with interest, which is to come under the control of the trustees in 1869, the magnificent gift of Mr. Peabody is likely to afford but one more illustration of the wisdom of the great Lord Bacon's observation, "Likewise glorious gifts and foundations are like sacrifices without salt; and but the painted sepulchres of alms, which soon will putrefy and corrupt inwardly." It is well that the benevolent donor took one method of providing for its due administration by obliging the trustees to submit their accounts once a year to the public. We cannot but hope the criticism we have bestowed upon them in this early stage may prove more useful in assisting to protect the property of the poor and needy than if delayed until the whole fund was exhausted in profitless and extravagant expenditure.

ARCHITECTURAL EXHIBITION SOCIETY.

THE annual general meeting of this society was held at 9, Conduit-street, on Friday last, when the report and balance sheet were read and adopted. The balance sheet shows that the receipts of the last year have been equal to the expenditure; and we gather from the report that the society is prospering, and there can be but little doubt that if the profession generally will support it, the annual exhibition may be made useful and attractive not only to the profession, but to the public at large. Mr. Beresford Hope, M.P., is the president of the society, and amongst the list of vice-presidents we notice the names of Messrs. George Godwin, F.S.A., M. Digby Wyatt, F.S.A., James Ferguson, F.S.A., William Tite, M.P., and other well known names; whilst the council is ably represented by Messrs. T. Hayter Lewis, F.S.A., William Burges, E. W. Godwin, F.S.A., E. B. Lambe, F. P. Cockerell, and others, with Messrs. Robert W. Edis and Rowland Plumbe as honorary secretaries.

The report goes on to say that the art of photography having become of great importance to the profession, through the means that it affords of securing truthful representations of architectural subjects, the council have been led to make arrangements with Messrs. Cundall and Fleming, the photographers, of Bond-street, whereby members of the society can have their works photographed at a considerable reduction in expense to that usually charged for such work, and the council hope that by this means gentlemen who are unable to find time to prepare drawings of their works for exhibition will be able to have their buildings represented.

The council propose to make various important alterations in the ensuing exhibition, and by a system of classification of the various works exhibited, hope to make such alterations tend to the more general usefulness of the exhibition; in addition to the usual coloured perspective drawings and sketches, the council invite architects to send working drawings of any buildings they may care to exhibit, sketches of old buildings or objects of art, photographs of buildings executed or in progress, &c., and as the arts of fresco painting and painted and mosaic decorations are yearly becoming of more importance in architectural works, they hope to induce artists and others to contribute their designs for these works, and by classifying the works sent in as before named, to add materially to the attractiveness and usefulness of the exhibition.

It has been too painfully evident that the exhibition for some years past has not been very creditable to the architectural profession, as it might by more cordial co operation be so made. We now, however, descry evidence of restored hope and awakened energy. The council have, we consider, acted wisely by putting the exhibition on a wider basis. Let the zeal of the council be met by corresponding zeal on the part of the profession, and the exhibition will have commenced a new history in its era. We would remind our readers that all drawings, &c., for the forthcoming exhibition must be sent to the galleries on the 5th or 6th of next month, and we hope that the profession generally will respond to the call, and help to make the exhibition a fair representation of the architectural progress of this country.

LIVERPOOL ARCHITECTURAL SOCIETY.

AT the meeting of this society on Wednesday evening last, Mr. Boult announced that the carriage of drawings both to and fro would be paid by the committee of the Architectural Exhibition. Mr. Roberts called attention to the charge which it is proposed to make in future for permission to erect hoardings around new buildings. In January last the Health Committee proposed to levy such a charge without notice, but a strong protest was made against the levying of a charge without previous notice, and also against the proposed scale of charge, according to which the charge for a hoading round the new Exchange-buildings would amount to £1,800. The scale had since been reduced, and it was now proposed to charge for a hoarding for six months 2s. 6d. per lineal foot; so that for a hoarding 100ft. in length remaining up for twelve months the charge would be £25. This would be a considerable addition to the cost of the building, which must fall ultimately upon the proprietor; and he asked why proprietors should be taxed in this manner for a convenience which all were entitled to alike—why those who wished to improve their premises, in doing which they also improved the town, should be made to pay a penalty for doing so. The charges would come into operation at the beginning of June, unless some effectual remonstrance were made in the meantime. Mr. Boult defended the principle of the charge, which he said had been in force for some time in London, and had been found to work very beneficially. It was an advantage to the proprietor of a building to be allowed to enclose a portion of the street, and its enclosure was a very great nuisance to the public; and if a charge were made dependent upon the space occupied, and the time during which it was occupied, it would be the interest of the contractor to restore the space to the street on the earliest possible occasion.

The paper for the evening was by Mr. Councillor J. A. Picton, and was entitled "Notes of a Sketching Tour in France and Belgium." A large number of sketches were exhibited in illustration of the paper.

COATING IRON WITH COPPER.

A NEW process has just been patented by M. Mayeul Bernabé, of Paris, and is based upon the employment of electro-metallurgy, applied to cover iron steel with a coating of copper or copper alloys, such as brass and bronze. The process is, of course, one of very wide application; armour plates, cotton and other printing rollers, boiler plates and tubes, fittings of machinery, and, in fact, any kind of ironwork come within its scope. By it, too, we are enabled to substitute iron coated with copper for many purposes for which solid copper has hitherto been employed. The effect when so produced is, by a peculiar action of neutralisation of the electric currents, to render the coated articles unoxidisable. In carrying out his process, M. Bernabé first cleans the articles to be coated, after which they are treated with acid. Then comes the coating of the article, which we will assume to be an iron plate, with copper, by galvanism. The plate is subjected to treatment with cyanide of potassium. In the bath is a plate of copper of the same size as the iron, opposite to which it is placed. The conducting wires of a galvanic pile are placed in connection with the copper and the iron plates, and an electric current is thereby established, which causes a deposit of copper upon the iron. This forms the first deposit, which has now to be strengthened, and this is done by submitting the iron plate to a second galvanic coppering. For this purpose it is immersed in an acid bath, a plate of copper being placed opposite as before. The bath is traversed by an electric current, and the thickness of the copper deposit is increased to the desired extent.

We have recently, says the *Mechanics' Magazine*, examined some samples of iron coated with copper by M. Bernabé's process, and can, therefore, speak with some confidence as to the highly satisfactory character of the results produced. We were certainly struck with the thorough adhesion manifested between the two metals, the copper penetrating the surface of the iron and affording evidence of the most perfect union. One of the samples had been planed down, and it presented a marbled appearance; whilst another piece—a steel bolt—which had been hand turned in a lathe, showed a similar result. This latter piece, too, gave good evidence of the close bond existing between the metals. Had not the copper coating been perfectly adherent to the iron it must have scaled off during the process of hand-turning to which it was subjected. As it was portions of copper remained on the iron after turning, which were very thin and perfectly isolated. The examination of these samples, moreover, shows that iron and steel can be coated with brass and bronze as well as with copper, and to any thickness. Next in importance to the perfectness of the process is its economy, upon which depends its commercial value, for no one would adopt a process of coating iron with copper which involves as much cost as the adoption of the pure metal. In the present instance it is stated that the cost is but little in excess of the value of the metal deposited. Taking into consideration the thoroughly reliable results of the process, the economy attending its practical use, and the infinity of purposes to which it can be applied, we augur for this invention a very wide and rapid success. It well deserves it, as one of the most recent and satisfactory applications of practical science to the arts and manufactures.

VERBAL v. WRITTEN AGREEMENTS.

IN the Marylebone County Court, last week, an action was brought by Joseph Lamb, a carpenter, to recover 8s. 4d. from Mr. William Richards, a builder. From the evidence of the witnesses it appeared that in May last there was a strike of workmen employed in the building trade, and it terminated in the masters agreeing to give the carpenters 8d. per hour. On January 31st and February 1st, plaintiff worked for defendant twelve hours, for which the latter refused to pay more than at the rate of 7½d. per hour. In opposing the claim, defendant's manager produced the pay-book to show that Mr. Richards had not been accustomed to pay more than 7½d. per hour, unless there was a specific agreement with the workmen to that effect, and such had not been the case with respect to the plaintiff. Mr. Richards disputed it because it involved a great principle between masters, and workmen, and his Honour's decision would have an important bearing upon, not only the building, but also upon all other trades. His Honour said it was a great pity that all such questions should not be decided in Arbitration Courts, composed of an equal number of employers and employed, and he must say that experience had shown to him that the obstacles to the establishment of such a tribunal were created by the masters, not by the workmen. The defendant in the case before him rested his defence solely upon the fact that there was no specific agreement in writing that he should pay the plaintiff more than 7½d. per hour, but a plea of that sort was neither just nor equitable, nor, as had been proved by several witnesses, in accordance with the custom of the trade. If such a plea was to be allowed, any master might employ a number of men, and when they went at the end of the week for their wages he might say, "Oh, I shall only pay 3d. per hour, because there is no specific agreement that I should pay you any more." There was really no defence to the action, and he should give judgment for the plaintiff, with all costs.

WORK.

HERE is a perennial nobleness, and even sacredness in work. Were he ever so be ghted, or forgetful of his high calling, there is ways hope in a man that actually and earnestly orks; in idleness alone is there perpetual despair. nsider how, even in the meanest sorts of labour, e whole soul of man is composed into real harony. He bends himself with free valour against task; and doubt, desire, sorrow, remorse, ingnation, despair itself, shrink murmuring far into their caves. The glow of labour in him a purifying fire, wherein all poison is burnt up, d of sour smoke itself, there is made a bright d blessed flame. Destiny has no other way of tivating us. A formless chaos, once set reving, grows round, ranges itself into strata, and no longer a chaos, but a compacted world. at would become of the earth, did it cease to olve? So long as it revolves, all inequalities perse themselves, all irregularities incessantly ome regular. Of an idle, unrevolving man, tiny can make nothing more than a mere melled vessel of dishonour, let her spend on what colouring she may. Let the idle think his. Blessed is he who has found his work; let ask no other blessedness, he has a life-purpose. our is life. From the heart of the worker s the celestial force, breathed into him by Almhty God, awakening him to all nobleness, to knowledge. Hast thou valued patience, rage, openness to light, or readiness to own mistakes? In wrestling with the dim brute ers of fact, thou wilt continually learn. For y noble work, the possibilities are diffused ough immensity, undiscoverable except to faith. Gideon, thou shalt spread out thy fleece at door of thy tent and see whether there be any teous moisture. Let thy heart be spread out lent appeal to Heaven; and dew to suffice thee have fallen.—Thomas Carlyle.

PARLIAMENTARY NOTES.

ACCESS OF LIGHT AND AIR TO ANCIENT WINDOWS.

Mr. Goldney, on Friday, March 1, called attention to the existing state of the law as regards the right of access of light and air to ancient windows, and to the necessity of providing by legislative enactment some means by which the owners of property, under proper regulations, or the payment of compensation if necessary, might be enabled to increase the height of their building. It appeared that so far back as the reign of Richard I. it was anticipated that the City of London would become overcrowded with building, and from that time to 1834 there was a custom which enabled the owner of a house in the City to raise it to any height he pleased, notwithstanding his doing so might diminish the access of light and air to adjoining tenements. But in 1834 an Act was passed which gave the owners of property a right to a perpetual injunction to prevent any diminution of the access of light and air to their property. That Act had led to a great deal of litigation. According to a decision of Lord Westbury, the law now stood thus:—When the windows of a dwelling-house shall have been actually enjoyed for a period of twenty years without interruption, the right to such window shall be absolute and indefeasible. Suppose a person willing to build said to the owner of a small window, "If you will enlarge your window, or do anything that will bring in rays of light, and will at the same time allow me to erect a building near your property, then you will not suffer from any diminution of light and air, but will obtain a greater access of them." The owner of the small window might refuse unless a very large pecuniary compensation was given to him, and the Court of Chancery would grant him a perpetual injunction to prevent any erection that would in the slightest degree diminish the light in his small window. The right of obstructing improvements extended over a street 20ft. or 30ft. wide. A fear of these perpetual injunctions prevented improvements throughout the City. Suppose two building plots of 100 square yards each were purchased by two persons, and that one of these plots let very easily to builders, while no buildings were raised on the other plot for a period of twenty years. Under the present law the owner of the latter plot could be prevented by a perpetual injunction from raising buildings that would interfere with the access of light and air to the buildings raised on the former plot. The law of France was different. An owner there could not acquire any right against an adjoining owner without giving him notice, and if he did acquire any such right it could always be restricted to 6ft. directly and 2ft. laterally. He (Mr. Goldney) thought that the right to these perpetual injunctions should be abolished, and that instead thereof there should be damages for any injury inflicted on an adjoining owner's rights. The suits instituted for the purpose of preventing an interference with light and air occasioned lengthy discussions on the difference between perpendicular light and lateral light, and the court itself was sometimes puzzled to know what sort of a decree it should make. If his suggestion were adopted such discussions would be avoided. He wished to know whether the Government thought it was possible to prevent litigation on this subject by bringing forward a measure. If it was thought desirable he would move for a select committee on the subject.

The Attorney-General said it would be quite impossible to accede to any such motion. The law upon this subject was carefully considered and settled in 1834. It was thought fit in that year to abolish the custom which had previously prevailed in the city of London with reference to the enjoyment of ancient lights, and the House ought not hastily to alter the settlement then made. This subject was too difficult to be dealt with offhand on a motion for going into committee of supply. No doubt there were some hardships under the existing law, but if the House at all interfered in the matter it must deal with the whole of the law upon this subject. Possibly a measure might be submitted to the House in a future session.

Consecration of Enlarged Churchyards.—Lord Redesdale's Bill recites, according to the *Times*, that it is held that any addition made to a church which has been consecrated becomes also consecrated, as forming part of that which is consecrated, and that it is expedient that no legal impediment should exist to the same principle being applied to land added to a churchyard. The Bill accordingly proposes to enact that whenever any land shall be united to a consecrated churchyard, so as to become part of it within one external enclosure to be used for burial purposes, and the bishop shall, by a memorandum deposited in the register office of the diocese, declare such land to have become consecrated, the said land shall be held to have thereby become consecrated, in like manner as if it had always been part of such churchyard.

NOTICES OF PUBLICATIONS.

Familiar Lectures on Scientific Subjects. By Sir John Herschel. Alexander Strahan. 1867.

These lectures must already be familiar to a large class of readers from having appeared in that popular periodical *Good Words*. They are here gathered together in a handsome volume of some 500 pages. Sir John traverses a wide range in the field of science, discoursing of volcanoes, earthquakes, comets, the sun, the weather and weather prophets, light, sensorial vision, atoms, the origin of force, and many other subjects. In the lecture entitled "The Yard, the Pendulum, and the Metre," he strongly opposes the proposed abandonment of our national system of weights and measures in favour of the French metrical system. He considers that this question has been mischievously urged in Parliament. We commend his arguments, many of which are sound and forcible, to the attention of Mr. Ewart, M.P., who has been the great advocate of the French system in the House of Commons. "On the Estimation of Skill in Target Shooting" is one of the most important lectures in the volume. It ought to be attentively perused, particularly by volunteers, as of national interest.

The Baths and the Mineral Waters of Bath. By R. W. Falconer, M.D. Fourth edition, enlarged. Hardwicke. 1867.

Bath is greatly indebted for its celebrity to its medicinal waters and to Beau Nash, who for so long a period ruled its destinies and presided over its pleasures with the title and power of King Nash has passed away, and much of the glory of Bath departed with him. While its mineral waters remain, however, the city will always be a favourite resort—a pleasant place to live in. The Roman City of Bath, historians tell us, is generally believed to have been named *Aquae Solis*, "waters of the sun;" but, as Dr. Falconer points out, there is some foundation for considering that the name may have been *Aquae Sulis*; the first word in both cases being probably the same as the Celtic *Ac* or *Acq*, and *Sulis* from the goddess *Sul*—Sul-Minerva the presiding deity of the mineral waters—whose name appears upon several of the altars discovered in Bath. This little work describes the arrangements, which appear to be as admirable as they are extensive, provided for the employment of the mineral waters, giving brief notices of their impregnations, and the medicinal uses and effects of the springs. Prefacing the work, we have an interesting sketch of the early history of the baths of Bath, and at the end a series of plans of the different bathing establishments, showing the improvements made during recent years. Altogether Dr. Falconer has given us an interesting and useful little guide book.

The Abbeys and Castles of South Wales. By H. H. Vale, Architect. Liverpool: Watts and Co.

Part I. of a paper read before the Liverpool Architectural and Archæological Society, December 12, 1866. The instalment of the paper before us makes us wish for the remainder. We desire no better companion on an architectural tour than Mr. Vale. Along with a keen eye, a fine taste, and an enthusiastic mind, he possesses the faculty of communicating his ideas in rich and vigorous language. His thoughts are always original, and here and there evince considerable poetic feeling. Setting out from the little border town of Ross, in Herefordshire, Mr. Vale visits in succession Wilton, Goderich, Raglan, Chepstow, and Caerphilly Castles, Tintern Abbey, and Llandaff Cathedral. The architectural beauties of these famous and venerable piles are duly described, the descriptions being blended with brief glances at their origin and history, and particulars of the personages connected with them. A villanous act of sacrilege mentioned by Mr. Vale in his account of the glorious old abbey of Tintern we think it our duty to give publicity to. Says Mr. Vale;—"There is a patch of encaustic tiles in the south aisle carefully railed around, but the guide informed us that a party, being locked in the ruin by their own desire, managed to abstract one of these mediæval treasures and get clean away before the theft was discovered! So it would seem that kleptomania is not unknown even amongst quasi artistic tourists. 'Should this meet the eye' of the kleptomaniac let him take notice that there is a Providence who watches over encaustic tiles and all other beautiful things intended for the pleasure and enlightenment of his creatures, and to abstract one such object by stealth from a public treasury is to provoke the wrath of such Providence and arouse the righteous indignation of all who follow in his track to mark with mingled feelings of shame and sorrow the vacant corner where a thing of beauty formerly gladdened the eye of each beholder. The guide besought us, with tears in her eyes, if we came across the missing treasure to endeavour to have it restored to the spot where it had lain unmolested for the space of six hundred years." It is to be hoped that this wrong-doer may read the above, and, repenting him of his conduct, restore the missing treasure to its rightful place.

Black's Guide to the Paris International Exhibition of 1867. Edinburgh: A. and C. Black.

As "all the world and his wife" may be supposed to visit Paris sometime between April and October of the present year, guide books to the world's fair make their appearance at a very opportune time. Messrs. Black, who, as regards their "Guides," may be called the Murray of Scotland, have produced a volume which, having regard to the amount of information it contains about the coming Exhibition, the French capital, and its environs, is a marvel of cheapness at sixpence. A map of Paris and a plan of the Exhibition are annexed, the whole being got up in an attractive and convenient form. The work is edited by David Thomas Ansted, F.R.S.

Street Nomenclature. By Edmund White. Effingham Wilson.

This pamphlet has been forwarded to us since, and in consequence of, the appearance of an article in our columns on London street names. In that article we commented on the absurdly inconvenient system, or rather want of system, which is followed in naming the streets of the metropolis, pointing out among other things the sad confusion, the loss of time, and the vast amount of unnecessary labour incurred therefrom. We gave from the London Street Directory a specimen of some of the curiosities which that certainly useful, though hardly diverting, volume contains. It was shown that there were upwards of a score of words which repeat themselves as the names of streets

from a dozen up to at any rate sixty times. For instance there are sixty streets in the metropolis answering to the name of York-street. Nor does this number include the terraces, crescents, roads, or places, bearing this once popular title of royalty. Mr. White comes forward to help us towards reform in this matter. He proposes to divide London into districts (say twenty), each district to be distinguished by a single letter—A, B, C, &c.; to number all the streets, squares, lanes, &c., in each district, from 1 upwards to the end; such streets, &c., to be called, for postal purposes, A1, A2, A3, B1, B2, B3, &c. To paint the letter and number of each street or place conspicuously, as near as possible to the line of sight, at all corners thereof. To have the letter and number of each street or place printed in the Post-office and other directories, in the column appropriated to the present district letters, and in their places; notice to be given that, for all postal purposes, such letter and number may be used instead of the name of such street or place. In the case of new streets names would be unnecessary, the letter and number would be sufficient. Mr. White's plan, besides being simple, would not, as far as we can see, require any alteration in the present mode of performing the duties in the Post-office, not even in the beat of a single postman, while the only expense attending the plan would be the painting the letters and numbers at the corners of the streets. It is at least entitled to consideration.

Photographs of English Cathedrals. Mason and Co., 28, Old Bond street, London.

We may once more state for the benefit of our readers that Mason and Co., the well known photographers, of London and Norwich, are publishing a uniform series of first-class photographs of English cathedrals. The first part, which contained exterior and interior views of Norwich Cathedral, was noticed by us a short time since; and the second part, which contains five splendid pictures of Ely Cathedral, is now before us. The photographs are executed in the first style of the photographic art. We do not know whether Messrs. Mason have sent these views to the Paris Exhibition to represent early English architecture and modern English photography. If not, we are sorry, as by so doing they would have rendered a double service. We see that views of Canterbury, Rochester, and Peterborough Cathedrals are to appear shortly. We reproduced in lithography one of the interior views of Norwich Cathedral, in the Building News of the 8th ult.

General Items.

The cost of replacing the iron railings round Hyde Park will be £3,372.

The question of new approaches to the river at Liverpool is at last likely to be settled, the Corporation having agreed to contribute £20,000 towards the cost of the plan prepared by Mr. Lyster, engineer to the Dock Board.

The railway round Paris, one part of which has long been terminated, was opened in its whole length to the public last week. The line goes over a distance of twenty-one miles.

The Leeds Corporation have adopted a steam stone-breaking machine, which performs its work very well, and reduces the cost from 15d. per ton to 3d. or 4d. The machine breaks 100 tons of limestone per day. Labour is also saved in the carting of the stone, for it is discharged wholesale from the hopper of the machine, and fills a cart in 6 min.

The dilapidated brick wall which enclosed the grounds of the old Lambeth Palace from the footway by the Bishop's-walk, extending from the Palace New-road to the tower of the entrance gate, is in the course of being razed, and a new one is being constructed of red brick, relieved by devices in black glaze. It will give an increase of 12ft. to the width of the footway.

The following were elected members of the Royal Institution of Great Britain on Monday last:—Jerry Barret, Esq.; John Brunskill, Esq.; Lord Sackville Cecil; Frederick James Chester, Esq.; Henry Collinson, Esq.; Charles Newton, Esq.; Algernon Perkins, Esq.; Captain Richard Phelips; James Rankine, Esq., B.A.; T. A. Rochussen, Esq., M.I.C.E. George Lake Russel, Esq., M.A.; Edward Sartoris, Esq.; Mrs. William Spottiswoode; John Williams, Esq.; James Christopher Wilson, Esq.

It was announced in the early part of the week that Mr. Beresford Hope was about to be manufactured into a peer, and some of his constituents in the Potteries were taking preliminary steps to elect his successor. Mr. Hope has since totally denied the accuracy of the statement, and added to it that he was never offered, and that he never solicited, any such a mark of favour. By this manly avowal Mr. Hope has done himself more honour than anyone else could confer on him.

At last the judges appointed to adjudicate on the designs for the new National Gallery have reported to the Chief Commissioner. The report states that the judges are unanimous in not recommending the actual execution of any one of the designs; but they are of opinion that Mr. Edward Barry's designs for a new building, and that Mr. Murray's design for alterations of the old building, possess great architectural merit. "What next and next?" We suppose, as Sir Robert Peel would say, one of three courses must be adopted—either the old building must be altered, or some one architect appointed to superintend the erection of a new building, or another competition invited.

Mr. Gladstone has done another gracious thing by offering to lend the Liverpool Corporation, for a term of seven or ten years, his fine collection of ceramic ware. The collection will be placed in the free library and museum. There are many other men who have art treasures who would do well by imitating Mr. Gladstone's example. They would not be poorer, but the community would be richer.

At a meeting of the Leeds Town Council, on Wednesday last, Mr. C. A. Curwood, Deputy Town Clerk of Liverpool, was elected Town Clerk of Leeds, at a salary of £1,000 per year.

It appears that the School of Art in Macclesfield is not in a flourishing condition, but rather the contrary. In fact the silk trade of the town appears to be in a state of decay. The subscriptions to the school of art having fallen off, a public meeting was called together last week by the mayor to advocate the passing of a local rate to sustain the school. Though strong reasons were urged why such a rate should be imposed, the majority of the meeting would not acquiesce in it, and the resolution proposing it had to be withdrawn. We think this is a mistake; the art education in such a town as Macclesfield is a public benefit, and the public should co-operate in promoting it. We cannot but think that the gentlemen who opposed the rate are "penny wise and pound foolish." The money so raised would not be spent out of the town, but in the town for the advantage of the town. We are sorry to see this "impatience of taxation" in reference to one of the highest phases of national education; it is a discouraging symptom.

A plan of the Archduke Albert for the fortification of Vienna has been adopted. The new fortifications are to be erected at points from 2 to 3 English miles distant from the octroi boundary. On the right bank of the Danube there will be a series of twenty-two detached forts, the first of which is to be erected on the Leopoldsberg, from which Sobieski advanced to the rescue of Vienna in 1683. On the left bank there will be two *tetes-de-pont*, one at Löbau, and one at Florisdorf, connected with the fortifications on the adjoining hills. The cost of these works is estimated at 32,000,000 florins.

An operation of some interest was carried out last week by Mr. J. Heywood, of Derby, the contractor for the ironwork for the new line of the London and Brighton and South Coast Company, at Battersea, under the instructions of Sir Charles Fox and Sons, the engineers in charge of the work. The new high-level line is intended to cross the low-level railway at Longhedge by a bridge of 120ft. span. This bridge has two main girders of lattice work 11ft. deep and 126ft. long. In consequence of the increasing traffic at this point during the day it was impossible to erect a staging across the line; the iron girder was therefore put together on the adjoining viaduct, and cross lines having been laid across the railway to carry a strong trolly or movable tressle upon eight wheels, one of the main girders was successfully rolled over during the nights of Tuesday and Wednesday last, about eleven hours being occupied with this operation. The great weight of the girder, with its want of lateral stiffness and the very short time allowed for the work, rendered this a matter of some difficulty, but it was carried out with perfect success.

TO CORRESPONDENTS.

To Our Readers.—We shall feel obliged to any of readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the Editor, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty four Words.

Received.—J. D.—P. Bros.—J. E. C.—E. W. P.—J. P., (Iconoclast), scarcely worth inserting.—G. E. R.—E. P.—R. G. (declined.)—J. N.—P. Bros.—Rev. R. W. A.—J. W. B.—C. J. P.—J. F.—T. and H.—Rev. D. H.—R. and R.—J. T. H.—J. N.—W. W.

J. H. T.—Your question to be answered would assume too much the character of an advertisement, and is, consequently, not inserted.

Several questions asking the price of books are not and cannot be answered.

F. Dafforne had better consult a solicitor.

H. B. (Stevenage.)—There are no architectural books published at the Building News Office.

Correspondence.

REPTON AND THE MEDIÆVAL TILE FACTORY.

To the Editor of the Building News.

Sir,—Partly through the pressure of business and in the hope of further discoveries being made which might in some measure solve the problem of the use to which the chambers already discovered were devoted, I have, although having the matter before me for two months, thus far refrained from communicating to you upon this subject; but as a correspondent in the *Pall Mall Gazette* has called your attention to it, it may not be out of place to supplement those remarks with a few particulars. Being a member of the Midland Scientific Association, my attention was called to the discovery at an early stage; but as they do not embrace archæology in their programme of studies, Repton in this instance has received no official assistance from that learned body, and, through the indisposition of Llewellyn Jewitt, Esq., of Derby, and other causes, it may fairly be said that this interesting discovery has been somewhat neglected.

Leaving the churchyard by the south gate, and passing on to the south-east corner of the enclosure, we arrive at what is called the Abbey Gateway, a notable feature of antiquity, bearing details of the Early Decorated period. Thanks to the ability and foresight of its builders it has recently been able to withstand the shock of a large elm tree falling across it. This severe blow has given it a leaning attitude, which does not at all interfere with its charms. Although bearing the name of the Abbey Gateway, it is now the entrance to the original schoolhouse, a building which is supposed to have been saved from the wreck of the old priory; and it is also the entrance to the Hall, the residence of the Rev. Stewart Adolphus Pears, B.D., a mansion principally of the Stuart age, but still owing its origin to the same circumstances as the schoolhouse. In this latter respect the kitchen is the most noteworthy feature, which occupies the ground story of a large mediæval brick tower, which plays a most important part in the river or northern elevation of the hall. The ceiling of the kitchen is of moulded oak, black with age, and the panels between the great beams are enriched with carved central bosses bearing the monograms or rebuses of the old priors of the convent. Not the least interesting are the grottoes in the gardens, which are mainly formed of the broken tracery of the ancient priory. They are rich in mouldings of the Early Decorated age, and, what may be noted, the original mason's marks, which in one respect differ from some examples in this district by being incised on the beds or jointed faces of the stone. With the view of inspecting the late discoveries, we pass from these private to what is termed the kitchen gardens, which occupy the site of the great nave, transept, and south aisle of the old priory, the floor of which is only two feet below the surface; here and there bases of the arcade are seen above the ground, and at one point, which might be mistaken for some small fish pond, is the entire base of one of the great pillars at the junction of the nave and south transept. Responds, windows, doors, &c., either walled up or in use, are numerous in the garden walls; with these exceptions the old priory is razed to the ground. Amid jutting walls and remains of old buildings, the use of which has long been forgotten, we enter the enclosed paddock, an open

p of beautiful greensward, occupying the rn slope of the hill upon which the town of on stands, and it is here, on the highest nd towards the south-western corner of the sure, a space now being levelled for a playnd to the school, that the old tile works have found. The upper part of the hill is being ved to the lower grounds, and it was during operation that the old chambers, which were ly covered by the turf, were struck upon by excavators. The first thing that presented f was the crown of an arch, or, more strictly king, a semicirular rib turned in tiles 1½in. and 9in. square, evidently moulded for the ose, and forming as a whole an arch or rib ft. span with a chamfered soffit. These tiles, g no cement or other bedding material in oints, were consequently disturbed, and it was when other and similar arches were disred that a careful exploration commenced. It soon discovered that these ribs or arches ned a chamber 2ft. in width and 5ft. in h, and that a similar chamber ran parallel to irst with a divisional wall between composed e stilts of the arches, the space between g filled up with one tier of 5in. flat tiles h were placed in their position without bed; the whole of the latter tiles were found to azed encaustic tiles, as were those composing side and end walls, which were carefully ght to light. From the fact of such a quanof these valuable floor tiles being used for an unseemly purpose it naturally led to the lusion that it was a portion of some ancient manufactory, and this surmise was further gthened by the fact that every tile was of class which might reasonably be called imct; one had a corner off, another only parbore the impress of the design, and all were or less imperfect in either shape, colour, or . Nor did the evidence end here. The whole e adjacent *debris* was composed of broken generally of encaustic pattern; but instances found of plain glazed tiles. Large masses of ied tiles were also found, which bespoke ons of a furnace or kiln floor, and upon the r face broken parallel ridges were seen, which been formed by tiles which had been built edge for burning and had become attached e floor during that process. From this evie other portions of these ancient works were looked forward for, but the search has at nt been useless. Edwin Brown, Esq., of on, examined the adjoining ground in a gical point of view, and gave it as his on that the ground, which was largely com- of the *debris* of neighbouring rocks and gravel, lay undisturbed. We are thus told the ground is about its normal level, and that e chambers, for whatever purpose they may been devoted to, were sunk in the ground. end of the chambers, which was opposite the ng side of the hill, was open, and there was ufficient left above the arches to enable any to judge of the superstructure. That they been subjected to heat was evident from the ed and discoloured state of the soffit of the s; but that the heat had only been of moderate erature was apparent from the loose and deed form of the tiles composing the walls, for it ly fair to presume that if any heat of suffipower to burn or glaze the manufactured had been applied, it would have left the wall in one vitrified unshapely mass. No clear thesis has been given of the use to which e chambers have been devoted further than formed a drying stove in the manufacture of iles. To the Rev. S. A. Pears the preservaof this relic is due. No tiles have been dised further than what has been necessary, he has caused a temporary wooden erection to laced over it. From out the adjoining *debris* rge number of imperfect tiles have been ered, and with patient care designs of no mean r have been developed, varying in size from to sixteen tiles. They are principally of the teenth century period, and represent geoical designs, enriched with foliated cusps and metric leaves of the vine and maple, impressed yellow clay into red tiles. Instances are d of red tiles with a deep brown glaze, bearin incised or impressed outline pattern of an leaf. The above-mentioned gentleman has some fine specimens of spandrail tiles, with a tiful green majolica glaze, and bearing an y English conventional design upon their face imple relief; but as these latter specimens been found at various times in other parts of grounds, they in no way connect the discovery under notice with the thirteenth century. We are told that when the old priory was in the zenith of its power it possessed lead mines and other valuable property in the mountainous districts of Derbyshire, and there is little doubt but those rural churches borrowed somewhat of the grandeur of the mother priory. Amongst the treasured antiquities in the south porch of Bakewell Church are specimens of the above-mentioned brown glazed floor tiles ornamented with oak leaves, and there is little doubt that if some diligent lover of such relics would search out the isolated examples of mediæval tiles, found both in Derbyshire and the adjoining counties, a great light would be thrown upon this interesting subject.

Taking, then, another standpoint, we have some interesting facts connected with the material these ancient craftsmen worked in. From the arch tiles before alluded to, we learn that the discovery of fireclay, which is now so largely used, is not of recent date, but that its fire-resisting qualities were known before its ally coal, was sought and mined for. This description of clay, which is peculiar to our coalfields, is little known in the county of Derby, and then only of secondary quality, and at depths quite unapproachable in those times. We have next to turn to the coalfields of Staffordshire, which approach to within a few miles of Repton, and there we find fireclay of a superior quality cropping out upon the surface. There is little doubt but the fireclay now worked by Edward Ensor, at Church Greasley, near Burton-on-Trent, is identical with that used for the ancient arch tiles under notice. The floor tiles in some instances are made of fireclay and fine sand; in other cases, of fireclay and sandy red marl intermixed; but in most instances, of the ordinary red marl of the district belonging to the new red sandstone system. It was apparently kneaded from selected unground clay, and in the process of manufacture was rolled out to the required thickness on a large table covered with sand; the patterns upon the composition tiles were pressed in as a whole in a very superficial manner and the soft floor of clay at this stage was cut up into square tiles 5in. in diameter; the edges being cut back with a knife or other sharp instrument, to enable the tiles to be laid close at the joints upon the face side. The yellow material composing the design, which is pressed into the red clay, is of a brilliant colour, and of the finest washed description; its base is no doubt fireclay. With these few remarks, I must leave this pleasing addition to the already important history of Repton, hoping that some further discoveries may be made, which will settle the different points at issue, and that Mr. Parker, of Oxford, who I understand has been favoured with restored designs of the majority of the tile patterns, may lay the same before the public. I may, in conclusion, observe that Mr. Richard Keene, photographer, All Saints, Derby, has published a small view of the present condition of these remarkable chambers.—I am, &c.,

Nottingham. William Stevenson.

NUTFIELD HOUSE.

Sir,—I have read Mr. Norton's letter with such astonishment that I cannot help writing to say that, at the time the drawings for Nutfield House were made by Mr. Phipson, I was a pupil of his, and assisted in making them, and that the view given in the Building News is virtually the house as then designed, some additions having been subsequently made. The drawing does scant justice to the original design.—I am, &c.,

S. W. Tracy, M.R.I.B.A.

26, Spring-street, Sussex Gardens,
Hyde Park, March 6.

[We consider that Mr. Norton's letter in answer to Mr. Phipson was unjustly severe, if not inaccurate, and the insinuations it contained were altogether uncalled for. We omitted Mr. Phipson's second letter because it would only have added fuel to the fire, and prolonged an uninteresting and unprofitable controversy.—Ed. B. N.]

The annual meeting of the Birmingham School of Arts was held in the Rotunda last week, Lord Dartmouth in the chair. Mr. C. R. Cope read the report, which stated that, notwithstanding the terrible financial disasters of the past year, and the consequent stagnation of the trade and manufactures of the town, the number of students has been 1,007, showing a decrease of only two from the numbers registered on the books for the preceding year; which, it will be remembered, was the largest number that had been reached since the establishment of the school.

Intercommunication.

QUESTIONS.

[287.]—BRONZING FIGURES.—I shall be glad if any of your readers could inform me of a method by which I may be able to bronze plaster of Paris figures.

T. E. M.

[288.]—VARNISH FOR POLISHED IRON.—Could you inform me what transparent varnish I can use for covering polished iron, so as to prevent it from rusting?

L. M. D.

[289.]—BURNING OF CLAY.—I should be greatly obliged if you or any of your numerous readers would kindly inform me through the "Intercommunication," the best method to set about burning clay to form ballast, as to the preparation of the clay before burning, how to commence the fire, and the continuance of same; also, the quantity of coals required to burn a given quantity of clay, and the best sort of coal for the purpose.

W. K. W.

[290.]—STAINING BRICKWORK.—I shall feel obliged if you, or any of your readers will inform me how to compound the best materials for staining old stock brickwork (red) to match new red brickwork. A Subscriber.

[291.]—ARCHITECTS' PUPILS.—I am one of the very many architects' pupils who think that the mere office work is not sufficient for our improvement. Very often the governor is so busily engaged that it is impossible for him to attend to us, and you may guess how much interest the others take in our improvement. With others, I should be extremely obliged to you or your kind correspondents to point out the best path to pursue in order that we may so improve that, when our pupilage is served, we may keep pace with our fellow architects, and with an art reviving community. Provincial.

[292.]—VARNISH FOR IRONWORK.—Would you kindly inform me of a good method how I can make a good black varnish for ironwork? T. W.

[293.]—WHITE VARNISH.—I should like to know the way to make white varnish? Possibly some generous correspondent will tell me; and, as one good turn deserves another, I will, if I can, at some time, give him or some other inquirer a bit of information on some other subject.

S. W.

[294.]—ETCHING CLUB.—I have recently joined an etching club, and shall be obliged if any of your readers can inform me what materials are required, their cost, and where they are to be purchased; also, if they can supply me the address of anyone who will give instructions in the process. Architectus.

[295.]—COST OF BUILDINGS PER CUBIC FOOT.—I shall feel obliged if you or any of your many subscribers would favour me with the price per cubic foot of buildings, of stone alone, brick, and brick with stone dressings; I wish to know the prices of various classes of buildings in different parts of England. A Subscriber since 1858.

[296.]—CUBING-UP WORK.—Could you or any of your numerous correspondents explain to me how the architects cube up their work? I have asked several persons who have done a great deal of estimating who don't understand the system, and who consider it as lump work. If you can explain, I am sure you will oblige a great many of your numerous readers. Ignorum.

[297.]—GLAZING BRICKS.—Would you or any of your readers inform me of a composition for glazing bricks made from clay (white), from the neighbourhood of Norwich? and you will greatly oblige, John Jobson.

[298.]—SEASONING OAK.—Would you or any of your readers inform me which is the best and most expeditious way of seasoning oak? Cannot steam be employed for that purpose? J. Dexter.

[299.]—CLERK OF WORKS.—Will there not be several wanted to carry out the new Law Courts, and those appointed by Government be subject to the approval of architects? How were the Houses of Parliament carried out? The above struck me from reading last week's number.

J. B.

[300.]—IVORY INLAY.—In representing subjects in ivory inlay, is the effect to be produced entirely dependent on the outline of the figures, &c.? or is the ivory shaded by any process? If so, by what? If shading is not made use of, how are (say) the features of the face, or the folds of the dress, &c., generally shown? Juvenis.

[301.]—CONCRETE WALKS.—Will you kindly permit me to inquire, through "Intercommunication," the reason of my failing to produce a good firm concrete walk? Having mixed 5 parts of good sharp gravel (suitable for garden walks) with 1 part of Portland cement, and sufficient water to bring them to the consistency of a mortar, I worked them well together by means of a hand mortar mill, and then laid the same on a well formed gravel walk about 1in. thick; I then spread a very light covering of finely screened gravel over it, thinking to give it the appearance of a gravel walk, and to have a firm bottom free from weeds and worms. I now find, after it has been down six months, that it is quite soft to walk upon, and does not prevent the worms working through it near the edge. T. C. T.

[302.]—MELTING OLD BRASS BEARINGS, &c.—I have some old brass bearings, &c., which when melted down will not fill the moulds well, and is too hard to work easily. Can you inform me how I can remedy this?

J. F. D.

[The addition of a little zinc, say 20 per cent., would improve it.]

REPLIES.

[241.]—MINING CASUALTIES.—We believe that the Government is fully alive to the desirability of extending its inquiries into the causes of so many disastrous accidents in our coal-pits, and should the present session of Parliament not be frittered away by party squabbling, something of a practical nature in the direction named may be accomplished. No doubt there is much room for mechanical improvements in the working of collieries, and "Sympathetic" has hit upon one or two weak points in regard to existing arrangements. "Overwinding" is a thing which ought never to occur, and yet it is responsible for many fatal casualties every year in the pits of this country. Several clever mechanics have devised self-acting apparatus for preventing accidents during the ascent and descent of workpeople through pit-shafts. Mine owners seem apathetic, nevertheless, and prefer old and primitive plans to new and ingenious schemes of working their pits. The disengaging catch to which "Sympathetic" refers is probably that invented by Mr. John Bryham, of Ince Hall, near Wigan. It consists mainly of two wrought iron plates forged with a slot to receive the shackle to which the cage is attached. A wrought iron disengaging plate is suspended by a brass pin between the two plates already named, and projects beyond them. If the cage is being raised too high, this plate strikes against a stud placed above, and being forced inward detaches the cage. To prevent the cage from falling when detached, two catches or pauls come at once and infallibly into action against the guide or receiving rods, and keep the cage stationary at the point at which it has arrived. The plan is, we believe, in successful use at Ince Hall, but in other mines it is not recognised. Lord Kinnaird probably spoke advisedly when he stated that this and similar improvements find their way very slowly. His lordship is chairman of the Royal Commission on Mines and Mining, and knows full well of the impediments which intercept the progress of life-saving inventions in coal-pits. Hydrocarbon.

[271.]—COMPOSITIONS FOR COVERING ROOFS, &c.—A cheap and simple covering for sheds, &c., may be made by (supposing, of course, the roof to be boarded) pasting on sheets of coarse brown paper, and, when dry, painting it two or three coats with oil paint. The paint I use is the common paint, which is made by emptying cans, pots, &c., into a tub, and which, in fact, is of no particular colour, and which all colourmen have in stock, and may be had at a low price. Wickham.

[271.]—The question of "Wat Tyler" is one of considerable importance to those who have to construct or to pay for the construction of temporary buildings. Many patents have been taken out for accomplishing the objects named by our correspondent, those of making roofs waterproof, and preserving them from the destructive effects of rain, extreme heat, and bad weather. Generally these have proved inadequate, but the most satisfactory and effective composition we know of is that for which Mr. Spence, late of Portsmouth Dockyard, has secured a patent. It is applicable to a variety of purposes besides that of covering roofs, and is made up of sundry materials to suit each particular purpose. The Messrs. James Brothers, of Fish-street-hill, London, are the manufacturers of Spence's compositions, and from personal inspection we can answer for the extreme efficacy of that kind which they recommend for covering and preserving corrugated iron roofs. Its application to any roof, whether of wood or iron, is very simple, and two or three coats are ample in most cases. One ton of the roofing composition will cover a surface of 500 feet area with a thickness equal to 1¼in. It is wondrously repellent of moisture, and is at the same time non-combustible. Hydrocarbon.

[272.]—SMOKE.—There is unquestionably a great deal of misconception abroad as to the nature and chemical constitution of smoke, although most persons coincide very justly in voting it a nuisance. "Anthracite," in last week's Building News, appears anxious for information on the subject, and which, I presume, he intends to turn to practical account, if he can get it. Smoke, however, is by no means easily defined in a scientific sense. Popularly, "smoke" is understood to mean all the products given off during the combustion of fuel, and which pass through the flues and escape at the chimney top into the atmosphere. Chemically, it is really made up of a number of substances, which vary according to the character of the fuel from which it is eliminated. Bituminous coal, such as is generally used in the furnaces of steam-engines, is constituted mainly of carbon and hydrogen, in the general proportions of 85 per cent. of the former to 6 per cent. of the latter, the residuum, making the 100 parts, being earthy matter, with perhaps a trace of oxygen. These constituents are united and solid when the coal is obtained from the pit, but after its exposure to heat a marvellous change in their condition takes place, the hydrogen is quickly liberated in the form of gas, and is accompanied by minute particles of carbon. Steam is also at once generated by the evaporation of the moisture of the coal. The admixture of the carbon and hydrogen constitute carburetted hydrogen, and when this is consumed the product is carbonic acid gas. In order to consume the carbon oxygen is necessary, and this being extracted from the atmosphere entering the furnace leaves a residue of nitrogen, which passes also up the chimney. It will thus be comprehended that smoke contains as a general rule watery vapour, carbonic acid gas, and nitrogen. Intermixed with these ingredients are too often found unconsumed carbon. This becomes disengaged from the hydrogen, and floats away with the gases and vapour named; hence the "long black streamers" to which "Anthracite" refers, and which deposit what are called "blacks" or soot, poisoning and blighting trees and flowers and constituting a veritable smoke nuisance. Perfectly constructed furnaces and complete combustion of fuel are, of course, the only remedy for the latter evil. Hydrocarbon.

[273.]—DETERIORATION IN THE QUALITY OF CAST AND WROUGHT IRON.—"Metallum Martes" asks some very important questions as to the deterioration in the quality of cast and wrought iron. It arises from many causes—first, founders use too much old metal in their castings; secondly, hot blast iron is not so good as cold blast, and nearly nine-tenths of the pigs for either making wrought iron or castings are hot blast; thirdly, competition, no doubt, makes the manufacturers use inferior brands; and, fourthly, engineers or architects are not able, as a rule, to tell good metal from bad when they see it. The best way to get over the difficulty is to specify, in every case, that the cast or wrought iron shall bear certain tensile or other strains, and not, as is usual, that the wrought iron shall be the "best boiler plate," and the cast the best "cold blast," which in neither case is ever attended to by manufacturers. Metallurgy.

[275.]—BLACK POINTING.—Mortar is made by mixing with fine mortar common vegetable black at about 4s. or 4s. 6d. per cwt., and which may be obtained of any ironmonger or colourman. The colour is determined by the quantity used, and may be made to any shade. Wickham.

[275.]—Black pointing can be made of mortar which, in place of ordinary sand, has the sand that has been used by ironfounders for casting purposes. Architectus.

[276.]—MEASUREMENT OF CYLINDERS.—Multiply half the circumference by half the diameter, and the product by the depth, will give the cubical contents. T. W.

[276.]—In answer to "F. R. B. W." I give the requir d information:—Rule: Multiply the area of the base by the perpendicular attitude of the cylinder, and the product will be the required cubical contents. Let A B C D represent a cylinder, and let A C = 6ft., the height, and A B = 3ft., the diameter. To find the area of the base multiply the square of the diameter by the constant ·7854. Area A B = 3² × ·7854 = 3 × 3 × ·7854 = 7·0686ft. ∴ area A B × altitude A C = 7·0686 × 6 = 42,4116ft., or 42ft. 5in., the content.

E. Pritchard.

Leigh, March 4.

[We have received] similar answers from L. Slonur, Rochester; J. F. Wheeldon, Birmingham; and X. X.]

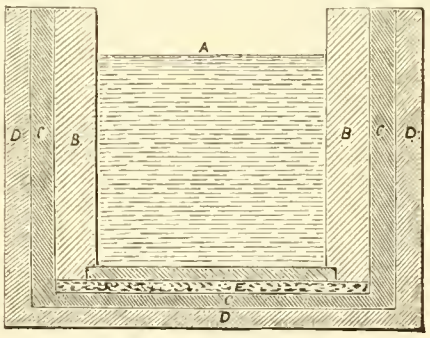
[279.]—DOOR SPRINGS.—"S. C. S." will find Messrs. Charles Smith and Son, Deritend Bridge Works, Birmingham, make as good floor door springs as any firm in the trade, and those gentlemen will give him all information if he writes to them. I speak from experience in this matter. Spring Centre Hinge.

[280.]—INK FOR SKETCHING.—I have found Messrs. Winsor and Newton's "indelible brown ink" the best for this purpose. It is more fluid, and less apt to clog the pen than any other I know of, and will stand a wash of colour over it. For pens, I prefer quills, as most free in drawing curves; small nibs, which can be carried in a box, are the best. Draughtsman.

[280.]—I have always found the "indelible brown ink," made by the colourmen, the best for sketching, and a pen made of a reed the best instrument. Architectus.

[282.]—HOW TO MAKE A CESSPOOL WATER-TIGHT.—"Compo" will make his cesspool watertight by puddling with soft clay round the outside of the brickwork. Architectus.

[282.]—The most sure way to make a cesspool watertight is to puddle it round. Let A represent a section of the



cesspool, B B the walls supporting the sides, C C C a sod wall to prevent the water impinging against the puddle D D D. E represents a layer of broken stone upon which may be bedded 4in. rough flags, or 6in. sets, to prevent the action of the water from disturbing the loose material below. If clay can be obtained, there is not the slightest use for hydraulic lime for the walls, but in case clay cannot be had, "Compo" must mix an equal measure of the best Halkin mountain lime, in powder, to an equal measure of sharp, clear sand. Care in this case should be taken, for it is difficult to make rubble masonry watertight. The clay for the bottom of the cesspool should be well pounded in a dry state, so that there is no possibility of the weight of the walls pushing it aside. The puddle walls should be of a uniform thickness of 15in., and the sod walls of 12in.—Wm. Watts, Swineshaw.—Waterworks, Ashton-under-Lyne.

[283.]—CRACKED BELLS.—In answer to "A Clergyman," to restore a cracked church bell to its original tone it should be re-cast, but if (as is often the case) it is too great an expense for the parish to bear, trace the crack with a magnifying glass to its extreme end, at that point drill a round hole about an inch in diameter (right through the side of the bell), and then saw down the course of the crack to prevent the broken edges from jarring against each other, and the bell will be almost as good as new. Bellfounder.

[283.]—Allow me to inform your correspondent, "A Clergyman," that a cracked church bell can be restored to its original tone simply by drilling a small hole at the end of the crack, and by cutting a narrow slice out of the bell straight down to its edge, so as to prevent the edges from meeting, and thereby disturbing the vibration. The small hole prevents, besides, the crack from extending. P. B. Flood.

[283.]—This question has also been answered by "A Bell Rope," and "H. A. X."

[284.]—CEMENT FOR LEAKY TIN ROOFS.—Equal parts of gutta-percha and pitch, melt in a ladle, and put on hot, is the cheapest I know of, and may be used by anyone; the next best remedy is to employ a tinman. T. W.

[284.]—The surest method to adopt with your roof to make it waterproof is to strip off the whole roof, re gauge the sheets, and fix them similar to slates, giving 3in. in cover. No cement or quackery about the joints will trouble you again. Experience.

[284.]—In reply to "H. W.," he can make an excellent cement for the joints of leaky tin roofs with white lead, linseed oil, some dry white sand, and pipeclay. It will soon become almost as hard as stone, and keep out water perfectly. It should be rendered sufficiently thin to be put on with a brush. G. W. G.

Suggestions.

COMPOSITION FOR WELDING CAST STEEL.

Take 10 parts of borax and 1 part of salammoniac; grind them together and fuse them in a metal pot over a clear fire, taking care to continue the heat until all spume has disappeared from the surface. When the liquid appears clear, the composition is ready to be poured out to cool and concrete, when it is ground to a fine powder and is ready for use. To use this composition the steel is put into the fire and raised to a bright yellow heat, it is then dipped among the welding powder, and again placed in the fire until it attains the same degree of heat as before, when it is ready to be placed under the hammer.

CEMENT FOR PIPES.

Take 6lb. of plumbago, 3lb. of fine chalk, 8lb. of the sulphate of baryta, and 3lb. of linseed oil, and boil them together for half an hour. The black lead, chalk, and baryta must be reduced to a very fine powder, and well mixed with the oil. A cement is thus obtained which may be employed with great advantage in luting the joints of steam boilers, water-pipes, gas-pipes, &c.

ENAMELLING CAST-IRON VESSELS.

Reduce into fine powder and grind together 9 parts of red lead, 6 parts of flint glass, 2 parts of purified pearlash, 2 parts of purified saltpetre, and 1 part of borax. This is put into a large crucible about half full and melted until a clear glass is obtained. This glass is then ground with water and the cast-iron vessel is covered with a coating of it and then heated in a muffle in a furnace. This will melt in a very short time if the furnace is at a good heat, and the cast-iron vessel will be covered with a very fine black enamel of a shining appearance. To make it tough, it should be put into an annealing oven.

PAINT FOR OUTDOOR WORK.

A very good and durable dark green paint for outdoor work may be made by mixing a certain quantity of ground charcoal with litharge as a drier, and some common ochre mixed like any common pigment with boiled linseed oil. H. W.

SUBSTITUTE FOR TRACING PAPER.

A very good substitute for tracing paper may be manufactured with ordinary paper by the help of a little benzole. A sheet of ordinary Bath post moistened with this oil renders the material perfectly transparent; the tracing may then be effected, and, within a short time, the volatile fluid has evaporated, and left the paper perfectly opaque and clear as before. The drawing sustains no detriment by the operation. Xeno.

WAGES MOVEMENT.

Another body of workmen in Paris, the carvers in oak have gone on strike.

About 20,000 operatives are out on strike at Stockport, against a proposed abatement of 10 and 12 per cent. in their wages.

The operative plasterers of Leicester have sent a notice to the master employers that, having taken into consideration the advantages derived by both employers and employes, of other trades, by closing their shops early on Saturday, they have decided to cease work at 1 o clock, to come in operation on the 6th April next. Their rate of wages are, summer, 5s. 8d. per day the first five days of the week, and on Saturdays, 3s. 8d.; in winter, 5s per day the first five days of the week, and 3 . on Saturdays.

The operative plumbers of Liverpool have given eight days notice that they will require an advance of 3s. per week to their wages. It appears that last year they had an advance of 2s. per week in their wages, and the year before the Saturday half holiday was conceded to them. Their unfair demand, if persisted in, will probably be refused by the masters, who will have the support of the Master Builders' Association.

On Monday last the plasterers' labourers of Manchester struck for an advance of an extra shilling, avowing that that was the understanding come to when the last advance was made, which was last year 2s. Their present wages are 23s. per week.

The carpenters and joiners of Scarborough have struck for an advance. Their present rate of wages is 27s per week of 56½ hours. The men demand 28s. per week of 54½ hours, in summer; and six weeks before and six weeks after Christmas, to work from seven to five o'clock, or from light to dark, at the buildings, and receive the same wages all the year, viz., 28s. per week. The masters offer to reduce the time as proposed, from 56½ hours to 54½ hours per week; the wages to remain as they are, but the men reply that they will make no concession to their demands whatever. The masters have, consequently, resolved unanimously not to alter the present rate of wages or the hours of labour; and in consequence of this decision the men struck work on Friday last.

Months ago the joiners of Blackpool gave notice to their employers that they must have an advance of 3s. per week for the 1st of March. The masters have held several meetings, but without coming to any satisfactory arrangement; consequently, the men have struck work. The present wages are 26s. per week, but some hands receive 30s. more. The building trade here is dull, consequently the masters cannot give the advance.

The operatives in the Nottingham lace trade have resolved to establish a permanent board of arbitration with a view of preventing strikes and lock-outs, provided the masters concur in the endeavour to form such a tribunal.

The coopers of Edinburgh and Leith have now been out on strike for nearly eight weeks. Up to the commencement of the strike, the wages of the coopers had been 25s. per week, and the men were not seeking any advance; but a number of the employers intimated to their workmen at the same time that their wages would be reduced from 25s. to 23s. The men declined to accept of the reduced wages, and the result has been that 198 men in Edinburgh and Leith have been eight weeks out of employment. Several of the employers have not joined in the movement to reduce the wages, and have kept all their men at the old wages of 25s. per week; but the others appear to be determined to adhere to the reduced rate.

The notice of reduction posted in the Consett Iron-Works, Liverpool, during the last few days, caused considerable excitement among the workpeople of this district. At first, some of the more impulsive of the workmen were willing to renew the disastrous experiment of striking, but more prudent counsels prevailed, and on Saturday the men and the masters had a meeting, when, after hearing the reasons assigned by the masters for the reduction, the men decided to accept the reduction of 5 per cent. on the prices at present paid to them. In the afternoon, the men and the millmen had a meeting, and after the position of their employers had been given, the men decided to accept the reduced price, after the termination of the notice.

WATER SUPPLY.

At the monthly meeting of the Glasgow Water Commission on Monday last, it was reported that on 25th February there were 138 days water supply in the lochs, 60 days supply (additional) in the Mugdock reserveir, and 8 days' supply in the Gorbals reservoir. The average daily quantity of water delivered in the city during the month then ended was 26,900,000 gallons.

A report has been issued by Messrs. M'Clean and Stileman, as to the progress of the South Staffordshire Waterworks, in which they state that the supply from the tunnel Dudley field, previously in existence, is 4,000,000 gallons a day; in addition to which, is the supply from Bourne Brook, which is connected with their pumping shaft by a tunnel, which, for a length of upwards of a mile and a half, is lined with brickwork, and forms a subterranean reservoir, in which water may be drawn at any time, as required for the supply of the engines. By means of this subterranean storage, the water will have a temperature at the pumping shaft not exceeding 50 deg. The increased supply of water that may be taken from the Bourne Brook, when occasion exists, exceeds 5,000,000 gallons daily, without the construction of any reserveir for storage."

LEGAL INTELLIGENCE.

COURT OF CHANCERY, MARCH 2.

(Before the Lord Chancellor.)

PILGRIM V. THE AUCTION MART COMPANY (LIMITED).

This was an appeal from a decision of Vice-Chancellor Wood, who in March last, after great consideration, refused the erection of certain large buildings in Tokenhouse-yard, City, under these circumstances:—The plaintiffs, Messrs. Pilgrim and Phillips, were solicitors; the house which they occupied was situated on the north side of Bartlett's-court, Lothbury, and was held under a lease for 21 years from Christmas, 1859. It was a very old house, and had been occupied by this firm and their predecessors for forty years; fronted towards the south, and was west of Coleman-house-yard. The old houses in Tokenhouse-yard ran at right angles to the front of the plaintiffs' building, the back of them rising 35ft. high, and set back about 11ft. from the front of the house. The defendants had owned rows of houses situated in Tokenhouse yard, which ran nearly due north and south, and fronted into Tokenhouse-yard towards the east, the backs being in no part more than 9ft. 10in. high, the front walls of the same height, sloping roofs. The defendants pulled down these houses and commenced building a very extensive erection on their site, and this it was which was the cause of this suit, inasmuch as it was alleged that a great obstruction of light and air was and would be the consequence. It was stated that the defendants contemplated raising the buildings to a uniform height of 70ft.; but subsequently this height was varied to 58ft. or 59ft., with 3ft. for the roof. In consequence of the defendants' excavations the walls and buildings of the plaintiffs' house began to crack, and one witness deposed that there was actually a risk that the house would fall; but the defendants alleged that as to this no reparation could be made for £5. As to the obstruction of light and air, a vast amount of evidence was brought forward, and it appeared that the defendants' new buildings ran across at right angles to the plaintiffs' front for a length of 22ft., and hence it was alleged to be evident that much larger amount of sky surface was cut off than was intercepted by the old buildings at a distance of 11ft. It appeared on the evidence that whereas, previously to the erection of the defendants' buildings, light fell on the floor of one of the principal rooms to an extent of 7ft. in., it now came in only 1ft., and the light which came to the room generally 8ft. now only came in 4ft. 6in. The house formed one of three upon which his Honour had visited on the former occasion.

The arguments in this part-heard appeal from a decree of Vice-Chancellor Wood were on Wednesday morning resumed and occupied the court during its sitting, without being concluded. The plaintiffs' seek by their bill to restrain the defendants' from erecting a large building in Tokenhouse-yard in such a way as to obstruct the free use by the plaintiffs' on their adjoining premises of the light and air. The Vice-Chancellor granted the injunction, and the defendants appealed. Sir R. Palmer, Mr. Osborne, Mr. Giffard, Mr Wickens, and Mr. Colt were for the appellants; Mr. Daniel, Mr. Wilcock, and Mr. Bagshawe for the plaintiffs.

VICE-CHANCELLOR'S COURT, MARCH 6.

NAPIER V. WALLER.

After two days' hearing of the issue in this suit, which was instituted by Lady Napier to obtain an injunction against the defendant for materially interfering with the light and air of her house, No. 1, Hobart-place, so as to render it unfit for occupation by her, by the erection of a new mansion on the site of Grosvener-street West. The special jury who were empannelled to try the issue, having intimated that after a controversy of three hours, they saw no chance of agreeing to a verdict as long as they had to decide whether the house would be materially injured, were discharged.

Building Intelligence.

CHURCHES AND CHAPELS.

The scraping of the walls of Wrexham old Church, during last week, brought to light, over the archway spanning the chancel, a large painting, which, as far as it can be deciphered at present, seems to be a picture of the Last Judgment. It has been decided to preserve it as perfect as possible, and some thoughts are entertained of restoring it.

The Church of St. Michael, Lant-street, Borough, London, was consecrated on Wednesday last by the Bishop of Winchester. It is a handsome building in the Gothic style, composed of Kentish rag stone, with ordinary stone facings.

A new organ for Christ Church, Blackburn, was opened last week. The organ was built by Messrs. Conacher and Co., of Huddersfield, at a cost of £400.

BLAKEDOWN, BIRMINGHAM.—A new spire has been added to the tower of the church here. The tower rests on four corbels, very elaborately carved, and is intended for three bells. The church was erected by Mr. Street, and is in the French Gothic style. The spire is from the designs of Mr Smallman Smith, of Stourbridge, and the work has been executed by Mr. Briannian, of Kidderminster.

HOLLOW, NEAR WORCESTER.—On Tuesday last the foundation stone of a new church at Hollow was laid by the Earl of Beauchamp. The church will be in the Early Decorated style, and will cost, without the tower, £3,050. Mr. Hopkins, of Worcester, is the architect, and Messrs. Inwood and Osborne, of Malvern, the builders.

KEIGHLEY.—On Tuesday last, the foundation stone of a new Methodist Chapel was laid. The chapel will be in the Decorated Gothic style, with nave, aisles, and side galleries, and a school room in the basement. The expected outlay will be about £4,000; and the accommodation will be for 1,000 persons. Mr. W. Sugden, of Leek, is the architect; and the works have been let to local builders.

KEIGHLEY.—On Saturday last the foundation stone for the re-erection of a new Wesleyan Chapel, was laid. Messrs. Lockwood and Mawson are the architects. The front will be of simple Italian. The contractors for the work are Messrs. Gibson and Maud, of Keighley, and the probable cost of the re-erection will be about £2,000.

BUILDINGS.

The cost of building the new theatre at Leipsic has already exceeded the estimate by 60,000 thalers. The expense now run up amounts to 527,000 thalers.

The first stone of Mr. Spurgeon's almshouses, illustrated in the BUILDING NEWS on the 1st of February last, is to be laid in April by Mr. Thomas Olney. The contract has been accepted for £4,500. Homes for 18 almswomen, and schoolrooms for 200 children, with tutor's residence, are provided in the plan. Coloured brick is largely used in the elevation.

A new Corn Exchange is about to be erected at York, at a cost of about £8,000.

The plans prepared a short time ago by Mr. Crozier, architect, for rebuilding the present Durham Assize Courts, were submitted to, and approved by, Mr. Justice Mellor and Mr. Justice Shee, on Monday last. The entire cost of the rebuilding and extension of the courts is calculated to be upwards of £5,000.

At a meeting of the Gateshead Town Council on Monday last, it was unanimously proposed that a new town hall should be built at a cost of £12,000, and also police cells at a cost of £360.

At a meeting of the Liverpool Baths Committee on Tuesday last, the plans of Mr. Edward Holmes, architect, of Birmingham, were selected for the new baths about to be erected, at a cost of about £8,000.

On Monday last, the foundation stone of the Working Men's Institute, at Ormskirk, Liverpool, was laid. The proposed building will be constructed of brick. Mr. R. Downes, of London, is the architect; and the contract for building the same was taken by Mr. T. Riding, builder, of Ormskirk, at a cost of £1,520.

THE NEW THEATRE, BRISTOL.—The tenders for this building were opened on Saturday last, and that by Messrs. Davis and Son accepted, at £10,125 for the theatre and two shops in the Park-row frontage. This amount does not include decorations, seating for boxes, furnishing, or stock scenery, for which an additional £4,000 is reserved. The theatre will stand isolated upon a fine site, so that lights will be obtained on all four sides. The area of ground covered will be 105ft. wide by 130ft. long, with saloons and shops towards Park-row, 50ft. by 50ft. additional. The principal dimensions are as follows:—

From curtain line to front of dress circle	44ft. 6in.
" " Upper circle	47ft. 6in.
" " Gallery	50ft. 0in.
Width of the proscenium opening	30ft. 0in.
Height " "	27ft. 0in.
Height—pit floor to ceiling	45ft. 6in.
Depth of stage	60ft. 0in.
Width of ditto between walls	64ft. 0in.
Width of ditto (including two scene docks)	100ft. 0in.
Height from ditto to gridiron floor	57ft. 0in.
Depth from ditto to sinks	21ft. 0in.

The accommodation provided in each part of the house is as follows:—

Dress circle	340
Orchestra stalls	50
Twelve private boxes	50
Pit	800
Upper boxes and amphitheatre	360
Gallery	800
Total	2,400

The works are to be pushed on with the greatest despatch, for the proprietor, Mr. J. H. Chute, has already, in one of the comic scenes of the pantomime, advertised the date of opening as 14th October, 1867. The architect is Mr. C. J. Phipps, F.S.A., of London and Bath, and, judging from the rapidity with which he built the theatres at Bath, Nottingham, South Shields, and Brighton, the date for opening does not seem improbable.

MEETINGS FOR THE WEEK.

TUES.—Institution of Civil Engineers.—Discussion on Captain Tyler's paper "On Steep Gradients and Sharp Curves on Railways"; and, time permitting, "Memoir on the River Tyne," by Mr. W. A. Brooks, 8.
Royal Institution.—"Botany," by Rev. G. Henslow, 3.

THURS.—Royal Institution.—"Coal Gas," by Professor Frankland, 3.

FRI.—Royal Institution.—"Early Mental Condition of Man," by Mr. E. B. Tylor, 8.
Architectural Association.—"On Egyptian Architecture," by Mr. R. Phené Spiers, 7.30.
Royal United Service Institution.—"The Recent Campaign in Bohemia," by Lieut. H. M. Hozier, 3.

SAT.—Royal Institution.—"Coal Gas," by Professor Frankland, 3.

Trade News.

TENDERS.

BARKING.—For eight houses, for Mr. Hawes. Mr. J. W. Dennison, architect:—Ashmole, £1,867; Rivett, £1,743; Stokes, £1,500; Withers (accepted), £1,360.

BRISTOL.—For the new theatre, Bristol. Mr. Phipps, architect:—Hughes, £11,722; Diment, £10,700; W. Baker, £10,476; Davies and Son (accepted), £10,125; Beavan and Sons, £9,631; Hayes, £9,552.

BURSLEM.—For the erection of Sneyd national schools. Ralph Dain, architect, Burslem:—Blackhurst, £1,532 15s.; Watkin, £1,514 11s.; Walley, £1,511; Woolrich, £1,495 10s.; Bennett and Brindley (accepted), £1,284.

HARROW.—For plastering at Sudley Hall. Mr. J. Dale, architect:—Eastlake, £353; Ford (accepted), £248; Dowling, £240 14s. 4d.; Harvey, £235; Andrews, £215; Horne, £198 10s.

LONDON.—For new vagrant wards and local offices, for the Guardians of the West London Union. Mr. Lewis H. Isaacs, architect. Quantities supplied by Messrs. Arding and Bond:—King and Son, £5,372; Browne and Robinson, £5,084; Bamford, £5,057 10s.; Patman and Fetheringham, £4,997; Clemence, £4,994; Simpson and Son, £4,898; Hill and Keddell, £4,540; Phillips (accepted), £4,497 16s. 9d.; Langmead and Way, £4,370.

MAYFAIR.—For the erection of two houses and shops, Shepherd-street, Mayfair, for Mr. W. H. Whitehouse. Mr. Joseph S. Moye, architect. Quantities supplied:—Stener, £1,857; Sapwell, £1,794; Walton, £1,582.

OXFORD-STREET.—Accepted for improvements on Crown property in Oxford street, for Mr. T. Holloway. Mr. Dale, architect:—Stone front, Carter and Son, £1,678; fittings of ground floor and library, Carter and Son, £1,987; plastering work, Parsons, £750; ornamental ceiling, Jackson, £260; hoist, Johnson, £70. For works per schedule of prices, the following trades were accepted:—Iron shutters, Clarke and Co.; decorations, Cowtam and Co.; scagliola, Dobson and Son; engineering and copper works, Ashton; general fittings, Ashton.

PIMLICO.—For making alterations to 21, 22, and 23, Victoria road, Pimlico, for Mr. F. Gorringe. Messrs. Walford and Donkin, architects. Quantities supplied by Mr. Doughney:—Turner and Sons, £4,315; Lawrence and Sons, £3,932; G. H and A. Bywater, £3,771; Ramsey, £3,786; Newman and Mann (accepted), £3,384.

SNARESBROOK.—For two houses and shops, for Mr. Wilkinson. Mr. Marshall, architect:—Rivett, £1,383; Mundy and Hutchinson (accepted), £1,325.

SNARESBROOK.—For house and shop, for Mr. Bodger. Mr. Marshall, architect:—Lose, £675; Mundy and Hutchinson (accepted), £650.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

William Bailey, Finchley, builder, March 13, at 12—George Barnes, Grove road, Mile end, slater, March 20, at 2—Lewis Green, Hornsey, builder, March 25, at 1—Wt Purkiss, sen., Hampden street, Somers Town, builder, March 13, at 1—Martin Roots, Shipbourne, Kent, timber merchant, March 19, at 12—W. Swatman, Elm street, Gray's Inn road, painter, March 14, at 2—W. H Thorn, Lower Thames-street, zincworker, March 19, at 11—John Williams, Lewisham, plumber, March 13, at 1—William Packhurst, Twickenham Park, builder, March 27, at 1—Edward Samuel Downs, Hadleigh, builder, March 19, at 12—John Gilbert, Brightling, wheelwright, March 27, at 1—James Howlett, St. Thomas's road, Stepney, bricklayer, March 18, at 11—C. H. Page, Carlton street, Kentish Town, builder, March 25, at 12—J. Stringfellow, South grove, Stamford hill, builder, March 18, at 12—James Walkley, Battersea, carpenter, March 19, at 2.

TO SURRENDER IN THE COUNTRY.

William and Harriet Cooper, Tamworth, plumbers, March 22, at 12—W. Field, and W. Palmer, Birmingham, timber merchant, March 13—George W. Francis, Lason, Devon, road surveyor, March 12, at 11—John Jones, Friog, near Dolgelly, joiner, March 14, at 11—W. Laband, and Harriet Payne, Birmingham, carvers, March 13, at 12—John Bancroft Shuttleworth, Hyde, plasterer, March 18, at 11—Henry Sidders, Teynham, brickmaker, March 13, at 12—William Stainton, Waterloo, Lancashire, painter, March 12, at 3—Thomas Emery, Wednesbury, carpenter, March 20, at 12—Thomas Knowles, Manchester, machinist, March 25, at 11—John Seeming Taylor, Barrow-in-Furness, plasterer, March 11, at 10—Benjamin Westell, Accrington, wheelwright, April 5, at 11.

PARTNERSHIPS DISSOLVED.

Knowles and Higham, Blackburn, ironfounders—Webster and Atkinson, Leeds, builders—J. and T. Brightmore, Sheffield, painters.

DECLARATION OF DIVIDEND.

J. W. Pollard, Liverpool, slater, dividend 5s.

DIVIDENDS.

March 14, R. Johnson, and J. Addie, York street, York road, slate merchants—March 14, G. A. H. Eades, Sun Tavern fields, Shadwell, iron merchant—March 19, W. Sutcliffe, Halifax, mason—March 18, H. Tuff, Walmer, near Deal, contractor's agent—March 20, W. Booth, Sheffield, engineer & toolmaker—March 20, I. H. Schofield, Sheffield, joiner's tool manufacturer.

NOTICE OF SITTINGS FOR LAST EXAMINATION.

March 20, T. Dockerty, Jarrow, builder—March 27, J. Street, Hulme, journeyman bricksetter—March 27, H. Shepherd, Hulme, journeyman ironmoulder—April 26, J. W. Tout, Portsmouth, engineer—April 30, G. Croft, Brighton, builder—March 22, C. Martin, Duke street, Adelphi, engineer—March 22, C. Woolnough, Falkland road, Kentish Town, plumber—March 25, C. Rooke, Blandford Forum, builder—March 27, T. Wallis, Harrow road, plumber—March 27, G. H. Johnson, Richmond, plumber—April 16, J. Rovery, Park road, Clapham, timber dealer—April 12, G. Aish, North Petherton, Somerset, carpenter—April 25, J. Bell, Penrith, plumber—March 16, G. Craven, Dacre Banks, near Ripley, journeyman mason—March 18, T. Longdon, Litchurch, moulder.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9	0	£10	10	Archangel, yellow ..	£12	0 £13 0
Quebec, red pine	2	5	4	15	St. Petersburg, yel...	10	10 11 0
,, yellow pine..	2	15	3	10	Finland	8	0 9 0
St. John N.B. yellow	0	0	0	0	Memel.....	0	0 0 0
Quebec Oak, white..	5	10	6	0	Gothenburg, yellow	9	0 10 10
,, birch.....	3	10	4	10	,, white	8	0 8 10
,, elm	2	10	5	0	Gefle, yellow.....	9	0 11 0
Dantzic oak	3	10	8	0	Soderhamn	9	0 10 10
,, fir	2	0	3	10	Christiania, per U.,		
Memel fir	3	0	3	10	12 ft. by 3 by 9 in.		
Riga.....	3	0	3	5	yellow	18	0 22 0
Swedish	1	18	2	3	Deck Plank, Dantzic,		
Masts, Quebec red pine	6	0	8	0	per 40 ft. 3 in.	0	14 1 4
,, yellow pine..	5	0	6	0	PUMICE STONE pr ton	5	0 8 0
Lathwood, Dantric, fm	4	10	5	10	OILS, &c.		
,, St. Petersburg	6	10	7	10	Seal, pale....per tun	46	10 47 0
Deals, pr C., 12 ft. by 3					Sperm body	140	0 0 0
by 9 in., duty 2s per					Cod	41	10 0 0
load, drawback 2s.					Whale, Sth. Sea, pale	45	0 0 0
Quebec, white spruce	13	10	22	10	Olive, Gallipoli.....	63	0 0 0
St. John, white spruce	13	0	15	10	Coconnut, Cochin, ton	58	0 0 0
Yellow pine, per reduced C.					Palm, fine	40	0 41 0
					Linseed	35	10 0 0
Canada, 1st quality.	17	0	19	10	Rapeseed, Eng. pale..	38	10 0 0
2nd do.....	12	0	13	10	Cottonseed.....	30	0 36 0

METALS.

IRON:—						
Welsh Bars in London .. ..per ton	6	15	0	0	0	0	3¼
Nail Rod ..... do	7	10	0	8	0	0	2
Hoops ..... do	8	17	8	9	0	0	
Sheets, Single ..... do	9	17	6	10	0	0	
Staffordshire Bars ..... do	7	17	6	8	10	0	
Bars, in Wales ..... do	5	15	0	5	0	0	3
Rails ..... do	5	0	0	0	0	0	nett
Foundry Pigs, at Glasg. No 1 .. do	2	13	6	3	7	0	
Swedish Bars ..... do	10	10	0	12	10	0	2½
STEEL:—							
Swedish Keg, hammered .....per ton	15	15	0	16	0	0	
Swedish Faggot ..... do	10	10	0	12	10	0	
COPPER:—							
Sheet & Sheathing, & Bolts ....per ton	86	0	0	91	0	0	3
Hammered Bottoms ..... do	96	0	0	101	0	0	
Flat Bottoms, not Hammered .. do	91	0	0	96	0	0	
Cake and Tough Ingot ..... do	76	0	0	0	0	0	
Best Selected ..... do	84	0	0	89	0	0	
Fine Foreign ..... do	86	0	0	88	0	0	
Yel. Metal Sheathing & Rods ....per lb	0	0	7½	0	0	8	
TIN:—							
English Block .....per ton	90	0	0	0	0	0	2½
do Bar ..... do	91		0	0	0	0	
do Refined ..... do	93	0	0	0	0		
Banca ..... do	88	10	0	89	0	0	nett
Strait ..... do	85	10	0	86	0	0	
LEAD:—							
Pig, English .....per ton	22	5	0	22	10	0	2½
,, Spanish Soft ..... do	19	15	0	0	0		
Shot, Patent ..... do	23	10	0	24	0		
Sheet ..... do	21	0	0	0	0	0	
White ..... do	30	0	0	81	10	0	
SPELTER:—							
On the Spot .....per ton	22	6	0	22	15	0	nett
ZINC:—							
English Sheet .....per ton	28	0	0	0	0	0	
Devaux's V. M. Roofing Zinc .... do	27	0	0	0	0	0	*

* And 5 per cent. discount if laid upon the new system.

QUICKSILVER .....per btl	6	18	0	7	0	0
REGULUS OF ANTIMONY.						
French .....per ton	34	0	0	0	0	0

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THE MECHANICS' MAGAZINE, of March 8, 1867, Price 4d., contains articles on:—
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The Paris Exhibition.
The Late Mr. Bethell.
The Dublin Exhibition of 1865.
Notes on Recent Scientific Discoveries and their Practical Applications.
New Works at Woolwich.
Coal-Cutting by Machinery.
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THE BUILDING NEWS.

LONDON, FRIDAY, MARCH 15, 1867.

A PHILOSOPHICAL VIEW OF ART.

No. 3.—CONCEPTIONS OF ART.—THE INTELLECTUAL CRISIS.

A RAPID review of the conceptions prevalent among the Oriental and earliest nations has prepared us for an examination into the Greek and Roman periods. We have seen that the preponderance of the imaginative faculty, especially among the Indians, imparted to religion and art a peculiar significance. A poetical mysticism under a veil of symbols, and a creative fancy seldom equalled and never surpassed, are the salient features that strike us in viewing them from our present distant standpoint. Indeed, the mythic religion and art of early eastern civilisation show us the near approach the higher faculties of man—unguided as they were—can make towards perfection, when left to a natural and instinctive impulse. Never was a purer form of polytheism conceived than that which regarded the deity as an absolute ideal, the supreme essence from whom all souls and things emanate, and with whom they are finally incorporated, after successive migrations through the corporeal world. The triple relation of the divine being (the Timourti) of the Hindoo religion constitutes, indeed, a striking analogy to our doctrine of the Trinity, as well as indicates a faculty for abstract conception. But with all this undeniable proof of nobility of consciousness and intellect, found in the early believers of Brahma, the time had scarcely arrived when a separation between the material and immaterial—or the form and the idea—became necessary. Ancient Greece was the stage on which that great intellectual movement began, and it is from that epoch, moreover, that the history of philosophic thought commenced. The creative fancy of primitive man, externalising ideas, first seeks the evidence of his religious belief without, objectively; but afterwards, the development of his reason seeks it subjectively, within; and thus he advances from poetry and faith, to science and reason—from particular to universal ideas.

To understand the influences which brought about the struggle between the imagination and the reason, it is necessary to bear in mind the diversity of elements which combined to form the Greek civilisation and intellect. Besides two distinct races, the Pelasgi,* the aboriginals, dwellers of Peloponnesus, and the Hellenes, who subjugated them and spread themselves over the country, there were various other races of foreign extraction who intermingled, and gradually became united, with the indigenous tribes. Thus we find Cadmus, from Phœnicia, teaching the alphabet; the Egyptian Cecrops establishing religious and social observances, and the Areopagus. The earliest period of Grecian history was one, indeed, of tradition and fable, in which the symbolical ideas of the east mingled with the notions of the country. Hence gods and mortals, titans and giants, vied with each other as objects of worship. Divided into states ruled by kings, there was yet no bond of union between them. Such a union was, however, soon formed by the Trojan war, but chiefly by the universal reverence for the Oracle of Delphi, which, together with the Olympic and Isthmian games, promoted that national unity so necessary to the arts of life. The exclusive character of Asiatic civilisation, united to a monarchical rule, contrasted greatly with the unsettled and migratory aspect of early Greece, which soon led to the development of a republican spirit; and this tendency is apparent in the Greek theogony and institutions, as well as in the innumerable republics of cities and provinces which divided between them the states of Greece. The diversity in the moral and intellectual habits of the Greeks doubtless first gave rise to this republican spirit, which made itself felt, as a writer has remarked, in all the arts, "and in a science engaged in incessant strife, and marching from system to system amid the noise and tumult of opposition."* All these concurrent circumstances combined to develope prematurely an intellectual mode of thought, to which the earliest philosophy of Greece, which was a religious or poetical philosophy, soon gave place. The sensuous veil which clothed the abstract thought in the early ages began gradually to fall away, and to give prominence to a philosophical reason which regarded man, and his relations to the world, and to the Divine essence rather than the vague and general ideas previously entertained.

To see how this spirit of inquiry was infused into thought, it is only necessary to trace the rise and progress of scepticism, as it revealed itself in opposition to dogmatic teaching, during the chief periods of Grecian philosophy. First, we find the Greek intellect began to speculate on the external world. The Ionic school of Thales, taking experience as their guide and matter as the basis, tried to discover the origin and elementary principle of all things. Water, air, and fire† were severally taken to represent the original element; though in what manner these material principles were related to the spiritual part of the system is not clear. In the Pythagorean philosophy, we trace the ascension of thought from matter to abstract notions and principles. An occult power was attributed to words and numbers; the world and its relations to the Deity were defined in a sort of physico-mathematical manner; the doctrine of the metempsychosis, and the faculties were also combined with an occult system of mathematics; and many noble ideas on an ethical system were partially developed.

Next, in the speculations of the Eleatic school, which number among its followers Parmenides and Zeno, we find a still further endeavour to disregard appearances and make them relative to abstract ideas. Idealism reached its height; reason became opposed to experience; and scepticism, for the first time in the world's history, became a dominant fact. This disbelief in outward appearances sprang from the notion that a plurality of real essences implies qualities, such as similitude and dissimilitude, movement and repose, mutually destructive of each other.‡

The philosophers of the Atomic school sought to combine the experimental and intellectual systems. The existence of motion and plurality was asserted; atoms and a vacuum were the elementary principles of this corporeal system; and the soul itself was differently defined to be a mass of round atoms, imparting heat, motion, and thought; sensation, a species of emanation from surrounding objects; while other disciples of this school combined the elements of various other systems with atomical theories. This system of thought must be regarded as a sort of reaction to the metaphysical theories of the Eleatic school, and in it we trace a spirit for more exact science. Anaxagoras, of Periclean renown, for example, explained the existence of animals and vegetables on physical principles; regarded the testimony of our senses as true, though insufficient for objective truth, the proper sphere of the reason. Passing over the school of Sophists which arose out of the conflicting notions of truth and morality, and the consequent deterioration of religious belief, another period of reason commences. Hitherto reason was characterised by an unsystematic method; now it proceeded from man to external nature. Speculation and practice went hand in hand, and an endeavour was made to deduce principles worthy of the name of philosophy. And it is important to mark that this new era in the progress of thought was identical with the most significant aspect of Greek art and literature. Athens was now the focus of civilisation. Socrates laid the foundation of a system which sought to unite religion to morality and philosophy; in which the higher duties of man were regarded as the principal exercise of his faculties. In this system, essentially a moral one, the relation of the soul to Divinity was nobly and simply defined, and certain laws determined the exercise of freewill and nature.

Passing lesser constellations of philosophic genius, more or less of a mixed character, we come to that period of intellectual effulgency which brought out into prominent notice the profound and exalted Plato, a listener of Socrates. Like the latter, embracing in his mental grasp the elevated ideas of contemporary thought, the highest faculties of humanity were united to a practical element. Based on a system of rationalism he yet distinguished the sphere of ideas beyond sense or the eternal archetypes or unities, and conceived more comprehensive views of the extent and end of philosophy than did many of his contemporaries. Plato also distinguished the different sciences—the corporeal from the spiritual—and discriminated between the faculties of cognition and sensation, the analytical from the synthetical modes of inquiry, thus rendering his philosophy more complete than any previous system. Beauty he considered to be the expression of moral and physical perfection—synonymous with truth and goodness, and leading to love and virtue. Such were the leading features of a philosophy in which ideas are blended into a united whole, and made accordant to the sublimest modern conception. Aristotle, Plato's disciple, excelling his master in discrimination, drew a more defined line between reason and imagination, but endeavoured to reconcile Nature with ideas, proceeding in his reasoning from the particular to the universal. He enlarged the field of philosophy, dividing it into Logic, Physics, and Ethics—the speculative or real from the practical or accidental—developed the ideas on psychology, and deduced from Nature a theory of the fine arts.

Such is a slight sketch of the conflicting systems of thought which, for a period of upwards of two hundred years, occupied the intellect of Greece. Another period was taken up by the stoical doctrines, which regarded cognition as opposed to scepticism, and established rigid laws of morality, and a distinction between corporeal and incorporeal beings was made. The dogmatism of the Porch, however, soon found opponents, and its union with the scepticism of the Academy tended to weaken all philosophic speculation, which gradually lost its spirit under an oppressive and Oriental learning. It will thus be seen that a new era of thought had dawned—one which distinguished the imagination from the reason, and which separated the subject from the object, instead of that inversion of high and low, God and Nature, which marked a mytho-philosophical era. Yet the popular religion of the Greeks was little influenced by the intellectual atmosphere. Amid the conflicting and extremely opposite hypotheses that characterised the philosophy of Greece, there was little on which national religion could safely repose, and hence it remained a system made up of mythological fictions—a sensual religion refined by the intellect. The metaphysical abstractions of the philosopher only perplexed, and could not find embodiment in a poetical theology thoroughly anthropomorphic and confined to external rites.

Though the intellect was the predominant feature of Greece, there was yet a poetical element in its constitution which served to keep alive the feelings and sentiments of life. Thus the Homeric poetry of Greece occupies

* Constructors of those Titanic erections known in Italy as the "Cyclopean."

* Fred. von Schlegel, in his "Philosophy of History."

† Heraclitus maintained that fire was the universal agent, the principle of life, force, and thought.

‡ Zeno was the propounder of this argument.

a middle position between the fictions of Oriental fancy and the intellect of a prosaic age; and this poetry became the vehicle for the hymns to the gods. In Sophocles an artistic refinement and moderation, attributable to the flourishing epoch of his life, raised still higher the poetic element of civilisation. Philosophy, life, public games, and festivals were regarded from an ideal point of view; beauty and poetry clothed everything. The athletic exercises afforded models for sculptors, and the feelings of humanity were developed to a remarkable degree. Hence, a compromise was effected between the reason and the imagination; thought was exalted and found its sublimest consummation in the Platonic notion; and all were embodied, by the refined æsthetic sense of the Greek mind, in the most sublime anthropomorphic art. From a period of fetichism, in which stones and symbols were worshipped, we see the Greek conception for art rising higher and higher, till the wooden painted idols perfected by Dædalus became under the chisel of Phidias the most perfect embodiments of the beautiful. And I may observe here that this sense of beauty became at last to be entirely independent of the portrayal of religious feeling; beauty was worshipped for itself alone, and all that was sensuous or dignified, from whatever source, became incorporated with the plastic art of the nation. Thus, in the figures of Jupiter and Hercules ideal faces and animal strength were given, and every statue became typical of an ideal conception. This tendency of art to become more separated from religion was unquestionably the result of philosophic thought, and I shall have occasion in the course of these remarks to refer to the same tendency among us moderns. The Greek idea was a purely intellectual one, something transitional between the corporeal idea of an early embodying nation, and the religious conception of a subsequent age. The national character and education of the Greeks tended also in a remarkable manner to develope the perception for the fine arts. A love of beauty was inherent. Even games were instituted, and prizes awarded to the most beautiful; and it is said the Lacedæmonian women kept before them in their bedrooms the finest statues. Philosophers, too, relished art; and artists studied philosophically, beginning with geometry and form. Pythagoras, Plato, and Aristotle wrote upon art; and Plato asserted that a mastery of form in man and animals was the basis of all design. Nothing, however, developed the fine art perception more than the Olympic games. They roused the energies of all engaged in the contest of skill and superiority in the arts; and Aristotle observes, "All were taught literature, gymnastics and music, and many the art of design,"* for the purpose of educating the people in the principles of those pursuits which gave them honourable distinction, and enabled them to decide with strict impartiality their merits. Aristotle says, "The multitude is the surest judge of the productions of art." Comparing Greek with Egyptian art, though we see a similarity in some of the fundamental forms, the simplest and earliest Greek temple, finding its prototype in Egypt,† yet there is a marked difference in the perceptive power of the two nations. The Egyptians had not the power of perception enough to rise above nature, nor an instinctive imitation of natural forms—in other words, to attain to any ideal excellence or beauty, like the Greeks. Hence the figures we see are mere transcripts or childish portrayals of life. In architecture, form, not colour, was noticed, the latter having only a subsidiary office. In Egypt the buildings themselves were symbolic records; in Greece they were conventional works of art, in which sculpture and painting were intimately associated, and these generally embodied the epic or myth.

* In his "Politics," lib. VIII.
† Proto-Doric Grotto, at Beni-Hassan.

Without the variety of preceding developments, and less corporeal in its character, Greek architecture displayed a chastened expression of abstract idealism which previous types of art never possessed. More conventional in treatment, the exquisite members of the Greek temple, as seen consummated with all the Hellenic refinement in the Parthenon at Athens, seemed to be a petrifaction in marble of the dialectics and deductive philosophy of Greece. In the echines and other mouldings, as well as in the Panathenaic frieze, the entasis of the columns and the other optical corrections of form we almost fancy we can realise the severe and rigid metaphysics of the Greek intellect. All this refinement took the place of the size and imitational ornament of an earlier and more corporeal architecture. It would be losing sight of the main features of our present sketch were we to enter minutely into an investigation of Greek art, or to detail the great works now so well known to all lovers of art. We have dwelt rather fully, on the other hand, on the Greek conception, because Greek civilisation, in its diversity of character and opinions, may be regarded as an epitome of advanced thought and life, which a lapse of 2,000 years has scarcely excelled—or at any rate, which did not find its equal till the varied impulses of the fifteenth century created a new power of thought, and laid the germs of a new civilisation.

THE COURTS OF JUSTICE COMPETITION.

Article IX.

Mr. Deane is the only competitor who has had the good sense to admit that 700ft. may be too much for one mind to grasp as the length of a single façade. In our first article on this competition* we took it for granted that no one would be foolish enough to propose to give up any of the site to the Strand. We therefore assumed that owing to Pickett-street there would be a break somewhere about the centre of the Strand front, and that this might suggest a division of the composition into two or more groups of buildings. This division constitutes the peculiarity of Mr. Deane's scheme—"The narrowness of the site (he says) has obliged me to bring the building closer to the Strand than I should have wished. To obviate the inconvenience of having to enter direct from this leading thoroughfare, I have arcaded the lower story from east to west, thereby giving a covered approach for foot-passengers, and this arrangement has the further advantage of removing the lower rooms, placed in the Strand front, from the noise of the street traffic." This idea, in itself good, has not, however, been well developed. There is a straggling, irregular look about the whole design which is sure to detract from any merits it may possess, whilst, in spite of its great tower, the building looks more like a large country mansion with extensive offices attached, than a palace of justice in the midst of a crowded metropolis. In the arrangement of the courts and the corridors, we cannot congratulate Mr. Deane. On a level above the court floor is the public corridor, and in a mezzanine below the court level is the private corridor for barristers and attorneys. This arrangement we regard as fatal, for the Barristers' Corridor should undoubtedly be on the level of the court floor, as shown in all the good plans. Barristers' time is the most valuable time which the architect of a law court has to consider, and any arrangement, therefore, by which this time can be economised must necessarily weigh much in the final adjudication. Those plans where the barristers' corridors and rooms are placed at different levels from the court level would fail in the very important point just mentioned, for the time which counsel would lose in going up and down stairs or into and out of lifts, would be a most serious loss to the profession, and cause in the aggregate a considerable delay in public business, to say nothing of the personal trouble and inconvenience. But if Mr. Deane has failed in his plan or arrangement, still more has he failed in his elevations and sections. Here and there we see bits of the design for the Government Offices, which, our readers may remember, were designed while the late Mr. Woodward was a partner of Sir Thomas Deane and Son. It is no secret that Mr. Ruskin and Mr. Woodward were great friends, and that the architectural genius of the celebrated Dublin firm took wing when its junior partner died. No one who has carefully looked at the Crown Assurance Office, Bridge-street, Blackfriars, erected in Woodward's happiest days, and at the Crown Assurance Office in Fleet-street, just completed, can fail to recognise the enormous loss Mr. Thomas Newenham Deane has sustained in the loss of his partner. That Mr. Woodward, had he lived, would have succeeded at last in embodying much of the poetry and refinement which run through all that Mr. Ruskin has said or written about architecture, few people who knew him could doubt. Whatever difference of opinion there may be as to the best kind of Gothic to take as a *point de depart*, we have no hesitation in saying that Messrs. Deane and Woodward's works in Dublin, Oxford, and London are to be classed among the very best examples of the architecture of the age, whatever Mr. Fergusson may say to the contrary. But, unfortunately, Mr. Woodward's mantle has not fallen on Mr. Deane, whose Italian Gothic, as set forth in the design before us, has no more spirit and life in it than has the Gothic of Mr. Lockwood. Anyone who will take the trouble to examine these designs will soon find out how eminently unfit Italian architecture, Gothic or not, is for such a building as an English Palace of Justice. The necessity of getting in as many windows as possible, and of avoiding all deep shadows, destroys at a blow the strength and charm of all Italian architecture, whatever be its style. Cut up the grand unbroken wall surfaces of such buildings as the Ducal Palace at Mantua, the Palace of the Jurist Consults at Cremona, and the Broletto at Como or Monza, with stories 14ft. from floor to floor, and a thick-set array of windows, and we should like to know what sort of architecture would remain. Of course, if people will persist in thinking that proportions of voids to solids, and the arrangement of them, have nothing to do with architecture, and that an Italian Gothic building is rather more easy to make than a plum pudding, provided you have got a constant supply of shafts, soffit cusps, stones of different colours, notches, and dentils—if it is thought that any quantity of these things may be mixed up together, and yet result in a good building, then all we can say is, we pity, from the bottom of our hearts, the unfortunate architect of whom such is expected—to whom not even the liberty of a cook is allowed, and to whom all thought as to the relative proportions of the ingredients of his work is denied. Mr. Deane's design has turned out much like a plum pudding would have turned out compounded of—

½lb. of flour,
1lb. of suet,
3lb. of raisins,
2lb. of currants,
1 dozen of eggs,

and an unlimited quantity of milk and water, and all this solely because people will not see, and architects will not try to make them see, the difference between the climate of England and that of Verona, and the great gulf which Time has placed between the conditions under which a Venetian architect of the fourteenth century worked, and those under which English architects are now called upon to act. That a great exaggeration of the capabilities of Gothic art has been thrust

* Building News, January 11, 1867, p. 18.

upon us by some of its champions we firmly believe. To make the public take to it before it was ripe all sorts of virtues were attributed to it. The Gothic was the true elastic style. Anybody could do anything in any place under any conditions with it. If you wanted the all-window style, or the no-window style, Gothic was equally well suited. And now we have got to such a pass that architects talk about their architecture as if it were a kind of old Parr's life pill. "My Gothic" will do this, and "My Gothic" will do that, until there is no evil known to the art world or the building world that "My Gothic" won't cure. We are ashamed of a profession that has no remedy for such a state of things; or if it has, is so corrupt that it declines to use it.

* * * * *

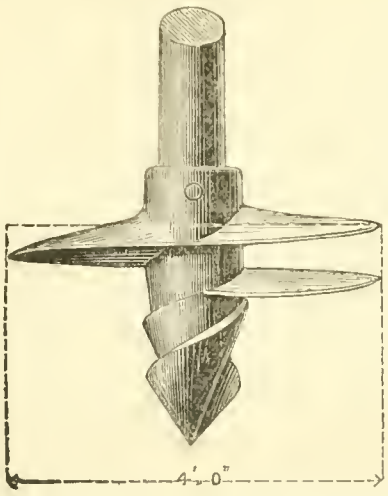
We publish this week an illustration of Mr. Brandon's remarkable design. Certainly no one amongst the competitors deserves more praise than Mr. Brandon for labour bestowed. The £800 premium we feel sure will be quite inadequate to meet the mere expenses of the drawings which this architect exhibits, whilst the great amount of thought shown, not in one or two drawings, but in all, entitles the author to a very careful consideration of his work. We shall therefore reserve what we have to say upon this design until after we have noticed Mr. Burges's equally remarkable scheme; premising only that if Mr. Brandon had had as much to do with the law as he has had to do with the church, he would have learnt that there is a slight difference between a Lord Chief Justice and a Right Reverend Father in God.

SCREW PILES IN THE CONSTRUCTION OF A WROUGHT-IRON GIRDER BRIDGE AT VERONA.*

Mode of Screwing.—In order to accomplish the screwing operation in the cheapest and most expeditious manner, it was considered better to dispense with a scaffolding supported by timber piles, as with the then existing depth of water, powerful current, and frequent sudden floods, there was danger of the whole platform being swept away, as happened during the building of the stone railway bridge about a mile lower down the stream. Instead of an ordinary scaffolding, therefore, two of the largest river barges were hired, which served as pontoons; these were firmly braced together by cross timbers fastened over the decks, leaving sufficient space between the barges for sinking the pile and screw. The whole framework was then well planked over for the men working at the capstan to walk on. A stout rope extended across the river with a travelling pulley, from which another rope was attached to the barges. From the stem and stern of the latter four guy ropes stretched up and down stream to capstans fixed to both shores, so that the stage was under perfect command. This arrangement had the advantage that the whole apparatus could be moved, with little loss of time, to any point where a pile was to be pitched, and, in fact, the stage was floated from one pier to the other, across the river, in a couple of hours; further, during the frequent changes in the water level, the working platform always remained at the same height above the water. On the other hand, a drawback accompanied this arrangement, which was the great difficulty of keeping the piles perpendicular whenever the screw met with an obstacle which forced it out of its centre, as even the strongest ropes would then stretch, and it required the constant attention of the men at the guy ropes to slacken or tighten them.

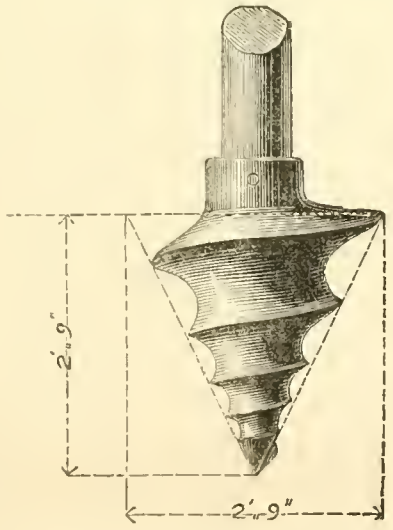
The screwing operations were commenced on May 22, 1863. The first 2½ft. were penetrated by the screw, with the aid of twenty-five men, in about two days, but below that point it was found impossible to drive it, as it rose over the obstruction instead of going through it, and after a whole day's grinding the progress made did not amount to half an inch. The pile was then raised, and it was found that the circumference of the screw, although armed with a serrated edge, according to Mr. Wells's recent patent, was worn away to a depth of 5in. from the circumference. This naturally gave rise to the surmise that one of the threatened boulders had been encountered, but as the same features presented themselves in every instance, it became evident that the obstacle was not an accidental one, and it was afterwards ascertained beyond a doubt that the river bed was indeed covered with a stratum of compact though easily penetrable gravel to a uniform depth of about 3ft., but that underneath this was extending a bed of extremely hard natural concrete, of

First Screw.—Fig. 1.



unknown thickness, but of tolerably homogeneous texture. That this bed was of limited extent, however, was proved by the fact that during the boiling of the already mentioned railway bridge, a solid foundation was only with the greatest difficulty obtained, and recourse was to be had to extensive piling. It was evident that the present screw was not of a shape fitted to penetrate this ground, and the writer therefore applied again to Mr. Wells for his advice, who offered to send out at once new screws of 2ft. diameter, as proposed by him at the first, and which screws no doubt would have fully answered their purpose; but the delay occasioned by the transport opposed an obstacle to this remedy, and the writer had, therefore, new screws cast in Venice, of 2ft. 9in. diameter, and the same in depth, the thread going twice round, with a pitch of 12in. Mr. Wells thought that such a steep pitch would require more power to drive the screw than was available, and fixed upon 8in. as the maximum, but his advice came unfortunately too late. It was not long before

Second Screw.—Fig. 2.



Mr. Wells's predictions were verified; and, in order to obtain the necessary driving power, recourse was then had to blows, at first by sledge hammers, and afterwards by a pile-driving engine, the monkey acting on the top of the pile; but as the rams used in that country consisted simply of blocks of oak bound with hoops, and the blows upon the hard surface of the pile would have injured the timber, a wrought-iron plate was screwed with wood screws on the bottom of the ram. Notwithstanding this precaution, the hoops flew off, injuring the men below, and the monkey was soon smashed to pieces. The only substitute then available consisted in a wrought-iron square bar 4in. by 4in., of excellent German iron. This was cut into four equal lengths, 3ft. 9in., and these were firmly bound with hoops notched into the edges.

This new ram weighed 8 cwt., and the wooden ones from 1½ cwt. to 2 cwt. The fall varied from 3ft. to 10ft., according to the nature of the ground. During this process of driving the screws, it was found that, as is the case in all pile-driving, there was a considerable rebound after each blow; and in order to counteract that, and take full advantage of the force of the blow, it was found necessary to give a quick and sudden turn to the screw the very instant the monkey fell, even a quarter of a turn at the capstan sufficed, and thus no ground was lost. Four smaller capstans were also added, placed round the central one, and, on an average, forty men were employed. In consequence of all these delays, amongst which was the breaking of the capstan boss, nearly four months elapsed before the fourth pile was driven home, although it required less than six weeks to drive the second pair of piles, which were no less than 16ft. in the ground. Another and not the least obstacle to progress was the great number of holidays which had to be strictly observed, occurring in the middle of the week, which not only caused delay through loss of time, but also through the demoralising effect on the workmen, as on the day following the holiday a much less amount of work could be got out of them. In other respects, the writer must do the Italian workmen justice in asserting that they are intelligent, and that the better class of them, when properly encouraged, work willingly.

Mode of Erecting Bridge.—The girders for the first span were erected on shore, and placed on lorries made for the purpose; the outside end of the girder was then suspended to the tackle of the floating stage, and brought forward until it rested on the base plate over the pile. After the first two girders were thus fixed, the cross girders were laid at once, and a temporary flooring made with planking on which to erect the second pair of girders, which were towed into their position in the same manner, and so on with the last girders. In this manner, any extra expense of erecting a scaffolding in the river was avoided, the same barges serving also for erecting the bridge. In addition to Mr. Wells, to whom the writer was indebted for his valuable assistance and advice, he has further to acknowledge the services of Mr. William Parsey, C.E., who assisted him in the design and calculation of the girders, and also superintended their execution in this country. This part of the work was most creditably performed by the firm of Messrs. Porter, of the Tividale Ironworks, in Staffordshire. It may be observed, however, that neither the writer nor Mr. Parsey can be answerable for the design of the details of these girders, of which they did not approve, it being an antiquated combination of wrought and cast iron; but the writer was obliged to conform to a design previously sanctioned by the corporation. It was, moreover, necessary to employ a greater amount of cast iron in the construction than was desirable, on account of the enormously heavy duties on foreign wrought iron. The cost of the two piers, including first cost of the iron in England, freight to Verona, import duty, and erection complete, was £1,400, while the cost of two stone piers, estimated by Italian architects for a bridge of three iron arches, amounted to £2,600.

Conclusions from the foregoing.—1st. Cause of Floods.—While writing out the above account, a few considerations suggested themselves to the mind of the writer, which he wishes to submit to this meeting, trusting to be favoured and enlightened by the remarks of more experienced members. The first subject of importance, upon which there will hardly be a difference of opinion, is that of the increasing violence of inundations and their causes, consisting, as is now ascertained beyond a doubt, in the indiscriminate cutting down of the trees on the mountain slopes. Although it may justly be objected that this is a subject totally irrelevant as regards this country, it will not be denied that it deserves a passing mention respecting the East Indian empire, a country of yearly increasing importance to the English engineer. There the circumstances are analogous to those described, and as Anglo-Indian engineers had to go into Italy to study the best system of irrigation, they might at the same time have taken warning how not to waste the resources of nature. The writer noticed, there-

* Read by Mr. J. J. Horner, before the Society of Engineers, March 4, 1867. Concluded from page 171.

fore, with pleasure, in one of the latest numbers of *Engineering*, that the present Home Secretary for India, with a wise foresight, has taken the necessary steps in time in organising a staff of forest engineers, through whose supervision alone the wholesale destruction of timber, as well as the frequently recurring inundations, can be prevented.

2nd. The Use of Screws.—The second subject for consideration that occurred to the writer is the choice of the most fitting substructure for a bridge. This, of course, is entirely dependent upon the locality, the abundance or scarcity of building material and of labour, and the nature of the foundations. From the writer's limited experience, he is inclined to think that screws, with either wrought or cast-iron piles, may be employed in any ground short of the hardest rock (although some of Mr. Wells's screws have penetrated pretty hard limestone), and that they can be employed with greater economy both of time and money, in most cases, than piers of brick or masonry, whether they be enclosed in cast-iron cylinders or not, and especially in waters where the current is rapid and the river-bed uneven, as one screw may be sunk to a lesser or greater depth than another in its immediate vicinity without affecting the stability of the structure, and the screwing may take place at all seasons independently of the water level. In the present instance the work was commenced at a time when no native engineer would have ventured to lay a foundation in such a river as the Adige previous to the month of November, whereby six months would have been lost, which, to a speculator anxious for a quick return for his outlay, cannot be indifferent. The writer fully admits that for monumental structures, such as bridges in a large town, that are expected to be slender, iron columns are inapplicable; but these are exceptional cases.

3rd. Comparisons between Wrought and Cast Iron Piles.—The third consideration which the here-mentioned operations suggested to the writer is, that wrought-iron solid piles, in one length wherever practicable, are preferable to hollow cast-iron pipes, although the greater first cost of the former might deter an engineer from employing them. The choice between the two materials will again be dictated by local circumstances, but in the case of rivers subject to heavy floods, with the constant danger of heavy masses being hurled against the piers, one would think the choice could not long remain doubtful, as any saving in the first cost could never compensate for the loss of the whole structure. Another advantage possessed by iron and, above all, wrought-iron piles, lies in the small surface they oppose to the current, which entirely obviates the danger arising from the scour and consequent undermining of the piers. In corroboration of this, may be mentioned the fact, that during the heavy floods of last autumn in the mountains of France and Italy, massive stone piers were swept away, while apparently fragile timber structures supported by a few wooden piles remained unscathed. The Italian engineers in those parts are in the habit of protecting their stone piers of bridges by heaping up a quantity of loose stones around them, so as to break the force of the current, and it was with some difficulty they were persuaded to omit this practice in this instance; but when they saw that in a flood which occurred in September, 1863, the iron piles remained unmoved, they were perfectly satisfied. Another circumstance in favour of the piles adopted in the Adige is the testimony of the bargemen navigating that river, that they preferred the passage under that bridge to any other, as there is no contraction of the water way, and consequently the velocity of the current was not so great as under bridges with massive piers, where, as is well known, the utmost skill in steering is often required to avoid disasters.

The 18th annual meeting of the Birmingham Freehold Building Society was held on Tuesday, Mr. Henry Allbutt presiding. In the report read by the secretary, the directors announced that, notwithstanding the commercial depression of past year, the operations of the society had been satisfactory. The receipts for the year ending January 10th were £17,815 5s. 2d., making the gross amount received £263,775 3s. 10d. 140 new members had been received; they had subscribed for 443 new shares; and the statement of accounts showed that, after deducting all charges, the profit on the business in the year amounted to £1,815 13s. 2.; and, after making all deductions, the reserve fund amounted to £25,744 19s. 1d. The financial statement was also read.

ELEMENTS OF ENGINEERING.

Docks.—No. 3.

Having previously described the operations to be undertaken, and the various points to be attended to in selecting a site adapted to the construction of a wet or floating dock, and also possessing in its immediate neighbourhood those facilities and accessories indispensable for receiving and developing marine traffic and commerce, we can now proceed to the construction and erection of the work itself. As already stated, it is imperative in nine cases out of ten to make a dam to keep out the tidal waters whilst the excavation and building of the dock is in progress; in fact, nothing can be really accomplished until this preliminary operation is concluded and the site of the proposed work rendered secure from the invasion of water. One of the difficulties to be encountered and overcome in the construction of a dam is the rendering the bottom of it watertight, or, in other words, to make a watertight joint between it and the surface of the ground upon which it is situated. This difficulty increases in proportion to the difference of the nature of the material of which the dam is composed and that of the bottom upon which it rests. For instance, it is a very arduous task to make a good watertight joint between clay and iron or clay and stone; and the history of waterwork reservoirs and embankments affords innumerable illustrations of the point in question. All our readers are familiar with the fatal catastrophe that swept like an avalanche over the neighbourhood of the Bradford reservoir when it succumbed to the power of the internal pressure. Iron pipes were laid naked through the embankment of the reservoir; and it was supposed by many that the creeping of the water along the outside of the pipes between the metal and the earth comprising the embankment materially conduced to the occurrence of the calamity. However this may be, the difficulty of establishing a permanently watertight connection between substances so dissimilar in nature and qualities as iron and clay is too well known to require further confirmation. But recently a confirmation of the same statement with respect to stone and earth has been afforded by the leak in the embankment of the Roundwood reservoir, which is intended to serve as a storage for the nearly completed Dublin Waterworks. In order to avoid the very objections raised to putting iron pipes naked through an embankment, a large culvert was built under it, and the pipes laid along the invert, the ends of the culvert being built in with solid masonry. In spite of all these precautions the water found its way in between the bank and the extradosal surface of the arch, and a large amount of time, labour, and money will be expended before the leak is made good. Many other instances might be alleged, but the above are more than sufficient to demonstrate the importance of thoroughly securing, in the first case, a perfectly watertight joint between the surface of the ground and the dam resting upon it.

We are supposing, for the present, that the site of the dock is situated upon any strata that are not absolutely rock, for in that case especial descriptions of dam must be used, which we shall refer to presently. To facilitate the connecting the natural strata and the material of the dam, the first step is to dredge a trench along the line of the dam, so that the bottom of the puddle shall be enclosed as it were in the bed of the site. This will be intelligible from an inspection of fig. 3, which represents the general features of an ordinary dam, suitable for any description of ground into which timber piles can be driven. The letters S S represent the natural surface of the ground, and P the puddle carried down into the trench below the ground line. The carrying the puddle below the surface of the ground is not the only object of sinking the trench, for it is equally important to remove in this manner all the loose, soft, spongey, and porous soil always overlying the surface of ground which is covered by water. If the dredging be done, as recommended, previously to the driving of any of the piles, it will materially facilitate that operation; sometimes a portion of the trench is excavated first, the piles are then driven, and the rest taken out between them afterwards. The exact order in which successive operations should follow one another must of course rest with those in charge of the works; as what might answer perfectly well in one instance might be exceedingly disadvantageous in another. The driving of the piles may be accomplished either by hand or steam labour, but in the formation of a dam on a large scale, such as invariably accompanies the construction of the works under notice, the latter may be employed to great advantage. These, however, are points with which we are not concerned, as the use of one description of labour in preference to another must depend upon a variety of circumstances relating to the contracting party, and over which the engineer has little or no control. It may, however, be

FIG. 3.

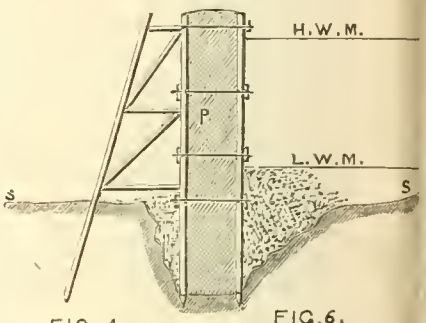
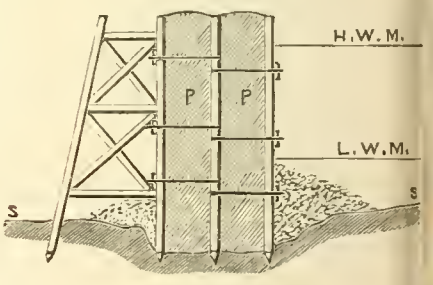


FIG. 4.

FIG. 6.

FIG. 5.



remarked that whether the piles are got dow by hand or steam power, in any case they ca be well or badly driven, and that the absolut method employed is no guarantee for th proper execution of the work. The mo important item in the formation of a dam the puddle; and the quality of the materi chosen, and especially the manner of puttir it in, deserve the most careful attention. distinction must be made where puddle employed for mere temporary purposes, ar where it is intended to act as a permane portion of any work, as when it constitut the puddle wall of the embankment of a r servoir. Manifestly the same stringent preca tions are not necessary in a work which is on intended to last for a year or two, and in th which it is hoped will, comparatively spea ing, endure for ever. At the same time must be borne in mind that the dama created by the giving way of a large dam, far as expense to the contractor is concern might be quite as great as that caused by t bursting of a small reservoir embankment, that it is not a question of mere permanen that is involved in the proper formation a dam. While, on the one hand, certain clay soils are admirably adapted for formi puddle, yet, on the other, almost any eart soil can, by proper management, be render

ectural effect, but also the ingenuity and profes onal skill which have been brought to bear upon ie difficulties of the task assigned to them.

"Having, however, come to the conclusion ready communicated to your lordship, we ıould have failed in our duty as a committee f advice had we not expressed our opinion pon the general principles which should be bserved in the construction of a National Gal- ry, and we are led to believe, from the result f our investigations, that such principles may generally adopted, and be found not alto- ether inconsistent with those architectural fects which should characterise a building of such ational importance.

"With this view we beg to submit the above port for your lordship's consideration.

"HARDINGE. "RICHARD REDGRAVE.
"ELCHO. "WILLIAM RUSSELL.
"A. J. B. B. HOPE. "T. GAMBIER PARRY.
"W. BOXALL. "WILLIAM TITE.
"DAVID BRANDON.

"London, February 28."

RCHITECTURAL INSTITUTE OF SCOTLAND.

NDER the title of "The Painted Windows of Glasgow Cathedral," a paper was read a meeting of the Architectural Institute Scotland, on Friday last, by Mr. Daniel ottier, architect, Glasgow. Mr. Cottier iticised in very unfavourable terms the ecimens of German glass painting in ie cathedral of Glasgow, remarking that the cred walls of the cathedral resembled more a yer's bleaching-green than a sacred edifice, and iat though Divine worship was celebrated in the uilding one day in the week, on the other six days did duty as a lion, where for a small charge the ass painted at Munich was exhibited. The olouring of the windows, he maintained, was too right and glaring, and the interior effect was arsh and crude. While they were thus faulty in olouring, they were also devoid of senti- ıent and without any design; and except in the rge windows, on which the prophets were repre- ented, there was a lack of feeling in them all. He dmitted that they were the best windows that had ome out of Germany; and, in concluding his aper, he gave it as his opinion that England ould yet have a school of glass painting immensely uperior to that in Germany. An interesting con- ersation followed the reading of the paper, in he course of which Mr. J. D. Peddie expressed it s his opinion that Mr. Cottier had been rather too evere in his criticisms on the German windows; nd all the members who took part in the conver- ation, including the chairman, insisted on the mportance of painted windows being in harmony vith the building in which they were placed, a hatter which had not been sufficiently attended to n the windows in Glasgow Cathedral.

CHURCHYARD CROSSES.

AT the Royal Institute of British Architects on Monday night, the Rev. E. L. Cutts ead a paper on "The Churchyard Cross," which vill no doubt appear, with illustrations, in the Transactions of the Institute. The lecturer traced he origin of the universal mediæval custom of lacing a tall cross in the churchyard to the prac- ice of the first missionaries to our Saxon fore athers, who used to erect a tall cross to mark nd consecrate the place where they were ac- ustomed to meet the people on their missionary isits for preaching and prayer. When the paro- hial system was introduced and each parish had ts resident pastor, still the people used to ssemble at the accustomed place for Divine worship; our ancestors were a hardy people, and did not find the same discomfort which we do in the absence of protection from the weather. And so in many parishes there was no church built for hundreds of years; in some, even down to the time of the Norman Conquest, the parishioners had only the open air church, whose columns were the forest oaks and its groining their interlacing boughs, and its font the brook, which flowed near by, and its altar the step of the churchyard cross. A discussion ensued in which Mr. W. White, Professor Donaldson, the Chairman, Mr. Hayter Lewis, and others took part, the Professor deprecating, and others advo- cating the restoration of these appropriate and beautiful adjuncts to the court of the House of God.

THE INCREASE OF FIRES IN LONDON.

MR. M'LAGAN, the member for Linlithgow, brought before the House of Commons, on Tuesday evening, a subject of great public import ance. In moving for a Select Committee to in quire into the existing legislative provisions for the United Kingdom, and as the best means to be adopted for ascertaining the cause and preventing the frequency of fires, he said the three points to which he wished particularly to call the attention of the House were, first, the necessity of a more efficient supervision of the construction of build ings; secondly, the means which ought to be adopted for extinguishing fires, such as the esta blishment of a fire brigade; and thirdly, the ex pediency of having an investigation into the causes of all fires. To show that fires were continually increasing, he might mention that whilst in Lon don in the year 1840 there were 681 fires, in the year 1864 the number was 1,487. He was sorry to say that fires had considerably increased since the fire brigade had been under the management of the Board of Works. To show how ineffectual the means of protection against fire were in London as compared with other capitals, he would mention that while in London for every square mile there was only one engine station, in Paris there were one and one-fifth, and in New York one and a half. In London the number of firemen to each square mile was 6, while in Paris the number was 11, and in New York 64. In London there was only 1 fireman to every 20,000 inhabitants, in Paris there was 1 to every 1,338, and in New York there was 1 to every 671. Although the means of extinguishing fires in London was very inadequate as compared with New York, it far exceeded any which existed in other parts of the country. With the exception of Edinburgh, Glasgow, Liverpool, and Manchester, the means of ext- inguishing fires were in the most unsatisfactory state. The present mode of conveying to differ- ent stations the intelligence of a fire having broken out was very inefficient. In America the telegraphic stations had been found most useful in spreading the alarm, and one object of the inquiry would be whether they could not be made equally useful in this country. The means of ascertaining the cause of fires were extremely scanty, and he believed that if an inquiry should be instituted greater care would be taken in the storage of petroleum, gunpowder, and other dangerous articles. Great numbers of fires were attributed to carelessness, and a full inquiry into these causes would be a great public benefit. In several cities in America the result of such in- quiries had been most satisfactory, not only in checking incendiarism, but in making people more careful. Mr. M'Lagan gained his object, the Gov- ernment having assented to the appointment of a committee.

THE DESIGNS FOR THE NEW PALACE OF JUSTICE.*

IN criticising these designs we must not shut our eyes to the magnitude of the task sub- mitted to the competitors; the difficulties at- tendant on this very vastness, and all the com- plicated arrangements of ground plan and detail it involved; the important questions connected with ventilation, lighting, warming, &c.; and the enormous amount of thought, experience, and labour necessary to grapple with a mass of build- ing some acres in extent. But, without having any intention of discussing these particulars or of chronicling the undoubted merits of many of the compositions, we propose noting down their short comings—for they are sufficiently numerous to startle one into a conviction that in the mass the designs are a failure.

That a fractional part bears the marks of true genius, and that a larger proportion evidences talent, architectural knowledge, and research, is patent to all. There are fine elevations; there is much satisfactory grouping; there is, compara- tively, however, only a small amount of pleasur able outline; there are graceful columns and arches; elegant shafts and tracery; massive piers and elaborate mouldings—but what is the im- pression with which a student of European archi- tecture comes away from an inspection of these drawings? "I have seen so much of them before —such a tower or dome is from such a place— —that arcading has a world-wide fame—those windows I remember well in one building, that roof in another—and of these members one is exaggerated, another distorted; one don't fit in like the original, and another is totally inappro- priate." The result of this is a feeling of un- satisfactoriness with what we see before us, and a craving for something better; whilst at the same time it lays Gothic architects open to the charge of being mere copyists and adapters. This, then, is the first fault we have to find with these designs. Whatever may be their merits, they are not in the main the creations of true genius; they lack its fire and are not penetrated by its force. In a work of genius there is a certain inner life, a mighty soul full of creative power, and brilliant with the light of original ideas and conceptions. And, as in other arts, so in architecture, this living soul will manifest itself unmistakably, and peer out and flash upon you in a thousand different ways with startling impressiveness. It seizes hold of you, as it were, and satisfies you at once that the work in which it is embodied is a true creation of art, stamped by the marks and notes of genius.

Now this is what we feel to be wanting in the greater portion of some of the designs, and entirely in others. They do not give you the idea of a man, who, relying on his own powers alone, shuts up every book and chases from his recollection all the choice bits and favourite examples he has collected, and then thinks and studies, and works out from his own brain a realisation of the ideas which emanate from his genius. If, in listening to a piece of music, we were constantly recognising ideas and passages from the works of various composers, however skilfully they might be appro- priated or dovetailed into the new work, we should feel impatient, discontented, and dissatis- fied. There is not, perhaps, an exact analogy between the two arts; but there is certainly a sufficient one to show how very different an effect is produced on the mind by the original creations of true genius, and the far inferior talent of using up, no matter with what professional knowledge or tact, the choicest examples of the most correct architecture. This, we believe to be one of the main causes of the scornful dissatisfaction with which many educated people view the generality of Gothic designs. It is not that they dislike mediæval forms or fail to appreciate true prin- ciples, or that the Pointed style is archaic and unsuitable, or gloomy and inconvenient; but that they have a natural perception of the presence or absence of those higher gifts and powers without which no work of really eminent exalted merit was ever achieved. As they can judge of poetry or music without being poets or musicians, so they can judge of architecture without being architects; and they will not fail to recognise the merits of a good piece of archi- tecture any more than of a grand poem or musical composition. What we want in our day in this great dirty city is not a reproduction of the dome of Florence Cathedral, or of the Bap- tistery at Pisa—not an appropriation of arcading from Venice or windows from Rouen—not the transplanting of a tower from Avignon or a roof from Belgium—not a ransacking of the works of Viollet le Duc or Pugin (valuable as they are for purposes of study), but a real *bona fide* work- ing out and application of true principles to every style of architecture, thereby reducing it to the obedience necessary for satisfying all modern wants and requirements. And this must be the work of the brain and not of the hand.

This fundamental fault of which we have been speaking necessarily entails others, which are lamentably perceptible in the designs. Where compositions are made up from a collection of examples from different places, naturally there result great confusion of outline, a want of balance and symmetry, a disproportion of parts and a fanciful application, or even a positive dis- tortion of features. Thus we have before us roofs, a mere confused mass of Pointed turrets (Mr. Deane), apparently taken from a church at Prague —a long row of attic windows immediately above a row of large church-like windows with tracery —(Mr. E. Barry)—diagonal lines, instead of being subservient, forming a marked and leading feature in the building—(Mr. E. Barry)—a gable appa- rently crested from an early French metal *chasse* —(Mr. Scott)—a tower admirable enough in the low countries, where there is nothing but brick— (Mr. Street)—three pointed roofs perched one on the top of the other, through which grows a tall chimney, as far as one can make out—(Mr. Seddon)—the Sainte Chapelle with an apse at each end adapted for a central hall—(Mr. Brandon)— not to mention a frightful misapplication of pinnacles, cuspings, parapets, crestings, crowns, mouldings, gables, turrets, dormer windows, vanes, panelling, sculpture, &c.

* From the *Westminster Gazette*.

How all this must destroy unity of design, and that natural growth of one part from another which is such a charm in good architecture, it is needless to point out, especially when a man is a skilful adapter without much power of original design. His own portions of the mass are common-place and of no account, whilst his carefully-culled examples stand out with a painful prominence, and form a sad misalliance with each other and with himself.

Before noticing the designs a little in detail, let us say that considering the magnitude and importance of the works to be executed—the ample remuneration given for the drawings—and the princely advantages accruing to the successful competitor—not one of the present designs comes up to the standard of excellence we had formed for ourselves, whilst the want of care, and the inartistic touch exhibited in some of the drawings, is anything but creditable to the draughtsmen.

We do not hesitate to maintain, therefore, that the judgment in favour of any one of the designs submitted should be withheld, and a larger number of architects allowed to compete. There are many names occurring to us, belonging, most undoubtedly, to men very far in advance of a full half of the present competitors. Surely one amongst the architects of England can be found who is quite competent to produce a building, marked by the originality, vigour, and power of true genius—a building which, by its stately presence, and beauty of feature; grand simplicity, and grace of outline; correct proportion and patent truth; flash of expression, force of nature, development of sinew, powerful bearing, and perfect anatomy of all its members, shall attract, charm, and convince at a glance without hesitation; and at the same time mark the age to which it belongs, instead of being a mere *rechauffe* of world-gathering examples, or a pile comprising cathedral, castle, town hall, monastery, college, prison, bazaar, crypt, arcade, all in one—the reflection of a past century, not the genuine creation of the present.

Building Intelligence.

CHURCHES AND CHAPELS.

A new organ, built by Mr. Robert Postill, of York, was opened last week, in Barmby Moor Church.

It is proposed to rebuild and restore the ancient church of Slingsby, Yorkshire. Plans and specifications have been prepared, and the authorities are ready to receive tenders for the execution of the work. The architects are Messrs. Austin and Johnson, Newcastle-on-Tyne.

At Busbridge, a picturesque district adjoining Godalming, Surrey, Mr. John Ramsden, of Busbridge Hall, has just erected a church at a cost of £4,000. The edifice, which will seat 220 persons, is in the Gothic style from designs by Mr. Gilbert Scott.

The proposed memorial cathedral to Cardinal Wiseman has been abandoned. The subscriptions have not exceeded £20,000.

Bradford. — The new United Methodist Chapel and schools in Otley-road were opened on Wednesday, last week. The building is in the Lombardian style of architecture, the dimensions of the chapel being 60ft. by 43ft., and 24ft. high; it will seat 300 people. The cost of the building is £1,600. Mr. Thomas Clarke, of Bradford, is the architect.

Bitterne, near Southampton.—Through the liberality of Steaurt Macnaughten, Esq., the district of Bitterne will in future possess an additional attraction in the acquisition of an illuminated clock which was placed last week in the tower of the church, and will confer a benefit not only on the inhabitants, but also be a convenience to travellers on the Bursledon and Botley roads. The church was built a few years ago at a cost of about £3,000. It is in the Early Decorated style, from the design of Mr. G. Guillaume, architect, and is arranged to accommodate 666 persons with a ready means of enlargement at a future time. It is substantially built of Swanage stone. The clock was manufactured by Messrs. Dent, of London; Mr. W. Gambling, builder, prepared the tower to receive the illuminated dial, under the directions of Messrs. Guillaume, Parmenter, and Guillaume, architects, of Southampton.

Culsalmond.—A new Free church—the foundation stone of which was laid in August, last year—has been opened in this pleasant Aberdeenshire village. The church is in the Early English style, cruciform in plan, and consists of a nave and transept, with single gallery. The length is about 56ft. by 47ft., and there will be accommodation for 400 persons. The walls are of rubble work, with facings and buttresses of drooved Elgin freestone, the spire, which rises to a height of 84ft. from the door-sill, with ornamental iron vane, being also freestone. The front of the church contains a large window of three lights, 22ft. by 11½ft., with freestone mullions, and serves to light both area and gallery. The roof, which is very steep, is of open woodwork, the couples and diagonal sarking being dressed and varnished. Mr. Macandrew, of Aberdeen, was the architect. The cost of the buildings, &c., in all, will be fully £2,000.

Eastbourne.—A new church, consecrated to St. Saviour, has just been opened. The style is Geometrical, and consists of a nave, chancel, and side aisles, vestry and porch. The nave is 90ft. long and 35ft. wide. The nave is lighted by a clerestory, the windows of which are 10ft. high by 5ft. wide. The basement of these windows is about 25ft. high and is supported upon arches and stone pillars. The height of the nave is 70ft. The chancel is 28ft. deep, and terminates in an apse. The roof is groined in brick with stone ribs, the latter springing from shafts of Devonshire marble. Mr. G. E. Street was the architect, and Mr. Peerless the builder. The stonemason's work was completed under the superintendence of Mr. Patchett. The total cost was about £8,000, borne by Mr. G. Whelpton, who intends to endow it and build a parsonage house.

York.—The foundation stone of a new Baptist chapel was laid last week. The style is in the Early Decorated, and consists of a nave and aisles, with transepts. The length of the nave will be 78ft. and width 24ft. The extreme width of the chapel will be 44ft. between the aisle walls, and 49ft. 6in. across the transepts. The roof will have curved ribs below the collar-beams, and terminating upon ornamental stone corbels in the sprandrel of the arcade. The exterior will be faced with stone, the dressings will be of Whitby stone, and the walling of Bradford sets, in thin beds. The height of the tower will be 61ft. Mr. W. Peachey, of Darlington, is the architect; and the various works have been let to local tradespeople. The total cost, including the land, will be about £5,000.

BUILDINGS.

The plans of Mr. E. Holmes, architect, Birmingham, for the erection of public baths, at Birkenhead, have been accepted. There were eighteen competitors. The cost of the baths will be £8,000.

The Wavertree Baths Company have recently erected a large plunge bath, and a commodious lecture hall. The hall was formally opened on Friday, and measures 60ft. long, by 37ft. broad, and 30ft. high. The erection of private baths by the company is in contemplation.

New Zealand.—A new Supreme Court for Auckland, New Zealand, is now in course of erection under the Public Buildings' Commissioners. The building will have four fronts, and the principal one is formed by an arcade of three pointed arches, springing from clustered shafts with carved caps and bases, over which will be the library, and above will rise a tower 60ft. high. The extreme size of the building will be 145ft. by 97ft., and is built of brick with Bath stone dressings. The total cost will, including the internal fittings, &c., be nearly £3,000, and is under the superintendence of Mr. E. Rumsey, architect, of Auckland, the contractors being Messrs. Amos and Taylor, of Melbourne.

Swansea.—The foundation stone of a new general infirmary or hospital was laid here on the 4th inst. The building will provide accommodation for 100 patients, and for a large number of outdoor patients. It will be constructed of coursed native sandstone, from the immediate neighbourhood, with dressings of the same. The roofs will be of tile. The portion of the building now contracted for is the out-patients department and the female wards, the amount of the contract for this part being a little over £4,000. The estimated cost of the entire hospital is £14,000. Mr. Alexander Graham, of London, is the architect; the builders are Messrs. Thomas, Watkins, and Jenkins, of Swansea.

General Items.

Two or three weeks since we announced the death of William Peters, Esq., of Wouldham Hall, Kent. We now refer to the subject to correct an inaccuracy, and to mention one or two additional particulars of his life. Mr. Peters was known in London as the Medway grey stone lime burner, and as the father of that trade. His valuable freehold and leasehold estates with the extensive works have passed into the hands of his sons, who will carry on the business as heretofore. He was known as one of the kindest of men and best of masters. He came from Dorking, in Surrey, and discovered and opened the Halling beds of grey stone on the Medway; he struck the *first* spark and burnt the *first* flare kiln on the Poynder's estates in 1820. He opened up and developed the resources and natural facilities of the district for the supply of grey stone lime, Portland cement, Goult bricks, pottery, &c., now manufactured to such a large extent at Halling, Wouldham, Burham, &c., for the London market, and towards the production of which 150,000 tons of coals are annually consumed.

A correspondent in a country paper says:—"In building a chimney put a quantity of salt into the mortar with which the intercourses of bricks are to be laid. The effect will be that there will never be any accumulation of soot in that chimney. The philosophy is thus stated:—The salt in the portion of mortar which is exposed absorbs moisture every damp day. The soot thus becoming damp falls down the fireplace." Our readers should remember or preserve this little piece of valuable information.

Mr. W. P. Frith writes:—"Allow me to suggest to those in authority that, as none of the national collections contain a single specimen of the works of the late John Phillip, R.A., it would be desirable to supply that deficiency by selecting some of those now in his studio. There are pictures in various stages of completeness, which would not only please the ameteur, but would be of great use to the student as showing the method in which that great painter worked."

A Lincolnshire ploughman has produced a curiosity, viz., a cork model of Lincoln Cathedral, in which the extraordinary number of 1,000,800 old corks were used in its production, and occupied ten and a half years in building. The model is now being exhibited in Redcar. The Lincolnshire ploughman is to be commended for his industry and perseverance, though after all *cui bono?* The result seems hardly worth the labour expended to produce it. A model made of old corks will soon be an old cork model—a monument neither very useful nor very lasting.

At a Court of Common Council held on Thursday week last at the Guildhall, the following motion was agreed to:—"That a Roman hexagonal column inscribed by Anencletus to his 'conjux pientissima Martina,' discovered beneath the wall of Ludgate in 1806, and supposed to have been lost to the city, being now found exposed in the open yard of the London Coffee-house, it be referred to the Library Committee to take immediate steps to receive the same for preservation in the museum of the Guildhall."

We learn that Mr. John Howe, of Bishop Auckland, has been appointed Assistant Surveyor to the Middlesbro' Corporation. There were 200 candidates for the office.

Mr. George Row Clarke, 27, Great James-street, Bedford-row, W.C., has been elected a fellow, and the following gentlemen have been elected associates of the Royal Institute of British Architects:—William Powell, 11, Crooked-lane, King William-street, E.C.; Henry Shephard, 34, Tavistock-square, W.C.; Charles Driver, 7, Parliament-street, S.W.; Ernest Turner, 1, Verulam-buildings, Gray's Inn; Francis Atkinson, 14, Bury-place, W.C.

As an indication that building societies are flourishing, we refer to the National Temperance Land and Building Company (Limited), a meeting of the shareholders of which was held at the London Coffee-house on Wednesday evening, to take into consideration the proposed increase of capital and the amount of the future shares, Henry Robinson, Esq., chairman of the company, presiding. It was unanimously resolved, "That the capital of the company be increased to £50,000, and that the new shares be of the value of £5.

e largest vessel ever built in Ireland was hed in Belfast on Saturday. The "Istrian" is 0 in length, 37ft. in breadth, and 2,900 tons er, or upwards of 4,000 tons burthen. Al-h the "Istrian" is the longest vessel in the o except the "Great Eastern," there are several s of greater tonnage—the "Istrian" being a paratively narrow ship.

. W. H. Gregory, M.P., has been elected to acant trusteeship of the National Gallery. The e is a very good one.

e United States Congress has appropriated 00 dollars to reward an ingenious citizen of York, for his efforts (finally successful) to t a machine for the perfect cancellation of e stamps and the post making of letters. Government receives the patent upon pay-of the above-mentioned sum.

e Commissioners for Building the New ts of Law have commissioned Captain Shaw, Chief of the Metropolitan Fire Brigade, to ine the drawings and designs for the proposed s, and to report upon the means suggested xtinguishing fire, and cutting off communica-in case of conflagration.

is stated that tenders will be immediately d for from the principal shipbuilders of the king-who happen to be on the Admiralty list, for onstruction of about ten gun-vessel; from oved designs of Mr. E. J. Reed, the Chief tructor of the Navy.

fteen designs for the new offices for the Sun-nd Gas Company were sent in, out of which directors selected one bearing the motto thing venture, nothing have," by Mr. G. G. ins, architect, Darlington, as entitled to the premium. This design, which it is intended rry out, is of a handsome Gothic building of brick with stone dressings, and will occupy a site at the head of Fawcett-street, facing the ay station and new extension park.

r years past, says the *Mining Journal*, the truction of bridges for foot passengers at dangerous crossings as those at the St. Paul's of Cheapside, and where the six ways meet site the Bank, Mansion-house, and Royal Ex-ge, has been from time to time advocated, we have frequently urged the thorough prac-bility of the suggestion, and the small cost at h it could be carried out. While the English been talking the Americans have been acting; of the most handsome and substantial struc-that could be desired having already been ted over Broadway, New York, by Messrs. and Griffiths, at a cost of only £4,000. The ge has been proved capable of sustaining 101 , and 100 men tramping over it at the same produced no perceptible vibration. Surely corporation of London, although they could be induced to set the example, will not longer y the consideration of the matter, now that have had the Broadway bridge as a prece-t.

t the monthly ballot at the Institution of l Engineers on Tuesday last the following didates were ballotted for and duly elected :—Members : Mr. Amias Charles Andros, Resi-t Engineer of the New Dock Works, Leith; Henry David Furness, Locomotive Superin-dent of the Riga Dunaburg and Dunaburg-epsk Railways; Mr. Robert Edward Johnston, neer of the Shrewsbury and Hereford, Shrews-y and Wellington, and Shrewsbury and Welsh-l Railways; Mr. William Jarvis M'Alpine, v York; and Mr. Allan Wilson, Westminster Associates : Mr. Horace Bell, executive neer, Public Works Department, Bengal; Mr. ucis Bramah Gilbertson, South-Eastern Rail-of Portugal; Mr. Spencer Herapath, Ken-gton; Mr. George Houghton, resident engineer the Berlin Gorlitzer Railway; Mr. Charles lowe Lowe, assistant surveyor of St. Maryle-e; Major William Palliser, Army and Navy b; and Mr. Edward Pritchard, surveyor to the l Board, Bedford, Lancashire.

he following are the principal features of the v press law in France. The authorisation erto required previous to establishing a jour-is suppressed; imprisonment for offences inst the press laws is abolished; the amount he fine which may be inflicted will be not less n one-fifteenth, and not more than one-half, of caution money. Printers and publishers will longer be required to take out licences. The makes no mention of any change in the amount he stamp duty or the caution money.

TO CORRESPONDENTS.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the Editor, 166 Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty four Words.

Received.—W. E. G.—E. W. H.—J. R. P.—E. L. C.—W. B. B.—W. B.—T.S. H. C.—J. S. C.—Rev. R. S. G.—T. and K.—W. H. T.—P. J. T.—T. P. and Co.—J. L. and Son.—L. and N.—T. F.—E. H.—L. Bros.—W. H. B.

The Rev. Canon North, of Crooms Hill, Greenwich, S.E., wishes for the names and addresses of "Bellfounder," "P. B. Flood," "A Bellrope," and "H. X. =.," see replies No. 283 in our last number, on "Cracked Bells," as he wishes to write to them upon the subject.

W. M'Kinley (Shaubane).—The *Illustrated Builders' Journal* was incorporated with the Building News in January, 1866, and ceased to be published as a separate journal from that time.

W. B. Ball (Newcastle).—We shall, in all probability, give drawings of some of the articles in the Paris Exhibition of this year, but are not at the present moment prepared to give any particulars.

Draughtsman's reply on "Etching," is inadmissible, because it smacks of the advertisement.

Correspondence.

DESIGNS FOR NEW NATIONAL GALLERY.

To the Editor of the Building News.

Sir,—It has always been held to be unwise for judges to give reasons, expressed or even implied, for their decisions. The judges in the late competition for the New National Gallery have made the unexpected report that no one of the designs submitted was in its principles either sufficiently fit or sufficiently meritorious to be adopted, though it would be subject of course to such modifications in detail (not in principle) as would appear well on further consideration and on the architect being placed in direct personal communication with his client; the absence of which direct communication is one of the difficulties and vices inherent in all competitions. Had they stopped there, we should not, Sir, have troubled you with this communication, but have submitted to their decision with as much philosophy as possible, as illustrating once more the exceptional hardship to which architects alone among professional men are subjected by the popular desire for competitive designs.

The committee, however, assuming the position of advisers, proceed to lay down a list of "suggestions of the principles which ought to govern the builders of a National Gallery."

Had we desired to express in the fewest words the principles which guided us in the preparation of our plan, we could not have used any words other than the committee do in making their suggestions, such as the following :—

1. Ample and unobstructed light, top light in all cases, such top light half the area of the floor.

2. Height of galleries to ceiling lights, equal to the width of such galleries.

3. Long galleries without subdivision to be avoided, as rendering classification of pictures difficult.

4. In addition to the galleries named in the instructions to be 50ft. wide, that it is desirable to have other galleries in easy connection therewith for smaller pictures of 30ft. and 40ft. wide.

5. Special care that the higher galleries do not obstruct light to lower ones.

6. Warming and ventilation openings to be in the centres of rooms and not at the sides.

7. Level of the floor galleries to be of ready easy access from the street level.

8. No considerable sacrifice of space for sculpture in what should be a picture gallery.

9. Architectural effect to be sought rather in projections and breaks in the façades, and consequently in the sky-lines, and not from domes, towers, and the like, which must obscure light through the gallery roofs.

All these principles are found in our plans to a degree that we believe does not apply to any other of those sent; and were we to assume that the decision of the judges would be guided by the principles they themselves lay down, we should have confidently anticipated the commission for the new building.

In two points only do our plans differ from the above suggestions of the judges.

1. We have no covered carriage entrance, a feature which could easily be added.

2. We have avoided all picture galleries on a ground floor, below the principal floor, as we hold it to be impossible in London, by any amount of side windows or other ingenious contrivances to light spaces under galleries 50ft. wide so as adequately to exhibit pictures, and the attempt to do so on the part of most of the other competitors renders necessary a long and fatiguing staircase for everyone visiting the real objects of art he desires to see, which would, of course, be in the principal galleries, where only top (*i.e.* adequate) light can be obtained. A ground floor, therefore, we conceived to be nearly useless for purposes of exhibition, while adding considerably to the cost, and by avoiding it the level of the picture galleries in our design is very easy of access from the streets all round, and by means of a staircase of only very moderate length from Trafalgar-square entrance.

While we cannot but know as architects that our plans have all the above desiderata to a remarkable extent, it is mortifying to feel that our having abstained with much artistic self-denial from the dreams of architectural grandeur to be derived from lofty towers, domes, and other obstructions to light, which we considered, and still consider, inadmissible in a picture gallery, but which other competitors have indulged has prevented us obtaining from the judges even the very qualified laudation "for architectural merit" they bestow on the designs they have named.

We see from the reply of Lord John Manners last night to Mr. Goldschmidt that the judges having given so indecisive a report, her Majesty's Government feel that the decision is after all remitted to them. We trust that that decision may be to remove entirely the present building; as the careful study which we, as competitors, have given to the subject, has convinced us that any attempt to utilise the present building would be financially no less than artistically a failure, and any attempt to govern the design of a new gallery by the lines and levels of the present building would only too probably result in making such new building as unsatisfactory as the present one is on all hands acknowledged to be.—We are, &c., Banks and Barry.

1, Westminster Chambers, Victoria-street, March 12.

BURNLEY UNION COMPETITION.

Sir,—It seems that the statements that appeared in your columns on December 14, in reference to the above competition were not without foundation, as I understand that there is a probability of the selected design being thrown over to give way to the design sent in by an architect of considerable local influence; although it is but fair to state that the Building Committee have acted very fairly in calling in two architects unconnected in any way with either of the competitors, and who awarded the designs as stated in your columns. It seems, however, that the Board of Guardians are likely to reverse the decision, upon what grounds I do not know, unless it is that the architect in question has succeeded in talking the Board round to adopt his design. A publication of this letter may yet prevent any unfair decision.—I am, &c., A Competitor.

Sir,—Will you allow me to draw your attention to a misprint in your paper of last week? In the notice you give of the Burnley Union Workhouse Competition you have given my name as J. P. Bracey; it should be John T. Bressey. I trust you will do me the favour to alter this.

I am, &c.,
John T. Bressey.

[Mistakes like the one spoken of frequently arise from the great difficulty compositors have in deciphering writing, and particularly proper names. Judging from the writing frequently sent us, it is marvellous that printers do not make more mistakes. Very many people write their names so frequently and so rapidly that they are apt to think that others are as familiar with their signatures as themselves. This is a mistake. Everyone who writes for the press should, for the sake of the compositors, to whom time is money, and to prevent errors, write with unusual care. Had Mr. Bressey done so, there would have been no necessity for the above letter.—Ed. B. N.]

PHOTOGRAPHS OF ENGLISH CATHEDRALS.

Sir,—In your last you express a hope that we have sent to the Paris Exhibition specimens of our photographs of English cathedrals "to represent Early English architecture." It may interest your readers to know that we have sent for exhibition views of Canterbury, Ely, Norwich, Lincoln, Peterborough, and Rochester.—We are, &c.,

Mason and Co.

28, Old Bond-street, March 11.

Intercommunication.

QUESTIONS.

[303.]—CORNICES, WINDOW SILLS, &c.—The Town Council of Penzance have come to the conclusion not to allow any cornices or window sills to be fixed to any buildings in the streets unless the front walls are put back. Such interference with our street improvement, if persisted in, will cause a great hindrance to persons wishing to improve their property. This is to be regretted, as our town is fast becoming a favourite watering-place. You will confer a boon on the inhabitants if you or one of your numerous readers could inform them what is the law and usages in other towns on this subject. A SUBSCRIBER.

[304.]—VARNISH FOR TIN BUCKETS.—Can any reader give me a receipt of a good varnish for coating the seams of tin buckets, so as to prevent them from rusting? N. Y.

[305.]—COLOURING BRASS, &c.—Can any of your numerous readers kindly answer me three questions:—First, how can I colour brass blue? second, how to bronze brass? and third, the best tool to use for turning brass? D. W.

[306.]—WROUGHT-IRON GIRDERS AND LATTICE GIRDERS.—I have an invaluable companion, "The Engineer's Pocketbook," but being a man of humble education, find it quite out of my power to solve the rules laid down in pages 46, 47, and 48 of this book, viz., to find the dimensions of either of the above girders, or the tonnage they would support. I shall feel obliged if some kind reader will show, by common cross multiplication and division, how to obtain the true dimensions for these sort of girders, or if he can recommend a work on this subject (of course void of algebra and Greek), and he will confer a great favour on FRANCIS HANSOM LUSCOMBE.

[307.]—MORTAR.—I shall feel obliged if your readers will inform me how many cubic feet or yards of sand, and how many cwt. of Buxton lime, will make sufficient mortar to set 100 square yards of 9in. brick walling, supposing the bricks to be 3in. thick, and the joints ¼in thick. T. C.

[308.]—LAW OF INDENTURES.—Would you be kind enough to inform me whether an apprentice's indentures stand good after his employer becomes bankrupt; and whether the said employer has any claim after he gets his discharge from the Bankruptcy Court. AN APPRENTICE.

REPLIES.

[247.]—THE STANDARD BUSHEL.—It is evident that the measurements of the bushel as given by "An Inquirer" cannot be correct. I have checked the numerical portion of his question, and as there is no question but that a standard bushel contains 1·28 cube feet, or 2218·19 cube inches, the error must lie in an assumption of false data, or the two calculations would tally within a very small amount. J. X.

[251.]—WATERCLOSET PANS.—If the flow of water is not sufficient to effect the removal of the soil, there is no other remedy but to increase the flow. The whole principle of a watercloset depends upon there being a proper supply of water, otherwise it becomes a mere privy; the pipes must necessarily become clogged up, creating a nuisance in the house, and dangerous to the health of the inmates. PLUMBER.

[255.]—TRUSSED SCAFFOLDING.—Would you allow me to inform "A Builder" that the trussed scaffolding would answer very well for the erection of the buildings he proposes? There is no book upon scaffolding of any kind, and it is, moreover, a subject known practically to a very few. I was employed superintending the erection of a chimney shaft 100ft. high, some time ago, and I found it well worth my while to send a long way for a first-rate scaffolder, and paid him very high wages besides. He was, however, worth the money, as he took all trouble off my hands, and got up the scaffolding from first to last with great skill and practical ability. SHAFTER.

[257.]—FOUNDATIONS.—The best plan for "A. N." to adopt is to excavate until the clay assumes a stiff, solid appearance, and then to put in 3ft. or 4ft. or more of cement concrete made with the best Portland cement. Let the bed be carefully levelled, or if cut in steps, according to the hardness of the clay, the top of the concrete must be on the same level, or otherwise cracks are certain to occur in the superstructure over the places where the steps are made. A remarkable instance of building in the Oxford clay, and a sinking occurring, was offered by the bridge over the Grand Junction Canal on the Northampton and Peterborough Railway. S. S.

[258.]—FLOW OF GAS.—With your permission I will give "Tyro" the information he requires. Let W = the quantity of gas in cube feet flowing through a pipe per hour; make L = length of pipe in yards; D the diameter in inches; H the head of water pressure, also in inches; and G the specific gravity of the gas. The general formula to calculate from is $W = 1350 \times D^2 \times \sqrt{\left(\frac{H \times D}{G \times L}\right)}$.

According to the data supplied by your correspondent, since he requires the number of cube feet per minute, or the sixtieth part of the above value of W, the equation will be inserting the correct values of the letters

$$W = 1350 \times 9 \times \sqrt{\left(\frac{H \times 3}{0{\cdot}42 \times 3520} \times \frac{1}{60}\right)}.$$

Taking H as equal to 1in., which is the maximum pressure, we may write

$$W = 202{\cdot}5 \times \sqrt{\frac{3}{1478{\cdot}40}},$$

from which the answer can be readily obtained. GAS ENGINEER.

[264.] — FLOORING — Bearing in mind that people packed close together weigh, on the average, 120lb., I do not think that the weight mentioned by "X. Y. Z." is so disproportionate as he imagines, particularly as it always includes the weight of the materials. For store and large office floors, the usual allowance is from 2 cwt. to 4 cwt. per square foot, according to the size and character of the building. SURVEYOR.

[268.]—UNDERPINNING CEMENT.—Portland cement is the proper material to use in the case mentioned by "Builder," and he might mix it with a small proportion of sand without impairing its qualities for the special work he intends undertaking. MORTAR.

[269.]—GIRDERS IN BUILDING.—If your correspondent does not allow for the expansion of his girders, his walls will, without the slightest doubt, be thrown out of the perpendicular, if nothing worse happens to them. The longest rails are only 27ft. in length, but about ½in. is always left at the joint for their expansion. R. R.

[271.]—COMPOSITIONS FOR COVERING ROOFS, &c.—Having a workshop to put up, and economy being necessary, I bought a lot of elm and fir poles, and built my shop 60ft. long by 22ft. wide. It is of slight fir joists on elm beams, strutted to prevent raking, and covered with fir boards 1in. thick, having a fall of 5in. in 22ft. In winter the surface is hard and smooth as ice, in summer it is rather soft, but not soft enough to run off. I do not believe a gallon of the composition has left the roof from the time it was laid until now. The only drawback to its use is that it drops through the chinks a little in the hottest days of summer, and the workshop is very hot also. The first thing I did was to put a strip of zinc to the edges, turned down 2in. over the edge of the boards, and 4in. or thereabouts over the roof, to form a drip; then I took common brown paper, and laid down one sheet, without anything between it and the boards (it is essential that all adhesion to the boards should be prevented, as the boards can then shrink or swell without breaking the paper); then cover one-half of the sheet with a composition as follows:—About three-fourths coal tar, one-fourth common British pitch and rosin, in equal quantities, and laid on hot with a brush. Then lay on the second sheet, covering over the half of the first; in the same way go all over the roof, as with slates, one sheet covering half and about 3in. of the edge of the neighbouring sheet. Go over the roof a second time with paper and hot composition, only this time you may cover the whole on both sides with a good coat. Then, having ready a large pot, in proportion to the size of the job (mine contained 30 gallons or more, and was of wrought iron), boil a quantity of the composition, say half full, and as it gets hot, stir into it dry brickdust, taken from the kiln, perfectly dry, sifted fine, until it obtains the consistency of mortar; have ready two smaller pots, a ladle, and a plasterer's trowel, carry the hot compo on the roof, and spread it like mortar, ½in., or less or more, as you like. It soon sets. I threw a little brickdust on the top, and nothing more. Avoid sand or gravel, nothing but brickdust will do. It is a dirty job, it is true, but if anyone tries, and succeeds as well as I have, he will be amply rewarded. Myself, and a rough carpenter, did my own in two days, and the cost was trifling. Two cautions I will give to anyone who tries it—first, have dry, and, if possible, warm, weather; secondly, do not let your compo boil over, and stir in the brickdust gradually, from a sieve. EXONISIS.

[273.]—DETERIORATION IN THE QUALITY OF CAST AND WROUGHT IRON.—"Metallum Martes" has raised a point which is of momentous consequence. It is, unfortunately, too well known that irons have degenerated to a fearful extent, and the degeneration still goes on. How to "stay the plague" is a question we cannot answer, but to some extent its existence may be accounted for. The introduction of hot blast smelting, with its wondrous advantage of lessening to a great extent the cost of the production of iron, effected anything but unmixed good. Before its discovery, only the finest argillaceous ores of the midland districts could be profitably converted into iron, but by the agency of the hot blast, every substance that contained the metal was made to yield it. It was also found that the refuse of the puddling forge or "cinder," previously of no value, could be utilised by the same means, and that iron—of a very inferior character of course—might be extracted from it. The pig iron thus obtained is known to the trade as cinder iron, and very sad stuff it is. Too often it is, for the sake of enhanced profit to the manufacturer, incorporated with better material, which it proportionably deteriorates. This, indeed, is one of the main sources of the evil which your correspondent deplores. The demand for low "quotations," or cheapness, is another. The public, in this as in many other cases, insists upon paying low prices, whilst it ignores the condition upon which alone low prices are advantageous. The manufacturer meets the public demand, and supplies an article which, though very bad in itself, he considers to be "good enough for the money." The public, having encouraged the production of a worthless article, has now no security for obtaining a good one at any price. The present aspect of the iron trade is in no way encouraging; there are "tricks" in it, as well as in other branches of commerce, and to some, we fear to a considerable extent, these are responsible for the deterioration of cast and wrought iron. ANTI-OXIDE.

[278.]—CAST-IRON PIPES.—The internal pressure of pipes depends upon the same laws that govern boilers, flues, or any other hollow medium enclosing a fluid. Putting H for the total fall, or, as it is usually called, the head of water, and F for the pressure in pounds per square inch against the interior of the pipe, we shall have

$$F = H \times 0{\cdot}434.$$

To obtain the thickness of metal "Waterworks" may calculate as follows:—Let D = the inside diameter of pipe, and T the thickness of metal, then we find that

$$T = H \times 0{\cdot}000055 \times (D + y),$$

or substituting the value of H in terms of F we have

$$T = 0{\cdot}000126 \times F \times (D + y).$$

The variable quantity of the formula is y, which has the following values:—For pipes under 12in. in diameter, $y = 0{\cdot}375$; for those between 12in. and 28in. y 0·50, and for those having a diameter above this latter dimension up to 52in. $y = 0{\cdot}625$. R. E.

[281.]—PAINTING ON GLASS.—In No. 41 of Weale's Rudimentary Works, "A Young Decorator" will find information on the subject he mentions. E. C.

[287.]—BRONZING FIGURES.—"T. E. M." may bronze figures by giving them a few coats of size, allowing each to dry, then applying the bronze as a varnish. Bronze powders of all colours can be purchased at almost every store where artists' materials are sold. You mix these powders with glue, or with lac varnish, and apply them to the figures with a brush. The bronze may also be dusted on when the size is damp. M. Y.

[288.]—VARNISH FOR POLISHED IRON.—Allow me to inform "L. M. D." that a transparent varnish for covering polished iron may be made with white seed lac dissolved in alcohol. The metal should be warm when put on. Another superior coating is to coat the iron with pure linseed oil, boiled with a small quantity of the sulphate of zinc. Both preserve the iron from rusting. ENGINEER.

[292.]—VARNISH FOR IRONWORK.—"T. W." can make a good black varnish for ironwork as follows:—Take 8lb. of asphaltum and fuse it in an iron kettle, then add 2 gallons of boiled linseed oil, 1lb. of litharge, ½lb. of sulphate of zinc (add these slowly, or it will fume over), and boil them for about three hours. Now add 1½lb. of dark gum amber, and boil for two hours longer, or until the mass becomes quite thick when cool. After this, it should be thinned with turpentine to the proper consistency. C. E.

[293.]—WHITE VARNISH.—In reply to your correspondent "S. W.," I beg to inform him of a good method to make white varnish. Take 1oz. of pure Venice turpentine, mix well with 2oz. of pure spirits of turpentine, warm in a large bottle. In another bottle put 4oz. of best fir balsam (it must be pure), with 2oz. of 95 per cent. alcohol, shake each bottle well frequently for six hours or more, then mix both preparations in the large bottle. The whole should stand several days in a warm place before using. V. O.

[301.]—CONCRETE WALKS.—In answer to "T. C. P." respecting garden paths, the substance should be 3 bushels of gravel to 1 bushel of Portland cement. I have done it with road grit, upon hard bats, bedding in lime mortar; and have used it as pavement before nineteen houses, erected twenty years ago, and still remaining sound. The paths of a lawn in front were formed of crushed cockleshell with tar and pitch. No weeds will grow through it. J. S.

WAGES MOVEMENT.

A rumour has been current that the workmen at the Paris Exhibition building intended to strike. The *Liner*, however, announces that the "difficulty" (if any ever existed) has been removed, and that the works are going on as usual.

BOLTON.—The three strikes continue—the bricklayers, the plumbers and glaziers, and the quarrymen. Never did men strike at a more inopportune time for themselves.

GREAT STRIKE OF ENGINE DRIVERS AND FIREMEN.—The strike of the engine drivers and firemen which was apprehended some few days ago, has now commenced, and assumes a very formidable appearance. What the men ask for is this—that ten hours a day, or a run of 150 miles, be reckoned as a day's work; that drivers in London and the districts receive for the first six months 6s., for the second 6s. 6d., and at the end of twelve months 7s. 6d. per day; for drivers in the country, the first six months 6s., for the second 6s. 6d., and at the end of twelve months 7s. daily; for firemen in London and the districts, the first six months 3s. 6d., the second six months 4s., and at the end of twelve months 4s. 6d. per day; for firemen in the country, for the first twelve months 3s. 6d., at the end of twelve months 4s., and after three years' service 4s. 6d. per day; that the firemen be promoted to the situation of drivers according to seniority or length of service; and that Sunday be paid as a day and a half. The directors of the North-Eastern Railway refuse to accede to these demands.

LIVERPOOL.—Deputations of the operative plumbers and painters have met deputations of the employers during the past week, who have come to a satisfactory understanding with each other. The plumbers are to have 33s. per week wages, commencing about June 1 next. The painters have modified their demands for walking time and extra pay for overtime. Six months' notice to be given in future should any alteration be required.

STOCKPORT.—The joiners' and carpenters' notice for an advance of 2s. per week and leave off work on Saturday at 12 o'clock, expires at the end of this month. The employers have resolved neither to grant the advance nor the reduction in the time on Saturdays. The bricklayers' labourers have also given notice for an advance of wages, and have met with the same answer.

YORK.—On Saturday evening last a long notice which had been given by the masters to their workmen of the various branches of the building trade, to the effect that future payment would be made by the hour, expired; and on Monday morning the masons, bricklayers, plasterers, and labourers struck, by absenting themselves from their labour. The joiners, however, have accepted the hour system, and the plumbers of the city, who on the previous Monday had struck for an advance of wages, have gone in on the old terms. The past system of payment has been by the day.

SANITARY MATTERS.

In spite of the vast sums spent by the Liverpool Corporation for water, the supply, particularly in dry seasons, is very insufficient, and it has been resolved to spend about £100,000 in constructing a new store reservoir at the Rivington works.

AIRDRIE.—At a meeting of the Town Council, held last week, it was agreed, on the recommendation of the Sanitary Committee, to warn the owners of several dwelling-houses which they considered unfit for human habitation, to discontinue letting them; and the removal of a rag store in North Bridge-street was also ordered.

STAINED GLASS.

We regret to hear that Messrs. Clayton and Bell, and Cox, have resigned their space for stained glass in the Exhibition of the Paris Exhibition.

A very handsome stained glass memorial window has been put up on the south side of the chancel in Campden Church, Oxford, by the executors of the late John Hiron, Esq. The work has been executed by William Holland, of the Stained Glass and Decorative Work, Warwick. The subject is the Raising of Lazarus.

NOVELTY IN PAINTED GLASS.—Messrs. Edmundson and Co., of this city, says a Manchester contemporary, have just completed a memorial east window for Peel Park, near Hulton. It is painted in enamel, upon plate glass, and therefore each subject in the three lights is unbroken by the leadwork which modifies the artistic effect usually that is done by glass stainers. The subject,—the Ascension,—is consequently treated as an artist would a picture, the subject, not hampered by consideration of any conventional forms as abound in this kind of decoration. Mr. S. Le Resche, who has designed the window, has made the figure of our Saviour in a graceful posture in central light, with St. John and St. Paul on either side. Above the apostolic and other symbols and inscriptions, lamb and eagle having been taken from nature.

WINDEWORTH.—A stained glass window by Hardman, of Birmingham, and designed by Mr. G. G. Scott, has just been erected in the chancel of the parish church in memory of the late Mr. B. B Colvin, of Pishiobury. The window consists of five lights, illustrating five great events in the life of Christ—viz., the Nativity, Baptism, Crucifixion, Resurrection, and Ascension.

STATUES, MEMORIALS, &c.

The first stone of a monument to the memory of the late Empress has just been laid at Nice. It will be raised on the site of the villa inhabited by the Russian Imperial family and where the young Prince died.

The Emperor Napoleon has commissioned Mr. Munro, an English sculptor, to execute a bust of the late Victor Cousin for the French Academy.

MONUMENT TO A SCOTTISH POET.—A monument, erected at the expense of the friends and admirers of the late Mr. Robert Park, was inaugurated last week in Paisley Abbey. The monument consists of a granite pedestal, about 4½ft. wide at the base, narrowing to 2½ft. at the top, supporting a colossal bronze bust of the poet. The inscription on the pedestal is as follows:—"Andrew Scott, author of 'Silent Love,' 'Songs for all Seasons,' Born, March 7, 1807. Died, 27th December, 1865. Tribute from friends." The monument is the work of Mr. Mossman, of Glasgow.

MONUMENT TO "ARTEMUS WARD."—It has been stated that the remains of this exquisite humorist, which were interred in Kensal Green on Saturday, will ultimately be taken to America for re-interment. A memorial, however, will be placed in Kensal Green. Mr. Geflowski, sculptor, of Liverpool, now of London, was enabled to take some of the features of Mr. Browne, and it is likely that he will be commissioned by the friends of the deceased and a gentleman to make a bust of him.

MONUMENT TO SIR CHARLES BARRY.—The accounts for the monument to Sir Charles Barry have been closed, and the expenditure has been as follows:—Mr. J. H. Foley, for the statue, £905 15s.; Mr. W. Field, for the marble plinth, £50 10s.; Mr. J. G. Grace, for gilding arch, &c., £10; Mr. J. Mabey, for two plaster models of statue, £10; adjoining portion of the building, £29 1s.; printing, £44 12s.; total, £1,198 7s. The receipts have been—subscriptions, £1,030; additional subscription from Mr. Wolfe (in addition to former subscription of £200), £200; balance of the account, £168 7s.; total, £1,198 7s.

LEGAL INTELLIGENCE.

NOTICE TO BUILDERS.—Joseph Kershaw, builder, appeared at the Borough Court, Bradford, to answer a summons taken out by the police against him for not having a sufficient light in Salt-street, Manningham, sufficiently protected by a light, whereby the lives and limbs of the liege lieges were endangered. It appeared that a little after ten o'clock one night a police-officer's attention was drawn to the danger of a hole in Salt-street, when the officer was told a cab had had a narrow escape of being upset in consequence of there being no light. The defendant pleaded in extenuation that he had been putting in a drain, and had left open for the corporate officials to examine it, but they were dilatory in coming, and he had covered over with planks, thinking there was no need for a light in addition. He was told that the hole should have been lighted, and was fined 10s. and 10s.

COMPENSATION CASES.

LORD MAYOR'S COURT, MARCH 6.—GORDON V. THE METROPOLITAN BOARD OF WORKS.—This was a claim for the leasehold interest of No. 24, Bread-street-hill, which was held under a lease for twenty-one years, from 1856, at a rent of £49 per annum. The claim sent in was for £1,760. The claim was taken by consent for £1,150.

BOWLEY V. THE METROPOLITAN BOARD OF WORKS, 1867.—This was a claim for leasehold premises, No. 11, Cornhill, occupied as a stationer's, at a rental of £65 per annum. The claim was made up of the following items:—The value of the improved rental, the cost of removal, the value of fixtures; and two years' profits as compensation for interference with business. The average annual profits were £1,045. The jury awarded the claimant £1,520.

Subscription by the late Mr. David Sassoon to contribute 10,000 towards erecting a building for a Mechanics' Institution at Bombay, has been accepted.

MEETINGS FOR THE WEEK.

MON.—Society of Engineers.—"Water and its Effect on Steam Boilers," by Mr. K. Bamber, 7.30.
Royal United Service Institution.—"The Conversion and Rifling of Cast-Iron Ordnance," by Major W. Palliser, 8.30.

TUES.—Institution of Civil Engineers.—Discussion on Captain Tyler's paper "On Steep Gradients and Sharp Curves on Railways"; and, if time permits, "Memoir on the River Tyne," by Mr. W. A. Brooks, 8.
Royal Institution.—"On the Practical Study of Botany," by Rev. G. Henslow, 3.

WED.—Geological Society, 8.

THURS.—Royal Institution.—"On Coal Gas," by Professor Frankland, 3.
Linnean Society, 8.
Chemical Society, 8.

FRI.—Royal Institution.—"On the Various Modes of Flight in Relation to Aeronautics," by Dr. J. Bell Pettigrew, 8.

SAT.—Royal Institution.—"On Coal Gas," by Professor Frankland, 3.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

2081. E. PAGE. IMPROVEMENTS IN MEANS OR APPARATUS FOR THE MANUFACTURE OF BRICKS AND TILES. Dated August 14, 1866.

This invention relates to adaptations of parts to a pug mill for the manufacture of bricks and tiles. In carrying out these improvements the dies or moulds are caused to travel immediately under the mill, so as to receive the clay direct from it, and, by preference, in two rows, one on each side of the axis of the mill. These moulds or dies are supported in chambers on frames which are capable of sliding on grooves provided for them, so that they may readily be fed for filling and drawn out again when filled. The axis or revolving shaft of the mill, in addition to the ordinary blades and stirrers, is provided at its lower end with a plate which is affixed to and revolves with this axis or shaft. This plate, except at an opening where the clay is forced through it, serves as the bottom to the mill, and also as a cover to the moulds passing under it. At one edge of the opening in this plate, for the passage out of the clay, the plate inclines upwards over such opening, somewhat in the form of a propeller blade, in order that the clay may thereby, in the revolution of this plate with the axis, be forced through the opening in it to the dies or moulds beneath; and then such clay is cut off and smoothed on the dies or moulds by the bottom surface of the plate. The lower part of the mill in which the bottom plate and propeller work is made somewhat larger than the main body of it, so as to admit of a greater number of moulds being supplied and filled at the same time. The revolving plate may have two or more openings and propellers in it for the discharge of clay into moulds passing under them. From the foregoing description the action of the apparatus will be obvious. *Patent abandoned.*

2089. H. J. PETTY AND C. F. SAYER. AN IMPROVED AND SIMPLE METHOD FOR THE WORKING OF PERPENDICULAR SLIDING SASHES, DOORS, AND SHUTTERS, OR OTHER PERPENDICULAR SLIDING FITTINGS, ADMITTING OF THEIR BEING TAKEN OUT FOR THE PURPOSE OF CLEANING OR OTHERWISE. Dated August 15, 1866.

This invention consists in the employment of a steel spring, similar in design to a carriage spring, with the addition of a roller at each end, and of power adapted to the weight of the sash, door, shutter, or other perpendicular sliding fittings to which it is intended to be fixed or fastened. The rollers are to be composed of metal or other hard material, which may be covered with leather, india-rubber, or other soft substance, to deaden the sound, if found necessary. The spring may be made either with double or single rollers. The double roller spring is the spring above described with a roller at each end. When the double roller spring is used, one spring is fixed with common screws in the centre of each side of the sash, door, shutter, or other perpendicular sliding fitting, a groove having been first made for each roller to work in. The rollers will run on the pulley stiles, and the sash, door, shutter, or other perpendicular sliding fitting can, by this means, be raised or lowered to the height desired. The single roller spring may be compared to a double roller spring cut into two halves. *Patent abandoned.*

Trade News.

TENDERS.

BEDS.—For the erection of a new wing, and other alterations and additions to the oilcake manufactory, South Mills, Blunham, Beds., for Mr. C. Powers. Mr. John Usher, architect. Quantities supplied:—Freshwater, £922; Dickins, £860; Twelvetrees, £856; Hull, £842; Horsman, £780; Winn and Foster (accepted), £727.

BIRMINGHAM.—For the erection of the new Birmingham schools:—Wilson and Son, £27,990; Corbett, £27,800; Barnsley and Sons, £26,788; Partridge, £26,750; Jones, £26,500; Briggs and Son, £26,410; Hardwick and Son, £26,284; Anderson and Son, £25,780; Matthews, £25,600; W. and B. N. Smith, £25,000; Naden and Sons, £24,990; Lovatt, £24,900; W. and J. Webb, £24,839; Jeffery and Pritchard, £24,700; Horsley Brothers, £23,879; Parnell, Son, and Bennett, £23,411 6s; Cresswell, £23,000.

CITY.—For warehouse, 127, Aldersgate-street. Mr. Smith, architect:—J. High, £5,789; Simms and Marten, £4,865; Johnson, £4,800; Nightingale, £4,611; Newman and Mann, £4,455; Bennett, £4,359; Perry, £4,300; Manley and Rogers, £4,287; R. Mann, £4,187; Kelly Brothers, £4,074; Warne, £3,925; Henshaw, £3,910; Stephenson, £3,813; Webb and Sons, £3,889; Crabb and Vaughan, £3,850; Nutt and Co., £3,661.

CITY.—For building printing office, Bartholomew Close. Mr. John Blythe, architect:—Gillet and Wisbey, £3,200; Mansfield and Son, £2,906; Patman and Co., £2,695; Myers, £2,688; Piper and Wheeler, £2,600; Sewell and Son, £2,578; Webb and Sons, £2,530; Brass, £2,487; Pritchard, £2,444

CITY.—For house, Lime-street-square. Mr. Robert Walker, architect:—Rodda, £3,200; Carter and Sons, £3,180; Sewell and Son, £2,813; Turner, £2,749; Kilby, £2,683; Webb and Sons, £2,598.

ENFIELD.—For works at Enfield Mr. T. J. Hill, architect:—Webb and Sons (accepted), £1,427.

FULHAM.—For pair of semi-detached residences, for Mr. T. Cross:—Stimpson, £1,510; Brass, £1,480; Whittick, £1,450 10s.; Richards, £1,414: Wigmore (accepted), £1,299 10s.

FULHAM.—For a pair of houses in the North End-road, for Mr. W. Kitchen:—Amos, £896; Smith, £800; Wilson, £795; Wigmore (accepted), £750; Johnson, £739; Ward, £735.

LIVERPOOL.—For veterinary hospital, Park-road. Mr. Thomas Cook, architect. Quantities supplied:—Tomkinson, £1,203; Barker and Son, £1,122; Westmorland, £1,119; Wiley, £1,087; Callie, £1,070; Urmson (accepted), £1,039.

PADDINGTON.—For rebuilding the Boatmen's Institute, Sale-street, Paddington. Mr. T. Heygate Vernon, architect. Quantities not supplied:—Manley and Rogers, £949; Cowland, £943; Dove Brothers, £938; Patman and Fotheringham, £927; Scrivener and White, £890.

SHOREDITCH.—For rebuilding the Prince of Wales Tavern, Holywell-lane, Shoreditch, for Mr. Henry Bateman, Mr. F. G. Widdows, architect:—Axford and Whillier, £1,413; Ingham, £1,380; Bishop, 1,225; Perry and Co., £1,210; Ennor, £1,153; Tully, £1,125; Chessum, £1,097.

TUFNELL PARK.—For residence at Tuffnell Park, for Mr. F. Morton. Mr. C. H. River, architect, Quantities supplied:—Tracey and Co., £2,867; Foster, £2,645; Wood, £2,470; Macey, £2,444; Warne and Co., £2,384; Jackson and Shaw, £2,332; Manley and Rogers, £2,172.

VAUXHALL.—For sundry works, Glyn-street, Vauxhall, for Mr. B Fabricotti. Mr. F. G. Widdows, architect:—Ashby and Sons, £643; Ennor, £595; Tully, £558.

WIGAN.—For fixtures and fittings of new gaol, police court, and offices. Mr. Thomas Cook, architect. Quantities supplied:—Burroughs and Son, £2,299; Anderson and Son, £1,990 6s.; Preston, £1,935 10s; Urmson, £1,819; Fairclough and Son (accepted), £1,798; Collin and Son, £1,695; Bridge, £1,550.

PROPERTY SALES.

MARCH 8.

AT THE MART.—By Messrs. Farebrother, Lye, and Wheeler.—Freehold residence with gardens, grounds, and paddock, containing 5¼ acres, situate at Thames Ditton, Surrey—sold for £2,750.

Leasehold three residences, Nos. 299, 301, and 325, Vauxhall Bridge-road, producing £288 per annum, terms 57½ years unexpired at £10 per annum each—£2,560.

Leasehold house and shop, No. 335, Mile End-road, let at £42 per annum, term 55 years unexpired, at £6 8s. per annum—£450.

MARCH 12.

AT THE MART.—By Messrs. Gadsden, Ellis, and Scorer.—Leasehold premises, situate No. 65, Lombard-street, for upwards of 36 years in the occupation of Overend, Gurney, and Co., together with the adjoining house, No. 13, Birchin-lane, term 28½ years unexpired, at £6,000 per annum—sold for £29,500.

Freehold residence, No. 3, Codrington-terrace, Ladbroke-road, Notting-hill—£1,800.

By Messrs. Farebrother, Clark, and Co.—Freehold estate, situate in the parish of Doddinghurst, Essex, known as "The Hall Farm," comprising a dwelling-house, outbuildings, and 154a. 3r. 2p. of arable and grass land, —£6,000.

Freehold 5a. 1r. 8p. of woodland, situate near the above —£110.

Freehold house, situate in Lower Sydenham, let at £30 per annum—£700.

Freehold house, situate in Lower Sydenham, let at £22 per annum—£250.

Freehold houses, situate in Lower Sydenham, let at £20 per annum—£250.

Freehold two houses, situate at Lower Sydenham, producing £50 per annum—£550.

Freehold Proprietary Chapel, situate as above—£450.

Freehold, 1 acre of building land, situate as above—£430.

Freehold, 2a. 1r. 16p. of building land, situate as above, —£1,060.

By Messrs. Debenham, Tewson, and Farmer.—Leasehold residence, No. 1, Craven-villas, Ealing, estimated annual value £75, term 34 years unexpired, at £8 10s. per annum —£960

Leasehold residence, No. 5. Healey-street, Prince of Wales-road, Kentish-town, estimated to produce £45 per annum, term 98 years from 1852, at £6 10s per annum—£470.

By Mr. P. D. Tuckett.—Leasehold residence, No. 81, Mornington-road, Regent's-park, let on lease at £50 per annum, term 72 years unexpired, at £10 per annum—£575.

Leasehold residence, No. 82, Mornington-road, let at £60 per annum, term and ground rent similar to above—£635.

Leasehold residence, No. 24, Woburn-place, Russell-square, also stabling in Tavistock-mews, term 95 years from 1802, at £50 per annum—£490.

Leasehold, two houses and shops, situate on Surbiton-hill, let on lease and producing £55 per annum, term 75½ years unexpired, at £6 per annum—£715.

Leasehold four residences, Nos. 1 to 4 Woodside, Long Ditton, let on lease at £100 per annum, term 84¾ years unexpired, at £20 per annum—£1,250.

Leasehold residence, No. 1, Holland-terrace, Holland-road, Kensington, let at £50 per annum, term 94 years from 1856, at £8 per annum—£515.

Leasehold six residences, Nos. 3 to 8 Holland-terrace aforesaid, let at £45 and £50 per annum each, terms similar to above, at £8 per annum each—£500 to £550 each.

Freehold two residences, Nos. 14 and 15, Verulam-terrace, The Grove, Hammersmith, producing £80 per annum—£1,115.

By Mr. Saffell.—Leasehold residence, No. 1, Arthur-terrace, Caledonian-road, and stabling, lofts, workshops, shops, &c., Nos. 1 to 17, Arthur Mews, producing £403 5s. per annum, term 76 years unexpired, at £50 per annum—£3,280.

Freehold residence, No. 3, Halliford-terrace, Grove-road, Bow, let at £35 per annum—£440.

Freehold the carcases of two residences, situate in Stanstead-road, Forest-hill—£690

By Messrs. Ventom, Clark, and Bull.—Leasehold business premises, Nos. 1 and 2, Ratcliff-cross, term seven years unexpired, at £50 per annum—£450.

Leasehold house and premises, No. 1, Handley-road, Hackney, let at £28 per annum, term 77 years from 1862, at £4 10s. per annum—£250.

AT THE GUILDHALL COFFEE-HOUSE.—By Mr. Murrell.—Leasehold six houses, four with shops, Nos. 6, 8, 10, 12, 14, and 16, Howard-road, Stoke Newington, producing £185 per annum, also a plot of land in the rear, term 86 years unexpired, at £38 per annum—£1,780.

Leasehold eight residences, Nos. 22, 24, 26, 28, 30, 32, 34, and 36, Albion-road, Dalston, producing £224 per annum, term 95 years from 1844, at £40 per annum—£2,415

By Mr. Tindall.—Freehold house, No. 80, Driffield-road, Old Ford, let at £25 per annum—£350.

Freehold three houses, Nos. 4 to 6, Unicorn-street, Kerbey-street, Bromley, producing £66 per annum—£690.

Leasehold two houses, Nos. 19 and 20, Norfolk-street, Globe-road, Mile-end, producing £42 per annum, term 56½ years unexpired, at £5 5s. per annum—£440.

AT THE MART.—By Messrs. Edwin Fox and Bousfield.—Freehold two residences, Nos. 3 and 4, Carmarthen Villas, Princes-road, Norwood, producing £80 per annum, subject to a mortgage—£100.

By Messrs. Fuller and Horsey.—Freehold manufacturing premises, situate in Wallis-road, Hackney Wick—£5,000.

By Mr. C. H. Webb.—Leasehold house, No. 89, New North-road, let at £44 per annum, term 75½ years, unexpired, at £4 19s. 9d. per annum—£550.

Leasehold two houses, Nos. 4 and 5, Witchampton-street, Curzon-street, Hoxton, producing £60 per annum, term 41 years unexpired, at £6 10s per annum—£510.

Leasehold hou e, No. 54, Grange-street, Bridport-place, Hoxton, let at £28 per annum, term 70 years unexpired, at £5 10s. per annum—£350.

By Mr. Adcock.—Leasehold house, known as "Frankfort House," 426, Camden-road, term 76 years unexpired, at £15 per annum—£1,530.

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BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

J. Braithwaite, Abingdon-street, Westminster, civil engineer, March 20—Bland William Croker, Zeitwog, Austria, engineer, March 21, at 2—John Kent, Stratford, builder, March 27, at 1—George Etches Mills, Cambridge, builder, March 20, at 1—George Smith, Hammersmith, builder, March 21, at 2—James Matthews Caddington, Herts, bricklayer, March 28, at 12—S. Shrubsole, Manchester-buildings, Westminster, surveyor, March 28—J. T. Smith, Lillington-street, Pimlico, journeyman carpenter, March 28.

TO SURRENDER IN THE COUNTRY.

Thomas Court, Kineton, plumber, March 27, at 12—Thomas Coxton, Stockton-on-Tees, bricklayer, March 22, at 12—William Jenkin, Redruth, mining engineer, March 20, at 1—George Thomas Lupton, York, painter, April 3, at 12—William Henry Morton, Leamington Priors, carpenter, March 30, at 11—Frederick Irwin Salter, Yarmouth, Hants, builder, March 20, at 11—William Barker, Leeds, joiner, March 23, at 12—Robert Beazley, Portsea, builder, March, 25, at 11—William Freeman, Wrexham, joiner's foreman, March 26, at 11—Hugh Jones, Penmaenmawr, joiner, March 23, at 12—William Kennett, Whitstable, carpenter, March 18, at 12—Thomas Minshall, Stoke-upon-Trent, brick manufacturer, March 27, at 12—William Moses, Waterloo, Lancashire, joiner, March 26, at 3—Thomas Whitfield, Wetherby, Yorkshire, joiner, March 26, at 10—Joseph Wormald, Leeds, joiner, March 25, at 11—William Sheppard, Gloucester, builder, March 22, at 11.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9	0	£10	10	Archangel, yellow ..	£12	0 £13 0
Quebec, red pine	3	5	4	15	St. Petersburg, yel...	10	10 11 0
,, yellow pine..	2	15	3	10	Finland	8	0 9 0
St. John N.B. yellow	0	0	0	0	Memel.....	0	0 0 0
Quebec Oak, white ..	5	10	6	0	Gothenburg, yellow	9	0 10 10
,, birch.....	3	10	4	10	,, white	8	0 8 10
,, elm	3	10	5	0	Gefle, yellow.....	9	0 11 0
Dantric oak	3	10	6	0	Soderhamn	9	0 10 10
,, fir	2	0	3	10	Christiania, per C.,		
Memel fir	3	0	3	10	12 ft. by 3 by 9 in.		
Riga.....	3	0	2	5	yellow	18	0 23 0
Swedish	1	18	2	3	Deck Plank, Dantzic,		
Masts, Quebec red pine	5	0	8	0	per 40 ft. 3 in.	0	14 1 4
,, yellow pine..	5	0	6	0	PUMICE STONE pr ton	6	0 8 0
Lathwood, Dantzic, fm	4	10	5	10	OILS, &c.		
,, St. Petersburg	6	10	7	10	Seal, pale....per tun	46	10 47 0
Deals, pr C., 12 ft. by 3					Sperm body	140	0 140 0
by 9 in., duty 2s per					Cod	41	10 0 0
load, drawback 2s.					Whale, Sth. Sea, pale	45	0 0 0
Quebec, white spruce	13	10	22	10	Olive, Gallipoli.....	63	0 0 0
St. John, white spruce	13	0	15	10	Cocoanut, Cochin, ton	58	0 0 0
Yellow pine, per reduced C.					Palm, fine	41	0 0 0
					Linseed	35	10 36 15
					Rapeseed, Eng. pale..	40	0 0 0
Canada, 1st quality.	17	0	19	10	Cottonseed.....	30	0 36 0
2nd do.....	12	0	13	10			

METALS.

IRON :—							
Welsh Bars in London .. ..per ton	6	15	0	0	0	0	3½
Nail Rod .....do	7	10	0	8	0	0	2
Hoops ..... do	8	17	5	9	0	0	
Sheets, Single ..... do	9	17	6	10	0	0	
Staffordshire Bars ..... do	7	17	8	8	10	0	
Bars, in Wales ..... do	6	15	0	6	0	0	3
Rails ..... do	6	0	0	0	0	0	nett
Foundry Pigs, at Glasg. No 1 .. do	2	13	8	3	7	0	
Swedish Bars ..... do	10	10	0	12	10	0	2½
STEEL :—							
Swedish Keg, hammered .....per ton	15	15	0	18	0	0	
Swedish Faggot ..... do	10	10	0	12	10	0	
COPPER :—							
Sheet & Sheathing, & Bolts ....per ton	86	0	0	91	0	0	8
Hammered Bottoms ..... do	95	0	0	101	0	0	
Flat Bottoms, not Hammered .. do	91	0	0	96	0	0	
Cake and Tough Ingot ..... do	76	0	0	0	0	0	
Best Selected ..... do	84	0	0	89	0	0	
Fine Foreign ..... do	86	0	0	88	0	0	
Yel. Metal Sheathing & Rods ....per lb	0	0	7½	0	0	8	
TIN :—							
English Block .....per ton	90	0	0	0	0	0	2½
do Bar ..... do	91		0	0	0	0	
do Refined ..... do	93	0	0	0	0		
Banca ..... do	93	0	0	0	0	0	nett
Strait ..... do	88	10	0	89	0	0	
LEAD :—							
Pig, English .....per ton	22	5	0	22	10	0	2½
,, Spanish Soft ..... do	19	15	0	0	0		
Shot, Patent ..... do	23	10	0	24	0		
Sheet ..... do	21	0	0	0	0	0	
White ..... do	30	0	0	81	10	0	
SPELTER :—							
On the Spot .....per ton	22	5	0	22	15	0	nett
ZINC :—							
English Sheet .....per ton	23	0	0	0	0	0	
Devaux's V. M. Roofing Zinc .... do	27	0	0	0	0	0	*
* And 5 per cent. discount if laid upon the new system.							
QUICKSILVER .....per btl	6	18	0	7	0	0	
REGULUS OF ANTIMONY.							
French .....per ton	34	0	0	0	0	0	

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'HE BUILDING NEWS.

LONDON, FRIDAY, MARCH 22, 1867.

IN PERPETUAM REI MEMORIAM."

'N the custom that has long existed on the continent—particularly in France—of ıblicly making localities interesting for their ıanection with notable personages or his-ical events, there is something refined and verential. Thomas Campbell drew attention this custom many years ago. "In Bou-ıne," wrote the poet, "we read as we ram-e through it, '*Ici est mort l'Auteur de* Gil as;' in Rouen, '*Ici est né* Pierre Corneille;' Geneva, '*Ici est né* Jean Jacques Rousseau;' d in Dijon there is the 'Maison Bossuet;' Paris, the Quai Voltaire.'" Many more in-.nces might be quoted. Rich as is our own ıuntry in memorials of this kind, we have herto not thought it worth while to pay a ıilar graceful compliment to those whose ımories we ought to delight to honour, ex-ıting indeed in very rare instances. A few our public buildings and monuments in-m the passer-by for what or for whom they re erected; but as regards even our public ifices, in a majority of cases they bear no ch index. Hence there is no question more ınmonly asked by the stranger in London ın "What building is that?" The modern ıctice is to bury in the foundation—where ıody will ever read it—an elaborate account a new building; it is by accident that we place ıy record on the building itself. But how ıny precious memorials of the past, how ıny cherished spots of literary and historical erest there are in the metropolis, which none ıt the learned antiquarian knows where to d or how to look for, and yet which are far ter worth knowing than (say) the Duke of rk's Column, or the Langham Hotel. There ıo city in the world containing so many ıts sacred to the memory of genius as Lon-a; no city where so many localities are rked by memorable events. Every street the metropolis is a Sermon in Stone; but most of us the sermon is a dead letter for k of a teacher. We are glad that a teacher s at length come forward. At a recent eting of the Society of Arts, that excellent dy resolved—there being no let or hindrance to adopt the plan followed on the continent; d the work has just been fittingly inau-rated by the erection of a tablet on the front the house No. 24, Holles-street, Cavendish-uare—the birthplace of the author of Childe Harold." The slab is of terra cotta, th deep blue face, and bears the following scription in white letters:—

"Lord Byron,
Poet,
Born here 1788,
Died in Greece
1824."

The poet's mother was in lodgings here at e time. Byron's own residence, during his ief and bitter married life, was at No. 139, ccadilly. He subsequently occupied cham-rs in the Albany, and here "Laura" was ritten. Other memorials will be erected, we lieve, as opportunity offers. We propose to te a few out of the many localities in the etropolis which are either hallowed by nius or associated with notable events. Our t may assist the Society in the pleasant and portant work which they have undertaken. s it is the oldest part of London, we begin th the City. Mercers' Hall, Ironmonger-ne, Cheapside, occupies the site of the mer-ry where the father of Thomas à Becket d a mercer's shop, and where the archbishop s born. Sir Thomas More was born in lk-street, and Milton in Bread-street. The et's father was a scrivener at the sign of the read Eagle. Milton himself resided in Jewin-street, died in Artillery-walk, and was buried in Cripplegate Church. It is said that the Young Men's Christian Association building stands on the site of a house once occupied by the author of "Paradise Lost." In Sweedon's-passage, Cripplegate, was a house pulled down in 1805, occupied by London's two great citizens, Sir Richard Whittington and Sir Thomas Gresham. Gresham lived likewise at what is now number 68, Lombard-street, the street in which Alexander Pope was born, in 1688. In Grub-street (now Milton-street) Foxe the Martyrologist lived, Defoe wrote "Robinson Crusoe," and John Speed his "Chronicles." No. 41, Cornhill, was the birthplace of the poet Gray, whose father was a linendraper. In St. Michael's, Cheapside, was born in 1605, Sir Thomas Browne, author of "Religio Medici;" in St. Botolph's, Bishopsgate, in 1556, Edward Alleyne, "the Proteus for shape and Roscius for a tongue," founder of Dulwich College. He died in 1626, and was buried in the chapel of his own college. It is discreditable that Alleyne has not even a monument at Dulwich. William Sharp, the engraver, was born in 1740, in Haydon-yard, Minories. The reminiscences that belong to the neighbourhood of the Old Bailey and Smithfield are not all of them of a disagreeable character. In the Old Bailey, William Camden, the great antiquary and historian, was born in 1551; his tomb is in Westminster Abbey. In a wretched room, No. 12, Green Arbour-court, Goldsmith wrote "The Vicar of Wakefield"—the house was recently taken down. Poor Goldy died at No. 2, Brick-court, Temple, and every visitor to that region is familiar with his unpretending tombstone. Smithfield gave birth to one of England's greatest architects, and to one of her greatest painters. In or near Cloth Fair, where his father was a clothworker, Inigo Jones first saw the light; and Hogarth was born in Bartholomew-close, a spot additionally celebrated from the circumstance that Benjamin Franklin worked here as a journeyman printer on his arrival in London. Franklin afterwards resided at No. 7, Craven-street, Strand. Van Dyck is said to have died in Blackfriars, but in what part is not known. St. John's Gate tells its own story; not far from it, however, in St. John's-square, is a double-fronted house, once the residence of Dr. Gilbert Burnet, bishop of Salisbury, who accompanied William III. as his chaplain, when he came over as Prince of Orange to take the throne. The bishop died in 1714, and was buried in Clerkenwell Church. An interesting relic was to be seen in this house some years ago, and may be there still. It was an iron stove, on the back of which was a bas-relief of Charles I. on horseback, trampling over a prostrate figure with the initials C.R., and the date 1644. This house is still called Burnet House. In the quaint old Bell Inn, Warwick-lane, good Archbishop Leighton breathed his last. Another eminent religionist, the "highly illuminated" Emmanuel Swedenborg, died in Great Bath-street, Coldbath-fields, in 1772. In Angel-court, Shoe-lane, Chatterton committed suicide. In Brook's-market, Holborn, Munden, the comedian, was born; in Fox-court, Gray's Inn-lane, the unfortunate Richard Savage; and in Red Lion-square, Henry Milne, the engineer to the New River Company, distinguished for his knowledge of hydraulics. He died in 1770, at the age of 90. In Lovell's-court, Fetter-lane, Richardson wrote "Pamela" and "Sir Charles Grandison." He resided also in Salisbury-court, Fleet-street, and is buried in St. Bride's. Close at hand, in Dorset-court, lived John Locke. Dr. Johnson completed his Dictionary in a garret at No. 17, Gough-square, and died a few yards off, at No. 8, Bolt-court. The large house at the north-west corner of Lincoln's Inn-fields, was built for the Marquis of Powis, 1686. It was subsequently the residence of Lord Chancellor Somers, and the Duke of Newcastle, Prime Minister in the reign of George II. In the centre of the Fields, three years previous to the above date, the amiable Lord William Russell and Algernon Sydney were beheaded. We have now passed beyond Temple Bar, and come to Essex-street. Here stood the house of Lady Primrose, where Prince Charles Stuart was concealed when in London in 1750. A little further on is the Somerset Coffee-house, at the bar of which Junius directed many of his letters to be left for Woodfall, the printer. Aaron Hill was born in Beaufort-buildings, and Colley Cibber in Southampton-street, Strand. Another great theatrical celebrity, Charles Mathews, the elder, was born at No. 18, in this street, 1776. A host of associations crowd round the neighbourhood of Covent Garden. At No. 6, King-street, Quin the actor, was born in 1693; No. 8, Great Russell-street, was the shop of Tom Davies, where Johnson and Boswell met for the first time. Maiden-lane is famous as having been the residence of Andrew Marvell, the birthplace of the witty Bonnell Thornton (1724), and where Voltaire lodged (at the White Peruke) when in London, in 1726. Turner the painter was also born here. In Henrietta-street—called after the Queen of Charles I.—Kitty Clive, the actress; Paul Whitehead, the poet, who was born in Castle-yard, Holborn; Samuel Cooper, the miniature painter; Sir Robert Strange, and M'Ardell, the eminent engravers, resided. No. 23 was Offley's Tavern; here, too, was the Castle Tavern, where Sheridan fought and disarmed Captain Mathews, his rival for Miss Linley's love. And the Society of Arts cannot but remember that its first meeting was held at Rawthmell's Coffee-house in this street, March 29, 1754. Grinling Gibbons lived on the west side of Bow-street, at the corner of King-street. He was born in Spur-alley, in the Strand, of Dutch parents, and lived for some time in Belle Sauvage-court, dying in 1721. Lord Bacon was born in York House on the site of Buckingham-street; Ben Jonson in Hartshorn-lane, near Charing Cross; Sir Joshua Reynolds lived in Leicester-square, in the house now occupied by Messrs. Puttick and Simpson, the auctioneers; Northcote and Sir George Saville in the same square. Nollekens, the sculptor, and Charles Rogers, the antiquary, were both born in Dean-street, Soho; the former died in Mortimer-street. At No. 37, Gerrard-street, Edmund Burke lived, and at No. 43, Dryden died. The house was lately occupied by a tallow-chandler. The "Ode to St. Cecilia's Day" was written here. The poet's house in Fetter-lane may still be recognised by an inscription over the doorway. No. 22, Soho-square, was the residence of Sir Joseph Banks. Sir John Vanburgh, the architect, lived in Scotland-yard; Tom Moore at No. 27, and Crabbe at No. 37, Bury-street, St. James's; Edmund Kean, at No. 12, Clarges-street, Piccadilly; Turner, at No. 47, Queen Anne-street, Cavendish-square; C. J. Fox, in Conduit-street. Thomas Campbell's last residence in London was No. 8, Victoria-square, Pimlico; and Louis Napoleon's, No. 3, King-street, St. James's. Horace Walpole died at No. 11, Berkeley-square; Sheridan at No. 7, Saville-row; Mrs. Siddons at Siddons House, Upper Baker-street; Garrick in the centre house, Adelphi-terrace; Flaxman at No. 7, Buckingham-street, Fitzroy-square; Stothard at No. 28, Newman-street, Oxford-street; Sir Thomas Lawrence at No. 65, Russell-square; Sydney Smith at No. 56, Green-street, Grosvenor-square; Handel in Brook-street; and Sterne at No. 41, Old Bond-street. In Pitt's-buildings, then called Orbell's-buildings, Kensington, resided Sir Isaac Newton; and here, in his 84th year, he had a fit of the gout, and shortly after died, in 1726. Better known is his house in St. Martin's-street, Leicester-fields. Lord Clive died at No. 45, Berkeley-street. Lord Nelson lived at No. 141, New Bond-street. The great Dukes of Marlborough and Wellington died, the one at Marlborough House, the other at Apsley House. With these illustrious names we end our list thus far. Among places and sites connected with remarkable events, the following suggest themselves:—Prescott-street, Good-

man's-fields, was the only street which had numbers on the houses until the time of Queen Anne. No. 49, Connaught-square, Edgware-road, is the supposed site of Tyburn gallows. At the Dove Coffee-house, Hammersmith, Thompson is said to have written the greater part of his "Winter." At Mr. Murray's, the publisher's (No. 50, Albemarle-street), Sir Walter Scott and Byron met for the first time. Palace-yard was the scene of Sir Walter Raleigh's shameful execution. On the site of the present Charter-house 50,000 persons were buried during the Great Plague of 1349. It was at the Blue Boar Inn, No. 270, High Holborn (now the Inns of Court Hotel), where Cromwell intercepted a letter from Charles I., which is said to have settled the King's execution. Barclay's brewery, Bankside, Southwark, stands on the site of the Globe Theatre, in which Shakespeare played. The Tabard Inn, Southwark; the Mermaid Tavern, in Bread-street; the Boar's Head, Eastcheap; the Devil Tavern (now Child's Banking-house, No. 1, Fleet-street); the Mitre, and other celebrated haunts, are worthy of being kept in remembrance. The Black Jack public-house, Portsmouth-street, Clare Market, as Mr. Peter Cunningham reminds us in the "Handbook of London," was a favourite resort of Joe Miller, and celebrated for the jump which Jack Sheppard made from one of its first floor windows to escape the emissaries of Jonathan Wild. Cheapside Cross might be commemorated by the erection of a tablet near the site of that once famous structure, which was close to Wood-street. The residence of Lord Harrowby, No. 39, Grosvenor-square, will always be historical in connection with the Cato-street conspiracy. At Cock-hill, Ratcliff-highway, July 23, 1794, a fire broke out, and consumed more houses than any fire since the Great Fire of London in 1666. It originated from the boiling over of a pitch-pot at a boat-builder's. 700 houses were destroyed, and 400 families lost all they possessed. The Tooley-street fire might also be commemorated in the way proposed. Scores of other places of historical note might be added, but we must stop. We are content to leave the matter in the competent hands of the Society of Arts. If they carry out the work with anything like completeness they will add many attractions of literary and antiquarian value to the metropolis, and enable us to learn at a glance much of the wonderful history of London from its stone walls. For "he that runs may read."

THE COURTS OF JUSTICE COMPETITION.

Article X.

Mr. Burges has contributed a design of very considerable merit, and although he stands at very much below par in his perspectives, the beauty of his geometrical drawings is more than sufficient to compensate for the absence of pretty pictures to those who understand architectural drawings. The public must, of course, be disappointed; there are no street views, no distant effects of tower grouping taken from the other side of the river, no grand façade view, as if the building stood on one side of Lincoln's Inn-fields, and no telling sketches of quaint corners; but where others have given all this Mr. Burges only gives a bird's-eye view, looking north-east, intended evidently as an explanatory drawing and not as a picture. It would, therefore, have been wiser had the architect been content with the same means of representation as that adopted in the elevations, and given us a strong pen and ink outline drawing, instead of the miserable sepia-shaded bird's-eye which his evil genius has led him to submit to public view. It is somewhat singular that whilst the Instructions distinctly ask for a "bird's-eye" view, Mr. Burges is the only man who supplies one. And as, of course, the object of all perspectives in architectural competitions is solely to *explain* the design as set forth to scale in plan and elevation, it is manifest that the unarchitectural mind, which can never grasp an elevation, cannot come to a fair judgment until all the designs are equally well explained. The wish of the competitors, as well as of the judges, must be that the best *design* should be selected; and, therefore, we would ask Mr. Burges to give the public a little more knowledge and explanation of his design by means of ordinary street perspectives; and we would urge upon the other competitors and the commission the great desirability of permitting this, in order that a design so much admired by architects and painters may have the chance of being understood by the public. It may be objected that as one man had as much time as another to prepare his drawings, it is purely the fortune of war that leaves Mr. Burges without a view. One of the elected eleven of all England may say: I devoted my time to getting up my perspectives, Mr. Burges has devoted his to getting up his *design*. In other words, I have gone in for pretty drawings, Mr. Burges has gone in for good architecture. If you allow Mr. Burges to do the pretty drawings, you should allow me the same time to develope my architecture. And, as far as we are concerned, we would be only too glad to see this sort of reciprocity put into practice. But we think there is an easier method of getting at the real nature of these designs, and that is, as we have hinted in a former article, by following Mr. Seddon's example, and by getting the country to spend a few hundreds of pounds in preparing models of each of the designs before any decision is made which will involve the expenditure of a few millions.

In his plan, Mr. Burges has kept to the extreme limits of the site, and boldly accepts the conditions imposed by the retention of Pickett-street. Where every foot of land is of so much importance, and where the site is so narrow from north to south, it is useless, for the sake of uniformity, to throw away that strip which extends from Pickett-street to Temple Bar. "I have, therefore," he says, "made it part of the outer zone, but opened the lower story, so as to allow carriages to pass through, and thus divide the traffic of the new courts from that of the Strand. That portion of the zone cut into by Pickett-street becomes an ornamental screen wall, doubly glazed, and serves as a means of protecting the offices within from the noise of the Strand." The general plan may be briefly described as consisting, first, of an external shell containing the minor offices, then an area about 30ft. wide, then a second shell or zone of buildings, containing the courts and corridors, another area, and a third shell or zone containing the judges' apartments, and in the centre, surrounded by very spacious areas, a hall, with staircases, &c., for the judges. The arrangement of the courts is as follows:—At the four angles of the zone or block of buildings in which the courts are placed are entrance halls for the use of barristers, attorneys, and suitors; external to the courts is a corridor for the use of the parties just mentioned, and on the opposite or inner side of the courts is a corridor for the use of the judges. The south side of the zone is occupied by the nine courts of common law, the Banco Court of the Lord Chief Justice occupying the centre, distinguished by a higher roof. On the north, or Carey-street side, we have in the centre the Lord Chancellor, and on each side of him the Vice-Chancellors, the Lords Justices, the Master of the Rolls, and the Spare Court. On the west side of the zone we have the Ecclesiastical Court, Admiralty and Divorce Courts; and on the east side the Bankruptcy Court, the Appellate Court, and the Spare Court; and in the centre of the whole building is the Exchequer Chamber.

The entrances for the jurors and witnesses are on the ground floor of the four angle halls already mentioned; from these the witnesses diverge to their private staircases, which lead to each court from the outer area or the street of the witnesses; and the jurors pass on the other side of the halls to their private staircases, entered from the inner area or street of the jurors. These classes of the semi-legal public have their rooms immediately underneath the courts, in a mezzanine floor. Then, too, the mere spectators have likewise distinct and separate entrances from the outside of the building to galleries over each court, so that a spectator in the Banco Court of Queen's Bench must descend 60ft. to the Strand, go out into the street, and ascend another 60ft. before he can reach the adjoining court. The judges enter in the centre portals of the two main façades, as also through side carriage entrances from the Strand to the central quadrangles. The barristers have bridge entrances on the court level from the Temple and Lincoln's Inn leading directly into their corridors, and have also private entrances from the street level at the four angles of the building. By these arrangements one of the most important questions to be solved in this very elaborate plan problem has been fairly met and disposed of, for every class of the people who would frequent the courts, and whom it would be desirable to separate, have their distinct entrances, corridors, and staircases, arranged in the most natural and easy manner. There is, however, one drawback to this portion of Mr. Burges's scheme. The judges would have to ascend eighty-eight steps from the low level in order to reach their corridor, or fifty-two steps from the Carey-street level. Mr. Waterhouse is the only competitor who brings the judges' carriages to the high level of the court floor. But such a feature as an inclined plane is no very great novelty, and might, perhaps, be applied to any design. Amongst the advantages which Mr. Burges's arrangement of entrances includes is one of such importance that it ought to have very large influence in the decision of the judges. For by it, and by omitting a public hall in the centre of the building, and limiting all carriage traffic within the site to the judges, this architect has succeeded in securing a greater amount of quiet than would be obtained by any other scheme before us. Collateral with this question of quiet is the equally important question of light and air, and here, too, Mr. Burges, by giving up the central hall scheme, has been able to supply every corridor and room with a full amount of these essentials. We have no gloomy tunnels, no dark corridors, and the only borrowed lights are top lights to the corridors of the law offices underneath the courts, which get direct light from the spaces between the courts, which in some cases are as much as 24ft. by 16ft. In the centre of the building there are two court-yards or squares, of an aggregate area of 23,000ft. by measurement, although Mr. Burges has the modesty to place it at 13,040ft. Perhaps, however, he wishes us to take this measurement as the area of *each* court-yard, but if so he has stretched a point which wanted no stretching. For whether we look at the plan, the sections, or the bird's-eye view, we cannot but be satisfied that this design is an eminently practical one in its working plan and arrangement. We must confess to the surprise we felt on examining these plans. We were quite unprepared for anything like the attention to convenience which is displayed in them, for—without wishing to cast any reflection upon Mr. Burges's qualifications as an architect—his works have not hitherto given such evidence of contrivance in plan as they have of a certain artistic power which runs very close indeed to that particular power, such as it is, which characterises some of the largest of the Early Pointed buildings in France. So, too, if it had been a question of a goblet or a grotesque, we should have expected Mr. Burges to rise superior to himself, or, as an American would say, to do tall things; but we certainly did not expect such an answer to the great practical problems set forth in the Instructions as he gives us in the

w drawings he exhibits. Indeed, we cannot elp thinking that Mr. Burges himself arcely expected it, and that in an excess of light with his plan he has overlooked—not say neglected—his elevations. Thus in s report he writes :—"It is evidently of the most importance that the public should not ave to ascend any great height for the purposes of business. The level of the courts ppears to be fixed at something like 40ft. by aragraph 29 of the Instructions, and in the resent design there is but one story over his level, except in some rare instances." he result of this is that the building in s general mass is low as compared with the esigns of the other competitors. This deression is particularly felt in the long unroken façade against Carey-street, where, wing to the rise of the ground, the height to e ridge of the main roof is not a tenth of e length of the façade. Towards the trand the addition of an extra story by the wer level of the ground makes this depreson less observable, whilst the break in the çade produced by setting back the front gainst Pickett-street and the change in the yline of this portion give a certain height d dignity to the eastern half of the Strand out, which, flanked by the towers and the idge over Temple Bar on the east, and by e towers of the grand gateway on the west, ay unquestionably be regarded as the eatest result of the competition. That the low roportions of the mass of the building have een felt by its author we cannot hesitate to elieve, and we must give him credit for tryg to obviate this defect by implanting towers herever practicable. Thus, in the outer zone e have towers at the four angles, towers in e centres of each front, and two in the interediate spaces of the Carey-street front, whilst the inner zone we have towers at the four gles, and besides these there is one in the ntre of the building and one on the other de of Temple Bar over the staircase to the idge, making in all eighteen towers. The rgest of these towers is the great Record wer, at the south-west angle of the building, hich measure, 75ft. by 60ft., and 335ft. igh. In the centres of the two chief çades two towers are brought together flank the chief entrances. By this rangement considerable dignity is secured r the main points of the composition, and if e upper part of the great tower had been as rectly cribbed as the upper part of the clock wer and from as good a specimen, we should ly have had the detail to find fault with. s it stands the whole of the top of the great wer, from the machicolations upwards, is alost as bad as it can be. The word "machilations" reminds us of those faults of detail which we have just referred. In the main ilding these faults can be best studied by e help of one of the most careful detail awings we have ever had the good fortune to ok at. This shows first an open vaulted arde of two orders resting on cylindrical shafts, th carved octagonal capitals and demiures in circular medallions in the spandrels the niches, the hood moulds of medallions d arches intersecting with the first stringurse. Now we have no hesitation in saying at, whilst recognising the beauty and temrance of this disposition of ornament, it is ipossible not to feel a great lack of proporu and refinement, and the consequence is at the lower or ground story is depressed, yond whatever it might have suffered from somewhat stunted proportions, by the largess of the detail in capital and medallion. nd this is all the more obvious because imediately above the first stringcourse is a nd of square panels filled with shields alrnating with various conventional forms so oroughly in harmony with the great arcade at the important and over-bold details of pital and medallion stand out with a relief, e coarseness of which no amount of careful awing can disguise. Above the band a cond stringcourse receives the piers of the windows of the first floor. The enclosing arches of these windows come so close together that the whole story may be regarded as a second arcade of nearly the same proportions as the last, except that the arches in this case rest on a group of five shafts still more stunted in their dimensions than those of the ground arcade. The wall space of the spandrels is covered with sculptured figures winged and throned, representing Virtues, and within the arches are two-light windows with a sexfoliated circle in the head; this window plane rests on shafts grouped with the shafts of the main pier, and within them is a second window-plane of stone, and within that the wood framework of the window itself. Now we must say that, however desirable it may be to secure a certain amount of reveal and shadow in our openings, this quadrupling of reveals is rather overdoing it. The effect of grouping seven shafts together when the width of the whole mass of the pier is greater than the height is another evidence of that want of refinement to which we have already alluded. The hood mould of this second arcade intersects with the third stringcourse, and then we have an arcade of five arches to each bay of one order, going all round the building and possessing enormous value in binding the whole together; the two arches which fall over the piers of the lower arcades are unpierced and enriched with statues which it is almost unnecessary to say are designed and drawn with consummate skill. Immediately above this arcade (rather too immediately) is a corbelled cornice and parapet, and within this an antic wall from which rise bold dormer windows in each bay, except here and there where two dormers are brought a little closer together, and thrown into one composition with a great gable, having an octafoliated circle of sculpture in the tympanum. These gables are flanked by angle shafts carrying statues, and the dormer gables by shafts supporting seated lions full of character. One great defect in addition to those we have already mentioned, is the treatment of the first-floor windows. The cusped circle rises to the ceiling line, and the whole window is out of scale with the room it lights. Had Mr. Burges been content with one order less, raised his springing line, and given the light space of the cusped circle to the lights below it, he might have been able to keep the upper part of the window solid without being heavy, and have secured to the whole of this important story a much more pleasing proportion. As to style, Mr. Burges, like most of the competitors, has selected the Gothic of the thirteenth century as his *point de depart*. He says: "In selecting the exact variety of the thirteenth century architecture to be adopted, we naturally give the preference to that of our own country; the only objection to this course is the small mouldings and ornaments, which, in the comparatively soft stone employed for building in this city, are so certain to be clogged up and obliterated by the acids and smoke of the London atmosphere. We are, therefore, driven by the exigencies of the case to the broad details of the French work, and I have accordingly used these details." In this we cannot but think he is right, but there remains one other very important question. With the exception of those details already mentioned, we have not a word to say against any of the mouldings, capitals, &c., of the main building. When, however, we get above the roof line, and consider the important part which the eighteen towers play in the composition, we feel that the architect has rather gone beyond himself. The tower of the Palazzo Vecchio, Florence, the palace at Poitiers, and the chateau at Pierrefonds, or one of the many chateaux which are more or less like it, have had unquestionably powerful influence on Mr. Burges's mind. We do not blame him for selecting these works as models. On the contrary, we think it is to this very wisdom of selection that we must refer much of the success of the design before us; and we only wish other architects were as carefully critical in the selection of their models. But what strikes us as strange is that because the Count of Poiton in 1395 built a palace with here and there traditional features of a purely military architecture, Mr. Burges should not only imitate him, but redevelope these features back again to that feudal condition of architecture from which even the fourteenth-century Count was trying to emancipate himself. There are machicolations, it is true, in the palace at Poitiers, but compared with this design for the Palace of Justice they are little more than cornice corbels. In both the uselessness of the feature is equally apparent, for on the walls below these means of defence are projections of mouldings and windows, and statues and canopies, which must have incontinently come to grief had the machicolations ever been used. This frolic, for we can call it nothing else, is the one eccentricity of the design—an eccentricity, however, which, happily for Mr. Burges, may be easily set right, and does not in the slightest degree affect the general character of his work, except in so far that it produces upon the most casual and superficial observers an impression that the building is like a large mediæval castle, to which, barring this excess of tower machicolation, it has not a single point of resemblance. We have dwelt much longer upon this design and entered more fully into its detail, because of all the designs exhibited we think it by far the most deserving of careful criticism. Besides the points we have taken exception to, there are others which are not what we should like to see executed, *e.g.*, the tops of the ventilating towers, the junctions of the square with the cylindrical superstructure in the gateway towers, and the ironwork of the bridges in the court-yards; but then, on the other hand, nothing can well exceed the strong beauty of the staircase approaches from the Temple and Lincoln's Inn—most exquisite pieces of design, and well deserving unqualified praise—whilst in the sections and interior views we see abundant evidence of the architectural power. We cannot conclude this review without commending to the notice of the Commissioners the last line of Mr. Burges's report, in which, spite of his evident desire, so manifest throughout the whole of this work, to repress the grotesque, we recognise the cloven hoof—

"Any number of perspectives can always be supplied if desired."

* * * *

We give this week an illustration of Mr. Garling's Gothic design, which we reviewed in our issue of March 8. We have only to add to what we have already said that this design exhibits a certain mastery of mass which is by the way a characteristic of all Mr. Garling's great works, and which was even more marked in his premiated Renaissance design for the War Office, in the Government Offices competition. We are also bound to add that in our opinion this architect has not added to the laurels he gained on the occasion we have just mentioned, and can only repeat our regret that he should have divided the short time allowed by the Commissioners, in order to give an alternative design in a style quite foreign to his usual studies, and upon which he has certainly not worked *con amore*.

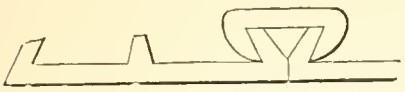
The Metropolitan Board of Works has given instructions to its auctioneers to sell the materials of 120 houses, at present occupying the first portion of the projected new street to the Mansion House, between Earl-street, Blackfriars, and Cannon-street, with a view to their demolition. It is expected that the ground between those points, with the exception of the Will Depository in Doctors' Commons, and the Equitable Insurance Company's building at the corner of Earl-street, will be cleared in the course of the summer. Negociations for purchasing the interests in the remainder of the line from Cannon-street to the Mansion House will be proceeded with as rapidly as possible in order to clear the ground.

ELEMENTS OF ENGINEERING.

Docks.—No. 4.

In addition to the example given in our last article, cast-iron sheet piling has been also employed extensively in dock and harbour work, although it will never supersede timber as the material to be generally used. The description of cast-iron pile represented in fig. 7 was used with much advantage at the

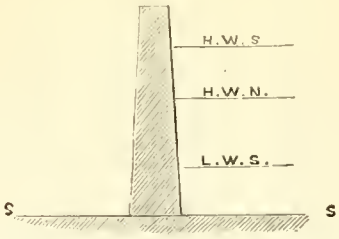
FIG. 7.



Liverpool docks, when the difficulty of keeping them perfectly vertical during the operation of driving was once mastered. This was accomplished by driving them between two heavy timber guide piles, to which were connected strong longitudinal balks which maintained them in a perpendicular position, and also caused the ram to strike fairly upon the centre of the head of the pile. In using cast-iron piling for the purposes of constructing a cofferdam there is no necessity for being particular about getting all the piles down to the same level, as it is a matter of no importance in a temporary work whether the heads of the piles are in line or not. This is a considerable advantage which cofferdams enjoy with respect to this special description of piling over permanent works built upon the same principle, as there is no slight difficulty encountered in getting cast-iron piles down so that their heads may range truly level. As will be readily perceived the same inconvenience attends the sinking of every description of iron cylinders and piles, since they cannot be cut to the exact length like a piece of timber. When iron foundations are used for bridges over rivers, it is usual in practice to have some short lengths made so as to avoid the necessity of the labour and expense that would be required to sink some of the piles down to the proper depth to make their heads range.

Although the excavation for a dock is a simple affair when the dam is made, and everything rendered snug and tight, yet there are a few conditions sufficiently important to be insisted upon in all specifications, and the non-observance of which would at the best be attended with considerably additional trouble, labour, and delay in the progress of the works. The first point to be determined is the depth, which depends chiefly upon the class of vessels intended to be accommodated, and the rise and fall of the tide at the site of the dock. It is very rare that the depth of water inside a dock is equal to that on the outside, that of the latter being usually the greater. At low water the depth of water on the outer sill of gates at spring tides is as follows for the principal London docks:—St. Katharine's, 10ft.; Commercial Docks, 9in.; East India, 6ft. 6in. The West India Docks have three entrances, giving a mean depth of 5ft. 4in., and the London, which possess the same number, have a mean depth of 5ft. It may be remarked here that were the Tower pulled down, the site could be adapted at a comparatively small expense for the erection of a splendid wet dock, offering every advantage with respect to size and facility of access. So far as the absolute depth of water available for the berthing of vessels is concerned, the East India Docks surpass the rest of their neighbours, as there is never less than 23ft. of water in them. Knowing the rise of the spring and neap tides, the depth of water that a dock will have may be calculated by the following formula:—Let R = the rise of an ordinary spring tide, and R^1 that of the corresponding neap tide, and make D = the depth that the dock is excavated below low water springs; then putting H to represent the maximum depth of water the dock can have, we find $H = (R + D)$. Similarly, making H^1 to represent the height at neap tides, we obtain $H^1 = \{(R + D) - (R - R^1)\}$. This will be more clearly seen by an inspection of fig. 8,

FIG. 8.

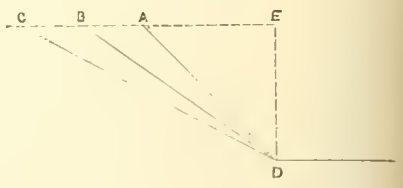


where S S is the bottom of the dock, and the rest of the diagram is self explanatory. It must be borne in mind that the line H W S represents the height of the usual spring tides, and not the highest that might occur. An equinoctial tide would be between three and 4ft. higher than that in question, but it would obviously not do to calculate the depth of water available, from so exceptional a datum.

In excavating for a dock, railway, or any other engineering work, the first thing to be considered in the estimates is what is to be done with the stuff excavated. It must be put somewhere. In railway work the line is so laid out as generally to enable the stuff taken out in the cuttings to be run into the embankments. Sometimes, however, the length of lead or distance the material would have to be run before being deposited, is so great that it is cheaper to adopt what appears rather an expensive mode of proceeding—that is, to purchase land for side cutting, as it is called, wherewith to make up the embankment, and also to buy land for running to spoil the material excavated from the cutting, thus incurring a double outlay. We have already mentioned that frequently a portion of the stuff excavated for the dock may be used for making the puddle dam; and also, if the material be good clay, bricks may be manufactured on the site suitable for the building of the work. The importance—in fact the imperative necessity—for the engineer to carefully consider all these points, and not leave them to be discovered by the contractor after the contract is let, becomes manifest when we reflect upon the difference of price that would be attached in a schedule of prices, to bricks made from stuff excavated upon the site, and to those which had to be procured perhaps from a distance of fifty miles or more. In many instances a sea wall has to be built between the dock and the sea, and in order to utilise the excavation this may be replaced by a strong embankment wherever the stuff is proper for the purpose, care being taken to pitch the sea slope well with heavy flat stones to prevent the action of the waves wearing away the face of the bank. It may be protected on the inside from vermin by the same precautions mentioned when treating on the formation of dams in our last article.

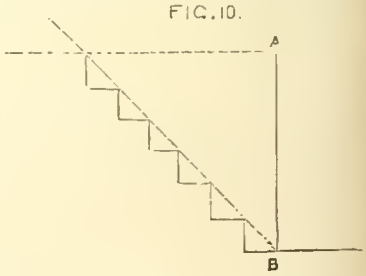
The occurrence of springs while excavating for a dock is a very frequent source of trouble and annoyance, and they must either be led away or stopped at once by overlaying the ground near them with a thick coating of watertight concrete or béton. Occasionally basins or outer docks, as they may be called, are not required to be sunk below low water, and then the excavation is carried on by tidal work. The great secret in undertaking this kind of work is to put on as many hands as possible, in order to make the most of the limited time at disposal. Should it be impossible to dispose of the stuff or a large surplus of it upon land, it may be run into lighters, carried away, and tipped out at sea. It may also sometimes be beneficially employed in this manner for filling up holes and hollows, and reducing a certain area of sea or river bottom to a uniform bed. The backing-up of the dock walls will always absorb a proportion of it, as will be perceived when we come to that part of our subject. Docks, moreover, always being in close contiguity to the sea or a navigable river, the vessels trading in the neighbourhood will generally be glad to take some of the stuff as ballast; and in this manner a very large quantity can be got rid of. At a short distance from the sides, towards the centre, the stuff may be taken out altogether at random in any manner which best suits the contractor, but the sides themselves must be treated a little more carefully. They cannot be taken out plumb, but should batter backwards, as shown in fig. 9. The exact angle or

FIG. 9.



the ratio of the slope depends upon the nature of the soil, the shape intended to be given to the walls, and many other circumstances which render it impossible to fix any one particular angle of slope. It should not, however, be less than one perpendicular to one horizontal, as represented in the fig. by the line A D, which is laid off so that A E = E D. The two other slopes are 1½ to 1, and 2 to 1, represented by the lines B D and C D, where B E = 1·5 × E D and C D = 2 D; the last being flat enough for almost any soil intended to stand only for a short time at that inclination. To prevent the backing between the sloped off sides of the dock and the back of the wall sliding down the slope, and acting like a wedge at its lower extremity, the sides are cut in steps (see fig. 10), and the backing well punned as it is

FIG. 10.



carried up. In the fig. A B is supposed to represent the back of the wall, and we thus see that the backing does not press upon it in the injurious manner it would do were it placed upon the slope in fig. 9, in which none of the pressure is resisted vertically, as in the last diagram. When preparing the entrance to all docks and harbours, all shoals should be reduced to a regular inclined plane, so as to leave no sudden jump in the river bed. There is one bad practice worth calling attention to in connection with excavation in general, and that is the system so prevalent of skimping the room for the men to work in. It is false economy to save in the comparatively insignificant item of excavation, and then afterwards crowd more men together than there is room for. Numbers are not always beneficial; and although there is much truth in the proverb, "Many hands make light work," yet there is no worse sign of bad management than that of putting too many men to one job. All soft stuff at the bottom of a dock must be taken out, which can be done without excavating the rest of the area below the necessary depth, as it will be much cheaper and safer to refill these holes with good solid material—concrete if necessary—than to take out any part of what will form a good bottom. The remaining considerations with respect to excavating the dock may be safely left to the contractor, as his

nterest will be the best guarantee for it done properly. We shall pass on next article to describe the erection of lls, and mention the best forms most to the particular duty they have to m.

PLATE GIRDERS.—No. I.

late girder is so called from its booms or being built up with plates until the d sectional area of metal has been arrived designing a girder, it is necessary to have ical knowledge of the tensile and compres- ains the metal employed is capable of sus- , as well as a mechanical knowledge of the and appliances used in the shops for punch- aring, welding, and riveting the various gether. This experience it is best, if pos- get from actual observation. The fol- rules should be always kept in mind:—No late should exceed 5 cwt. in weight, or an rice per ton will most likely be charged by master, as it entails the necessity of extra labour to manage the metal while passing the rolls. Some of our old engineers, as never go beyond from 3 to 4 cwt. in one ut every day we hear of improvements in ing of iron, and if all plates are kept under as a rule it will pass the rolling mill with- extra charge being levied. The tensile n of bar and plate iron runs between 20 tons per square inch of sectional area. The ssive strength of bar and plate iron averages per square inch sectional area. But by rd of Trade regulations, engineers are not to tax the strength of wrought iron past per square inch in tension and compres- Therefore the load imposed upon any gir- uld not exceed one-quarter of the breaking that is, the heaviest load that should ever girder must not exceed 5 tons per square sectional area. A girder will carry twice h if the weight is distributed as it will eight be on the centre. For instance, sup- late girder be constructed to carry 10 tons on the centre, the same girder will safely tons if the load were distributed equally out its length. No L iron or T iron exceed 24ft. in length for similar reasons to ven about plates. Rivets, being made from er iron than bars or plates, might very well ulated to bear a strain of 5 or even 6 square inch of sectional area; but as im- workmanship is always likely to occur, it to keep to the 4 tons per square inch as s, L and T iron. Rivet heads should be formed by having 1½ times the diameter ivet, that is, a rivet 1in. in diameter and g between the heads should be made from length of 1in. round iron, for if the heads ivets contain less metal they will always nger of giving way before the rivet itself ak.

GYMNASIUM FOR NEWCASTLE.

idea of establishing a gymnasium by the eople of Newcastle-upon-Tyne has been e time under consideration, and now the is likely to be carried out. A meeting interested in the matter was held the y to receive the report of the provisional tee appointed to consider the best means lishing a gymnasium. From this report that after inspecting numerous sites, the tee have selected a piece of ground in Bath- longing to the corporation. This site is ng by 50ft. to 75ft. wide, and the corpo- ffer the land at the annual rental of £20 years' lease. Plans, and an estimate for le building, have been prepared by Mr. Oliver, and approved of by the com- The sum required to carry out the scheme about £2,500, and following the example on, Liverpool, Birmingham, and Manches- committee propose to raise the necessary by forming a limited liability company, lled the Newcastle-upon-Tyne Gymnasium y (Limited), with a capital of £2,500, in res at £5 each. The recommendations unanimously adopted by the meeting.

The ceremony of laying the first stone of the eat and Poultry Markets, at Smithfield, e place in the first or second week of next

Archæology.

BRITISH ANTIQUITIES AT SHOEBURY.

A FEW days ago a fine bronze celt was found at South Shoebury, near the barracks of the Royal Artillery, at a depth of 7ft., in what appeared to be undisturbed gravel. It measures 6¼in. in length and nearly 3in. across the blade, and belongs to the second class of bronze celts of Du Noyer's classification, viz., "The wedge with sides more or less overlapping, blade thicker than the wedge for insertion into the handle, and a stop ridge or elevation at the termination of the blade." In this example the blade is ornamented with four ridges, and the flange of the wedge does not overlap. It is in the possession of Colonel Wilmot, the commandant of the fort. The site of the discovery is within the area of the extensive earthworks at South Shoebury, to which the Danish forces under Haesten (or Hasting) retreated after their defeat at South Bemfleet by Alfred the Great; but the celt is probably British, and at such a depth as to lead to the conclusion that it was deposited there long before the time of the "Black Danes."

ARCHÆOLOGICAL DISCOVERY AT LINCOLN.—Some workmen in excavating a cellar at the back of the premises belonging to Mr. Old, of High-street, Lincoln, a few days since, found two Norman window heads, two large capitals, and a smaller one, all quite perfect, which evidently belonged to an ancient church. The men also found, in digging, several pieces of Roman and Samian pottery. One piece of Samian ware has a lion's head upon it, and another piece has the maker's name upon it; and there is also a very curious part of a Roman or Anglo-Saxon jar, with a face made upon it. The stones and the pottery are in Mr. Joseph Durance's possession.

FRANCE.—ROMAN TOMB.—A gardener of Vienne (Isere), when lately engaged in digging, discovered a Roman tomb, containing the skeleton of a young girl, partly decomposed, as well as some curious objects of jewellery. The most remarkable is a necklace, formed of gold wire articulated in figures of 8, separated from each other by six beads of red cornelian, dividing the whole into seven equal parts, with two gold beads pendant in front. Two gold pins were also found, and a fibula for attaching the peplum at the shoulder, made of copper gilt, and inlaid with flowers in enamel. There were also five hair-pins, one in bronze and the rest in ivory.

A TARTAR POMPEII.—The Russian correspondent of the *Standard* reports that a discovery has just been made in the Syr-Daria, which is likely to turn out of considerable interest to archæologists. An officer of engineers, who was superintending the building of a fort, observed that the bricks which were brought by the Kirghis for the work were not modern, but of unusual quality, partly covered with mortar, and evidently of great antiquity. On inquiry he found that the bricks were brought from some ruins at about fifteen miles distance, on a spot which was formerly on the banks of the Sea of Aral. Some officers were sent to examine the place and found a large town, about three miles from side to side, buried in sand and overgrown with bushes. None of them was archæologist enough to give an opinion on the interesting discovery, but news was sent to the central administration, and as the Russian Government takes a very enlightened interest in the historical antiquities of the vast country under its rule, it is probable that a proper examination of this Tartar Pompeii will be made by competent agents.

ROME.—Inexhaustible Rome has lately yielded some extremely interesting antiquities discovered under San Crisogono, a very curious church in the Trastevere, which is supposed to date from the time of Constantine the Great. The discoveries consist of vaulted chambers covered with inscriptions in black lead; a tomb containing the skeleton of a young girl; and some very curious objects of jewellery. This church is supposed to occupy the station of the 7th Cohort of the Guards.

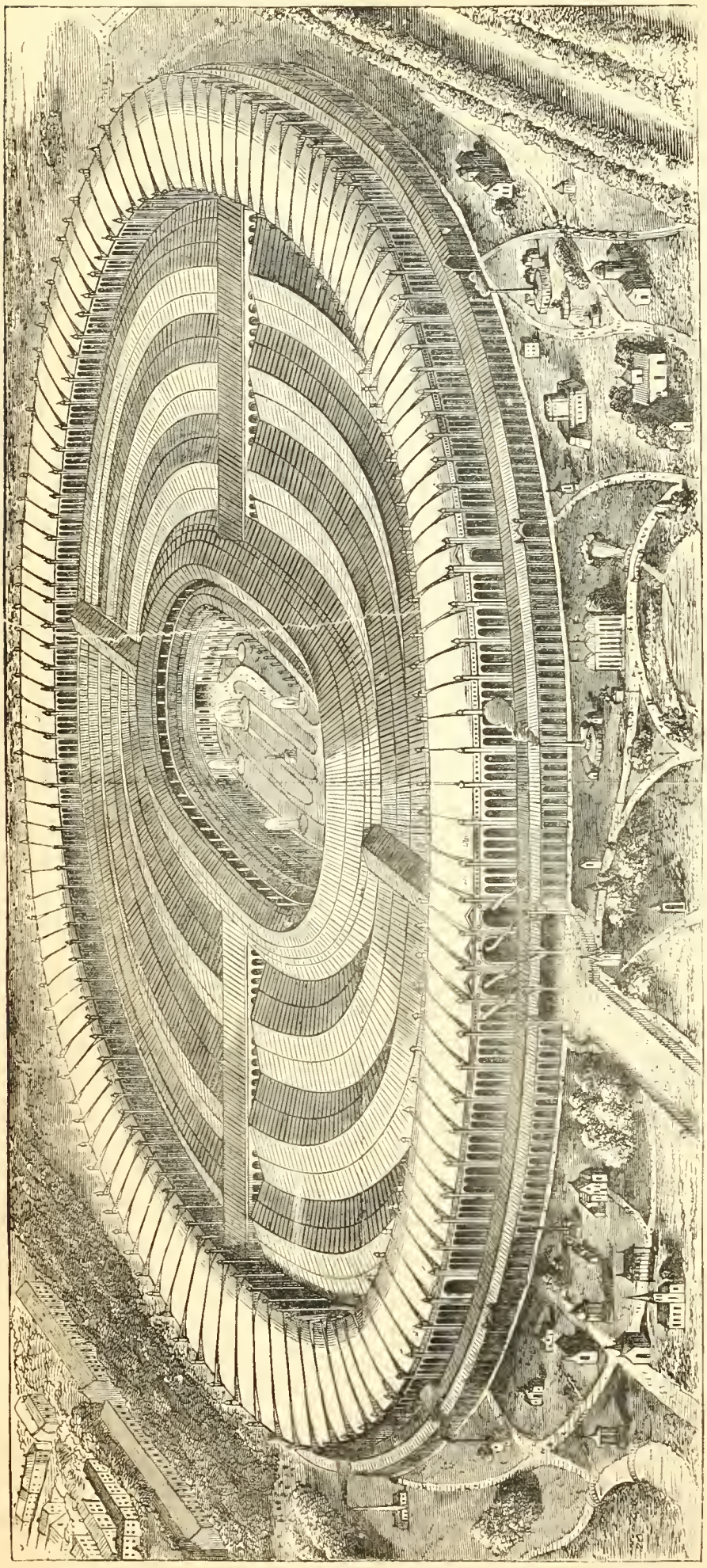
The Marquis of Hertford picked up a clock by Mynnel last week. It is of the reign of Louis XIV., and a splendid art specimen as well as unique as a clock. For picking it up he had to put down 45,000f., and it is said to be cheap at the sum.

Among the minor curiosities exhibited at General Sabine's *conversazione* was a bank-note of the colony of New Jersey, interesting as a specimen of the "Continental money" circulated during the War of Independence. The size of the note is 4in. long and 2in. wide; the value 15s., the date 1776.

ST. PETER'S AND ST. PAUL'S, CORK.

WE this week give an illustration of the interior with ground plan of the Catholic Church of St. Peter's and St. Paul's, which was opened at Cork on the 29th of June last year. The design is by E. Welby Pugin, architect. The church is calculated to seat 1,500 persons, and the entire cost of the edifice was about £24,000. It is built of rich red stone and limestone dressings, and consists of a nave, two aisles, and a tower. The aisles run parallel to the nave, which is covered with a gable roof, while the aisles themselves are built with a roof sloping from the exterior walls to the clerestory. The ridge of the roof of the church is decorated by ornamental ironwork, partly gilt, terminated at the western gable by an ornamental cross with foliated arms. The church is entered by the western doorway, which is recessed, having moulded jambs with carved shafts and capitals—the arch over the doorway being surmounted by a triangular heading, finished by crockets and finials. The doors are hung with ornamental iron hinges, of most skilful and beautiful workmanship—while, on either side, the principal doorway is flanked by small blank arches in the manner of an arcade. Over the doorway is the great western window of the church, the upper portion of which is occupied with geometrical tracery and mullions. From the top of the window to the roof the monotony of the gable end is broken by horizontal bands of limestone. Entering the church, the nave is found to terminate in an apse of polygonal form, lit by eight narrow windows, four of which are mullioned, and the heads filled in with tracery. The aisles are divided from the nave by an arcade of eight arches, four on each side, the two other arches immediately adjoining the sanctuary separating it from the side chapels. The clerestory—the portion of the church surmounting the nave—is lighted, as well as the nave itself, by large windows, which are mullioned, with heads decorated with tracery of quatrefoils, circles, &c. The roof is of open timber work, the principals resting on corbels carved in representation of various angelic figures, the graceful spandrels formed by the principals being pierced by circles and other geometrical figures. Coming now to the body of the church, we may first consider the columns at either side of the nave. They are five in number on either side, forming eight arches. The bases of all these columns—in the proportion, design, and carving of which and their capitals much of the best art displayed about the church is to be found—are formed of black marble, obtained at the mouth of the Shannon at Foyness. Over this the plinths and columns rise, in polished red marble obtained in the Co. Cork, from the locality of Churchtown, and hitherto, as we understand, only used for making roads. We may incidentally remark that this has been found to be a most beautiful and valuable marble, and that since these columns have been erected of it in this church it has been exported by hundreds of tons to England for the adornment of public buildings in various towns there. The capitals resting on these columns are carved in the manner we have described—in fruit, flowers, &c., symbolical in various ways. The other pillars in the church—those smaller ones round the side altars and under the choir, which is, as usual, over the principal doorway—are carved, round the sanctuary, in white Sicilian marble and Galway green, and under the choir in red marble, had from the Little Island, Co. Cork. The three altars—the grand and two side altars—terminating the building in the apse and the two side chapels, are objects of great beauty and interest.

We are glad to hear that the Castle Hotel at Aberystwith, which has had a somewhat chequered career, promises something useful at last. We believe that the provisional committee who are engaged in promoting the establishment of universities in Wales have offered £10,000 for the building, and that the offer has been accepted. In a recent number we gave an illustration of the Castle Hotel. It cost £80,000, and contains 150 bedrooms.



A BIRD'S-EYE VIEW OF THE PARIS EXHIBITION.

PARIS EXHIBITION.

We give a bird's-eye view of the wonderful building which will be thrown open to the whole world on the 1st of next month—the Paris Exhibition. The first International Exhibition of France, in 1855, took place in the Champs Elysées. The present remarkable structure, or rather series of constructions, stands in the Champs de Mars. The principal entrance to the vast enclosed area of nearly 40 acres, is on the north side of the Seine, opposite the Pont d' Jéna. The grand vestibule, 140ft. in length, leads to the principal nave, 100ft. wide and 80ft. high. An immense gallery runs round the building, and will contain specimens of industrial tools and machinery. This gallery leads to the outer galleries or naves, and to the centre of the building. The not very ornamental oval belt of buildings is surrounded by and encloses gardens laid out with marvellous taste. These are rich in every kind of vegetable growth, and adorned with statues, fountains, and everything calculated to delight the eye. They are so contrived as to unite the picturesque with the useful, and are all made subservient to the general purposes of the Exhibition. "Here we see a chapel constructed to show off the various kinds of painted glass. Close by is a lighthouse, illustrating the various modes of obtaining intense and steady lights for marine purposes. There are restaurants for all the principal countries, illustrating the various ways of cooking food, and the national dishes of each country. In other parts there are houses and palaces illustrating the peculiar habits and customs of the civilised peoples of the East. The temple of Marriette Bey is expected to astonish and delight the world. With regard to the objects of the ordinary kind exhibited, those from France will be found to occupy all the eastern half of the building, or that part extending to the left from the Pont d' Jéna, Great Britain taking the first ground to the right, and separated only from France by one of the main avenues. America and Asia follow England, and the various countries of Europe come in order in long narrow slices of the central building, each having its expansion in the gardens beyond. The arrangement is, as far as possible, double—the various groups of objects in classes being in concentric ovals, while the countries radiate and cross these ovals at right angles. However the building may fail as being an unpicturesque object in itself, there cannot be a doubt that the general plan is eminently ingenious, and that very perfect results will be produced. It is not intended that the whole construction shall remain, but it is not unlikely that parts may be retained for public purposes, as was the case with the great building erected for the Exhibition of 1855."* The cost of the Exhibition buildings is estimated at 11,000,000f.

The earthworks of the Paris Exhibition, including the Park, amount to upwards of half a million cubic yards. The ironwork amounts to 13,200 tons, of which 10,000 tons are in the great machinery gallery. The windows of this gallery present a surface of 53,700 square yards, and those of the other galleries 25,000. The Palace itself occupies an area of 140,184 square yards. Of this, 61,000 square yards will be occupied by France, 21,653 by England, and 2,900 by the United States.

The French fine art admission juries have done their work, and the result is the admission of 550 oil paintings, 102 statues, 40 busts in marble or terra-cotta, 83 frames of engraving, 23 of lithography, and 28 of architecture.

It is now definitively settled that the opening of the Exhibition will take place on the 1st of next month.

COMPETITION.

The Schools in Wilton-street, attached to the Holy Trinity Church, St. Anne's-street, Liverpool, being found altogether inadequate to the requirements of the district, a new school is about to be erected. Nine architects sent plans in public competition for the work, and the prize has just been awarded to Mr. J. F. Doyle, architect, Wason-buildings, Harrington-street. Miss Wright, a member of the congregation, has generously undertaken to defray the expense of the work, which will be proceeded with immediately.

* "Black's Exhibition Guide."

MR. TORRENS'S LABOURERS' AND ARTISANS' DWELLINGS BILL.

We lately pointed out certain objections to the proposal of this bill for purchasing out of public rates, at "compensation" prices, the property of those who had neglected all the duties attaching to property. We are glad to find that our views are endorsed by many of the London vestries who oppose the bill; but the Metropolitan Board of Works, which is naturally not averse to the enlargement of its own taxing powers, decline opposition to the bill upon the ground that the rate of 3d. in the pound will be found practically unnecessary. It would certainly be unnecessary if the dwellings were to be erected by private persons or companies trading in the ordinary manner. But does the experience of public management of such undertakings justify the expectation of economy, or that having the power to levy a rate they will debar themselves from the exercise of that power? The argument, besides, is most perfectly suicidal. If no rate be likely to be wanted, why take power to make one? Will the friends of the bill show their sincerity by consenting to the passage of the bill minus this rate-making clause?

THE CAB QUESTION.

The cab question has now become one of the great social questions of the day, and there seems reason to hope that it is about to receive a satisfactory settlement. It has long been felt that the whole system of our cab arrangements is about as bad as it could be. Everybody grumbles. The public complain loudly, the cabmen have their grievances, and we dare say, could it be known, that the cab horses are not at all satisfied with the present state of things. It would appear from recent proceedings that even the cabowners are discontented. There is, in fact, a general demand for cab and cab law reform. We are not of those who believe that honesty is a virtue impossible with a cabman. Cabmen may or may not be necessary evils; we believe, however, that as a class they are not worse, to say the least, than might be expected. A great deal might be said in palliation of cabby's shortcomings if we consider the terms and conditions on which he himself hires his cab—and which we believe are excessive and exacting to a degree—the great hardships which, from the very nature of his occupation, he has to endure, and the very great difficulty there is in ascertaining the exact fare, rendering dispute almost certain. At the same time there can be no question at all that the public have only too good reason for complaint in the matter of cab service. In many cases the character of the driver is by no means what it ought to be, nor, as a rule, is the quality of the vehicle, as well as the horse, up to the mark. Especially is this true as regards four wheelers. It is said that if the law as to cab fares were revised and more clearly defined, the public would soon find out the benefit, as a superior vehicle and a better class of driver would be introduced. And this we take it is really the point that, more than any other, we have to consider in dealing with this question, to wit, the almost impossibility of knowing what is the "right fare." Among the suggestions which have been recently thrown out with a view to meet this point, as well as to improve our cab arrangements generally, that of Mr. J. L. Haddan, C.E., of the Hackney Carriage Department, Metropolitan Police, deserves attention. That gentleman proposes to regulate the cabs of the metropolis by what is called the "course" system. Mr. Haddan's plan, which has just been published, is briefly this:—He would divide London into a certain number of regular or irregular figures (37, as shown in his diagram), distinguishable by a different letter or figure, each of which may be considered a "course." The initial letter or figure of a district, made of coloured glass, would be affixed to all the lamp posts in that district. Then, as to fares, a table stating the fare from any one district to another would be attached to the cab in the usual way, and all that a person would have to do when hiring a cab would be to look at the nearest lamp for the initial letter (say O), and repeat the operation when discharging the vehicle (say at K); then refer to the table for the fare from K to O. One great advantage of this plan is that it would prevent all chance of the driver going a roundabout way, his interest being to drive as directly as possible. Another is that it shows the exact legal fare from any one place to another. Mr. Haddan states that he has found radial divisions to be of the best form, as by reducing their size gradually from the centre to the circumference of the four mile radius, a progressively higher rate can be arrived at, thereby inducing all drivers equally to ply for hire in the suburbs as in the more crowded parts of the metropolis. For instance, the first circle, A up to H, is taken as the standard fare; the next circle, K up to Z, being increased 25 per cent.; and the outer circle having a still further augmentation of 25 per cent. As regards the fares, however, Mr. Haddan proposes that a commission should determine them. His own opinion is that the present rates are too low, and that they ought to be raised. Mr. Haddan's plan, which we observe has met with the approval of the cabowners of Westminster, is by far the best we have seen suggested. It has the merit of extreme simplicity, and we believe it would completely answer the purpose. Nor would the expense necessary to the carrying of it out be excessive. We trust that Mr. Haddan may succeed in his endeavour to obtain a commission to examine his plan. Now that something like combined action has taken place on this question, it ought not to be allowed to drop without something being done to remedy the grievances under which the public interest so greatly suffers.

THE THEATRES AND MUSIC HALLS.

We wonder what the particular secret is which keeps the theatre and the music hall so unarchitectural in their construction and so unartistic in their decoration. How is it architects of the weakest capacity and the shallowest of "artists" are generally found linked together as the advisers of that strange world behind the footlights? In a word, how is it our amusements are so low, so degraded, so vapid in themselves, in their appointments, and in all that relates to them? These questions occurred to us more strongly than ever after a visit to our last new theatre—"The Holborn." Not that the Holborn is much worse than Astley's, or others we could name, but then it is the last, and, so to speak, bran new, and people have a weakness for always comforting themselves with the reflection that when things are at their worst they are sure to mend. This is why the Holborn is so very disappointing. We had thought when Mr. Dion Boucicault changed the circle of Astley's into an "auditorium," and made the stalls about as cold and uncomfortable as stalls could possibly be, that things had then come to their worst, but it seems that we were mistaken. Possibly in things theatrical there is no limit to the bad, and that the atmosphere of the stage is peculiarly adapted to downward growth. Whether it be so or not, no reasonable unprejudiced being can visit any of our theatres or music halls, with the exception perhaps of the three great theatres, without being painfully aware, not merely of their having been built and "decorated" by people who were totally incompetent for their work, but of the majority of them having been re-"decorated" and made many degrees worse than they were before by people still more incompetent than those who built them. One of the most important buildings of this class is Mr. T. Hayter Lewis's work in Leicester-square. Architecturally it is the most original thing of the sort we possess, but if any of our readers remember the old decorations, and are physically strong enough to look at the present daubings of paint we are satisfied that they will readily endorse our remarks as applied to this popular place of amusement. The Canterbury Hall has just undergone the re-"decorating" process, and we need scarcely say that everything is worse than it used to be. The interior of the Oxford is perhaps on the whole the best of the music halls. It always looks clean and cheerful without being violently gay, and if its entertainments were only up to its architectural mark it would be a very serious rival to the Alhambra. A very cheerful hall, though somewhat out of the way, is the Metropolitan, which deserves praise not only for its plan and decoration, but for the decent way in which everything is managed, and the varied and amusing nature of its entertainments. We have no wish to criticise in detail any of these entertainments, but we cannot help thinking that Mr. and Mrs. Randall would confer a lasting blessing on a vast portion of society if they would transfer their talents to the boards of Australia or America.

EGYPTIAN ARCHITECTURE.

A paper on this subject was read before the Architectural Association by Mr. R. Phené Spiers on Friday evening last, Mr. Tarver, vice-president of the Association, in the chair. The lecturer introduced his subject by remarking that he had to draw attention to a series of monuments the latest and most modern of which barely reached down to the beginning of our era, while the earliest surmounted in date to nearly three thousand years before it; and, what was still more singular, the older the monument the more wonderful the execution and the higher the art that seemed to have been bestowed upon it. Before proceeding to describe the Egyptian monuments themselves, Mr. Spiers gave a brief description of the climate and country in which they are found, and a slight sketch of the history and religion of the wonderful people by whom they were executed. The monuments were divided into two classes, the first comprising the tombs, the second, the temples, palaces, &c. The lecturer said he placed the tombs first, because he wished, as far as possible, to follow a chronological order; and as the tombs near Cairo were the most ancient remains of Egyptian art, he would begin with them. The tombs, observed Mr. Spiers, may be divided into two classes, those erected or built up, and those (which constitute by far the larger portion) excavated in the rock. Of the first class the Pyramids are the only examples; they are all situate in Lower Egypt. Dr. Lepsius, the Prussian traveller, has discovered and examined some sixty-seven of them. The construction of all these pyramids commenced in the centre and gradually developed itself, each successive layer of stone increasing in lateral dimension and height the pyramid, each king commencing his tomb on his accession to the throne, and according to the length of his reign so did the size of the pyramid correspond. The largest and best known of the pyramids are those of Gizeh, some seven miles from Cairo, and situated on a rocky platform beyond the cultivated plain which stretches itself on the west bank of the Nile. With the pyramids of Sakkara, Dashoor, and Abouseer, they form portions of the great Necropolis of Memphis. The first and greatest pyramid was built by Cheops, a king of the fourth dynasty, in material brought from the quarries of Tourah, on the opposite bank of the Nile. The stone was conveyed to the spot along a magnificent causeway 60ft. wide, constructed in stone, with the sides polished and sculptured. 366,000 men were employed in building the causeway and the pyramid, ten years being employed in the former and twenty years in the latter. The exterior was coated over with a casing of polished stone, the whole of which is now missing, having been used, as well as a considerable portion of the pyramid itself, by the Caliphs in the construction of the various cities, particularly Cairo, north of it. The original height was 480ft., the length of one of its sides 764ft.; as it now stands it is only 454ft. high, and consists of 203 steps or

courses of stone varying in height from 4ft. 10in. to 26ft., making it a most fatiguing though not difficult ascent. The interior passages, 5ft. square in section, are lined with polished granite blocks, the setting together of which is so accurate that the joints can scarcely be distinguished. The grand gallery of this pyramid is simply a lofty passage with a peculiarly constructed roof, each course of stone overhanging the one below it, so that the light and top course covers over the top with a very small bearing. The King's Chamber is 34ft. long, 77ft. broad, and 19ft. high, with a flat roof formed of blocks of granite resting on the side walls, the weight being taken off the centre by five successive chambers one above the other. The second pyramid in size (though probably the first erected) is due to Cephren, the brother of Cheops; the material and construction are similar, and it still retains at its summit a portion of the external casing. The third, which is considerably smaller than the other two, was coated over with granite brought from Assouan, 500 miles up the Nile. Of the other pyramids, the only remarkable one is that of Dashoor; it was built in brick, and as traces of a chamber have been found in it, and that chamber was covered over with the same material, it could only have been done with a vault; so that possibly that constructional feature may date from 2600 years before Christ. The plans of the second class of tombs include all those excavations in the rocks and hills at the foot of which the Nile flows; they are found everywhere along its border, and form burial-places not only for human beings, but for every description of animal. In plan they consist simply of small cells opening from one into the other, with entrance passage and doorway; the walls are sculptured in that beautiful kind of low relief which flourished in the early period of Egyptian art, representative of plans of gardens, houses, country villas, farms, &c., and all the pursuits of the ancient Egyptians. Sometimes the façades of temples are represented. The mummies were deposited in pits under the floor of the tomb. One of the most remarkable discoveries made in late times was that of Colonel Marriette Bey, who, in 1851, lighted upon the burial-place of the sacred bulls Apis. A long avenue of Sphinxes, a hemicycle of Greek statues with various temples and chapels on either side, all buried 60ft. deep in the sand, led to the entry of the vast tomb containing the sarcophagi of the various sacred bulls which had been buried there from the time of Rameses, 1300 years before Christ. The tomb or temple found near the Sphinx lately, also by M. Marriette Bey, has its walls cased with polished granite of the most exquisite workmanship, and were it not for the difference in colour of the blocks the joints would be imperceptible. Ascending the Nile, the next tombs in succession, and also in date, are those of Beni Hassan; these are remarkable for the existence of what would seem to be an original form of the Doric column, a sixteen-sided fluted column with abacus. There is a portico with two columns in front, covered with a segmental arched vault cut in the rock, and outside, above the architrave over the columns, are cut in the overhanging rock above representations of wooden rafters. Inside the interior is divided into nave and side aisles, as it were, with two columns, each side supporting architraves, and three segmental arched vaults. The vaults are useless, but their form and the existence of an architrave evidently show they were copied from existing vaulted buildings. I would draw attention to the curious form of the roofs of these tombs, representing a pent roof, and also to the extremely small diameter of the columns, which are quite insufficient (if there were need of them) to support the weight of such a roof—an additional proof that the features of these tombs were copied from examples of buildings constructed, and not *vice versa*, as has been so often maintained. Mr. Spiers proceeded to describe the well-known tombs of the kings and queens at Thebes; and then passed on to the Egyptian temple, the external and internal features of which, so far as these are known to us, were minutely described. Under this head of his subject the lecturer drew the following sketch of the Hall of Columns, the grandest feature, he remarked, in an Egyptian edifice:—"It would be impossible for me, with drawings of columns a few inches in height, to convey to your minds the impression which features one hundred times as large have upon the beholder, still less to instil into you that feeling of awe and astonishment which all must feel in threading those endless avenues of columns. I say avenues of columns advisedly, for the so-called hall does not impress you as such; by a hall we mean a large open space covered over and uninterrupted by supports, or with columns so slender that they do not intrude themselves; but the columns at Karnac are so enormous, and their intercolumniation comparatively so small, that we can never see diagonally in any direction. Only in the direction of the axes of the avenues does one obtain any idea of the immense size. The Hall of Columns of a Theban temple consists of a nave and side aisles, with clerestory windows, and on the right and left of the side aisles a series of additional aisles, lighted probably by small apertures on the roof. The central columns of the nave are higher than the rest, and have bell-shaped capitals; the columns of the side aisles are smaller, with bud-shaped capitals, with architrave and cornice above, supporting a series of piers, between which is a kind of stone lattice work to admit the light. The columns, cornice, and clerestory equal in height the central column, its abacus and architrave. On these rest the huge stones forming the roof. These stones at Karnac must have measured 45ft. in length, and they were elevated at a height of 70ft. in the air. The rest of the hall on the various side aisles was formed of similar columns to those of the principal side aisles, and of similar height. Speaking in detail of the columns and capitals of the temple, Mr. Spiers said:—The earliest form of support would be a simple square pier with or without abacus or cornice. And we find it in the tomb discovered by M. Marriette near the Sphinx, in front of the Temple of Abydos, at Dahr, El Bayree, Amada, and other places. The polygonal column of the tomb of Beni Hassan, 2020 B.C., is the earliest example of column we find. Other examples of this column of later date exist at Karnac, at Dahr, El Bayree, and in the small Temple of Bayt El Wellee, in Nubia. These columns have sixteen sides; fourteen of them fluted and two flat, with hieroglyphical inscriptions. At Beni Hassan it exists in its greatest purity; it is five diameters in height, slightly diminishing in diameter towards the top, which is covered with a small abacus, but has no entasis.

It has been called the prototype of the Greek Doric order; but I much doubt the probability of its having been copied by the Greeks, because the earliest Greek Doric columns were very clumsy in shape, of three or four diameters in height only, with a considerable diminution in diameter, a marked entasis, a wide projecting abacus, with echinus moulding beneath, and it is not till one arrives at the date of the Parthenon that one finds a column of similar proportion to the Egyptian example. It is true that at Bayt El Wellee is a polygonal column three diameters only in height, but there is scarcely any diminution of diameter towards the top. Beside the polygonal column, we have two others which seem to have served all the purposes of Egyptian architects till the rule of the Ptolemies; the difference is only in their capitals. The one has a bell-shaped capital, like the full-blown flower of the papyrus; the other, a capital shaped like the bud. The bell shaped capital was decorated with flowers and buds of the lotus and papyrus painted or slightly incised upon them. They occupy invariably positions on either side of the central avenue of the temple in preference to the bud-shaped capital, possibly because the light admitted through the clerestory windows at the side lit up the under surface, rendering visible its decoration. For a similar reason the bud-shaped capital was used where the light shone down on them from above. These last named capitals, with their columns, present more varieties of form than the other; they would seem also to be of earlier origin. The first examples we find of them are in the southern caves of Beni Hassan, where they are found in close proximity with the polygonal column, both being of the same date, viz. 2020 B.C. They consist of four papyrus stems, with their buds bound together by cords, probably made of the papyrus leaf. Later varieties have eight stems bound together, and the lower portions of the columns curve in, and conventional leaves (similar to those round the bottom of the papyrus plant in nature) sheath round them. In after times the column became circular in section from top to bottom, and its primitive form was represented only in painting. The lecturer next glanced at the domestic architecture of Egypt, remarking that it is only from the illustrative drawings on the walls of the tombs that we can form any idea of what the private houses of the Egyptians were like. Whilst the temples and palaces were built in stone, and therefore have, in a great measure, escaped the destructive effects of time, the residences of the people were built in crude brick, and were probably very similar in general appearance to the huts of the fellahs of the present day. The wealthy had dwellings in accordance with their rank and means. Some of the better class of houses had three or even four floors, though the greater portion seem to have been confined to a first floor. The materials used by the Egyptians in their buildings were chiefly sandstone and limestone, the latter, however, rarely in Egypt and never in Nubia. All the monuments north of Assouan, excepting the pyramids, were built in the sandstone obtained from the quarries of Silsilis; and had all the Egyptian temples still remaining entirely perished, these quarries would testify to the stupendous consumption of the stone in them. In Nubia the sandstone used came from various quarries along the banks of the Nile, but the material is much inferior to the Silsilis variety. Streaks of red, due to the presence of iron, as seen in the temples of Abousimbel, Gircheh, and Derrdewa, abound in it. Alabaster was used sometimes for the inlaying of sanctuaries, as in the Temple of Osiris at Abydos, and in the Tomb of the Sphinx at Gizeh. Our marble inlays in Europe are about ½in. to 1in. in thickness; an Egyptian inlay was 3ft. thick. For obelisks, red granite, called Syenite, was used; for colossal figures and sarcophagi, black or grey granite and basalt. The Colossi of Thebes are in gritstone. After giving a graphic and interesting review of the state of art in sculpture and painting amongst the ancient Egyptians, Mr. Spiers concluded as follows:—You will have noticed that of the three arts, painting, sculpture, and architecture, the latter occupies the most important place in Egyptian civilisation—more so than in that of any other country. In regarding the monuments still remaining one seems to have been in an entirely different world, where art has developed itself with the genius of the nation to which it belonged, neither borrowing nor receiving from any other country. The general appearance of the construction is massive, and comparatively of small elevation, and the inclination or rake of the outer walls adds greatly to its solidity. Everything is calculated to work on the imagination and strike the beholder with a profound religious impression. All is severe and simple. Never do the architectural lines twist or bend about; and never does the decoration detract from the effect of the whole. The appreciation of the beautiful was, to a certain extent, not inherent in the Egyptian race. Their æsthetics seemed concentrated entirely in the grand and gigantesque. The drawing and sculpture never freed itself from the conventional rules imposed upon it; and as we find it in the tombs of Memphis, 2700 B.C., so it appears in the temples built under the Roman rule, varying only in detail and execution, the original conception remaining the same throughout. And yet, with all this, the general effect of Egyptian monuments is imposing to the last degree, the mysterious painting and figures with which they are embellished tending to increase the lasting impression which the traveller receives who visits these stupendous remains of a most remarkable people.

The lecture was illustrated by a large number of drawings taken by Mr. Spiers during his recent visit to the East, and which were lately noticed in these columns.

SHOP FRONTS.*

Mr. Blashill stated that he did not intend to present anything on the subject of shop fronts of a complete or exhaustive character, but merely some rough ideas which might be found useful. Early examples of shops were simply open booths, with a hinged shutter, which could be put up or down at night. The same style of shops might be seen in the present day at continental fairs. Rows of booths were formed, the shutters of which acted as a covering over each row, under which people walked as in an arcade; the shops were open in front, and the articles displayed in the unglazed windows. The shopkeeper wanted as large a space as possible open to the street for the display of his goods; his business was retail; perhaps he depended on chance customers; it was, therefore, essential that he should have this large space. This being the case, the fact that the lower portion of a building

* Paper read before the Architectural Association. By Thomas Blashill, A.R.I.B.A.

was to have an open front ought to govern the design of the entire building. It was of no use to talk about "a yawning cavity under a heavy superstructure," or to say that an open shop front was not in accordance with the rules of architecture. A wide front was a practical necessity, and must be had; therefore it remained for the architect to provide it without breach of architectural propriety. Formerly, an architect was limited in his design for a shop front by the capabilities of crown glass; in modern times, however, the introduction of plate glass had removed any such limitation, and sheets of glass could now be had of almost any size.

Much had been said about the old mullions in contrast with the sash-bar of modern times; there was, however, no kind of comparison between them. In olden times people had mullions to divide and support the spaces, which were glazed with lead lights. As the size of squares increased, the sash-bar superseded the lead lines; the sash-bar was thus the descendant of the lead line, and not of the mullion. We had now returned to the old open front, the only difference being that it was now glazed, when formerly it was unglazed; the whole sash, with its fittings, was sometimes omitted from the design of a building, being left to the tenant to fill in at his pleasure.

Each building should support itself. It should stand clear, so that if the next house were pulled down, it should not be in any measure weakened, or in danger of falling. Several architects had tried the experiment of constructing shop fronts with an arch carried up to the first floor; he thought these attempts were wrong, whether Gothic or Classic. The proper way of carrying up the building was to use the breastsummer; it might sometimes be badly done, but that was not the fault of the breastsummer; if it were of proper dimensions, whether of iron or wood, we might feel as much confidence in the strength and stability of the structure as in the arch. When the arch was used, it was necessary to carry it up to the first floor; the effect was always bad, and the abutment usually doubtful. With the view of carrying the front, the breastsummer was sometimes seen only supported by the party walls, and this in cases where the glass had to be in five or six divisions; they disturbed the aspect of the shop front as much as a pillar would do. In such a case, the best thing to do was to put a good column as an additional support. If the space between the actual supports were too large for a single sheet of glass, it would be better to have a horizontal division of the glass at a proper height rather than a perpendicular division.

Another bad plan was to have arches upon the sash-bars that cut up the glass and pretended to carry the front, which, however, they did not. It was better to have fewer sash-bars, and one or more conspicuous columns which would give some real support to the building.

The upper openings of a front were sometimes arranged on what had been called the pyramidical principle; that is to say, the windows became smaller in size and number, and approached more towards the centre, on each successive story, while the brickwork became heavier and heavier towards the top of the edifice. It was better to keep the windows more equal in size and number on each floor, and to obtain as regular a distribution as possible over the breastsummer.

Supposing that the door of the shop was to be placed at the side, the best way of having the glass placed in the window was in one sheet; if the space were large, it was better to have the glass in three pieces than in two. Tradesmen wished to show certain articles in the centre, and it disturbed the appearance of the window when "dressed" if the glass were divided in the centre.

In small shops, where it became necessary to have a separate passage up to the first floor, the best way of placing the door of the shop was to have it in the passage; this made all the rest of the space available for the window, which was, of course, the more important. In shops where the space was limited, it was a good plan to have the door placed considerably back from the street, so as to make a slanting window; this very considerably enlarged the space for the display of goods. In cases where it was necessary to have three or four sheets of glass, the front was quite large enough for the introduction of a substantial column, as the space was so great that additional support would be requisite. He presumed no one would think of having an iron pillar inside the window, either covered with paper to look like marble, or else surrounded with looking glass to conceal its presence. There were several trades in which the fronts were entirely open, such as furniture dealers, fruiterers, fishmongers, and butchers. In the case of such trades, of course, the question of how the glass was to be managed did not require any consideration at all. In deciding upon the section of a shop front, not only the ground floor, but also the basement required to be considered. Now that the system of deep drainage had been introduced, the value of the basement had increased considerably; it was very nearly as dry as any other floor in the house, and it was perhaps better to go down one flight of steps than to go up two or three. The basement could be best lighted by having the stall-board moulding of the ground-floor window at as high a level from the ground as possible; if it were a short distance from the ground little, if any, light could penetrate into the basement. Many tradesmen desired to have the stall-board placed as low as possible. The height at which the stall-board should be placed has to be considered with reference to the height at which people can see the articles in the windows. The ordinary height for a stall-board was 2ft. to 3ft. from the ground; and 2ft. was a good height, 2ft. 6in. was better, looking chiefly to the value of the basement. The orbit of vision in which people could see small things distinctly was a limited one. In well-arranged windows articles were placed in shelves which became narrower and narrower as they rose from the stall-board, while from the ceiling of the window articles were hung by hooks, the whole presenting itself to the eye as a semicircle, each article being equally distant from the eye. It was impossible to examine anything at a low level, so that it was useless to have the show-board placed so low that a person required to stoop in order to examine any article placed on it. It was very objectionable to have a step at the door of a shop. People who were indifferent would not enter a shop if they had to go up a step; the best thing was to have an inclined plane.

For the more thorough lighting of the basement, the pavement in front of the shop should have a grating glazed with thick glass. The next question was to decide upon the proper plane for the glass. The front was often brought out from the building; this was a mistake, especially in our narrow footways. The better way was to have the glass in a sort of recess. This was sometimes done in narrow streets with very good effect in appearance, besides being a great convenience to the public. If the pavement were broad, this was not necessary; but in a wide front the best plan was to have the columns in front and the glass immediately behind. This gave people room to stand and look, without being jostled by passers by. The effect of this arrangement of the glass from a distance was that the supports stood well out from the front.

Since the introduction of large squares of glass, a remarkable effect was to be noticed. In some shops, everything in the window was to be seen at a glance in passing by, in others the goods were seen only with difficulty. This was in consequence of the reflection of the figure of the observer and of the street traffic upon the glass, which, in shops where the goods were not properly arranged, prevented the passers by from seeing the display. The usual distance at which articles were arranged in the window was a couple of feet from the glass, and the usual distance at which those people nearest the window walked past it was also about a couple of feet; thus the reflection of the passenger's figure was just where the goods were arranged. It was bad to have the reflection before the goods, but it was still worse to have it exactly where they were.

The best way of arranging the fittings also required consideration. The general plan was to put wooden shelves into the window upon a wooden floor. This was objectionable, as it served to darken the window; the shelves might be made of glass, supported upon brass uprights. If the basement also required additional light, the show-board should be made of thick ground glass. Sometimes looking-glass was fixed on the show-board; this multiplied the reflection of the articles, and served to increase the glitter which some tradesmen desired to have in their windows. Another manner of exhibiting goods was to place the articles close to the window. With such arrangement it was necessary to light with gas from the outside when dark. The question of lighting the window with gas was very important; it was certainly the most natural method to light from the outside, but it depended upon the trade. If goods were arranged at a long distance from the window pane, then interior lights were necessary. If they required glitter, a naked light was the better; in other cases it was better to have obscured shades, with argand burners, and the ceiling of the window of a dead white. With regard to the use of silvered glass in the windows, it was often employed with great disadvantage. It should be a cardinal rule that silvered glass should never be used where it could reflect anything which was passing in the street; it should be placed so that it should reflect nothing that was not in the window.

It was of course desirable that there should be as much glass in the door as possible. But in placing the handle of the door a difficulty occurred. Either it had to be put on the low woodwork, in which case people had to stoop in order to open the door, or else the handle was placed on the narrow side frame, when people usually hurt their fingers. The best way to obviate this difficulty was to use the lever door handles.

The best way of fixing the shutters, which are now usually made to revolve, was to place them at the top and let them be unrolled downwards. The sun-blind was commonly disposed of by fixing it in a box outside. Some shops had holland blinds fixed upon hooks, which were removed and carried into the shop, where they could be dried if wet; these were perhaps more troublesome in fixing, but lasted longer and were less exposed to the influence of the weather than the regular sun-blind. In France, the sun-blinds were wound up and down very simply by a toothed wheel and rod fixed at the side of the window. It was becoming a practice to dispense with shutters altogether and to adopt iron railings; indeed, under ordinary circumstances, there was no need of shutters. The only danger which might arise, except in the case of goods of value, in which case shutters could be of use, was in the event of a mob suddenly congregating at one place. The iron railing was common in America, and would become more common in England. If the shutters were not closed, the police could see if anyone were in the shop at night, and in the event of fire the danger would be much more quickly detected.

The inscriptions generally necessary were the number of the street, the name of the firm, and the occupation. Some people disregarded the rule that the number should be on the shop front. It should be as conspicuous as possible, for the public convenience, and nothing should be written up that could not be easily read. Mr. Blashill said he had simply promised to give a few notes, but he trusted that he had given hints which would be found useful by the younger members of the profession.

THE SEWAGE QUESTION.

An adjourned meeting of the Cheltenham Commissioners was held on Monday, Mr. Collings Robinson in the chair. The Sewage Committee recommended the purchase of 120 acres of land, at Boddington, for irrigation of the town sewage. Mr. Fallon, in moving the adoption of the minutes, said that it was the most important subject that had ever been before the Board. They knew that they were bound to discontinue the pollution of the Chelt, and that the law was only restrained in order to give them time to avert the nuisance. The Board had affirmed that the principle of irrigation was the best plan, therefore it was unnecessary for them to dwell upon that; the committee had recommended them to obtain land, leaving the Board to decide whether they would lease or purchase. An admirable piece of land was offered them by Mr. Arkle, of Haydon, who would lease it to them at £4 per acre per annum, or sell at £10,000. The Committee strongly recommended the Board to purchase, and proposed that £17,000 should be borrowed, £10,000 for the purchase of the land, and the remaining sum for the execution of the works, including a sewer about two miles in length to carry the overflow water from the Hallesley tank to the Chelt tank, which sewer would be capable of discharging 5,000,000 gallons per day. The interest on the borrowed money, the principal being paid off in thirty years, would be 6½ per cent.; the estimated yearly expenditure £1,570, including £1,105 required for the liquidation of the debt; and the receipts for the first year were put down at £963, so £609 had to be provided for, and a rate of ¾d. in the pound upon £195,000, the rateable value of property in Cheltenham, produced exactly that amount.

was stated that landowners representing 400 acres had signed an agreement to take the sewage upon their land, paying 10s. per acre, and it was only intended to irrigate the land proposed to be purchased when the sewage could not be applied to the adjoining land. A lengthy discussion took place upon the details of the scheme, but ultimately the minutes and recommendations were passed, twelve voting for and six against.

ARCHITECTURAL SOCIETIES.

Edinburgh Architectural Society. — The usual fortnightly meeting of the Edinburgh Architectural Association was held on Friday night, in the rooms, George-street, Mr. William Beattie, president, in the chair. The preliminary business having been disposed of, a discussion took place, the subject being "Are the opinions advanced by Mr. Ruskin in his lectures in Edinburgh right or wrong?" The question was opened by Mr. Nicol on the affirmative side. His remarks were chiefly occupied with a *resume* of the various points touched upon in the lectures, and he concluded by maintaining that the views advocated by Mr. Ruskin would, if acted upon, greatly improve the domestic architecture of the Scottish capital. Mr. Dewar, in reply, contended that the premises on which Mr. Ruskin's conclusions were founded were false, and, consequently, his whole theory was erroneous. Remarks followed by various members, and the general opinion seemed to be in favour of Mr. Ruskin's views in a somewhat modified form.

Liverpool Architectural Society. — The fortnightly meeting of the Liverpool Architectural and Archæological Society was held last Wednesday evening, at the Royal Institution, Colquitt-street, Mr. W. H. Picton, vice-president, in the chair. A letter was read from the secretary to the Master Builders' Association, stating that the committee of that association had carefully considered the sundry clauses of Mr. Plevins' form of contract, and whilst they were anxious to bear testimony to the general fairness with which the document had been drawn up, they ventured to propose certain modifications which in their opinion would be requisite to made it entirely acceptable to the members of the association. In order to bring their views clearly before the society, the committee had had the form of contract re-written, with the proposed modifications inserted, and they recommended it to the consideration of the society, in the hope that it would be approved and adopted. They proposed that a committee should be appointed consisting of two or more members of the association and a similar number of members of the society, for the purpose of mutual discussion, with a view to an amicable settlement of the contract question. On the motion of Mr. Boult, seconded by Mr. Chantrell, the communication was referred to the council for consideration and report. In the absence of the president, the secretary expressed the views of the council with regard to the several designs for an early English window sent in by the student members, and announced their decision as to the relative merit of the designs—a decision which, he said, they had great difficulty in coming to in consequence of the very equal merit of several of them. The three marks for design had been awarded to that on which a red dot in a circle was inscribed, and one mark for drawing had been given to the design inscribed with a plain circle. In reply to a question, Mr. Boult stated that Mr. Wyatt had recommended the directors of the Exchange-buildings Company, and it had been determined to introduce into the north front of the new buildings, looking towards Oldhall-street, the four statues emblematic of the elements, which at present stand on the south side of the north wing overlooking the flags, together with the four columns underneath, and the entablature and cornice. Mr. Boult brought under the notice of the members a number of photographs published by the Architectural Photograph Association, London.—A model was exhibited of an improved school desk and bench, patented by Mr. T. R. Jones, Derby-road, Bootle. The top of the desk can be made available, not only for the ordinary school purpose, but as a table on the occasion of tea meerings, and being let down after tea forms a comfortable sloping back-board to the bench.—The chair having been taken by Mr. Bradley, Mr. W. H. Picton read the paper for the evening, "Concerning Doorways." The paper was profusely illustrated by drawings, photographs, and engravings.

SCHOOLS OF ART.

The Hanley School of Art. — The works of the students of the Hanley School of Art, which are to be sent to London for national competition, were exhibited at the school on Tuesday, and inspected by a good number of persons. The collection of finished productions is scarcely so large as in some previous years, but in quality is decidedly superior, and includes several well executed water-colour paintings of still life, and a number of good crayon drawings. Elementary drawings are unusually numerous (more than 200), and are all more or less creditable productions. The school seems likely to fully maintain its high position among schools of art in the approaching national competition.

West London School of Art.—On Wednesday evening the fourth annual distribution of prizes to the students of this school took place at the school, 204, Great Portland-street. The chair was taken by A. J. B. Beresford Hope Esq., M.P., the President, supported by Mr. Peter Graham, treasurer, Mr. George Godwin, Mr. W. Graham, Mr. Macdonald Clarke, head master, and other friends of the school. The room was crowded with the pupils and their friends. The President congratulated the students on the success which had attended the school since its first formation in humble and obscure premises in Wells-street, and said that though there had been a change in the minutes of council, by which less State aid was now granted than formerly, still the West London School of Art had successfully weathered all difficulties, and in most respects was now second to none in the kingdom. Much of its progress was due to his friend Mr. Peter Graham, and to the committee, but the great cause of the efficiency of the school was undoubtedly the energy and ability displayed by the head master, Mr. Macdonald Clarke. Of course, South Kensington stands first; and it would be strange if it did not, enjoying its peculiar advantages and unlimited resources. Leaving, therefore, South Kensington aside, he found that only two Schools of Art, Edinburgh and Glasgow, had gained a greater number of prizes at the inspection at South Kensington, and only six had sent a greater number to be examined. Only two schools had succeeded in having a greater number passed than the West London School in the time-drawing examinations. More than two-thirds of those sent from their school to the time examination had passed, whereas the average of the examinations in the whole of the schools was that only one-half had so passed. The number who passed through the school during the past year was 492. Mr. Beresford Hope concluded his address by an exhortation to the students to use their talents for the benefit of their country. The distribution of prizes then took place, after which Mr. Godwin addressed the students, proposing a vote of thanks to the President, which was seconded by Mr. Peter Graham, and carried with hearty acclamation.

PARLIAMENTARY NOTES.

Mr. H. B. Sheridan's annual motion for the reduction of the duty on fire insurances has shared its usual fate. On Tuesday evening, after a short and animated discussion, the motion was defeated by a majority of 59—156 members having voted for, and 215 against it. Both Mr. Gladstone and the Chancellor of the Exchequer spoke against the measure. The same evening Lord John Manners introduced a bill to make further provision for the enlargement of the National Gallery. He remarked that under the arrangement sanctioned by Parliament last year, the right hon. gentleman the member for Hertford (Mr. Cowper) hoped he should be able to purchase by private contract the property to which this measure referred, viz., Archbishop Tenison's school and the parochial schools of St. Martin. Difficulties, however, had arisen, and it was necessary to pass the Bill which he now moved for leave to introduce.

The Metropolitan Poor Bill was read a second time in the House of Lords on Tuesday.

At the weekly meeting of the Royal Geographical Society, to be held on Monday, March 25, Sir Roderick I. Murchison, Bart., in the chair, despatches will be read from Dr. G. E. Seward and Dr. J. Kirk, on the last journey of Dr. Livingstone.

Building Intelligence.

CHURCHES AND CHAPELS.

Building, Enlargement, and Repairing of Churches and Chapels.—The Incorporated Society for Promoting the Enlargement, Building and Repairing of Churches and Chapels, held its monthly meeting on Tuesday at the society's house, No. 7, Whitehall, S.W., the Right Hon. the Earl of Romney in the chair. Grants of money amounting to £830., were made in aid of the following objects:—Building new churches at Blackheath, in the parishes of Hales Owen and Rowley Regis, near Birmingham; Cassop cum Quarrington and Coxhoe, in the parish of Kelloe, near Ferry-hill, Durham; Kempston, near Bedford and Street, in the parish of Petersfield, Hants. Rebuilding the church at Whitchurch, Hants. Enlarging and restoring the churches at Gateshead (St. Edmunds), Headless-cross, near Redditch, Luton, Christ Church; and Willesborough, near Ashford, Kent. Re-arranging the seats and restoring the churches at Cardington, near Church Stretton, Salop; Chatham, St. John; Llanelli near Abergavenny; Norton Canon, near Weobley Hereford; Standish, near Stonehouse, Gloucester and Upton, near Southwell, Notts. The grant formerly made towards rebuilding the church at East Acklam, near York, and restoring, &c., the churches at Holsworthy, Devon, and Long Whatton, near Loughborough, were each increased. A grant was also made from the mission and school church fund towards building a mission church in the new district of St. John, Kennington. The society likewise accepted the trust of a sum of money as a repair fund for the new church at Skirwith, Cumberland. The society's year, as far as regards the making of grants, ends with the meeting, and during the past twelve months it has voted £7,560, the increased church accommodation gained being 27,597 sittings, of which 26,4[illegible] are free and unappropriated; grants to the amount of £9,225 have been paid for works completed. The income during the same time falls far short of that received in former years, and it is hoped the new year will prove more advantageous to the society, and warrant an enlargement of its most beneficial and greatly needed operations.

Kettering. — The new Wesleyan Chapel situated in Silver-street, is now nearly completed. It is in the Italian style, and is built of red bricks, the front and sides being faced with Bath stone, carved. The chapel will seat about 700 persons, and the entire cost is £3,000. Mr. John Tordoff, who has given £1,000 towards the building fund, has announced his intention of presenting an organ to the chapel. Mr. George Woolhouse, of Bolton-le-Moors, is the architect and Mr. John Watkin, Northampton, the builder.

Preston.—Last week the United Methodist Chapel, which has been closed six months for the purpose of being enlarged, was reopened. The roof of the old portion of the building was taken off and raised 3ft. The cost for the various improvements has been about £680, and the chapel will now accommodate about 650 persons. The whole of the improvements have been carried out under the superintendence of Mr. S. Openshaw.

BUILDINGS.

Gasworks to cost £1,500 are about to be erected at Lydd, Kent.

On Monday last the foundation stone of a new Primitive Methodist Chapel was laid at South Stoke-ton. It will be a small brick building in the Gothic style, will accommodate nearly 400 persons, and cost about £700.

Bradford.—On Wednesday week the new Exchange at Bradford, the foundation stone of which was laid by Lord Palmerston in 1864, was formally opened. The building is in the Gothic style. The principal entrance, at the east end, is surmounted by a clock tower and spire to a height of 150ft. On each side of the arched entrance are figures or statues; one is a sculptural presentment of Bishop Blaize, the patron saint of the woolcombers, and the other is that of King Edward III., who gave a trading charter to Bradford. The great hall is reached by a short flight of steps from the porch. It is 80ft. long and 5[illegible] wide, and on the north side is a large semi circular projection or apse. The roof is divided into three divisions, those at the sides being 10ft. in width and forming, as it were, an ambulatory round the room; the centre compartment is supported by

eighteen large polished shafts of red granite, 2ft. in diameter, with carved capitals. From these columns arches spring, which are filled with opaque glass. The roof is entirely open, and the spars and timbers are exposed. The news room is 68ft. by 28ft., and is furnished throughout with oak reading stands and chairs of mediæval pattern. The front of the building in Market-street is divided into shops, each occupying one of the large arches of which we have spoken; the windows occupy two compartments of the arch and the door the third, the top being filled with carved work. The building is crowned with an open pierced parapet, terminated at each corner by corbelled turrets. Between each of the arches on the ground floor are circular medallions, containing the heads of those who contributed to the commercial enterprise of the country, and the prosperity of the town. At the western end is that of Mr. Bright, M.P.; at the opposite end is that of Richard Cobden. The architects are Messrs. Lockwood and Mawson, and the principal contractors are Messrs. Beanland, of Bradford. The cost of the building is about £30,000.

Galashiels.—The contract of Messrs. Robert Hall and Son, for the erection of the new police cells and court-rooms, has been accepted. There were four offers, the estimates being respectively £1,798 10s., £1,820, £1,841, and £1,913. The lowest offer was made by Messrs. Hall and Son. The commission resolved that Mr. Hall should supply the architect with his schedule of prices, so that the plans and estimate might be cut down to £1,600.

General Items.

Mr. Alfred Harris, of Bradford, recently invested the sum of £3,800 in the names of trustees, for the erection of a fever hospital in that town, and his example has been followed by Mr. Titus Salt, who has made the magnificent contribution of £5,000 towards the same object.

The special meeting of the Royal Institute of British Architects (of members only), to award the gold medal and prizes for the year 1866, will be held at No. 9, Conduit-street, on Monday evening next, at eight o'clock.

We observe with regret that the Nottingham Mechanics' Hall, the largest in the town, has been completely destroyed by fire. Fortunately the books belonging to the library, the chemical apparatus and most of the rare objects in the museum have been saved, but the loss includes many valuable pictures, and the great organ, which was built at a cost of £1,300. The origin of the fire has not transpired.

The Town Council of Liverpool have decided upon adopting Aveling and Porter's large 22 ton steam road rollers for rolling the sharp granite with which the fifty miles of streets in Liverpool are mended. In the interests of every overworked horse we wish that the Metropolitan Board of Works would follow the example.

In consequence of that portion of the graveyard which is situate between Holborn-hill and St. Andrew's Church being required for the Holborn Valley Improvements, the remains of mortality deposited therein are being exhumed, and removed in large coffin-shaped boxes, painted black, to the burial-ground at the back of the church, where they are re-interred with every regard to the respect due to the deceased.

The Norwich Association of Master Builders held their annual dinner last week, when about forty gentlemen met, under the presidency of Mr. J. W. Lacy and Mr. D. Balls. In replying to the toast of "the Norwich Association of Master Builders" the secretary stated that the objects and principles of the association were by no means of a coercive character towards the workmen, neither was there any attempt to establish a monopoly in restriction of trade. But that it was simply to meet the union of the workmen with a union strong enough to take its stand on right and just principles of commercial economy in relation to the labour question, without the inconvenience which they had hitherto individually met with when they had been bold enough to take such a stand; and to introduce and cultivate that good feeling which ought to exist in a community whose interests were identical, but which, from the absence of such good feeling, had greatly suffered; and, as far as possible, to identify the interests of the employed and of the employers.

We have to announce that the voluntary architectural examination in connection with the Royal Institute of British Architects will be held in the second and third weeks of May. The following gentlemen (fellows of the Institute) have been nominated as Examiners and Moderators:—A. Ashpitel, F.S.A., E. Nash, F. C. Penrose, M.A. (examiners); C. F. Hayward, J. W. Papworth (moderators). Applications for examination and all preliminary work must be delivered on or before March 30. Copies of revised regulations (which will apply only to 1867), together with course of examination, list of books recommended, copy of questions used in the last examination, list of medals and prizes for 1866, regulations for the Pugin travelling studentship, &c., may be had on application to Mr. Charles L. Eastlake, the Assistant Secretary, at the Institute, No. 9, Conduit-street, price 2s. or 2s 6d postage stamps.

With reference to "A Competitor's" letter on the subject of the Burnley Union Competition, which appeared in our last, Mr. James Green, F.R.I.B.A., writes that as the statements made by "A Competitor" could only refer to him, he (Mr. Green) wishes to repeat the assertion of the Clerk of the Board in his letter to us on December 21. "I never intended," he says, "to be a competitor. I sent in no design whatever, directly or indirectly; in fact, I have had nothing whatever to do with the affair since I left the Board two years ago." Our correspondent adds:—"With respect to the one chosen for first premium, it must either have been that the committee took the only design which in their opinion could be built for the stipulated sum, or that they were inclined to revenge themselves on those Guardians who have been so clamorous for a new workhouse by selecting about the very worst design sent in."

TO CORRESPONDENTS.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the Editor, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

Received.—J. S. P.—J. H. D.—J. S.—G. R. W.—H. G. and Son.—E. W.—B. and D.—A. B. T.—W. S.—W. B.—J. B.—E. G. P.—C. R.—G. C.—J. P.—R. R.—S. M. and Co.—W. and W.—P. and K.—T. W. N.—J. F. D.—J. M.—P. D. P.—A. S. A.—K. and Co.—H. G.—G. N. B.—W. C. and L. C.

H. H. V.—We cannot say anything about the suitability of the group for illustration without seeing the drawings.

J. C. J.—MS. received.

A. F. B.—See notice on page 216.

E. A. (Torquay.)—We will answer the question when we see the design at the Architectural Exhibition.

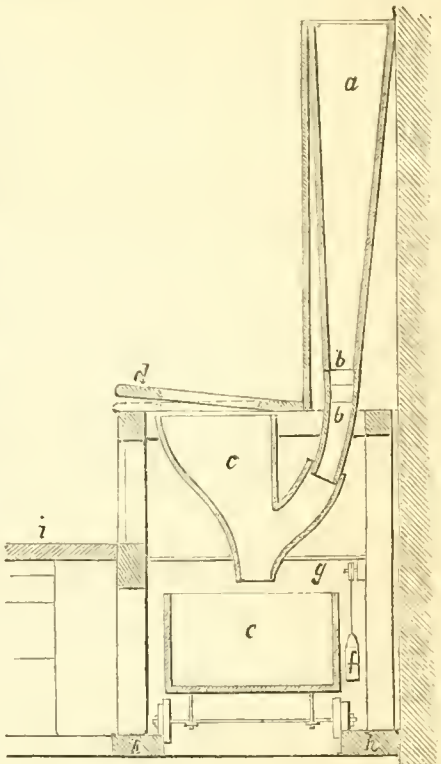
G. T. (Bristol.)—See answer [285] in Intercommunication.

Correspondence.

ASH CLOSETS.

To the Editor of the Building News.

Sir,—Your columns have lately contained several articles on the proper and most advantageous disposal of night soil. I have paid some attention to this subject, and it may be that my ideas and the practical result I have gained will be of some general use. I do not wish to say anything concerning the watercloset system beyond this—I believe the system to be wrong, and one to be avoided wherever it is possible to do so. With regard to the other system, namely, the system of earth closets, it appears to me the difficulty has been not in the principle itself, but in clumsiness in the mode of applying the system. In the first place, it has been contended that earth should be used; but I believe it is apparent to all minds that have given much consideration to this subject that it would be impossible to procure the earth, and the delivery of it (could it be procured) would be surrounded with great difficulties and much expense. I believe ashes would be found an excellent and thoroughly effective substitute for the earth. It has been said farmers object to the use of ashes, and where they have been used the experiment has failed. I believe it would be found, on inquiry, that the proportion of ashes used was larger than necessary, and this fact would account for the farmers' objection. I think I had better proceed to explain to you the system I have had in use on Bass and Co.'s premises for a considerable period, and leave you then to decide upon its value or otherwise. I recommend the use of ashes, because they are easily at command in all cases, and in my opinion, to make them practically available, it is only requisite to use a small and measured quantity. I have a machine, a drawing of which I send you, and the following



SECTION.

explanations will, perhaps, be sufficient for your guidance:—

a Hopper for ashes.
b Two valves; when one is open the other is shut.
c Earthenware pan.
d The seat shown up and the bottom valve open.
e Box for soil.
f Weight for returning seat and working valves.
h Tram road for drawing out soil.
i Floor of closet.

You will observe the ashes are placed in the hopper, and the quantity of ashes used is measured and can be increased or diminished. I have found in practice that one bushel of ashes is sufficient for one hundred actions of the earth closet. I may remark the closet is perfectly free from smell. You will also observe the construction is simple, and the apparatus will bear rough usage, and above all things is self-acting. The plan has succeeded perfectly well in a manufactory, and I believe may be applied to streets with great facility. The cost of altering the ordinary closets would be about 30s. or £2 for each. From the observations I have placed before you, you will see the removals would not be frequent, and, I wish to add, would be entirely inoffensive.—I am, &c.,

Burton-on-Trent, March 2. T. S. Cressey.

FATAL ACCIDENT TO A MASTER BRICKLAYER.

Sir,—A fatal accident occurred a few days since to an old and industrious parishioner of mine, named Charles Warr, a master bricklayer, of Liverpool-road, Islington, who fell from a scaffold opposite my house, and sustained such severe injuries that he died within two days, leaving a widow and nine children (many of them very young) totally unprovided for. A committee has been formed for the purpose of raising a fund to enable the widow to enter into some business for the support of herself and her family. I can confidently recommend the case to the sympathy and benevolence of your readers, and I shall be happy to receive any contributions, as will also the chairman of the committee, Mr. Joseph Surr, 19, Milner-square, Islington; and the treasurer, Mr. D. W. Hill, 378, Camden-road, Holloway.

I am, &c.,
Daniel Wilson,
Vicar of Islington.

9, Barnsbury Park,
March 14.

THE LAW OF APPRENTICESHIP.

Sir,—Would you have the kindness to insert the following communication for the benefit of your readers:—A case has just been tried in which it has been decided that an indoor apprentice is not compelled to work after one o'clock on Saturdays, the said apprentice being a carpenter and joiner, and that the master must go by the rules of the trade. The reason I write to you is, because a great many masters consider that an apprentice is compelled to work on till five or six o'clock on a Saturday.—I am, &c.,

The Apprentice.

Lincoln's Inn, March 18.

Intercommunication.

QUESTIONS.

[309.]—THE NEW LAW COURTS.—Will you inform me whether or not the designs for the Law Courts are open to the public; if they are not, will they be open to the public any more, and if so, please state when? And as the public is admitted by cards to be obtained of the Commissioners, will you also state where the office of the abovementioned Commissioners is situated? A. H. D.

[The exhibition of the designs for the new Law Courts will be open to the public on Thursdays until further notice. The office of the Commission is No. 33, Lincoln's Inn-fields.]

[310.]—SMOKY BRICKS.—Will you be so good as to inform me, through your valuable journal, whether there is any cheap composition for putting over sooty smoky bricks, to stop it showing through the plastering? I have had to use a great number in some cottages that I have lately erected. A Builder.

[311.]—RAILING AROUND MONUMENTS.—Can any of your readers give me, through your valuable "Intercommunication" column, any information as to the best method of finishing in colour the railing round a monument of Gothic design in a cemetery? Alexis.

[312.]—SKYLIGHTS.—I should feel much obliged for the following information through the medium of your "Intercommunication":—1. What are the proper sizes for caps, &c., of the leadwork to skylights (open and fixed) in a roof of common (*i.e.* quarter) pitch. 2. The usual method of computing same in taking quantities. Enquirer.

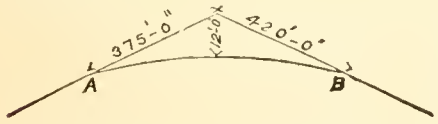
[313.]—THE LAW OF APPRENTICESHIP.—Is it legal to advertise for employment in tracing, &c., after office hours, and to receive money for the same, while yet an apprentice, if by so doing you do not hinder your regular occupation? Reader.

[314.]—SALINE SCUM ON TILES.—Will some reader inform me how to prevent saline scum on floor tiling? Perhaps some one in either Maw and Co.'s or Minton and Co.'s establishment will be able to answer the question satisfactorily. Mosaic.

[315.]—STRAINING DRAWING PAPER.—Can any of your correspondents inform me of any way to obviate the unsatisfactory method of straining drawing paper by sticking it to the boards with paste or glue? Jack.

[316.]—FIREPROOF BUILDINGS.—Although fully aware of the fact that the subject of fireproof buildings has been dealt with again and again in the Building News, and many other papers, and although I have read much on the question, there are still grave doubts in my mind as to whether any really model construction of the kind exists at present in the metropolis or in the provinces. Theoretically, there are plenty of plans which are "fireproof;" practically, somehow, they never prove to be so when fire overtakes them. Do you not think it possible that, by the judicious combination and use of such materials as nature supplies, or art furnishes in great abundance, an actual immunity from destruction by fire might be gained for large warehouses and public edifices? To me it seems that there might. I entertain certain notions of my own about the advisability of builders devoting more attention and study to this question, so as to devise a means of obviating a reproach which is often levelled at them when a fire breaks out and demolishes their fine fireproof structures, and consumes thousands and thousands of pounds' worth of valuable property. By opening your columns to these queries, it is not, I hope, apart from probability that a little discussion may arise. If so, we shall all be gainers; for discussion at once stimulates to thought and evolves latent knowledge. Waterproof.

[317.]—RADIUS OF A CURVE.—I should feel obliged if you or one of your numerous readers could inform me how to find the radius of a curve by the use of such dimensions as the following, viz.:—



A B being the regular curve of which the radius is required. And a favour will be conferred upon B. N.

REPLIES.

[247.]—THE STANDARD BUSHEL.—I am much obliged to "J. X." for his remark, and have since referred to all the reliable authority I have. In "Walkingham's Arithmetic" he will find the following: "The bushel is a vessel of a circular form 19½in. in diameter and 8½in. deep." And in "Barncott's New Universal Penny Table Book," this: "The standard bushel is 19½in. in diameter and 8½in. deep, containing 2218·192 cubic inches." I should be glad if "J. X.," or any reader, can help to puzzle out this question. An Inquirer.

[291.]—ARCHITECTS' PUPILS. — I can but refer "Provincial" to the lives of Pugin, who, when he had served his time in his father's office, and "had learnt all that he could of architecture according to the usual formulæ, still found that he had learnt but little, and that he must begin at the beginning and pass through the discipline of labour. Young Pugin accordingly hired himself out as a common carpenter at Covent Garden Theatre, first working under the stage, then behind the flys, then upon the stage itself"; of George Kemp, who was the son of a Scotch herdsman, but having a love for architecture, got apprenticed to a joiner, and, when his time was out, travelled through Scotland, England, and eventually over the continent, working at his trade and studying architecture in his spare time. Unfortunately Kemp did not live to see his great work, the Scott Monument, at Edinburgh, and "the first result of his indefatigable industry and self-culture, embodied in stone." I refer to the lives of all the men who are, and have been, great among us. Let "Provincial" ask himself whether these men were contented with the knowledge they acquired in the office? I think their lives will point out that to become real artists we must begin at the very bottom, and get, by every means possible, a thorough knowledge of construction. I should advise your correspondent to take every opportunity of questioning builders and their workmen about the construction of the works which his governor has in hand, and if he can, to do some carpentering himself, or at least get up at six in the summer and spend a couple of hours before breakfast in watching carpenters or builders, and seeing just how they put a door together, &c. He should, if possible, also join an architectural association, and make all the use of it he can, and get as much sketching from old work as he can, as it will give him a thorough knowledge of proportion and a freedom of execution not to be obtained by any other means. "Provincial" must remember that he has entered upon a profession which needs a lifetime to master, and must go to work in earnest, never letting one fragment of information pass by, but ever pressing onward and upward, gradually and naturally, not by fits and starts, ever remembering that it is very necessary to sow, and that thoroughly, before you even think of reaping. Adelphi.

[304.]—VARNISH FOR TIN BUCKETS.—In reply to "N. Y.," he can use good copal varnish for coating the seams of tin buckets to prevent them from rusting. The varnish, after being applied, should be dried in a warm place, such as an oven, heated to a temperature of boiling water. Put it on in two or three successive coats, and dry each time. J. W.

[305.]—COLOURING BRASS, &c.—In order to colour brass blue, mix some ultramarine with copal or other resin varnish, dip the brass into it, then dry in a warm room or oven. To bronze brass, mix some common bronze powder with lac varnish, and dip the brass into it, and dry as before described. The best tool to use for turning brass is one not very acutely inclined to the working surface; in cutting gun metal particularly, the keen edge or sharp angle of an ordinary tool would jump in and destroy the work. X.

WAGES MOVEMENT.

The employers and operatives engaged in the building trade at Birmingham have agreed to settle their disputes in future by arbitration.

An effort is being made by the joiners of Glasgow to get the hours of labour reduced to nine hours a day.

The joiners of Blackpool are still on strike. The wages paid to good men are 29s. and 30s. per week. The society wishes to impose a uniform rate upon the masters of 29s. per week.

Loughborough.—The union joiners here are on strike. They went out on Monday morning, but there are plenty of non-union men at work to carry on the trade of the town. They could not have struck at a better time for the masters, as trade is now slack, with no prospect of being better at present.

Manchester.—Notice has been given to the bricklayers' labourers here that the alteration of the rules respecting the hours of labour, &c., will apply to them equally with the bricklayers, beginning in June next.

Sheffield.—A meeting of employers connected with the various branches of the building trades in Sheffield and Rotherham, was held on Monday, for the purpose of considering certain questions relating to the interests of the trade, amongst them being the subject of the Commission on Trades Unions. In the course of the evening, the desirableness of the masters being united in seeking to promote their own interest, and the interests of the trade generally, was fully urged. The following resolution was unanimously adopted:—"That it is desirable that all persons employing operatives in any branch of the building trade, including the stone merchants and brick manufacturers, become members of the General Builders' Association."

STAINED GLASS.

Another ornamental stained glass window (by Hardman, of Birmingham) has just been placed in the south-east side of the chancel of Southmolton parish church. It is the gift of Mr. W. G. Smyth, of Southmolton. One more window in the north-east side is wanted to complete the chancel.

Alnwick.—Three memorial stained glass windows to the memory of Algernon, late Duke of Northumberland, have just been inserted in the chancel end of St. Michael's Church, Alnwick. The first is erected by the friends of his Grace; the second by his Consort, Eleanor, Duchess Dowager; and the third by the present members of the family of Percy. The windows are of the Perpendicular order of architecture. The whole of the windows are from the studio of Messrs. Ward and Hughes, London, and are executed in the highest style of art.

Cheshire.—A stained glass window has been recently put in the parish church, Hale, Cheshire, to the memory of the wife of P. F. Clarke, Esq.; it consists of one large opening, which is occupied by a picture of the Resurrection, surrounded by rich borders and panelling, with a dedicatory inscription across the bottom of the window, showing the time of the death and name of the deceased lady. The window is from the establishment of Messrs. R. B. Edmundson and Son, of Manchester.

Lincoln Cathedral.—Another beautiful stained glass memorial window has just been placed in the nave of the cathedral, on the north side, and next to the Boole window. It has been put in, in memory of his parents, by Field Uppleby, Esq., of the Minster-yard, Lincoln. The window was supplied by Messrs. Ward and Hughes, of London, and it consists of three scriptural subjects, in circles, the topmost being the conversion of Saul, "Saul, Saul, why persecutest thou me;" the middle one, Paul before Festus; and the lowest, Paul shaking off the viper.

STATUES, MEMORIALS, &c.

An interesting event has recently taken place at Nassau in the Bahamas, the unveiling of the bust of Shakspeare which took place at the *soiree* of the Bahama Institute. This work of art is to be placed in the Public Library, in proximity to the handsome volumes presented by the Duke of Edinburgh.

We understand that Mr. E. G. Papworth, of Milton street, Dorset-square, is at present engaged upon a memorial bust of the late Dr. Thomas Young, the eminent philosopher and discoverer of the hieroglyphics on the Egyptian monuments. The bust, which is erected by public subscription, is to be placed in the Shire Hall, Taunton. The likeness has been modelled from a portrait painted by Sir Thomas Lawrence, and is very successful. The bust, of Carrara marble, is draped in the costume of the day, the pedestal bearing the inscription being of polished Sicilian marble.

The late Sir Minto Farquhar.—A large and handsome monumental tablet, in the Florid Gothic style, to the memory of the late Sir Minto Farquhar, for some time one of the representatives of Hertford, was, on Thursday last, put up in the south transept of the parish Church of All Saints, in that borough.

The Late Colonel Sir Richmond C. Shakespear.—A mural tablet to the memory of the late Sir Richmond Shakespear, C.B., of the Bengal Artillery, has just been erected in the cloisters of the chapel at the Charter House, where he was a Carthusian, with Thackeray, the Havelocks, &c. The tablet is of the finest Carrara marble, in the purest Gothic form, quatrefoil, and richly wrought and illuminated, and bears an appropriate inscription. The tablet is erected by those who served under him, and associated his single-minded character and christian virtues. The site was presented by the Venerable Archdeacon Hale, and is near those of Thackeray and Leech, with those of the Crimean and Indian officers to the west. A duplicate tablet has been sent out to be placed in St. Ann's Church, Indore, Central India, where Sir Richmond closed his career. The work was entrusted to Mr. Richardson, monumentary sculptor of Melbury Terrace House, Harewood-square, the original designer of the details of the Nelson Column, and the restorer of the Temple Church effigies.

The O'Connell Statue.—A Bit of Irish Humour.—Mr. Auditor Benson, says the *Athenæum*, put up a bust of Milton in Westminster Abbey, with an inscription, which, as Dr. Johnson remarks, "Mr. Benson has bestowed more words upon himself than upon Milton." This incident has narrowly escaped being repeated in Dublin, in connection with the O'Connell statue, which is now in front of the City Hall. At a recent meeting of the Corporation, Alderman Reynolds requested the Lord Mayor to move that the following inscription "be placed on the statue:—"This statue of the Liberator was executed in Rome at a cost of 2,000 guineas, by the great Irish sculptor, John Hogan, and removed to its present site (by order of the Right Hon. the Lord Mayor and the Corporation of Dublin), on the motion of O'Connell's staunch and sincere friend, Alderman John Reynolds, J. P. February, 18[illegible]. What followed was a bit of old Irish humour. On the motion of Mr. Sullivan, the Corporation voted to Alderman Reynolds *their thanks*, and then separated!

Statue of Adam Smith.—M. Gasser, an eminent artist of Vienna, has executed a statue of this great economist. The statue is rather larger than life, and the material is the finest statuary marble. Some photographs of the model and of the statue, now nearly finished, and a small fac-simile in plaster, have been exhibited for some time past in the reading-room of the Bodleian Library, and have been greatly admired. M. Gasser engages to deliver the finished statue at any British port for the sum of £700, a very moderate sum for a work of great beauty and merit. In the belief that the erection of the statue in some one of the buildings belonging to the University would be a befitting tribute to the memory of one among the most illustrious persons who have received their education in Oxford, the following gentlemen have agreed to act as a committee, with a view to purchasing the statue and presenting it to the University of Oxford:—The Right Hon. Lord Taunton; the Right Hon. the Lord Justice General of Scotland; the Right Hon. W. E. Gladstone, M.P.; the very Rev. the Dean of Christ Church, Oxford; the Master of Balliol; and the Rev. James E. Thorold Rogers, Professor of Political Economy at Oxford. Subscriptions in aid of this fund may be paid to the Master of Balliol, treasurer; to Professor Rogers, secretary; to the Old Bank, Oxford; or to Messrs. Coutts and Co., 59, Strand.

LEGAL INTELLIGENCE.

An Unruly Apprentice.—At the Westminster Police Court, the other day, an apprentice rejoicing in the appropriate name of Charles Cross, was charged with wilfully damaging a slab of marble belonging to his master, Mr. Thomas Hartley, proprietor of the Westminster Marble Works. The defendant's pocket money had been stopped by the foreman owing to his misconduct, and when he was informed it would be withheld, he said, "I shall have my pocket money somehow or other." As he passed by the side of a chimneypiece, of trifling value, he wilfully kicked it over, and it broke in the fall. The defendant pretended it was an accident. Mr. Arnold committed him to prison for seven days, with hard labour.

Intimidation.—One of the plasterers' labourers now on strike at Manchester, has been charged before Mr. Trafford at the New Bailey Police-court, with intimidating another labourer, in the employ of Mr. Kirkham, and threatening to take his life if he continued to work with a non-society man. Owing to a technical error in the summons the case temporarily broke down, but a new summons is to be issued, and four other cases are about to be prosecuted by the Builders' Association.

COMPENSATION.

On Friday and Saturday the Recorder of Bath and a special jury were engaged in deciding the value of some land required by the Midland Railway Company. A mass of evidence was adduced on either side, and there was a great difference between the value put upon the property by the surveyors on each side, something like £3,000; the claimants' witnesses putting it at between £6,000 and £7,000, and those of the company at £2,800 or £3,000. The jury found a verdict for £4,500.

MEETINGS FOR THE WEEK.

MON.—Royal Geographical Society.—"Last Journey of Dr. Livingstone—Dispatches from Dr. G. E. Seward and Dr. J. Kirk, 8.30.

TUES.—Institution of Civil Engineers.—Discussion "On Steep Gradients and Sharp Curves"; and, if time permits, "Memoir on the River Tyne," by Mr. W. A. Brooks, 8.
Royal Institution.—"On Botany," by Rev. G. Heaslow, 3.

THURS.—Royal Institution.—"On the Antiquity of Man," by Mr. W. Pengelly, 3.

FRI. — Royal Institution. — "Water Supply of the Metropolis," by Professor Frankland, 8.
Architectural Association.—"The Arrangements of St. Alban's Abbey," by Rev. M. E. C. Walcott, 7.30.

SAT.—Royal Institution.—"On the Antiquity of Man," by Mr. W. Pengelly, 3.
Chemical Society—Anniversary Meeting, 8.

Trade News.

Among the many new designs for articles of domestic use which have recently been submitted to our notice, we may mention those of Messrs. Turner and Allen, of Upper Thames-street, London. These gentlemen have produced designs for balconies, gates, railings, garden fountains, lamp-posts, dwarf gas-pillars, lamp-brackets, &c. The most ordinary observer must admit that there is a wide field for improvement in the manufacture of these and other things which continually meet the eye in our large cities and towns.

TENDERS.

BARKING.—For the erection of a villa residence, Barking, Essex, for Mr. Fitt. Mr. J. W. Dennison, architect:—Martin, £819 10s; Stokes, £815; Ashmole, £755; Withers, (accepted), £720.

BETHNAL GREEN.—For building three shops, with workshops in rear, in Church-street, Bethnal Green. Messrs. Reeves and Butcher, architects:—Langmead, £1,473; Higgs, £1,417.

BETHNAL GREEN.—For rebuilding warehouse at Clay Corner, Turville-street, Bethnal Green. Mr. T. B. Insoll, architect:—Deavine, £1,565; Beale, £1,456; Christoffer, £1,385; Henshaw, £1,360; Perry, £1,360; Langmead, £1,347; Pritchard, £1,327; Mitchell, £1,316; Forrest, £1,228; Higgs, £1,217.

BLUNHAM (BEDS).—For the erection of a new wing and other alterations to the Oil-cake Manufactory, Southmills, for Mr. Charles Powers. Mr. John Usher, architect. Quantities supplied:—Freshwater, £922; Dickens, £960; Swelvetrees, £856; Hull, £842; Horsman, £780; Winn and Foster (accepted), £729.

BRIGHTON.—For schools at Brighton in connection with the London, Brighton, and South Coast Railway Company. Mr. H. N. Goulty, architect. Quantities supplied by Mr. J. C. Lansdowne:—Bland, £714; Cheeseman, £690; Simms and Martin, £683; Nightingale, £645.

BRECON.—For erecting a new college at Brecon, South Wales, for the Independents. Mr. T. Thomas, architect. Quantities supplied by Messrs. Curtis and Son, in connection with Messrs. Rake and Ranwell:—Williams, £8,950 7s. 10d.; Thomas Watkins and Jenkins, £8,650; Griffiths, £8,400; Jones and Sons (accepted), £8,000.

CHELSEA.—For new shop front, &c., No. 25, Sloane-street, Chelsea, for Mr. C. J. Pringle. Mr. H. J. Hansom, architect:—Nightingale, £193 8s. 9d.

CHEAPSIDE.—For the erection of a warehouse, Lawrence-lane, Cheapside. Mr. Hudson, architect:—Clements, £2,490; Lawrence and Son, £2,440; Buston and Moreland, £2,293; Newman and Mann, £2,218; Sewell and Sons, £2,184; D. King and Sons, £2,065.

CROYDON.—For two small houses, Croydon, for Mr. Rice. Mr. Henry William Broadbridge, architect:—Collier (accepted), £736.

DOVER.—For additions and alterations at the gaol. Mr. John Hanvey, architect. Quantities supplied by Messrs. Liu and Clark:—M'Kenzie, £8,722 17s.; Tunbridge, £8,314 5s. 4½d.; Nightengale and Bushel, £7,941 17s. 6d.; Richardson, £7,450; Adcock, £7,270 7s. 10d.; Ayers, £7,190; Naylor and Son, £7,190; Matthews, £6,810 15s. 9d.

HORNSEY.—For house for Mr. J. C. Corbin. Mr. George Duffitt, architect:—Madgin, jun. (accepted) £1,160.

HOUNSLOW.—For a pair of semi-detached six-roomed cottages, proposed to be built at Hounslow Mr. William Lum, architect:—Cole, £375; Wilson, £370; Emmerson, £330; Walker, £298.

HOXTON.—For part of excavators' work for warehouse and four shops, St. John's-road, Hoxton. Herbert Ford, architect:—Dodd, £180; Winn, £175; Lansbury, £149; Fortescue, £140; Blenkins (accepted), £130; Drummond, 2s. 5d. per yard, cube.

HUNTINGDON.—For the erection of Trinity Church, Huntingdon. Mr. John Tarring, architect, London. Quantities supplied. General estimate:—Dove, Brothers, £9,695; Hall and Sons, Cambridge, £8,668 0s. 9d.; Newman and Mann, £8,200; Simpson, £7,955; Saunders, £7,655; Myers and Sons, £7,863; Pattinson, £7,618 16s. 6d.; Maile and Richardson, Huntingdon (accepted), £7,377. Separate estimate:—Dove, Brothers, £625; Bell and Sons, Cambridge, £556 14s. 3d.; Newman and Mann, £550; Simpson, £518 10s.; Saunders, £716; Myers and Sons, £503; Pattinson, £579 14s. 6d.; Maile and Richardson, Huntingdon (accepted), £440.

MAIDSTONE.—For alterations and additions to Elsfield House, near Maidstone, for Mr. W. Lawrence. Mr. Hubert Ansted, architect:—Gibbon, £1,695; Clements and Wallis, £1,530; Anscomb, £1,450; Vaughan, £1,327; Naylor and Jull, £1,287; Grensted (accepted), £1,270.

NEWINGTON CAUSEWAY.—For decorations and painting of the Metropolitan Tabernacle, Mr. Spurgeon's:—Sykes, £275; Hayward, £1,200; Smith, £1,180; Sayers, £1,060; Lachlan, £1,053; Threadgill, £1,047 1s.; Tarrant, £979 Phillips, £840.

PORTSMOUTH.—In constructing a reservoir on Portsdown Hill, for the Borough of Portsmouth Waterworks Company. Mr. J. Quick, engineer. Quantities supplied by Rake and Ranwell:—Light Brothers, £5,900; Lawrence, £5,500; White, £5,490; Furness (accepted), £5,195; Pines, £5,030; Simms and Marten, £4,873.

TOTTENHAM-COURT-ROAD.—For alterations to the Horseshoe Tap House, Tottenham-court-road. Messrs. Mayhew and Calder, architects:—Turner and Son, £1,265; Oriel, £1,210; Laurence, £1,190; Eaton and Chapman, £985; Bracher and Son, £978; Curtis, £900.

TRING (HERTS.)—For the Main Drainage. First portion:—Wainwright, £3,272 18s.; Morris, £2,874; Knight, £2,641 12s. 8d.; Whittick, £2,482 11s. 10d.; Mann, £2,411; Neaves, £2,364 13s. 9d.; Wigmore, £2,310 15s. 11d.; Moore, £2,156 14s. 8d.; King, £2,140 9s. 6d.; Coker, £2,017 4s.; Chappel, £1,994 14s.; Baker, £1,994 5s.; Coker, jun., £1,974 3s.; Honour, £1,926; Durley and Son, £1,798; Cooper, £1,631 12s. 6d.; Dickenson and Oliver (accepted), £1,626 1s. 2d.

TUNBRIDGE WELLS.—For the erection of seven houses and other buildings, for Messrs. Fielder and Chapman. Mr. Henry H. Cronk, architect. Quantities not supplied:—Anscombe, £4,368; Stradge and Sons, £3,835 11s; Noakes, £3,699 15s.; Pink, £3,696; H. Hammond, £3,551; Mercer and Campfield, £3,419.

WESTMINSTER.—For a fire brigade station at Victoria-street, Westminster, for the Metropolitan Board of Works:—Nutt and Co. (accepted), £4,228.

WORCESTER.—For alterations and additions to a dwelling-house for Mr. T. R. Goodwin. Mr. A. Coombe, architect. Quantities supplied:—Wilson, £398; Bishop and Grisman, £366; Beard (accepted), £345.

WORTHING.—For the erection of offices, Chapel-road, for Messrs. Tribe and Green. Mr. Henry Carpenter, architect. Quantities supplied:—Thorne, £1,577; Dove, Brothers, £1,455; Hide and Patching, £1,433 8s.; Blaker, £1,298; Howell, £1,232; Garrud, £1,225; Longhurst (accepted), £1,195.

PROPERTY SALES.

MARCH 18.

AT THE GUILDHALL COFFEE-HOUSE.—By Mr. Whittingham.—Freehold building land, fronting Hoe-street and Grove-road, Walthamstow, Essex—lot 180 sold for £120; lot 197 sold for £56; lot 215 sold for £55; lot 294 sold for £50.

Freehold building land, fronting Hooley-road, Red Hill, Surrey—lots 1 to 202 comprised the previous sales. Lot 203 sold for £180; lot 204 sold for £270; lot 205 sold for £310; lot 206 sold for £330; lot 207 sold for £340; lot 214 sold for £350.

MARCH 19.

AT THE MART.—By Messrs. Daniel Smith, Son, and Oakley.—Freehold and part copyhold estate, known as Bakeham House, situate on Egham Hill, Surrey, comprising a residence with stabling, coach-house, farm premises, cottages, and 175a. 0r. 2p. of land—sold for £18,300.

By Messrs. Ellis and Son.—Leasehold premises, No. 9, Fanchurch-street, City, producing £2,075 per annum, term 88 years from 1862, at £570 per annum—sold for £15,000.

Leasehold premises, Nos. 21 and 22, St. Dunstan's-hill, and Nos. 1 and 2, Cross-lane, City, producing £560 per annum, term 30 years from 1860, at £275 per annum—sold for £1,500.

Leasehold premises, No. 13, America-square, City, let on lease at £110 per annum, term 67 years from 1819 (renewable every 14 years upon the payment of a fine), at £18 per annum—sold for £1,000.

Freehold Residence, No. 128, Windmill-street, Gravesend, Kent—sold for £475.

Freehold, two houses, Nos. 5 and 6, Clifton-place, New North-street, Finsbury, producing £44 per annum—sold for £755.

By Messrs. Winstanley and Horwood.—Freehold ground rent of £13 15s. per annum, arising from five houses, Nos. 37, 38, 39, 40, and 41, James-street, East India-road—sold for £320.

Freehold ground rent of £30 per annum, arising from No. 3, Suffolk Cottages, James-street aforesaid—sold for £560.

By Mr. W. H. Moore.—Leasehold house, No. 18, Raglan-street, Keotish-town, let at £24 per annum, term 70 years from 1854, at £5 per annum—sold for £195.

Leasehold, two houses, one with shop, Nos. 14 and 15, Clarendon-square, Somers-town, producing £125 9s. per annum, term 73 years from 1806, at £30 per annum—sold for £420.

Leasehold, three houses, Nos. 23 to 25 Brill-place, Chapel-street, Somer's-town, producing £50 14s. per annum, term 94 years from 1788, at £5 10s. per annum—sold for £260.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

George Bate, Great George-street, Westminster, engineer, April 5—Thomas William Blofield, Belvedere, Kent, builder, April 10—William Wynne Houchin, Peerless-row, City-road, engineer, April 10.

TO SURRENDER IN THE COUNTRY.

Henry Aspden, Blackpool, Lancashire, joiner, April 2—Edward Barrow, York, joiner, April 3—Wm. Carver, Coal Brook Dale, Salop, carpenter, April 3—John Holdsworth, Leeds, marble mason, March 28—Thomas Woodfin Jones, Ruthin, painter, March 27—James Morris, Pontypool, engineer, April 1—Isaac Stone, Temple Cloud, Somersetshire, carpenter, April 1.

NOTICE OF SITTINGS FOR LAST EXAMINATION.

T. W. Gazeley, Leyton, builder, April 15—C. Geary, Libra-road, Old Ford, builder, April 15—G. Paice, Battersea, builder, April 15—W. J. D. Coker, St. Paul's Wharf, contractor, April 12—P. Castleton, Tottenham, mason, April 15—G. G. Payne, Bromlay, Middlesex, builder, April 29—J. Jones, Froig, joiner, April 8—J. Serjeant, Appledore, Devonshire, painter, April 30—J. Shaw, Rotherham and Wakefield, architect, April 3—F. Marshall, Powick, carpenter, March 27—T. Goodhall Catshill, near Wallsall, builder, April 15—J. Barnes, Bromfield, Cumberland, stonemason, April 10—J. L. Taylor, Barrow-in-Furness, plasterer, March 25—T. Waller, Chertsey, painter, April 3—A. Wilson, Gainsborough, plumber, April 15—J. Feek, Stoke Holy Cross, Norfolk, carpenter, March 30—R. Phillips, Lake, Cornwall, carpenter, April 9—W. Taylor, Tamworth, carpenter, March 29.

PARTNERSHIPS DISSOLVED.

Keast and Moon, John-street, Camberwell, builders—Frost and Co., Derby, engineers—Brown and Co, Bridgenorth, glaziers—Oldfield and Haigh, Halifax, millwrights—Garrad and Leigh, Birmingham, ironmongers.

DECLARATIONS OF DIVIDENDS.

A. Gardiner, Chepstow, timber merchant, dividend ¾d.—J. Lewis, Carmarthen, painter, dividend 1s. 3d.—W. Moxon, Fulham-road, and New-street, Spring-gardens, contractor, dividend 9¼d.—J. and J. Smith, Liverpool, builders, dividend 4¾d.

DIVIDENDS.

R. L. Grant, Exeter, builder, April 3—R. Pratt, Yarmouth, bricklayer, April 15.

BANKRUPTCIES ANNULLED.

John Gillard, Drayton, Somersetshire, carpenter, March 13—G. Webb, Old Kent-road, carpenter.

SCOTCH SEQUESTRATIONS.

W. Johnston, Glasgow, plumber, March 21—H. Anderson, Inverness, timber merchant, March 23.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9	0	£10	10	Archangel, yellow ..	£12	0 £13 0
Quebec, red pine	3	0	4	15	St. Petersburg, yel...	10	10 11 0
,, yellow pine..	2	15	3	10	Finland	8	0 0 0
St. John N.B. yellow	0	0	0	0	Memel.....	9	0 0 0
Quebec Oak, white..	3	10	6	0	Oothenburg, yellow	8	0 10 10
,, birch.....	3	10	4	10	,, white	6	0 8 10
,, elm	3	10	5	0	Gefle, yellow.....	9	0 11 0
Oantzic oak	3	10	6	0	Soderhamn	9	0 10 10
,, fir	2	0	3	10	Christiania, per C., 12 ft. by 3 by 9 in.		
Memel fir	3	0	3	10	yellow	18	0 22 0
Riga.....	3	0	3	5	Deck Plank, Dantzic, per 40 ft. 3 in.	0	14 1 4
Swedish	1	18	2	3	PUMICE STONE pr ton	3	0 6 0
Masts, Quebec red pine	6	0	8	0	OILS, &c.		
,, yellow pine..	3	0	6	0	Seal, pale...per tun	46	10 47 0
Lathwood, Dantzic, fm	4	10	6	10	Sperm body	140	0 141 0
,, St. Petersburg	6	10	7	10	Cod	41	10 0 0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Whale, 6th, Sea, pale	45	0 0 0
Quebec, white spruce	13	10	22	10	Olive, Oaillipoli.....	63	0 0 0
St. John, white spruce	13	0	15	10	Cocoanut, Cochin, ton	58	0 0 0
Yellow pine, per reduced C.					Palm, fine	41	0 0 0
					Linseed	37	0 0 0
Canada, 1st quality.	17	0	19	10	Rapeseed, Eng. pale..	40	0 0 0
2nd do.....	12	0	13	10	Cottonseed.....	30	0 36 0

METALS.

IRON:—						
Welsh Bars in London .. ..per ton	6	15	0	0	0 0	8
Nail Rod ..... ,,	7	10	0	8	0 0	8½
Hoops ..... do	8	17	6	9	0 0	
Sheets, Single ..... do	9	17	6	10	0 0	
Staffordshire Bars .. .. do	7	17	6	8	10 0	
Bars, in Wales ..... do	6	15	0	6	0 0	8
Rails ..... do	0	0	0	6	5 0	net
Foundry Pigs, at Glasg. No 1 .. do	2	15	6	3	7 0	
Swedish Bars ..... do	10	10	0	12	10 0	2½
STEEL:—						
Swedish Keg, hammered .....per ton	16	16	0	18	0 0	
Swedish Faggot ..... do	10	10	0	12	10 0	
COPPER:—						
Sheet & Sheathing, & Bolts ....per ton	86	0	0	91	0 0	
Hammered Bottoms ..... do	96	0	0	101	0 0	
Flat Bottoms, not Hammered .. do	91	0	0	96	0 0	
Cake and Tough Ingot ..... do	78	0	0	0	0 0	
Best Selected ..... do	84	0	0	89	0 0	
Fine Foreign ..... do	86	0	0	88	0 0	
Yel. Metal Sheathing & Rods ....per lb	0	0	7½	0	0 8	
TIN:—						
English Block .....per ton	90	0	0	0	0 0	2½
do Bar ..... do	91		0	0	0 0	
do Refined ..... do	93	0	0	0	0	
Banca .. .. do	94	0	0	0	0 0	nett
Strait ..... do	89	0	0	0	0 0	
LEAD:—						
Pig, English .....per ton	22	5	0	22	10 0	2½
,, Spanish Soft ..... do	19	15	0	0	0	
Shot, Patent ..... do	23	10	0	24	0	
Sheet ..... do	21	0	0	0	0 0	
White ..... do	30	0	0	31	10 0	
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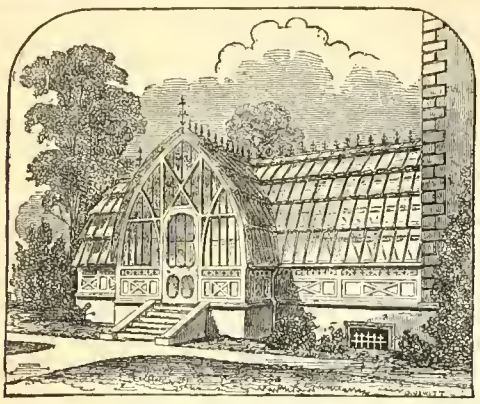

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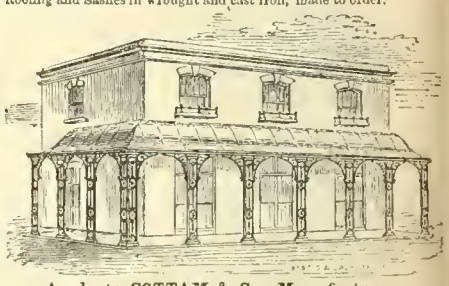

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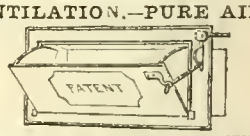

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THE BUILDING NEWS.

LONDON, FRIDAY, MARCH 29, 1867.

THE STRENGTH OF BRICKS.

COMPARISONS have been frequently drawn between ancient and modern bricks. The ancients employed bricks which were almost indestructible. A traveller in the Indies has informed us that he has not met with any bricks to equal those to be found in the ancient tombs at Tatta,—"the most beautifully chiselled stone could not surpass the sharpness of edge and angle, and accuracy of form, whilst the substance was so perfectly homogeneous and skilfully burnt that each brick had a metallic ring, and fractured with a clear surface, like breaking freestone." The bricks of Rome, which have withstood the wear of seventeen hundred years, the bricks manufactured by the Dutch, which have remained uninjured even when used for street paving, show the excellence which has been attained in the manufacture of this building material in past times. Our own British bricks made in the reigns of the Tudors and Stuarts were far superior to the bricks made in the present day. In an American journal, the Rev. M. D. Conway in a description of a visit to Thomas Carlyle's retired old mansion in Chelsea, states that the renowned owner, pointing to the bricks and mortar which compose his dwelling, remarked:—"Look at these bricks, sir, not one of them is a lie. Let a brick be once honestly burned, and the cement good, and your wall will stand till the trump of doom blows it down. These bricks are as sharp as the day they were put up, and the mortar is now limestone. The houses all around us crumble, the bricks in them were made to crumble after sixty years—that being the extent of most of the leases."

Of the actual truth of Mr. Carlyle's exposure there is but little doubt. Despite the fact that the means of production have vastly improved, we are left with bricks that are roughly finished, imperfectly burned, and perfectly unable to hold together for much more than half a century. Undoubtedly the system of building on leases for sixty or ninety-nine years has led to this deterioration in the strength and endurance of home-made bricks. The object is to obtain building materials as cheaply as possible; and although complaints were made a few years ago as to the high price of bricks, yet they can be obtained at prices which do not allow of any great perfection in the manufacture. Speculative builders will, of course, continue to encourage the sale of disgracefully-made bricks; but for works which are intended to resist the advances of time and the inroads of atmospheric influences, the best materials will be sought for.

The experiments which have been made of late years in testing the strength of bricks have been of great importance; while the careful methods adopted by the engineers engaged in the construction of the more recent of our great metropolitan works have led to good results. One of the most elaborate sets of experiments was made a few years ago by Mr. Hawkes, who was induced to enter into this subject by having to erect some farm buildings for himself. Mr. Hawkes, having experienced considerable benefit from testing pig-iron purchased for his foundry, thought it would be worth while to do the like with the bricks to be used by his builder. He obtained thirty bricks which were sent him as average samples of the kind proposed to be used for his buildings. He ascertained that the average strength of these bricks was somewhere about 1,300lb., but it appears that when the bulk of the materials was delivered, numbers of them were only of the average strength of about 800lb. Two men can test 300 bricks by a testing machine in one hour; and that number is sufficiently large to enable anyone to ascertain the average strength of a vast quantity of bricks. The method of testing was not to ascertain the breaking point, but the bearing power up to a certain average of strength. It has been stated that very few bricks will bear a pressure of three tons. Mr. Hawkes says:—"If you wanted to test bricks at Boston, where the mean strength is 5,064lb., it might be considered that 4,000lb. was a fair test. If bricks had been purchased at a tested strength in the year 260 at Uriconium, about 3,000lb., or if in London in 1860, I would advise the brickmaker to limit his guarantee to 360lb., because, unfortunately, some have broken at 366lb." Mr. Hawkes's experiments were to ascertain the transverse strength of bricks, not their power to resist a crushing force. It is important to know for how long a brick will carry a weight without breaking. We are told that one common Boston brick which broke with a weight of 920lb., sustained a pressure of 690lb. for forty-eight hours, and then broke with a weight of 1,330lb.; of course these experiments were made upon the half-brick, and calculated out at the standard size and bearing. A brick from dried ground clay by pressure sustained a weight of 820lb., for forty-eight hours—its original strength being 898lb.—and it broke when the weights were made up to 950lb. Half-bricks frequently require a greater weight to break them than whole bricks. Taking twenty-five bricks each from different districts, it was found that the average weight was 7·85lb., and the strength usually increased with the weight. We gather from Mr. Hawkes's tables of experiments the following useful facts:—

Boston red bricks, best.—These bricks are well made, and have a smooth surface, and are straight and square at the edges. They cost in Boston 17 dollars per thousand. Mean strength, 5,064lb. Common Boston bricks, of a dark red colour, labour at 2 dollars per thousand, are free from rubbish. Mean strength, 3,184lb.

Baltimore best bricks are hand-made. The very best sell at 25 dollars per thousand, and ordinary bricks at from 6 to 8 dollars. Mean strength, 3,551lb. Common Baltimore bricks are considered to be far stronger than stone—the bricks from old buildings being very sound. Mean strength, 3,040lb.

The Dutch bricks were furnished by Messrs. Rosher, of Holland-street, London. Greatest strength, 4,000lb.; mean strength, 3,580lb. The Dutch clinkers are stronger and heavier than American common bricks. The clinkers "are made at Moor, near Gonda, in South Holland, from the slime deposited on the banks of the River Yssel, and formerly from that of Haarlem Meer. The colour is a light yellowish brown. The clay or slime is washed to get rid of the earthy matter before being moulded."

From the experiments made on home-made bricks we gather these interesting facts:—The Tipton blue bricks give the greatest strength (5,553lb.), the mean strength being 3,975lb. Best Garrison-lane, Birmingham, bricks, which are hand-made, the clay being passed only through one pair of rollers, stand next in order. Greatest strength 3,530lb., mean strength, 3,376lb.; while the common bricks from the same neighbourhood were far inferior. The best Oldbury bricks gave the greatest strength at 4,600lb., the mean strength being 3,345lb., while the common Oldbury bricks stood at 3,361lb. greatest strength, and 2,193lb. mean strength. These bricks were manufactured by Messrs. Barnsley; those made by Messrs. Ingram by machines gave the following results:—Greatest strength, 3,703lb.; mean strength, 3,120lb.; the least strength being 2,078lb. Messrs. Bradley and Gavan's machine-made bricks, manufactured in Leeds, gave the greatest strength, 4,133lb.; mean, 3,198lb.; least, 2,616lb. The clay is taken from the pit, and does not undergo any previous preparation. In some cases no water is added. The hand-made bricks had a mean strength of 1,038lb. Some bricks from Bridgewater were tried and found to give the greatest strength, 3,200lb.; mean, 2,318lb.; and least, 1,515lb. Crickmay's bricks (near Weymouth), hand-made, one pair of crushing rolls, but no pug-mill:—Greatest strength, 2,680lb.; mean, 1,940lb.; least, 1,480lb.; while some bricks made in two yards nearer Weymouth only gave the mean strength of 725lb. White bricks made in Leicestershire:—Greatest strength, 1,472lb.; mean, 1,104lb.; least, 824lb. Oxford bricks:—Greatest, 1,187lb.; mean, 1,087lb.; least, 875lb. Two lots of London (stock) bricks were tested, and gave the following results:—No. 1: Greatest strength, 1,496lb.; mean, 998lb.; least, 366lb. No. 2: Greatest, 1,396lb.; mean, 825lb.; least, 485lb.

Prior to the commencement of the works in connection with the Southern Main Drainage, Mr. Grant, the engineer, made a series of experiments on the compression and strength of various bricks. These experiments were made about the same time as the testing trials with the Portland cement used for these works, and which have been described in this journal. 300 experiments were made on the strength of bricks, and some useful facts were ascertained. From the six tables in which these facts are recorded, we learn that in 1863, 173 experiments were made on the compression of bricks. We can only give the mean results, as the cubical contents, dimensions, and maximum or minimum results would occupy too much of our space. Gault bricks, which were used on the Bermondsey branch of the works, showed:—Average pressure when the specimen first showed signs of giving, at 13·380 tons and 12·120 tons; and pressure when finally crushed, average, 37·90 tons and 32·38 tons. Messrs. Allan's (Sudbury) Suffolk bricks, used for the pumping station at Deptford, showed:—Average pressure when giving signs of breaking to be 4·475 tons and 17·100 tons; and average pressure when crushed 31·75 tons and 48·45 tons. The following bricks, which we select from this table, were used on the Southern Outfall contract:—

	Weight. lb.	Pressure when first showed signs of giving — average in tons.	Pressure when finally crushed — average in tons.
Brimstone, Suffolks (Allan)	6·8	5·100	31·00
Best whites (Allan)	6·6	5·100	19·60
No. 3 Suffolks (Allan)	6·4	4·000	19·10
Best whites (Salters, Chilton)	6·3	5·300	25·90
No. 2 Suffolks (Salters, Chilton)	7·1	6·600	33·20
Gault wire-cut No. 2 (Webster, Burham)	5·4	6·400	32·90
Gault, pressed No. 1 (Webster, Burham)	6·1	7·400	36·80
Gault (Betts, Aylesford)	6·4	7·300	32·40
Best reds (Stares, Fareham)	6·3	8·420	26·10
Best rubbers (Stares, Fareham)	8·8	1·400	15·70
Best firebricks (Pearson, Stourbridge)	7·3	15·800	62·80
No. 2 Salmon (Ambrose, Colchester)	6·5	8·900	36·70
No. 2 Suffolks (Knight, Woodbridge)	6·1	8·800	37·30
Good stocks (Smeed, Sittingbourne)	5·3	5·700	33·90
Best blue (Gilbert, Tipton)	8·0	21·600	965·20*

Eighty-two other experiments were also made in 1859 and 1860, on the compression of bricks; and in the same years, thirty-eight experiments were made on the strength of various kinds of bricks, &c. From the tables recording these experiments we select the following items:—

Mr. Gilbert's blue bricks gave the total crushing power (average) at 50·00 tons, and 75·00 tons, the crushing power per square inch being 4,014lb. and 3,200lb.

Mr. Cliff's fireclay brick—total crushing

* This specimen withstood the utmost pressure of the testing press.

power (average) 65·62 tons and 37·50 tons, the crushing power per square inch being 4,218lb. and 2,401lb.

Machine bricks, red, manufactured by Mr. Platt—total crushing power (average) 28·12 tons and 18·74 tons; crushing power per square inch 1,667lb. and 1,619lb.

The following were the results of some blue bricks by three different makers :—Mr. Taylor, crushing power, 50·60 tons; ditto, square inch, 2,915lb.; Mr. Gilbert, crushing power, 75·00 tons; ditto, square inch, 4,759lb.; Mr. Cliff, Wortley Works, Leeds, crushing power, 72·00 tons; ditto, square inch, 4,639lb.

Mr. Helling's clay bricks showed a total crushing power (average) 26·00 tons, and a crushing power per square inch of 1,574lb.

These experiments are, of course, with the best made bricks, selected by the makers for the purpose. We need hardly say that the common bricks now so plentifully used in running up houses in London could not stand a pressure anything approaching that to which some of the varieties mentioned above were subjected.

In our recent article on "Home Made Bricks" we referred to a most excellent kiln, which had been successfully used by Mr. Moore, in a brickfield near Belfast. We have been requested to state that the kiln in question was invented by Mr. Hoffmann, of Berlin. The material used for these bricks is very rough, and they are produced at an extremely cheap rate. We understand that the cost of burning bricks by Hoffmann's patent is 8s. 4½d. less per thousand than by the old kilns. Mr. Rasch, a Prussian architect, speaks thus favourably of this furnace :—"As every new invention meets with difficulties by first realising it, I am happy to say that I was quite surprised to find the kiln built after your design answered the purpose directly at the first firing with complete success. Referring to the saving, in fuel I am happy to say that the result quite exceeds my expectation. I want for burning one thousand of bricks only 3 cwt., which shows a great saving compared with the old furnaces, requiring for the same number of bricks 11 cwt. of coals. I am convinced that your furnaces can be easily adapted to the manufacture of china, porcelain, &c."

A PHILOSOPHICAL VIEW OF ART.

No. 4.—The Religious and Secular Ideas.

With the Greek nation the endeavour to draw a distinction between the material and the immaterial, realism and idealism, or nature and humanity, died out. Unassisted reason, like the unassisted imagination, could at this period only turn upon itself, and invent theories that were often as impracticable as the wildest chimeras of the fancy. The speculative activity of polytheism, devoid of reliable physical knowledge, could only form a provisional separation between "moral" and "natural" science; while the contempt for practical arts among the Greeks tended yet more to estrange thought from the actualities of life—the internal from the external world. We find accordingly an advance in the mathematical sciences, or those developed from an *à priori* method.

Passing from Grecian to Roman civilisation a declension of the spirit of philosophic thought is manifested. The intercourse between the Greeks and Orientals tended to relax the vigorous pursuit after principles which distinguished the luminous epochs of Greek thought. The consequence of this was a reign of dogmatic and sceptical teaching destructive to real progress. Nor was this all. Essentially practical and warlike, the Roman mind regarded political aggrandisement too eagerly to concentrate its attention on the dogmas and speculations of opposite schools; and hence the Romans merely propagated or revived the old Pythagorean doctrines, or combined into systems by a process of eclecticism the ideas of Epicurus, Plato, and Aristotle; the severer principles of the Stoics and Academics finding fewer admirers than the sensual and accommodating system of the Epicureans. Between dogmatism and scepticism the Roman mind continually vacillated; now the Neo-Platonists popularised the religious and ethical ideas of Plato with an allegorical dress of religious mysteries, and then the system of the Empiric school reached an extreme that defied all future inquiry. I have elsewhere said that the preponderance of a single principle, or rather a stamp of unity, characterised all early civilisations, producing in Egypt and India an exclusive and stationary character; in Greece a rapid social development; and these different results are to be ascribed to the hereditary castes prevalent in the former countries, and the open competition of skill of the latter nation. It was different with Roman civilisation. A diversity of elements—a social agitation—prevailed; and the Empire itself sprang from an aggregate of municipalities or a confederation of towns. Italy and the west were covered by a number of towns; the intervening country being uninhabited, no social existence was found, and consequently there was no bond of union between them. The idea of a despotic central power organised and held together for awhile these scattered and independent states, till in the fourth century their dismemberment took place. The *à priori* reasoning of the Greek mind served rather to refine and elaborate than originate any new ideas; and hence in architecture the trabeated system of construction, suited as it was to the materials at disposal, received all the refinement and perfection of which it was capable. Principles seem to have determined all the Greek works of design. With the Romans it was otherwise. Little disposed to discriminate, and possessing a more daring and restless genius, their art displays an attempt to diversify and adopt what suited their ambitious views rather than to elaborate a previous system. The power of intensifying an idea, or working out a single principle to a philosophic subtlety shown both in the Greek philosophy and art, the Romans never possessed; they could not rest satisfied with such abstraction, but boldly introduced new elements. Hence, although known to the Egyptians, Pelasgians, and Greeks, the Romans were the first to introduce largely the principle of the arch, which attained in the Pantheon at Rome its fullest development. The Aristotelian principles of "magnitude" and "order" were readily seized by the Roman mind in the conception and realisation of their constructive art. Their temples, however, in size and importance yielded to their basilicas, theatres, and baths—an important fact to notice, as it constituted the first great step in the secularisation of art. In the Flavian amphitheatre all that characterised the Roman conception in practical vigour, warlike proclivities, and overpowering size, were majestically and architecturally embodied.

The dismemberment of the Roman empire, the inroads of the barbarian tribes, the increasing light of Christianity, and the downfall of Polytheism, all worked a wonderful change. The religious idea had dawned; and the mind became prepared for the dominion of monotheism. Christianity constituted a bond of union between the Romans and barbarians; in its simplicity of doctrine and in the association of common sentiments, it formed a neutral ground between a luxuriant and corrupted civilisation and a simple and nomadic life.

We have traced the transition from fetichism to polytheism, a change which mainly transferred the particular personification of phenomena or reverence for matter to more general and abstract deifications. The mind had passed its first social stage; it had begun to advance from particular to universal conceptions, from objects to classes, from the finite in nature to the absolute in spirit. Thus anthropomorphism succeeded to inert matter as the next step in the conception of Divine nature; from intelligence being imputed to matter it was ascribed to beings like ourselves. By the same process the variable began to be subordinated to invariable laws, and principles succeeded facts.

The rise of monotheism still further increased this spirit, though, on the other hand, the discordant elements of accumulated civilisation added to the difficulty of philosophic generalisation. The conception of man hardly kept pace with physical knowledge. Art as the exponent of a simple imaginative creed was thus far more expressive under the influence of polytheistic unity than it now is under the dominion of monotheistic diversity. Hence the primitive religion and thought of polytheism freely favoured the æsthetic faculties and the fine arts. We have now to see how, under the monotheistic spirit of the middle ages, the conception of art was influenced. Thought during this period of religious development was in general characterised by the subdued effort of reason under the dominion of a principle derived from revelation. Imagination and reason gave place to another power—viz., inspiration.

Though in a less material manner, we shall trace the same general law of mental progress during this era as we have hitherto been considering. The barbarian invasion may have temporally broken the chain of intellectual progress, and we find, after the primitive purity of Christianity had become dimmed, the monotheistic faith passing through phases analogous to fetichism and anthropomorphism. Many circumstances combined to make idolatry highly distasteful to the early church. The rise of the Gnostics was one of these. Distinguished as the most learned and influential among the Christians, they sought, like the Jewish cabbala, in various ways to reconcile and blend the dogmatic and obscure tenets of the East with Christian ideas. The religion of Zoroaster, and the existence of two opposite principles, are found blended in the Gnostic systems; and the identification of matter with the evil principle led the Gnostics to regard the universe as a fall from Divine perfection, as well as into all kinds of Oriental extravagance. Spirit and matter—God and the world—were thus put into direct antagonism. Hence primitive Christianity viewed Paganism in an odious light. We are told by Gibbon* that it was the general sentiment of the Church that the demons were the authors, patrons, and objects of idolatry. Interwoven as were all the public rites and spectacles with the deities of polytheism, it was natural that the Christian avoided with pious abhorrence anything approaching idolatrous reverence. Apollo and the Muses, Homer and Virgil, were, in the eyes of the Early Fathers, the organs and servants of the infernal spirit. The different phases of religious realisation are most faithfully reflected in the progress of Christian art, and it is to art alone, indeed, that we can turn in tracing them. Mr. Lecky, in his recent and able work "On the Rise and Influence of Rationalism in Europe," has, in a masterly manner, pretty fully sketched the tendency of thought as it revealed itself in the mediæval conceptions of art; and much light may be gathered from the valuable materials he has brought together in describing this particular period of religious thought.

From what I have said, it may be inferred that the early Christian artists adopted very cautiously the ideas and forms of paganism. We find accordingly Christian art at first only appropriating to its use those ideas which were marked by a simple and genuine sentiment; the world of sense and reason subordinated by the new doctrines to a more spiritual view of man's destiny; and the persecutions that raged so fiercely against the Christians led early Christian art into a particular channel. The catacombs became a striking object in the earliest development of

* "History of Decline and Fall of Roman Empire."

religious art. The simple and emblematic beauty of sepulchral decoration clearly portrayed the feelings and sentiments of the time. Among the Greeks and Romans images of sadness were banished from the tomb; death was deprived of its terror; and, instead of assuming the sombre garb of modern expression, the artist lavished wreaths of flowers and the genii of the seasons upon the tombs of the departed. The early Christian artists did the same; they scattered profusely upon their altar-tombs ornaments and emblems expressive of Christian hopes rather than memorials of suffering. Thus, the Crucifixion, scenes of the Passion, &c., were never represented by the early Church artist.

The Neo-Platonism of Alexandria, which combined with a knowledge and intuition of the absolute the prevailing spirit for Oriental fancies and a transcendental mysticism, aimed at a restoration of polytheism by recommending the worship of the gods as the emblems of the Supreme Being. Such doctrines as these tended in some degree to impart to the teaching of the church a kind of figurative expression, which soon formed a copious symbolism highly valuable as a means of instruction. The catacombs displayed many symbols borrowed from Paganism, as the masks, emblematic of lapse of life; the peacock, an emblem of immortality; while the Church produced many others in special significance of its own doctrines.

The barbarian invasion somewhat altered the aspect of art. Chiefly idolators, the barbarian tribes required a more objective form of art; their conceptions had not reached that refined power which enabled them to dispense with the assistance of representation. A tendency to directly represent the object of worship and to attach a sanctity to images becomes apparent. Spiritual conceptions that before needed no external aid were now expressed materially. During this state of civilisation a human embodiment of the Deity was necessary, and the Second Person of the Trinity was chosen for representation; while, as intermediate objects of veneration, the saints were also portrayed and received more or less deification. It is a remarkable fact, noticed by Mr. Lecky, that there existed no representations of the Supreme Being between the sixth and twelfth centuries—more unaccountable from the fact that there was so universal a tendency to embody conceptions; and it was not till the fourteenth century that portraits of the Father became general, and these representations increased in prominence till the first Person of the Trinity became the central figure. In Italy, Spain, and France, He was represented as a Pope; in Germany and France, chiefly as an Emperor or King.

THE COURTS OF JUSTICE COMPETITION.

Article XI.

We have already had occasion to remark the wide difference in *character* of designs the authors of which are well known to agree on most matters connected with art. We have seen with what affection Mr. Burges can cling to the French Palatial architecture of the middle ages. We have seen how deeply Mr. Street sympathises with the Cistercian, and how well he labours in that particular phase of monastic architecture which we always associate with that order. In Mr. Seddon's rows of gables and flat detail, we have something which unquestionably savours strongly of the English market town, and is of an essentially domestic character. And, lastly, in Mr. Brandon's design, we have the ecclesiastical feeling strongly marked; but, instead of suggesting to us quiet valleys and agriculturally-minded monks, it reminds us of the great works of the secular clergy, and more than suggests the Mediæval cathedral surrounded by its official residences. The reason of this is in great part owing to the very free use of spires and spirelets, in which Mr. Brandon has indulged. In plan, this architect has adopted the Central Hall idea, round which nearly all the courts of law are grouped. Outside the courts are the judges' rooms, then the judges' corridor, then an area or street all round the building, of the very ample average width of 33ft. 6in.; and then comes the outer shell of buildings, devoted to the minor offices. This outer block "measures about 687ft. from east to west, by 445ft. 6in. from north to south," and "the area required for the general accommodation" has been "exceeded by 34,850 superficial feet, besides spare rooms." These are extracts from Mr. Brandon's report, page 3, so that we may fairly conclude that this architect was more than satisfied with the site, and had none of those difficulties to contend with which seem to have pressed sore on those competitors who were so weakly practical as to fancy that public offices six or seven stories high would be in any way inconvenient. By the reduction of the site to the dimensions above quoted, the difficulty of Pickett-street is swept away altogether, and the site towards Temple Bar is given up for a raised pathway or broad bar walk terminating eastward in the clock tower, which stands detached from the main building, and forms an abutment to the new bridge over Temple Bar. The barristers' and attorneys' corridors, and nearly all the consultation rooms, are on the floor above the court level. The arrangements for barristers entering the courts seem to us very far from satisfactory; and, although there is undoubted ingenuity displayed in many parts of the plan, as for instance in the apsidal treatment of the ends of the great hall, yet we cannot congratulate Mr. Brandon, either on the question of convenience or on his solution of that important part of the problem which relates to the despatch of business. Before, however, we take leave of the plans it ought to be noted that Mr. Brandon, like Mr. Scott, has taken advantage of the liberty allowed to the architects "to make such projections or extensions of the building westward as they may find desirable . . . . . so long as they preserve an equivalent in area for Clement's Inn." Mr. Brandon has certainly made the most of this liberty, and has not been particular in taking a few other liberties which are not in the bond, such as the removal of the buildings lying westward of the site, so as to secure sufficient open space to get the whole of his building within the angle of vision. The planning of the west end of the building forms a very important part of Mr. Brandon's scheme. The angles of the outer shell of the building at this end are treated as quadrants of three stories, flanked by low massive towers or pavilions, and broken up by projecting circular turrets. Between the abutment or flanking towers of the quadrants which look west are two large towers with spires, and in advance of these two other towers, almost detached, of about the same size as those behind, but a story less in height and covered with high roofs instead of spires. Of the elevations and views, we think there can be but one opinion. Setting aside the eminently ecclesiastical *idea* of the whole composition, there is no design in which the various buildings would group more picturesquely, or in which the skyline would be so varied and yet so grand. Nor would it be just in us to pass by the thoroughly domestic character of the great mass of the building. For it must be remembered that whilst Mr. Brandon's design savours too strongly of the cathedral idea, it does so wholly by virtue of its western spires and central hall. We do not wish to inquire too particularly into Mr. Brandon's architectural studies, but if an architect who feels himself called upon to design a Gothic hall for a Palace of Justice 365ft. long by 130ft. wide knows no better models for his purpose than the Sainte Chapelle or the Minsters of Amiens or Westminster, we sincerely pity him. To reproduce almost line for line not only all the horizontal divisions of a mediæval minster, its nave and aisles and apse, and even its apsidal chapels, but also all the vertical divisions of main arcade, triforium, and clerestory, is an error of judgment that would be quite inexcusable if we did not think that its author had by this time heartily repented of it. And this is all the more to be regretted, because the design as a whole is so charmingly grouped, and possesses very many features of considerable architectural merit. We shall not pause to inquire whether six stories, including the basement, is a practically good way of overcoming the difficulties of the plan problem; but, apart from this consideration, there is a great amount of noble design in both the Strand and Carey-street façades. The great fault, as it appears to us in these fronts, as well as in the quadrants going westward, is the excessive amount of voids—in other words, of window space and plate glass as compared with the solids or wall space. The architect's report shows that this sacrifice of good art to the light mania of the day was deliberate and intentional. Mr. Brandon says "it is imagined by some that the latest period of mediæval architecture, known as Perpendicular, affords greater opportunities for free arrangement and for light than those which preceded it. These advantages really depend, however, on the mode of treatment, and it may be confidently asserted that all periods after the twelfth century show as great, or I may say greater, freedom from repetition of parts, and allow of a larger amount of glass than wall space, if necessary." Of course, "it depends on the mode of treatment;" but we would, with all humility, suggest to Mr. Brandon that "mode of treatment" is as much part and parcel of style as the sections of mouldings, or the forms of cusps, and that if you sacrifice the strong mode of treatment which characterises all the best and early works of the middle ages for the weak construction and panelled treatment of the most *effete* examples of the later styles, the details of a purer age will avail you but little.

We shall conclude our separate notices of the designs next week, for we find upon further consideration that it is quite impossible to give a separate notice to the lame apology for a design which Mr. Abrahams has had the hardihood to submit.

DECAY OF AN INTERESTING RELIC.

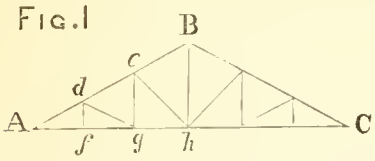
Archæologists will be sorry to learn that Cæsar's Tower, at Warwick Castle, has begun to show signs of decay, after having withstood the winds and storms of more than eight centuries. It appears that about one o'clock on Wednesday afternoon, a small portion of the parapet wall on the south side of the tower gave way together with its supports, and fell on the basement below near the mill, a depth of about 120ft. Between four and five o'clock on Thursday morning, a second portion fell, and the amount already fallen is considered to be about nine or ten tons weight, and about 15ft. in length of the parapet wall given way. This wall is about 5ft. in height, and extends several feet beyond the main body of the structure, and is supported by stone brackets. These brackets are a few feet from each other, and immediately inside the parapet wall is a small ridge made for the purpose of carrying off the water from a flat lead roof adjoining, and probably owing to the holes being choked through where it should run away, it has run over, and has consequently and for a considerable time past kept the supports of the wall very wet. This is supposed to have made the stone, together with old age, give way. The figure which stood on the top of the wall representing a spy, commonly called "Moll Jobson," has also fallen with the other portion. Other parts of it are considered to be not in a very safe state, and probably we shall soon hear of more of it falling. No damage was done by its fall, save that of the basement of the tower, which projects beyond the perpendicular, sustaining a little injury, but, if the fall had occurred the opposite side, the consequences might have been serious.

ELEMENTS OF ENGINEERING.

IRON ROOFS.—No. 3.

IN pursuance of the intention expressed in our second article on Iron Roofs, we now proceed to demonstrate the principles upon which the formulæ given in that article were based, those formulæ relating to principals of the upright truss construction as represented in the diagram (fig. 1).

FIG. 1



The whole principal A B C may be analysed into a system equivalent to five distinct trusses of the first class—the primary truss A B C, the secondary truss A e h, and the tertiary truss A d g, and truss similar to, and symmetrical with, the latter secondary and tertiary trusses situate in the half B C h of the main principal. It will be sufficient for our purpose to consider the theory of strains on one half A B h of the principal. The load on the rafter A B will be distributed on the points A d e B, in the following proportions:—Let w = load per foot lineal on the rafter, then the loads will be

$$\text{On point A} = \frac{w \times \overline{A\,d}}{2} \quad \ldots \ldots = W^{i}$$

$$\text{,, ,, } d = \frac{w \cdot (\overline{A\,d} + \overline{d\,e})}{2} = W^{ii}$$

$$\text{,, ,, } e = \frac{w \times (\overline{d\,e} \times e\,B)}{2} = W^{iii}$$

$$\text{,, ,, } B = \frac{w \times e\,B}{2} \quad \ldots \ldots = W^{iv}$$

Commencing with the tertiary truss A d g we will determine the strains on A d, d g, and A g, due to the load W^{ii} acting at the point d. Let i = the angle, g A d = the angle, d g A the load to be carried by each of the bars d A, d g will be

$$= \frac{W^{ii}}{2}$$

Determining the strain produced by this load according to the well-known principle of the parallelogram of forces and stating the formula trigonometrically, we find

$$\frac{W^{ii}}{2 \sin. i} =$$

the strain on A d, and also that on d g, these strains being in compression.

The strain in tension on the bar A g due to the load W^{ii} will be

$$= S \times \cos. i$$

where S = the strain in compression found by the previous formula, but

$$S = \frac{W^{ii}}{2 \sin. i}.$$

Hence the horizontal strain is

$$= \frac{W^{ii}}{2} \cdot \frac{\cos. i}{\sin. i}$$

$$= \frac{W^{ii}}{2} \text{ cotan } i.$$

The thrust upon the bar A d is resolved horizontally as above on the bar A g, and vertically upon the pier or support to the roof at A. That upon the bar d g is resolved horizontally on A g, and vertically on the tie g e. We must therefore now ascertain the amount of tension on the bar g e. Proceeding as before it will be

$$= S \times \sin. i$$

But

$$S = \frac{W^{ii}}{2 \sin. i}$$

Hence the strain of the bar g e will be

$$= \frac{W^{ii}}{2 \sin. i} \times \sin. i = \frac{W^{ii}}{2}$$

being equal to the portion of the load at d, which is carried by the inclined bar d g. This becomes also a load at the point e additional to that already referred to, the tertiary truss A d g being, as it were, carried at one end on the support A, and at the other end by the tie rod g e, suspending it from the apex of the secondary truss A e h. Thus the total load at the point e will be

$$W^{iii} + \frac{W^{ii}}{2}.$$

We must now proceed to consider the strains on the secondary truss. According to the laws of the lever the load at e will be carried at the points A and h in the following proportions:—

$$\text{Load at A} = \left\{ W^{iii} + \frac{W^{ii}}{2} \right\} \cdot \frac{\overline{g\,h}}{\overline{A\,h}}$$

$$\text{,, } h = \left\{ W^{iii} + \frac{W^{ii}}{2} \right\} \cdot \frac{A\,g}{A\,h}$$

Let m = the angle e h A, and n = the angle e A h, then will the strain on the bar e h

$$= \left\{ W^{iii} + \frac{W^{ii}}{2} \right\} \cdot \frac{A\,g}{A\,h} \cdot \frac{1}{\sin. m}$$

and the strain on the bar e A

$$= \left\{ W^{iii} + \frac{W^{ii}}{2} \right\} \cdot \frac{g\,h}{A\,h} \cdot \frac{1}{\sin. n}$$

The tension on the bar g h will be

S^{i} being strain on e h = $S^{ii} \times \cos. m$

But as shown above

$$S^{i} = \left\{ W^{iii} + \frac{W^{ii}}{2} \right\} \frac{A\,g}{A\,h} \cdot \frac{1}{\sin. m}$$

wherefore the strain on g h

$$= \left\{ W^{iii} + \frac{W^{ii}}{2} \right\} \frac{A\,g}{A\,h} \cdot \frac{\cos. m}{\sin. m}$$

$$= \left\{ W^{iii} + \frac{W^{ii}}{2} \right\} \frac{A\,g}{A\,h} \cdot \text{cotan. } m$$

In the case of the tie B h, or rather the half of it which may be regarded as belonging to the half A B h of the main principal, we proceed as with the bar e g, for as that bar carries one end of the tertiary truss A d g, so this carries one end of the secondary truss A e h. Hence the strain on B h will be

$$= \left\{ W^{iii} + \frac{W^{ii}}{2} \right\} \frac{A\,g}{A\,h}$$

which, being added to the load on B due to direct weight, gives as the total load at B for the rafter B A

$$W^{iv} + \left\{ W^{iii} + \frac{W^{ii}}{2} \right\} \frac{A\,g}{A\,h}$$

This load will produce on B A a strain

$$= \left[W^{iv} + \left\{ W^{iii} + \frac{W^{ii}}{2} \right\} \frac{A\,g}{A\,h} \right] \cdot \frac{1}{\sin. n}$$

and this will produce on the bar A h a strain

$$= \left[W^{iv} + \left\{ W^{iii} + \frac{W^{ii}}{2} \right\} \frac{A\,g}{A\,h} \right] \cdot \frac{\cos. n}{\sin. n}$$

$$= \left[W^{iv} + \left\{ W^{iii} + \frac{W^{ii}}{2} \right\} \frac{A\,g}{A\,h} \right] \cdot \text{cotan. } n$$

Having thus determined the strains produced in each truss separately, it now remains for us to sum these strains, in order to ascertain the total strain on each element, for it must be remembered that the five trusses of the principal are not, in practice, distinct and separate from each other, but the offices of their elements are combined, so that two or more strains act upon one bar. The summarised strains will be as follows:—

$$\text{On B } c = \left[W^{iv} + \left\{ W^{iii} + \frac{W^{ii}}{2} \right\} \frac{A\,g}{A\,h} \right] \cdot \frac{1}{\sin. n} = x$$

$$\text{,, } e\,d = x + \left\{ W^{iii} + \frac{W^{ii}}{2} \right\} \frac{g\,h}{A\,h} \cdot \frac{1}{\sin. n} = y$$

$$\text{,, } d\,A = y + \frac{W^{ii}}{2 \sin. i}$$

$$\text{,, } A\,g = \frac{W^{ii}}{2} \text{cotan. } i \quad \ldots \quad \ldots \quad \ldots \quad = z$$

$$\text{,, } g\,h = z + \left\{ W^{iii} + \frac{W^{ii}}{2} \right\} \frac{A\,g}{A\,h} \cdot \text{cotan. } m$$

The strains upon the bars e g and B h will be as already given.

From these complete formulæ the proportions of any roof designed on the principle above described may easily be calculated; and if even there be more trusses in each principal than are shown in the example the processes above given merely extended will meet the exigencies of the case. But it should be borne in mind that in such calculations the smallest truss should be commenced with working up from that to the primary or main truss.

When the proportionate lengths of the elements of the roof are known the formulæ may be greatly simplified, as may be observed from a previous article (No. 2, Iron Roofs), in which the bar A h is assumed to be trisected in the points f and g. When it is thought desirable the trigonometrical functions may be replaced by geometrical formulæ. Thus, the

$$\sin. i = \frac{d\,f}{A\,d} =$$

$$\sin. m = \frac{e\,g}{e\,h}$$

$$\sin. n = \frac{e\,g}{e\,A} = \sin. i$$

$$\text{cotan. } i = \frac{A\,f}{d\,f}$$

$$\text{cotan. } m = \frac{g\,h}{g\,e}$$

$$\text{cotan. } n = \frac{A\,g}{g\,c} = \text{cotan. } i$$

assuming that A C is a horizontal straight line.

F. C.

"Professional" in a letter takes exception to the definition of a plate-girder, as given by the writer on this subject. "Professional" says:—"A plate or solid sided girder is distinguished from all others of the open or lattice sided form by the fact of its sides or web consisting of solid sheets or plates of iron, while the web of the others is composed of upright or diagonal bars and sometimes of both. The booms or flanges of a plate girder have nothing whatever to do with its appellation, inasmuch as they are the same, and may be made in the same manner for any form of girder, whether plate or open-sided. The flanges of any description of girder may be built up with plates one upon another until the proper amount of sectional area is obtained. For example, the Charing Cross Blackfriars Railway bridges are open-sided girders, and the Cannon-street bridge, the unsightly structures spanning the street close to London Bridge and over Waterloo-road are plate girders. I notice, further, another mistake, where the writer remarks that L-iron above 24ft. in length will be charged extra. Will you allow me to state that I have ordered personally L-iron up to 40ft. in length without incurring any extra charge? I required it for a bridge I was designing of 36ft. span; I wished, if possible, to get the angle-iron for the flanges all in one length, which I found I was able to do without being charged extra for it."

THE POSITION OF TOWN SURVEYORS

(FROM A CORRESPONDENT.)

WILL you allow a late town surveyor to tell a true and sad tale? About two years ago an associate of the Institute of Civil Engineers was elected as a surveyor and waterworks manager to a town in the south-west of England, consisting chiefly of villa residences. The new surveyor was elected to supply the places of the previous surveyor and assistant surveyor—the former was given to understand that his resignation would be acceptable, the assistant was summarily dismissed.

The new surveyor, although a perfect stranger, was nearly unanimously elected on the strength of his testimonials, brought from a town in the north where he was much respected and his leaving universally regretted. The new surveyor had first-class testimonials from seven members of the Institute of Civil Engineers, six magistrates, five mayors, one mining engineer, who with the surveyor had been seven years in collieries of West Yorkshire; one town clerk, a Board of Guardians, a Vicar and Doctor of Divinity, a Chamber of Commerce, two eminent architects, and the chairman and members of the following committees, under whom the surveyor had served, viz., street and drainage, waterworks, building and improvement, sanitary, &c. The new surveyor brought his family and furniture 230 miles from his home; and when he arrived at his destination he found that he had the management of the waterworks (a very complicated system), twenty-five miles of roads to keep, also to superintend sixty or seventy men without the aid of a foreman for six months, and the Board did not even provide a clerk to attend to the office during his absence attending to the important outdoor duties. In addition to the before-mentioned works, he had the drainage of the district to lay out and superintend, new buildings and streets to superintend, and a multi-

te of other work of a character entirely u t for a man of education. After twelve months' hassing work and trouble the surveyor was sdenly called upon to resign. He then chalged the Board to state what charges or fault tl had to find with him. The committee met, s the surveyor made a truthful and honest stement, so said the faithful clerk, to the Board. Asolution was then passed to the effect that tl s was no necessity for any change. In the sg, summer, and autumn of 1866, the surv or had a vast amount of work thrown upon b. Amongst other duties devolving on him hassisted at night and early morning in a novel pess of cleaning the corroded water pipes: the n n sewers of the district were designed and laid o by the surveyor on the most approved system; s pipes also laid to carry the sewage into deep w er, there being no land suitable for irrigation p poses.

he harbour was also partly reconstructed, a many important streets were widened and i roved at a considerable cost by the surveyor, w has testimonials from the largest employers o eam labour referring to the superior character his work. The amount of work executed w excessive, the great bulk of the work having b designed and laid out at his residence, t e being no private room at the townhall. D ing the spring, summer, and autumn months t surveyor rarely retired to his rest before t a.m., and frequently had to leave his home b een four and five a.m. to assist in the scraping o s pipes, and at the same time to keep his w at the office and in the town in regular order. A r all this severe and harassing life, the sur r was obliged to put himself under care of hi medical adviser, caused partly by anxiety at t conduct of certain members of the Board and o work; and the probability is, that the disease i such a character that the surveyor will never re er from it. In August, the arch enemy of th surveyor made a most unjustifiable attack u his conduct, which the surveyor treated with co empt, well knowing that his previous cha r and testimonials refuted the slander; be s the gratification he felt at the severe remarks m e upon the conduct of the arch enemy by respect al inhabitants of the town. This animosity was con tly exhibited for some months afterwards; and a st, through the influence of the arch enemy and t friends bearing the same surname, a meeting e Board was called, and the surveyor was not al ed to be present as the usual custom was; a even their old and faithful clerk was requested to tire from their deliberations. In this secret a Spanish inquisition the arch enemy made the m gross and false attacks upon the surveyor's c acter, and was the cause of his having a three m ths' notice to leave the service of the Board. W n this result of their private deliberations was c municated to him, he demanded to know w t were the charges which ha d caused this s mary dismissal. To his great astonishment h ould not get an answer; and notwithstand n the many inquiries made by himself and others, n reason has been assigned to this day. The c sequences to the surveyor are most disastrous: h has lost in pecuniary matters, his health is i red, and his professional character damaged. I arge towns, where gentlemen, merchants, and p fessional and well-educated men have charge of t administration of their local affairs, their en gers and surveyors are invariably treated w respect, confidence, and that gentlemanly f ing due to their position, and also with d rence to their professional knowledge and s l, instead of preferring their own opinions, n acked by want of knowledge and expe ce. The treatment this surveyor has had i he south-west town is precisely the reverse of w t he had in the northern borough.

annot, under these circumstances, some means b devised to protect officers whose zeal and a duity administer and carry out the provisions o one of the most beneficial Acts of Parliament e r passed for the purpose of securing and pro ting the public health from being dismissed i summary manner? The present system de ys confidence; and civil engineers will despise s h appointments rather than compete for them, t ugh they ought to be posts of honour, as well a of emolument. In the Public Health Act t re is a clause to prevent surveyors from being d missed without just and sufficient cause, and t consent of the Home Secretary being ob ned to such dismissal. There is already a r edy in existence for special cases. On Decem l 19, 1866, the case, "Wilson v. the North Staffordshire Coal Company," was tried in the Court of Common Pleas, for wrongful dismissal. Damages £500, and salary due £6 0s. 8d.; costs to be paid by defendants. This case is not so bad as the late surveyor's. In the former case reasons were given—in the latter none.

Archæology.

The Round Tower of Ardmore stands 96ft. in height, and is generally considered as being one of the most perfect of the old Irish towers. It is said to be the intention of Mr. Edward O'Dell, the owner of the manor of Ardmore, to have the conical cap of the Round Tower repaired, and the crowning top stone, lately fallen, replaced in its ancient position. This stone appears to have been at some very remote date elaborately carved, but is now much defaced by the hand of time.

At Wrexham Church, a fortnight ago, a large painting was discovered on scraping the walls over the chancel arch. It appeared to be a representation of the Final Judgment. We are glad to hear that care is to be taken to uncover it, and thoughts are entertained of preserving it, if it shall be found in a state which justifies such a measure; if not, we trust that a careful drawing of it will be preserved.

A discovery of some interest has been made in a field belonging to Mr. Thomas Tombleson, on the south side of the Blow Wells, and west of the town of Barton. Two men were engaged in digging away soil to fill up a large hole near the drain separating the wells from the field, when they exposed several large worked stones, finely cut and faced. An old window made of lead, with fire bars, and the remains of what looked like coloured glass, were also found. A number of stones were dug up, which appeared to have formed a foundation. These stones are of a greyish character, whilst the other are limestone. The wells are deep springs of flowing water, and in the old town book are called "the Shadwells." Some such wells have existed for many centuries, and are usually at the foot of the chalk strata, merging on boggy ground. As there are similar wells at Barrow and Ferriby, known by the same name, and as there is good evidence that the old hermit, St. Chad, had a cell at Barrow, it is not unlikely these wells were sacred to him, and that small hermitages were erected in their vicinity, as the waters were supposed to be endowed with miraculous qualities in the dark ages.

Kent Archæological Society.—The Council of this society held their quarterly meeting on Thursday, at the Guildhall, Canterbury, when it was resolved that the annual general meeting should be held this year at Dartford, the day to be fixed later in the season. The following noblemen, gentlemen, &c., were elected members of the society:—The Earl Granville, K.G., Lord Warden of the Cinque Ports, the Athenæum Club, the Library of the Dean and Chapter of Canterbury, and Henry Kettel, S. J. Mackie, John Callaway, W. W. Cobb, J. L. Jardine, and — Scott, Esqrs., and the Rev. W. Newton. It was also resolved that the right of membership should be exercised by Lieutenant General Sabine, President of the Royal Society, on behalf of the Athenæum Club, and by the Librarian for the time being on behalf of the Chapter Library. Charles Powell, Esq., of Speldhurst, was elected honorary local secretary for the Tunbridge Wells district.

The Statues at Fontevrault.—The Imperial Society of Antiquaries of France, at its last sitting, received official notice that the statues of Fontevrault are not to be given up to England. Queen Victoria, it appears, has written to the Emperor to say that, in presence of the emotion caused among the French public and manifested in the organs of the press, she renounced accepting the present offered to her. Her Majesty only expressed a desire that those precious relics, actually buried in a dark recess of a low and damp chapel in the prison of Fontevrault, should henceforward be preserved in a more suitable manner.

Forgeries of Antiquities.—Edward Simpson, the once famous manufacturer of forged fossils and antiquities, has just been sentenced to twelve months' imprisonment at Bedford for felony. Thirty years ago he was a servant of Dr. Young, of Whitby, from whom, by assisting in his geological and antiquarian pursuits, he acquired an amount of practical knowledge of objects of interest and value to the students of those sciences, and for some years after his master's death he earned a living as a collector and dealer in fossils and antiquities. At length, however, he gave way to the temptation to manufacture forged specimens; and he showed great skill in the manufacture, and great industry and cunning in his disposal of them. For a time he established himself in the clay cliffs at Bridlington quay; then he removed to the woods of Stanton Dale. Here he had a regular manufactory of flint implements and of Roman and British urns. The North and East Ridings of Yorkshire were his principal field of operations, but his spurious specimens found their way all over England; they comprised not only flint arrow heads and hatchets, and stone celts, and hammers and adzes, and rude Roman and British urns, but also articles of jet, as seals, and rings, and necklaces; leaden antiques, Roman milestones, armour, and miscellanea; and many of them were so ingeniously forged as to deceive those who were not very well versed in the matter. In 1859, in one of his trips to London, Professor Tennant got hold of him and induced him to confess his trickeries, and even to appear at the meetings of several antiquarian societies, and describe the method by which his flint antiquities were made, in order to throw light on the question of the ancient manufacture of the genuine articles which he so ingeniously and easily imitated.

GLASGOW ARCHITECTURAL SOCIETY.

GAS LIGHTING.

At the usual monthly meeting of the above society held last week, Mr. Alexander Thomson in the chair, Mr. William Johnston, of the firm of Johnston, Fraser, and Co., read a paper on "Gas Lighting." After sketching early experiments—the first application of gas light by William Murdoch in 1792, at Boulton and Watt's works, Soho, in 1798, and other places—Mr. Johnston remarked:—Murdoch's discovery and practical application of gas lighting in 1792 could not be kept secret. Nine years afterwards, one of the Watts being in Paris wrote to his brother at Soho—"If anything is to be done with Mr. Murdoch's gas, it must be done at once, as there is a Frenchman in Paris who has similar ideas, and proposes to illuminate that city by these means." The first French patent, that of Lebau, was obtained in 1799, and the first English patent, that of Winsor, in 1804. If Londoners will insist upon ignoring the facts as to Murdoch's invention, as they generally do, and date the invention from the date of the patent, then the French patent, being of earlier date, will give the priority claimed by France for Leban. Fortunately Cockneydom is not Britain, and fortunately the preserved records of the committee of the House of Commons, with the evidence of the Watts, the letter from Paris of which I have just quoted a verbatim paragraph, and the evidence of others who knew of Murdoch's early experiments, have settled beyond power of cavil the claims of William Murdoch to have been by several years the first man to practically apply gas lighting. Gas lighting was first exhibited in London in 1803 (eleven years after Murdoch's house and offices had been lighted. This tendency of most Londoners and London writers to ignore or undervalue anything not "Town," is a serious disadvantage to themselves, and may, I think, account for the fact that the people in London have to tolerate the most clumsy and ill-fitted gas appliances in their shops and houses—gas so foul and coarse and street lamps of such imperfect construction as would not be tolerated in any third-rate town in Scotland. Why should escapes of gas and consequent accidents be so common in London as compared with this part of the United Kingdom, but from that conceit which tells a man he has nothing to learn from outside? and why is it that so many people in London decline to have gas in their rooms? Better fittings and better gas would soon cure this. Glasgow and Edinburgh have now the best and purest supply of gas in the kingdom, probably the best in the world; hence its use in every apartment of our houses, and few gentlemen's houses in Scotland of any size are without private gas works, if distant from towns where gas works exist. Coal gas is a carburetted hydrogen of various degrees of purity, depending greatly upon the quality and kind of coals used, but also

upon the care and skill evinced in its manufacture. So varied is it that in some towns gas has 2½ times the illuminating power it has in others. The intensity of the light depends upon the amount of carbon in the gas, and the length of time these particles of carbon remain in an incandescent state before being consumed. Common coal gas is deficient in free carbon; cannel coal gas is rich in particles of carbon. If there be a limited supply of air to the burner or if the gas be burned at too low a pressure, there is not sufficient power to sustain the particles of carbon in a sufficiently heated state, and a loss of light in proportion to the gas consumed is the consequence. In approaching the consideration of how best to apply gas in the lighting of buildings, so as to obtain the most available amount of value from the quantity of gas consumed, we are not left to vague conjecture. It is a well-known law that light decreases in intensity in proportion to the squares of distances, which was illustrated by reference to a diagram, by which law a lamp (say) with five burners, at 7ft. from table, would at such table give as much light as a lamp (double the distance) with 20 burners, or as a lamp 21ft. (triple the distance) with 45 burners, or as a lamp 28ft. (four times the distance) with 80 burners, the burners in each case being equal. Hence it follows that to remove the burners to the greatest possible distance in a building from the place where the light is required is the way to get the least possible benefit as to illumination from a given amount of gas consumed; or, in other words, it is the way to burn the greatest possible amount of gas to secure the requisite amount of light—where the light is required. Yet this is what is done by what are termed "sunlights" stuck up in the ceiling, a mode of lighting large buildings which has, notwithstanding, been rather fashionable during the last few years, and like many other mere fashions neither consistent with beauty nor usefulness. To use gas to the best advantage in large buildings, the lights should be distributed instead of clustered into centre nuclei, as the illuminating power decreases as the squares of distances; large halls should have the lamps well distributed, instead of from one large central group of burners. In this way 8 lamps of 20 burners each for a very large hall would equally light every part, while with a central lamp of 160 burners the extremities of the hall would be in comparative darkness. With more moderate sized buildings 4 lamps of (say) 15 burners each would be more useful than one central lamp with double the number of burners. For large dining and drawing-rooms two or more lamps are preferable to one in the centre, unless the one in the centre is supplemented by wall brackets. The best kinds of gas pipes were discussed, after which the lamps to be used in lighting apartments of private houses, shops, warehouses, and other public buildings claimed attention. All appliances for gas lighting should be designed, decorated, and finished with regard to the object or end for which they are constructed, viz., distribution of light. Everything that obstructs the light, and that can properly be dispensed with, is decidedly objectionable. The various kinds of lamps having been freely commented upon in detail, Mr. Johnston remarked that, as to the price of gas, there are few towns so well off as Glasgow, when the illuminating power is taken into account—4s. 2d. per 1,000 for 30 candle gas is as cheap as London 12 candle gas would be at 1s. 8d. per 1,000 cubic feet, with no deduction for the smoke and dirt. The two Glasgow gas companies pay their shareholders a more than ordinarily good dividend—in other words, they make a handsome profit by selling gas at 4s. 2d. per 1,000 cubic feet. To send cannel coal by ship to London would cost about 15s. per ton, and as each ton of cannel coal produces at the lowest calculation on the average 12,000 cubic feet of gas, the London gas companies ought to be able to sell gas at the rate of 5s. 5d. per 1,000 cubic feet of a quality 2½ times better in illuminating power than the sort they now supply. In conclusion, he submitted the following plain rules as an epitome of what he had by tests and otherwise pretty fully explained:—For coarse gas, use No. 5 fish-tail burners, at a moderate pressure; for cannel gas, Nos. 2 and 3 fish-tail burners; renew the burners frequently; check the pressure at the meter when it gets too strong; distribute the lights in all buildings instead of concentrating them in one spot; bring the lights as near as convenient to the place to be lighted; use in fitting good full-sized gas pipes; select lamps which offer the least obstruction to the light; above all, avoid low-priced appliances for gas-lighting.

DROMORE CASTLE, CO. LIMERICK.

Our illustration this week represents the north-east view of the building which is about to be erected at Dromore, near Limerick, as a residence for the Right Honourable the Earl of Limerick, from the designs and under the superintendence of Messrs. Godwin and Crisp, architects. The site selected is at at the extreme north angle of the wood which overlooks Dromore lake. The plans have been so arranged as to admit of extension southwards. The corridors are kept on the outer side of the building, and all the entrances are well guarded, so that in the event of the country being disturbed the inmates of Dromore Castle might not only feel secure themselves but be able to give real shelter to others.

IMPROVEMENTS IN MACHINERY.

Our attention has been drawn to improvements in machinery for cutting, shaping, and polishing moulding curves and all other forms in stone and wood. This improved machinery for cutting and shaping stone is capable of preparing and finishing from the hewn block every description of framing for doors, arches, windows of Gothic or other architectural character, together with mouldings, rabbets, and other shapes, and, in fact, is applicable to every kind of architectural work. The machinery may also be readily adapted for cutting curvilinear and other shaped mouldings in wood, and also finishing and polishing the same. The machinery is of a most simple character, being easily managed, and will accomplish as much work as twenty-five skilled workmen in the same period of time. The inventor is Mr. Robert Thompson, late engineer in charge of the woodworking machinery at H. M. Dockyard, Woolwich, and the inventor of the machine known as Thompson's "universal joiner and wood shaping curvilinear sawing machine."

A NEW CATHEDRAL FOR BERLIN.

King William addressed, on the 21st, the following letter to Dr. von Muhler, the Minister for Public Worship:—"King Frederick William III., my lamented father, now resting in God, desired, as far back as the close of the War of Liberation, to erect to the honour of God and for the assembly of the Christian community, a more handsome edifice in the place of the old cathedral at Berlin, as a visible token of thankfulness for the assistance given by the Lord in a season of pressing need. The circumstances of the time only permitted the idea to be carried out to an insufficient extent, but it has been handed down as a permanent and constantly recurring admonition to succeeding generations. King Frederick William IV. again took up the idea, but his munificent plan could not be prosecuted owing to the obstacles presented by events. At the close of this year of my life, in which I and with me my people, after new and arduous struggles, again thank God for so many mercies and for the restoration of peace, the desire is manifested anew to give common lasting expression by such a work to the gratitude we joyfully acknowledge with heart and lips. I again take up the plan for building a new cathedral worthy of the metropolis upon the site now occupied by the present edifice, and I await further detailed proposals from you as to the execution of this design.

"(Signed) William.

"Berlin, March 21, 1867."

ARTISANS' AND LABOURERS' DWELLINGS' BILL.

This Bill is now in a fair way of becoming law. The second reading was moved in the House of Commons on Wednesday, by Mr. M'Cullagh Torrens, who sketched its chief provisions. It gives power to the officer of health, either on requisition or without it, to inspect premises in a state likely to engender disease, and upon his report the local authority, after the process of a presentment to the grand jury has been gone through, may cause plans to be made for the improvement or demolition of the premises. The owner of the premises may either sell them to the local authority or carry out the works himself, and if he neglects or refuses to do either, the local authority may effect the improvements, charging the costs to the owner; but when total demolition is required the local authority must compensate the owner. The expenses of the local authorities in carrying out the Act are to be charged on the local rates, which however, are not to be increased by more than 3d in the pound; and they are also empowered to borrow money from the Public Works Loan Commissioners, under the sanction of the Treasury. Mr. Torrens intimated that he should gladly acquiesce in any improvements which could be suggested in the machinery of the Bill. In the discussion which followed, the Bill was warmly supported by Mr. Locke, Mr. H. Bruce, Mr. Sewyn, Mr. Hughes, and Mr. M'Laren; and its leading provisions were generally approved coupled with suggestions for the improvement of the machinery, by Mr. Ayrton, Mr. Henley, Mr. Potter, Mr. Powell, and others. Objections were taken to the Bill by Mr. J. B. Smith, and Mr. Bazley, particularly to the erection of new buildings at the expense of the ratepayers. Mr. T. Chambers pointed out that no provision was made for the evil of overcrowding; and Mr. H. Lewis complained of the burden which was about to be thrown on the rates. Mr. Walpole, on behalf of the Government, assented to the principle of the Bill, intimating that it would require amendment in some of its details, and it was read a second time.

BLACK MORTAR.

The liability of mortar to the infiltrating action of rain and damp has always been a source of anxiety to those engaged in building. There never was a time when bridges, houses, and every description of stone and brick erections, were constructed with so great rapidity. It was the usual custom to allow successive sections of the brick work to settle before proceeding to add to its height, but this would be too slow for the present generation. We now build a house in less time than it used to take to get the foundation in. It is, therefore, tenfold a matter of importance to have sound and durable mortar; any method of rendering it impervious to the influences alluded to is worthy of consideration. M. Chevalier proposes to effect this by adding a portion of coal to the usual ingredients and obtains in this manner, he states, a most solid and impermeable material. One part of coal ground fine, is mixed with two parts of sand and one and a half of slaked lime, and the whole treated with water in the ordinary manner. The only but nevertheless a very forcible objection to this mortar is its colour, although we see no particular advantage in mortar being of a dirty white colour in preference to a darker and more decided tint. The latter shade would certainly last much better than the former, which if clean looking when first laid very soon loses its fresh appearance.

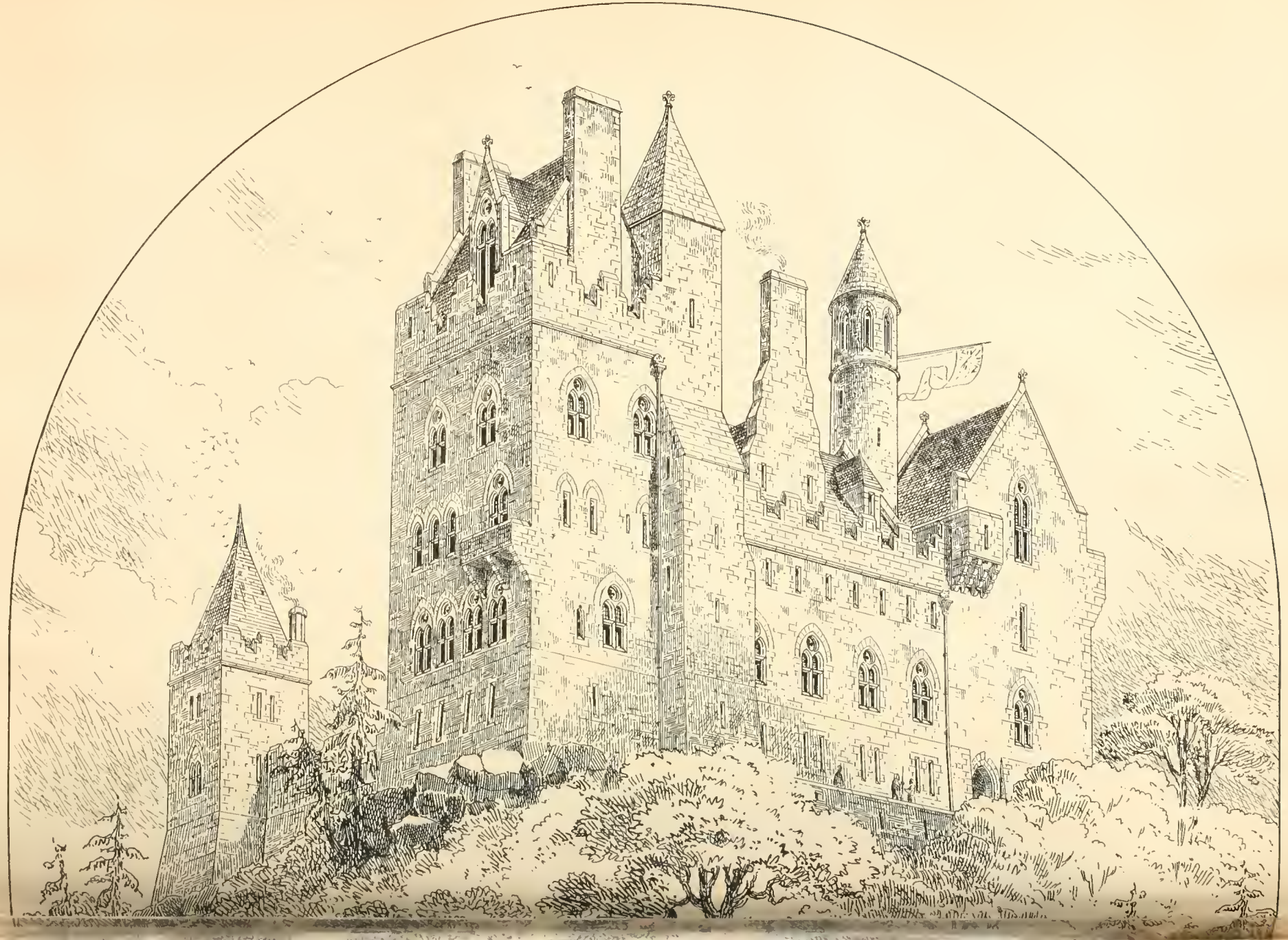
COMPETITIONS.

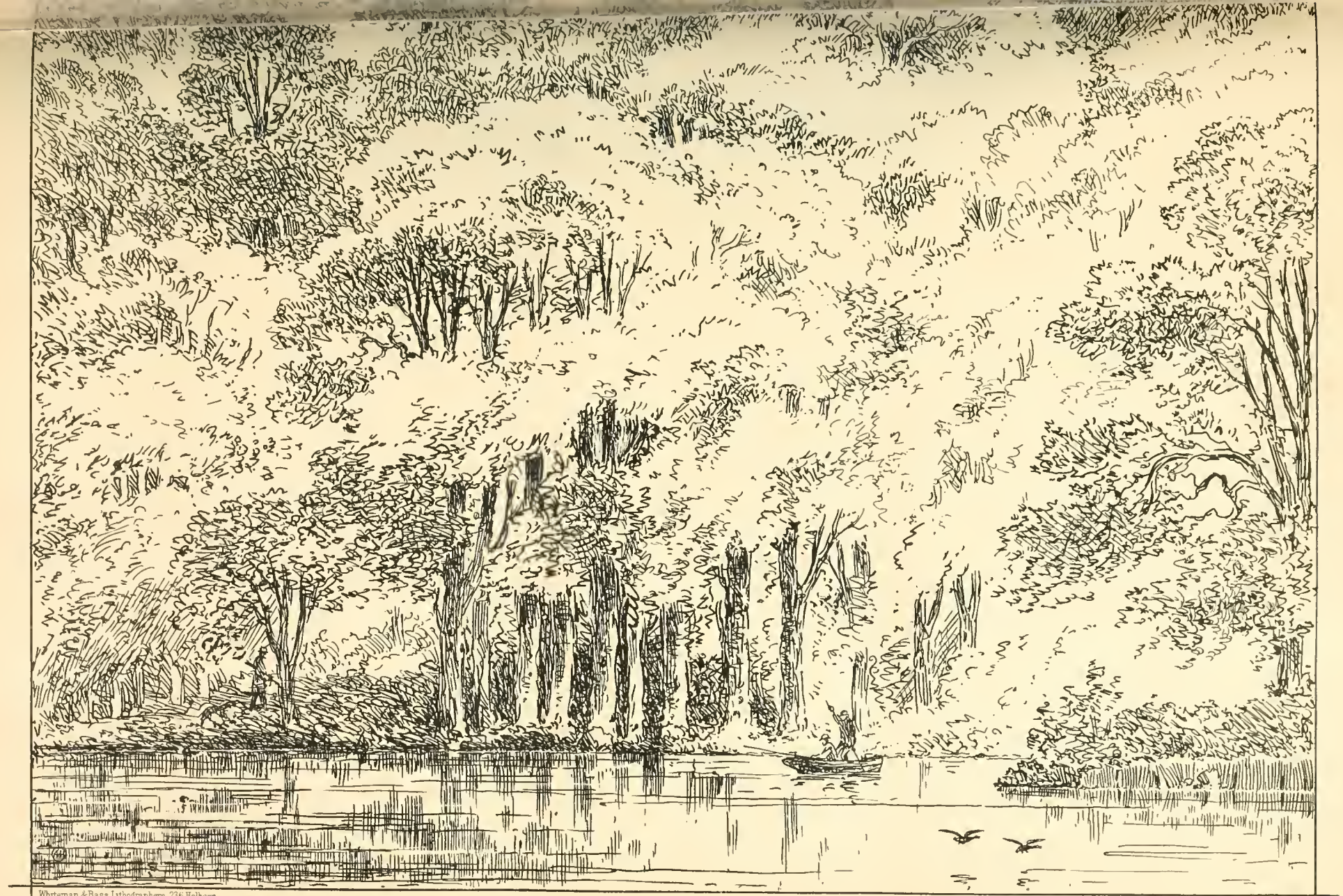
Messrs. Austin and Johnson, Mr. J. E. Watson and Mr. Thomas Oliver, architects, have been invited to send in designs for the new town hall and corporate buildings to be erected at Newcastle.

Great Yarmouth Terrace and Villas.—The Mr. J. T. Bottle, architect, Great Yarmouth, has been awarded the premium of £20 for his design for a terrace for first-class houses to be erected upon the building estate of the Corporation of that town. The houses will have a frontage of 23ft., and the cost of each is not to exceed £900, including the area railings and walls. Mr. J. S. Dodd, of Reading, has obtained a like premium for the best design for a detached marine villa, cost not to exceed £1,500, and the first premium (£20) for his design for a pair of semi-detached marine villas, cost not to exceed £2,000 the pair. The second premium, of £10, for the same has been awarded to Mr. J. Jackman, of 34, Soho.

At a public dinner at Coventry the other day the mayor presiding, Mr. J. E. Greatorex, late surveyor of that town, was presented with a gold watch, a silver cup, and a purse containing £150. The watch and purse were subscribed for by the members of the corporation and other gentlemen of this city, and the cup by the men employed under Mr. Greatorex while for fourteen years engaged as city surveyor. Mr. Greatorex's appointment to the post of engineer for the borough of Portsmouth was recently mentioned by us.

The Building News · March 29th 1867





Whiteman & Bass Lithographers, 236 Holborn

Drumore Castle, Ireland.—EDWARD W. GODWIN, ARCHT

SERMONS IN STONE.

We have no wish to encroach on the province of the moralist, with whom the grave has always been a favourite theme, and death a fitting topic. Our object is simply to draw attention to some old tombstones and some quaint epitaphs, which we hope will have a special interest for the antiquarian and the archæologist—leaving the reader to find the moral for himself. Many labourers have already been in this particular field who have brought to light much that is both valuable and interesting, but we think there may be a small portion of the field not altogether uninteresting which is comparatively unexplored. Dr. Johnson has written an eloquent essay on tombstones; Mr. Gough's learned and voluminous work is a great monument in itself; Hearne's "Collection of Curious Discourses is not only curious but interesting and important; and other writers have contributed to our knowledge of the subject, the latest and in some respects the best work being Mr. Pettigrew's "Chronicles of the Tomb." In addition to a very able disquisition on tombs and monumental inscriptions from the very earliest times, Mr. Pettigrew has given us the only complete collection of epitaphs which we possess. His book contains examples of almost every description of "lapidary inscription," in different languages and countries and in all ages. We have epitaphs admonitory, laudatory, adulatory, and denunciatory; epitaphs rhetorical, enigmatical, bombastical, satirical, professional, revengeful, as well as acrostic, punning, eccentric, ridiculous, and ludicrous epitaphs. The author's researches, indeed, must have been extensive and his labour great. He has left comparatively little for others to do who would follow him in the same path. The subject, however, can scarcely be exhausted. As might be expected Mr. Pettigrew finds the great majority of the epitaphs in his collection in the different counties of England. Scotland, though not so abundantly rich in tombstone literature or in elaborately sculptured monuments to the dead as this portion of the kingdom, yet possesses not a few tombstones and burial records as curious and interesting as any to be found elsewhere. Several of these find a place in the "Chronicles of the Tomb," but many others equally curious we miss. We will endeavour in some measure to supply the omission, confining ourselves for the present to Scottish tombstones. On the history of tombs and tombstones we will not touch, except to make a single remark. Burying-grounds were not established until the year 200. People before were interred in the highways, and ancient tombs are still to be seen on the roads leading to Rome. Hence these words so often repeated in epitaphs, *Sta Viator*—"Stop traveller." A very favourite expression on the Roman tombs, both of Pagan and Christian times, as Mr. Pettigrew observes, is to be found in the well-known passage from Tacitus, *Sit tibi terra levis*—"light lie the earth upon thy grave." The custom of burying in churches was unknown for many hundred years, the churches being found in towns and cities where burial was forbidden. About the fourth century, when persecution of Christianity ceased, it was not unusual either to translate the relics of martyrs from their tombs outside the walls into the city churches, or to build churches over the tombs in the country. Somewhat later kings and emperors had the privilege of being buried in the porch or some of the outer buildings of the church, but their bodies were not admitted into the church itself until the sixth century, at which time the people also began to be buried in the churchyards, though not as yet in the church. By degrees the people obtained this privilege also. Perhaps the earliest Christian monuments of which any trace exists in England belong to the period immediately following the final departure of the Roman legions in the year 427. In different parts of England and Wales large roughly-hewn stones are met with, bearing sepulchral inscriptions in Roman letters. Some had crosses, leaving no doubt the persons buried there were Christians. Those early remains might be set down as belonging to the fifth century. The earliest tombs in England which possessed an architectural character were the stone coffin lids of the eleventh and twelfth centuries. But to return. In the language of an old writer on epitaphs, "we will here but briefly collect some fewe which are remarkable partly for their antiquity, partly for their brevytie, partly for their rarenesse, partly for their excellenceye, partly to show the manner of stile of those ages in which they were composed, and partly to recreate the mynde with the simplicytie of their inventions." Professor Masson, in a paper in *Macmillan's Magazine* (Nov., 1863), makes the following observation:—"Mr. Hawthorne, I see, has been remarking on the absence of very antique tombstones in the churches and churchyards of this country, and has mentioned it as surprising to him that he has seen perhaps as old monuments of that sort in Puritan New England as in Great Britain. He is unaccountably wrong. In the common churchyard wall of St. Nicholas Church, in Aberdeen, I have deciphered with my own eyes a tombstone inscription which was cut in hard blue stone fifty years before Columbus discovered America," that is to say, the date of this stone would be about the year 1440. It would be interesting to know whether it still exists, since it must be one of the very earliest churchyard stones in the country, though it may have been originally in the church. We are aware that there are several very ancient tombstones in the Granite City. Henry Leighton, Bishop of Aberdeen, is interred in the Cathedral of St. Machar. He died in 1440. The inscription, however, is illegible. "Time corrodes our epitaphs and buries our very tombstones." There are also monuments, though not in the churchyard, to Alexander Chalmer, Provost of Aberdeen (1413), and to Sir Alexander Irvin, who died in 1400. The latter memorial is on a copper plate, and is probably modern. It is rarely that we find a tombstone in the kirkyard itself of older date than 1580 or 1600. In Dundee some of the most ancient stones and quaintest epitaphs are to be met with, but unfortunately several of the most curious have been rudely despoilt within recent years. The burying-ground known as the Houff, in that town, was originally a garden attached to the chapel of the Greyfriars, and was granted by Queen Mary for a burying-ground. It contained no stones or monuments before the year 1560, except one which had been transplanted from Blackfriars Churchyard, which stood a little to the west of what is now the Houff. This stone was a small square block, having on the east the name William Kenny, on the west Arthur Wemyss, on the south Matilda Kenny, and on the north Ann Alison. There are two flat stones near the middle of the north wall, one bearing the name and date James Fletcher, 1584, the other only the date 1584. There is also a stone to Isabel Richardson, Spouse to George Spence, with the date 1682, and another on the west side, dated 1603, to Andrew Christie. There is a memorial stone on the north wall to Gilbert Quittet, Town Clerk of Forfar, who died August 9, 1594, with the following couplet underneath:—

Hier Sleeps unto the Secund Lyfe
A Faithful Man to Friend and Wyfe.

The subjoined are a few of the more remarkable stones in this churchyard:—

Man tak hed to mi—How thou Sal be
When thou art dead—Dry as a tree.
Our mess shall eat ye—Thy great Bodie
. . . . . – Shall be like lead.
Thy time hath been—In my youth green
That I was clean—Of body as ye are.
But now my een—Twa Hols that's been
Of me is seen—But Banes hare.
1579. Thos. Simson.

Heir restis an honorabile Baroune, Jhone Kynneir of yat ilk, quha departit out of this mortal Lyf at Dundee the 21. day of June 1584. And of his age the 63. year.

Here lies a most chaste virgin, Jonet Mudie, only daughter to James Mudie, Sometime Baillie of the City of Dundee, who, ushering her Father in the Path of Death, died in 1612. Of her age 15. The whole Life of Man is a Passage to Death; and Death itself is a Passage to Life.
All things depend on Fates; all, in their Turns,
Sooner or later, hasten to their Urnes.

Here lies a godly matron, Jonet Tyrie, who was duly married to Mr. Alexander Dunmuire; She died in 1615, aged 79. [Then follows a prayer.]

Robert Strintoun, Apothecary, caused this monument to be erected and cut for himself and his dearest wives Jonet Duncan and Isabel Robertson, who died respective—The first in 1652, aged 39; the last in 1657, aged 44.
On right Duncan lies, in youth my Spouse
And the first Pillar of my rising House.
Left Hand, lies Robson, a most faithful wife;
Which was the best, it may procure a Strife.
First brought to me of Wealth Sufficient Store,
Which the other guided well, augmented more;
First blessed me with many children fair,
The Second nurst them with maternal care.
Virtue and goodness in them equal shone,
And both lie buried underneath this stone.

There is no date to the following. The combination of the deceased's qualities, moral and mental, is quaint, though formerly this style of epitaph was very common.

To her most lamented Mate, for the space of 26 years in marriage, Mr. Thomas Maule notably happy, and very well deserving from the highest as well as the lowest, in this Town and the whole Vicinage. Also a very excellent man skilful in the Latine, Greek, and French languages, considerably versed in Astronomy, and a Notable Practiser of Piety toward God, and Righteousness toward his neighbour.

We have a description of what appears to have been, and may still be, an extremely interesting sculptured monument here by a traveller who visited Dundee in 1782. "A very elegant monument," says this writer, "has been lately erected to the memory of Lady Wedderburn, a daughter of the Earl of Arlies. From a square base and pedestal about 7ft. high springs an Ionic column crowned with a flaming urn. On the plinth or faces of the pedestal, within a moulding, are four polished slabs, three of grey, and the fourth, on the west, of the purest white marble. On the last are the following figures in alto relievo, cut by Sheemaker. A lady, as if just dying, wrapt in a light flowing robe from the breast downward, and partly extended on a rough projecting eminence, near the bottom of the marble. In her countenance innocence and resignation are happily expressed. An angel sitting at her head supports her shoulders; her head and neck rest upon his right arm, below which is seen the lady's right arm hanging over the outside of the angel's knee. His face is averted from the body, and his head supported by his left hand, in which he holds a handkerchief to his eyes. In the background another angel, fronting the lady's face, holds up her left hand, tenderly pressing it to his lips, who seems as if he would say 'Sister, come away.' The tender feelings are strongly marked in the profile of the angel at the head; all that his amiable charge has suffered seems present to his mind. In the countenance of the other angel there is a mixture of grief and tenderness. The storm now over he welcomes the late tossed passenger to the calm regions of bliss, the ever-blooming groves of immortality. In a corner of the slab there is a sky, from which diverging rays of light point to the lady's face, emblematically to teach us this interesting truth, that living or dying we are always under the eye of Him who made us. If I had remained in Dundee a month I think I should have gone every day to see this beautiful monument of conjugal affection. Below the sculpture is the following inscription:—

Memoriæ Sacrum Dominæ
Margaratæ Ogilvy Sponsæ
Domini Joannis Wedderburn
de Ballandean, Militis Baroneti, Obiit die xxiii Martii,
Anno MDCCLXXV Ætatis Suæ
XXVII."

A gravestone near to this monument bore the following:—

Heir lyes ane honest man Walter Govrlay
Maltman and burgess of Dundee qvha decessit
in 28 day of Apryll 1628 of the aige of 46
yeires with his twentie bairnis.
Elspet Pie. Here ly I.
My Twentie Bairnies. My Good
Man & I. 1628.

Below was a coat of arms, and under that two large death's heads, for the man and wife, and four rows of smaller heads, five in each row for the twenty children. The meaning of the above would seem to be that a family of twenty-two persons died so near one another as to be all buried in one grave—a very remarkable circumstance. In the same place is a tombstone erected by his wife to the memory of David Alexander, "who being known for the goodness of his life and skill in his trade, died much lamented in 1623." Another to Richard Blyth, "a boy of generous Engine," who, "by the disturbed order of Nature was pluckt away from life." 7 February, 1637. But we must stop for the present. The writer would be obliged for any information on the subject of Scottish tombstones which any of the readers of the Building News may be inclined to favour him with.

THE NEW SITE OF THE ROYAL ACADEMY.

THERE is now at last a fair prospect that the Royal Academy will find a domicile worthy of itself. The workmen have begun to excavate the site of the new buildings in Burlington-gardens, and we may hope that before the summer of next year ends everything will be in readiness for the migration of the Academy from Trafalgar-square to its new abode. In the meantime, the plans for the proposed change are so far advanced that we can give some account of them.

The late president, Sir Charles Eastlake, came distinctly to the conclusion that if the Academy was to be excluded from Trafalgar-square, then of all the sites which the Crown had to offer its most suitable dwelling-place was to be found in the precincts of Burlington House. But Sir Charles Eastlake's idea was that the Academy should occupy an edifice to be raised on the Piccadilly front of this ground. The scheme on consideration was found to be impracticable, partly because of the great expense which the erection of such an edifice would entail on the Academy, partly because of the inconvenience of exhibition rooms arranged in a building the ground-floor of which has to be pierced in its centre by tall arches of entrance to the Burlington quadrangle. Then it was proposed that the Academy should accept a home in the South Kensington estate; and much was said in favour of that suggestion. There is just now being formed at South Kensington a museum of art which will before long be esteemed one of the chief glories of the metropolis—a casket of jewels worthy of a great nation. But it is an undoubted fact that this magnificent collection is not yet as famous as it deserves to be. The reason is that it is out of the way, and not well enough known. And if the Academy were to transfer its annual Exhibition to this neighbourhood, it would have for many years to submit to a considerable diminution of those shilling visitors upon whom its income largely depends. Here, then, was a dilemma. There were serious objections to the Piccadilly front of Burlington House, and there were serious objections to the South Kensington estate as sites for the Royal Academy. What was to be done? The new president, Sir Francis Grant, solved the difficulty by finding for the Academy another site in Burlington House itself and in the garden behind.

Few persons strolling about Piccadilly, even with the long vista of the Burlington Arcade to help them, have any adequate notion of the quantity of ground belonging to Burlington House, and extending from the dead wall in Piccadilly to the dead wall in the street known as Burlington-gardens. Some notion of it may be formed when we state that Burlington House itself occupies about the centre of the ground, and that it is proposed to raise at the back of it and parallel with it two great buildings, one for the London University, the other for the galleries of the Royal Academy, with a space as wide as Oxford-street between them. Of the edifice intended for the London University, and which is now being built at the extreme end of Burlington-gardens, facing the street known by that name, we have nothing to say, save that it fills the whole breadth of the gardens, with the exception of a 12ft. roadway on one side, leading to the Academy buildings, and, indeed, right across the grounds to Piccadilly. The London University will extend back into the gardens about 130ft. Behind it there will be a vacant space about the breadth, as we have said, of Oxford-street, and between this space and Burlington House will rise up (with a depth of about 120ft.) the galleries of the Royal Academy. These galleries will be built somewhat close to the back of Burlington House, with which they are intended to form one edifice for one purpose. In point of fact, Burlington House is given up to the Academy, and will form its frontage. The public will enter the galleries of the Academy through Burlington House. They will ascend the staircase of the house, to an opening at the back, which is now used as one of its principal windows. This will be transformed into a doorway leading through a short corridor to the exhibition rooms.

The galleries and offices which it is proposed to provide in the new buildings look well in the plans. The galleries are, of course, on the first—that is, the upper floor, in order to secure the advantages of top lighting; and they certainly have the merit of creating ample accommodation for the exhibition of pictures. The wall space allotted to pictures in the present rooms of the Academy is measured by 748 lineal feet. It is better to give the measurement in lineal than in square feet, because the precise height at which pictures can be advantageously hung is always a variable quantity, and in a calculation like the present it conduces to clearness to assume that all pictures are hung "on the line." This line in the galleries now occupied by the Academy extends, we repeat, to 748ft. In the new galleries it will extend to 1,884ft. The principal gallery, in which the annual dinner of the Academy will be given, is intended to be 82ft. long and 44ft. wide. The next in importance is equally long, but only 35ft. wide. The central gallery of all, which in the plan we have seen is called the vestibule, is an octagon intended for sculpture. Underneath these galleries is the ground-floor, which is allotted chiefly to the schools of the Academy. On the north side are the rooms destined for the life and the antique schools, lighted by windows looking to the London University, but receiving light from the sky at an angle of 45 deg. across the space which we have compared to Oxford-street for width. Besides these schools, accommodation is provided for the exhibition of casts, for the custody of rejected pictures, for a kitchen, for lavatories, for various cellars, for heating apparatus, for a lift to raise heavy sculpture to the upper story, and for many other purposes. Altogether, the arrangements in this new building, in so far as we understand them, seem to be very complete. In Burlington House proper the Academy will find further accommodation,—a council room for its meetings; chambers for its keeper; a library; a gallery for the exhibition of Gibson's works. In addition to this it is proposed to add a story to the building. The story thus added will have a double value. It will form a fine gallery for the exhibition of the diploma pictures of the Academy and some other treasures in its possession—as four Sir Joshua's, a first-rate Giorgione, and a fresco of Paul Veronese, recently bequeathed. It will, on the other hand, from the external view, give dignity to a façade which—graceful enough—was felt to be rather flat.

These plans promise well, and we heartily wish the Academy undisturbed and prosperous enjoyment of its 999 years' lease. But it is not yet in possession of all its rights; nor is possession possible until the Government has provided house room for the Royal and other learned societies which are at present lodged in Burlington House. The Government proposes as follows:—From Burlington House to Piccadilly extend two wings which are to be pulled down. In their place, and along the front of Piccadilly, there is to be raised an edifice harmonising in style of architecture with Burlington House, and intended for the abode of the Royal, Linnæan, Chymical, Geological, Astronomical, and Antiquarian Societies. These societies it is proposed to provide with rooms far better than any they now possess; and the frontage to Piccadilly, if it does not show much originality in the way of architecture, will at least be pleasant to look on, and will save our great thoroughfare from the reproach of a long, dull, dead wall—a hideous monument of exclusiveness. Originality in such a façade was scarcely possible, seeing that Messrs. Banks and Barry, the architects of this part of the building, had to adapt their design to that of Burlington House as it stands. We may say roughly that the front is not unlike that of the Privy Council and Board of Trade offices in Whitehall; with this, however, to distinguish it,—that a noble archway, 32ft. high by 20ft. wide, rises in the centre. The effect is good, and Messrs. Banks and Barry deserve not a little credit for the skill with which they have handled a style of architecture which is by no means remarkable for its variety, and is too often quite oppressive in its monotony.

We should add that in the block of buildings which it is proposed to rear on the grounds of Burlington House no less than three architects are engaged. We speak of Messrs. Banks and Barry as but one. They have charge of the buildings intended for the learned societies. Mr. Sydney Smirke is the architect of the Academy, and to him is due the improvement of the aspect of Burlington House by the addition of a story to it. Mr. Pennethorne is the architect for the London University.—*Times.*

CAMEO ENGRAVING.

THE art of cutting cameos is a species of sculpture rather than engraving. There are two kinds of cameos, one of which is stone of different coloured strata, so that the raised figure is of a different colour from the ground, the other is of the conch shell. The shells are sawed into squares with saws of soft iron, similar to those used by sculptors. After the shells are cut into suitable pieces they are ground; on a stone to their required shapes, by grinding them nicely on the edges and leaving them thick in the middle. After this they must be cemented on a stick about 6in. or 7in. long, with cement of Burgundy pitch and rosin of equal parts heated together until they are perfectly amalgamated. The end of the stick is immersed in the cement while it is warm, and enough attaches itself to it to fasten the shell, which must also be slightly warmed or the two will not be attached. After being cool the shell is ready for cutting. To produce a likeness of an object, the best way is to cut the profile on paper, lay it on the shell and trace it out. The best gravers, the harder the better, are alone fit for the work, and they are ground down to different shaped points, some diamond, some oval, some chisel-shaped, and some round. After the likeness or design is traced on the shell it has to be blocked out with the hand, or it might be done by flat drills in a lathe. The blocking out is done by tracing the design with the diamond pointed graver, and leaving the pencillings distinct and cutting away all the outside with chisels and gouges, taking care to leave the groundwork thick enough to finish up. After the blocking out is completed, begin with the top of the profession in making the head, by leaving a space for the hair a little raised and then engraving the features, taking great pains not to do too much at a cut, for if once spoiled there is no remedy. The neck and breast are done next, as cautiously as the face. The hair is done last, and is the most difficult part to perform, although the uninitiated would think it the simplest, but it is the most difficult work of all, for no matter how good the rest of the work may be, if the hair is poorly executed the whole figure looks bad. In cutting the hair it must be gracefully curled with delicate curves. Sculptured heads are the best models for the learner to study. After the figure or design is finished with the graver, the cameo is polished with pumice stone as smooth as possible, until all the marks of the graver disappear. It is then finished with a stiff toothbrush and potter's clay, or whiting and water, and afterwards washed in pure water, when it will be observed to have that beautiful polish for which cameos are so justly admired and which has made them, on account of their chastness of colouring, a very popular branch of jewellery. To take the cameo off the stick after it is finished it is necessary to heat the stick over a spirit lamp until the cement warms, when it is ready for framing. It may be observed that the grace of a figure depends much on the drapery.

MATERIALS FOR BUILDING THE NEW LAW COURTS.

THE *Pall Mall Gazette* says a recent correspondent, "Londinensis," has called attention to one or two matters in connection with the New Law Courts which require a little more discussion. He complains of the influence of London smoke in burying architectural details in a mass of soot, and he says that the Law Courts should, as far as possible, be built of polished stone or brick, or in parts of Portland stone. And this is true

nough, as to the mere blackening and smothering; but it is only half the truth. Smoke blackens all kinds of stone, but it also eats into and destroys many kinds, and the Portland perhaps most of all, as everyone will admit who remembers what was the condition of the balustrades on old Westminster Bridge. As to brick, it gathers blackness rapidly, and can only be cleaned by what bricklayers call "pointing," a process utterly to be condemned and out of the question, to say nothing of the poverty-stricken effect of bricks in any building of considerable size. As to "polished stone" or, in plain English, Italian marble, it is out of the question. Anything like a polish upon the flat outer surfaces of either Gothic or Italian buildings would be ridiculous to the effect, while the cost would be fabulous. The polish, too, would soon pass off under the influence of a clear atmosphere, to say nothing of the chemical agency of London smoke. The exterior of St. Peter's at Rome is built of a species of yellowish marble, but it is not polished. Milan Cathedral, which is of marble, is still brilliantly dazzling in its whiteness in many parts, but there are portions where it has become as black as the blackest wall in London itself.

The difficulty of preserving architectural beauty from defacement in the midst of London smoke has never, in fact, been fairly met. We have gone drifting on, from generation to generation, in homage to the old ideas about the increased beauty of churches and palaces when mellowed by the softening hand of time, forgetting that, delightful as is that mellowing touch and all of poetic suggestions, it is an impossibility in London. Here we have but one alternative: either to submit to this befoulment as an incurable evil, or to keep up artificially the whiteness and brightness of a perfectly new building. Accordingly, where people can afford it, they paint the outside of their houses, as in Regent-street, or they whitewash them. Whitewash, it need not be said, is the abomination of desolation in the eyes of every architect and lover of art; and paint is not much better. The question, therefore, is reduced to this: Can we construct our public buildings of such material as will be at once durable, agreeable to the eye, with a surface to which soot has but slight tendency to adhere, and above all susceptible of being annually or biennially scrubbed clean with soap or soda and water? In reply we venture these suggestions. Make all flat outer surfaces of the material of which they make unglazed encaustic tiles, and make all mouldings and all ornaments of terra-cotta. The encaustic tile, as made by Minton, Hollins, and others, is one of the hardest and most durable substances in the world. No stone, except a few marbles, approaches it in durability, whether as a pavement, or as the covering of a wall exposed to the outer air. Its texture is extremely close, and its surface so smooth, while having objectionable polish, that smoke clings to it very slow degrees, and would probably never penetrate into its substance. It can be made either red, or of that warm, creamy tint which is so eminently agreeable in buildings of any precious. And it may be moulded in blocks of sufficient size to avoid the petty, finikin look of ordinary brick; in fact, as large as the blocks of Bath, Caen, or Portland stone to which we are accustomed. What might be its cost we could not of course say, as at present it is not moulded in large blocks, but it could not possibly be extravagant. Terra-cotta, which is the corresponding material for ornamental work, has not hitherto entered largely into the construction of good buildings, but its use is advancing, and the display of the productions of English manufacturers in this material promises to be one of the most valuable sights at the Paris Exhibition. Its use for the mullions of windows, and for ornament generally, was by no means unknown to the Gothic architects of the past. A very interesting example of its use is still existing in a well-known and fine specimen of early Tudor domestic architecture—Sutton Place, about three miles from Guildford. The execution is fair, but not to be compared with that of the terra-cotta work now produced. If it be objected that this material would be tame and monotonous as compared to that of hand-cut stone, the answer is obvious. There need be no monotony whatsoever, as it is just as easy to multiply moulds in endless variety as to carve a large variety with the mallet and chisel. Advanced as the art nowadays, terra-cotta would be but little inferior to stone in sharpness of outline and depth of shadows, while at the end of fifty or a hundred years it would have lost nothing of its original form. Like the encaustic tile material, too, it presents a surface for which smoke has but small affinity, and it will wash clean. The notion of washing the faces of vast buildings once or twice a year is, we are aware, a novelty. But why should not the outer walls and mouldings and statuary be scrubbed with soap and water as well as those within doors? The scrubbing brush has been an unknown detergent out of doors in London, because brick and stone absorb so much soot that they resist perfect cleansing. So we content ourselves in our dirt, or conceal it beneath the plebeian whitewash or the more aristocratic paint. Is it within the limits of possibility that we may so far get rid of our prejudices as to take to covering our walls with the most durable materials in the world, and to preserving them in their beauty by the simplest means that can be imagined?

ANCIENT HELIOPOLIS.

An article in the *Constitutionnel* on the present state of Syria, gives the following details concerning the remains of the collection of gigantic constructions called the ruins of Baalbeck, also known as the Ancient Heliopolis, or City of the Sun:—"The ruins cover a less extent of ground than those of Palmyra, but are more colossal, and consist principally of a temple to Jupiter, measuring internally 49 metres (3ft. 3½in.) in length, and 26 metres in width. The edifice is surrounded with columns, 19 metres 81 centimetres in height, equal to a five-storied house in Paris. Those columns are 2 metres in diameter, and nearly all formed of three blocks. The temple was constructed entirely without cement, and the stones are so well joined that it is impossible to introduce the blade of a penknife in the interstices. The principal entrance is 15 metres high and 6 metres wide, the jambs being monoliths. Of the Temple of the Sun the six columns still remaining are more than 7 metres in circumference, and nearly 25 metres high—that is to say, half the weight of the Art-de-Triomphe at Paris. The whole of these buildings are worked with an admirable finish. The walls are composed of monstrous blocks of stone, three of them measuring each from 18 metres to 20 metres in length, 4½ metres in thickness, and as much in height. They occupy the base of the wall situated to the west, supporting six other blocks of smaller dimensions. To the north is a similar structure, excepting that the blocks are not quite so long. At the quarries, about a kilometer distant, lies another monolith, measuring 23 metres in length, 4 metres 30 centimetres in thickness one way, and 4 metres 50 centimetres the other. This block, perfectly finished, has been awaiting many centuries the power which is to transport it to the building for which it was intended. According to certain authors, the weight of this stone would be 1,500 tons, and would require the force of 40,000 men to move it, if the rollers could support the enormous weight. The transportation of these masses is still an unsolved problem, and we have no idea of the means employed for the purpose in remote ages."

Building Intelligence.

CHURCHES AND CHAPELS.

The foundation stone of a new church in the village of Stamford Bridge was laid on Saturday last. Lord Laconfield has presented the site. The plans have been prepared by Mr. J. Fowler Jones, architect, York, and the church will be dedicated to St. John the Baptist.

The Congregationalists of Nottinghamshire are making active exertions to extend the principles of their denomination in that county. Upwards of £14,000 is required to enable them to provide suitable places of worship, and no less than about £10,600 have already been either subscribed or promised.

At a meeting of the committee for the erection of a new church at Leyburn, Leeds, it was agreed that the plans of Mr. May, architect, should be adopted and the contract of Mr. Jones, builder, should be accepted, and that the works should immediately be proceeded with.

A new Congregational Church has just been opened at Leicester in which there will be no pew-rents, the maintenance of the minister and all other expenses being dependent on the weekly offertory. This is the second Dissenting place of worship which has abandoned the pew system in Leicester.

The foundation stone of the new Roman Catholic Church at Crossgar, County Down, Ireland, was laid a short time ago. The style adopted is Early French, from designs by Mr. M. H. Thompson, architect, Belfast. The contractors are Mr. James Gracey, and Mr. Samuel Hastings, of Downpatrick.

A Liberal Church Builder.—At the ceremony of laying the first stone of the new church at Thornton Hough, Neston, Cheshire, Mr. Hurst, who is its founder, and who is also providing schools and a parsonage house at his own cost, addressed a few words to those assembled, intimating that in the new church there would be no charge made for its occupation, and that it would be entirely free to all, that when inside the church he and they would be on the same footing, and that anyone who went early to church, and went there before him, would or could take precedence of himself in respect to seats.

Brighton.—On Wednesday last week the Congregational Chapel in Queen's-square, Brighton, was reopened after extensive alterations. In fact, the chapel has been enlarged and reconstructed, the interior has been transformed, and accommodation provided for about 200 additional seatholders. £4,000 has been expended on the alterations. Having seen the chapel before and subsequent to the alterations we are of opinion that the money might have been expended to much better advantage. In saying this we do not wish in any way to condemn the architect—Mr. Poulton, of Reading. He, we suppose, obeyed instructions. There is a gallery all round the chapel, and there are no less than six rows of seats behind the pulpit—an uncomfortable place, to say the least of it, for the seatholders. The chapel is badly ventilated, and we suppose the schools, which are underneath, are even worse off in this particular. Ministers, architects, and building committees involve a fearful responsibility in the non-provision of sufficient ventilation, and particularly in the erection of schoolrooms. Grown-up people can take care of themselves to some extent, but children are almost powerless in such matters. This chapel on account of its fragile structure will never present an imposing appearance. But when the spire and the tower are added, the exterior of the building will be attractive.

Forden.—The new church for the parish of Forden, near Montgomery, in the diocese of Hereford, was, together with an addition to the churchyard, consecrated on Tuesday week by the Bishop of Worcester, who officiated for the Bishop of Hereford. The church is in the Early Decorated style of architecture, and consists of a nave, north and south aisles, chancel aisle, vestry and organ chamber, and a detached south-western tower. The cost has been about £3,000, but the spire is not yet added to the tower and forms no part of this outlay. The architect was Mr. Thomas Nicholson, F.R.I.B.A., of Hereford, the diocesan architect.

Fleetwood.—The new Roman Catholic Church, from a design by Mr. E. W. Pugin, is rapidly approaching completion. The exterior of the building is nearly finished. In the interior the roof is perfect and the walls are being plastered. The east end and clerestory windows are inserted, and the glazing of those in the aisles is rapidly progressing. The erection of a memorial window to the late Sir S. P. H. Fleetwood, Bart., to be placed in the west end, is spoken of. The tolerant spirit and generous heartedness of the deceased baronet were ever conspicuous during his lifetime, and many of his political and personal friends would gladly avail themselves of a fitting opportunity such as that now presented, to perpetuate the memory of the Founder of Fleetwood and the Benefactor of the Fylde. The entire structure is expected to be finished about Midsummer.

Hightown.—A new Wesleyan Chapel, to meet the requirements of a rapidly increasing population, has just been opened at Hightown, Crewe. The chapel is a parallelogram on plan, and will accommodate about 500 persons on the ground floor; it is built to receive galleries at a future period. The style of architecture is Gothic of the twelfth century. The front is of white brick with stone dressings; the doorways of stone, with arches deeply recessed, and supported on columns of Mansfield stone; pierced trefoil arches are over each door, and within the large arch above the doorway is a handsome three-light window, the

arch being filled in with circular panels of cusped tracery. The rostrum is formed by an arcade with carved newels, turned columns, and richly moulded rails. The benches are open, of red deal, stained and varnished. The roof is open timbered. The contractor for the building is Mr. Ellson, of Hough Heath; and the whole has been executed from the designs and under the superintendence of Messrs. Scrivener and Sons, architects, Hanley, Staffordshire.

London.—Last week Bishop Anderson, in the absence of the Bishop of London, consecrated the new church of St. Paul, Charlton, S.E. The church will seat 890 persons, and consists of nave, aisles, chancel, transepts, organ chamber, vestry, and porches, and is 128ft. long by a width of 58ft.; and is 60ft. high from the floor to the ridge of nave. The tower and spire, 190ft. high, are not yet built. It has been erected from the design of Mr. W. Wigginton, F.R.I.B.A., and has cost about £5,500, including heating, lighting, &c.

Torquay.—A temporary church (Congregational) is now in course of erection in Belgrave-road, from designs by Mr. E. Appleton, architect of that town. The walls are of wood partition work, lined inside and out with boarding and felt, and the roofs are covered with No. 14 gauge Vielle Montagne zinc. As the building is only of a temporary character good construction has been aimed at rather than ornamentation. The several parts, including the boarding of the walls and floors, are screwed together, as it is intended to remove the building elsewhere when the permanent church is erected. The internal dimensions are: Length, 60ft., width 46ft., height of nave ridge, 35ft. The church will seat about 500, and the total cost, including foundations and masonry, lighting and warming, will be about £2 per sitting.

Urmston.—The Lord Bishop of Manchester on Saturday week laid the foundation stone of St. Clement's Church, in the village of Urmston, near Stretford. The style of this church will be Geometrical Decorated Gothic. The body of the church comprises a nave and south aisle, divided from each other by an arcade of four arches, borne by pillars, with different flowered and moulded capitals. Accommodation is provided for 360 persons, to begin with; a future north aisle will hold nearly 200 more. The whole of the external walls are faced with stone, three colours being used to give relief. The roofs are slated, in two colours. The architect is Mr. J. Medland Taylor. The conttract has been taken by Mr. M. Fogget, for £2,125.

York.—The Hon. and Very Rev. Dean Duncombe has taken in hand the very beautiful but greatly dilapidated church of St. Mary's, Castlegate, with a view to its complete restoration. During the last week Mr. Butterfield, of London, architect, was engaged in making a close inspection of the fabric. The entire length of the church is 110ft. 6in., and its width 47ft. It consists of a tower and spire, nave and chancel, with north and south aisles to both. The north aisle extends from the west base of the tower. All the windows of the aisles are square-headed and foiled, with the exception of the N.W. and E. of the north aisle, which are perpendicular of three lights, five-foiled, and super-mullioned three-foiled, with double embattled transome. The tracery of the third window from the east end of the north aisle is very curious. At the west end of the tower there are remains of windows showing the position of the crypt. The parapets are embattled, the buttresses stayed, and running up through gurgoyles into crocketed pinnacles or into pedimented heads. The tower is open to the nave by a lofty arch; the nave is separated from the aisles by round and pointed arches, resting upon piers of Norman character. The nave arch is pointed. The chancel is separated from its aisles by pointed arches, probably of the Decorated style. In the course of his researches Mr. Butterfield has found a sedilia on the south side of the chancel, containing three stalls; also a piscina, and the archway of the priest's door, leading into a chantry chapel. All these had been carefully plastered and white-washed. Some remains of the original floor in encaustic tiles have been discovered.

BUILDINGS.

Sir Moses Montefiore has determined since his return last spring from the Holy Land to erect another hospice at Jerusalem for the residence of several poor Israelitish families. The building will be on a large scale and built near to that erected in 1859.

A new Public Hall is to be erected at Hadlow, Kent, at a cost of £800. Mr. Friend will be the architect.

A new hotel is about to be erected at Hanley by Messrs. Scrivener and Sons, architects, of that place. The design was selected in a limited competition.

A new school has just been opened at Ottery St. Mary, Exeter. The school is built of stone, and was built at the sole expense of Sir J. T. Coleridge, at an entire cost of £1,200. Mr. G. B. Wollaston was the architect, and Mr. J. Digby, the builder.

"Within the last three or four years," says the Canadian correspondent of the *Liverpool Mercury*, "Several of the oldest business streets of Montreal have been pulled down, widened, and reconstructed; the new edifices are lofty, spacious, and architecturally beautiful, it being to the stranger a question if they should be classed as buildings of masonry or crystal palaces. I was six years absent from Montreal, and on returning four months ago found nine new churches (most of them occupying conspicuous positions, and having lofty spires) and many new streets and squares of private residences grand as palaces, all reared in that brief time."

Bedford.—The Bunyan Memorial Schools.—These schools are erected with red bricks, and stone and white brick dressings. The front to Castle-lane is 90ft. in length. The basement consists of a large room 46ft. by 34ft. and 10ft. high, which, if required, would make a soup kitchen or ragged school. There are also departments for coal, sundry stores, kitchen, &c. The next floor is approached by gates at each end of the building. The public room is 60ft. by 34ft.; at the east end is a platform 7ft. 6in. wide, extending the whole width of the room, with a sedilia of the Tuscan order, consisting of five arches resting on ten red Mansfield columns, with Bath stone capitals and bases, the archivolts being in Keene's marble cement. The roof, which is an open one, is framed as a queen trussed roof. The works have been executed by Messrs. Dickens, Maxey, Cunvin, Carling, Kilpin, and Jarvis, under the superintendence and from the designs of Mr. John Usher, architect and surveyor, Bedford, at a cost, including the organ, of £3,400.

Leith.—The new Public Institute, which is situated in the Tolbooth Wynd, was formally inaugurated last week by the provost and magistrates of the burgh. The building is of brick, with doorway of stone, and has an elegant appearance. On the ground floor is a spacious reading room, 48ft. by 26ft. Adjoining the reading-room is a committee-room, 15ft. by 12ft. From the lobby, a staircase leads to a gallery, which has been fitted up with shelving sufficient for 10,000 volumes. For the convenience of those who wish to consult works of reference, a room has been specially set apart, measuring 23ft. by 14ft., which is entered from the gallery. At the further end of the reading-room, a stair leads to the bagatelle and smoking rooms, which occupy the back part of the building. The dimensions of the bagatelle-room are 28ft. by 10ft., and those of the smoking-room 18ft. by 10ft. The roof, being open timbered and furnished with large windows, secures an abundant supply of light and gives to the whole building a cheerful appearance. The whole structure, together with its furnishings, has been reared at a cost of somewhat less than £1,300. The architect was Mr. James Simpson, the assessor for the burgh.

Shirley.—Mr. N. N. Jefferys, of Hollybrook House, Shirley, has given £1,500 and a site of one acre and a half to build new schools, which, when completed, will be conveyed to the incumbent and churchwardens for the education of the poor in the parish of Shirley. The present schools, which were also built by Mr. Jeffreys, are too small for the increasing population and incapable of enlargement.

General Items.

Monday, the 8th, and Tuesday, the 9th of April, are "sending in" days for the Royal Academy. The exhibition this year is expected to be an unusually good one.

No fewer than four fires occurred in different parts of Edinburgh between Saturday morning and Sunday morning last. Considerable property was destroyed, and in consequence of one of the disasters two little girls lost their lives.

St. Andrew's Church, Notting Hill, was completely destroyed by fire on Saturday night. It was an iron structure, erected at a cost of £1,700, about four years ago, for the accommodation of the well-known Kensington Potteries, and was in every respect as commodious and elegant as iron churches can be made.

The restoration of the beautiful crypt of the new Palace at Westminster (St. Stephen's crypt) is now completed, the altar, with its embellishments and screen, being finished. Candles of mixed hues of colour are placed on the altar, but are unlighted.

At a meeting of the general council of the National Art Exhibition, to be held at Leeds next year, held on Monday, it was resolved that one of the objects to be secured by the exhibition should be the formation of a permanent art gallery in Leeds.

The following gentlemen have been elected members of the Society of Arts:—S. Beaumont, 144, Picadilly, W.; J. Dunderdale, Tiverton-lodge, Cheetham-hill, Manchester; W. K. Hopkin, 5, New Cavendish-street, W.; R. H. Hutchinson, Tenter House, Rochdale; Sir J. B. Karslake, M.P. (Solicitor-General), 50, Pall Mall, S.W.; J. Nield, Dunster-house, Rochdale.

There is a project on foot for constructing a park at Washington, U.S., upon a plan which, to say the least, is quite novel. It is proposed to make a park which shall represent the United States in miniature, a proportionate portion being set apart for each State and Territory, and the position of these parts to correspond with the actual location of the State and Territories which they represent.

Among those who took part in a recent meeting in Dorsetshire against Ritualism was a gentleman who is reported to have spent £30,000 on the rebuilding and decoration of his parish church and who is now driven out of it by the Ritualistic practices which have followed.

Dr. T. Anderson has reported to Government that great success has attended the introduction of the mahogany tree into the Calcutta Botanical Gardens. Several of the trees, originally introduced in 1795 from Jamaica as young trees, were destroyed in the cyclone of 1864, when they were seventy-one years of age. They had attained very large size, averaging from 12ft. in girth at 4ft. above the ground. The wood is in great demand at high prices in Calcutta. Dr. Anderson believes that the mahogany tree might as easily be spread over all parts of Bengal as the larch has been in Britain.

In reference to our recent article on street tramways, "Zero" writes: "The writer is evidently under the misapprehension that the bill is still before Parliament. May I be allowed to inform your readers that the bill has been thrown out on "standing orders," from some stupid blunder of the lawyers; at least, so I was told by the engineer. I had heard, too, that in the case of the country bill the money had not been deposited. Whether that was so or not, I cannot positively say. However, the fight is indefinitely put off, to the great delight, no doubt, of the London General Omnibus Company."

The New York Glass Manufacturing Company of Newburg, Wisconsin, are now successfully turning out quantities of glass ware from rock with the two peculiarities of unequalled toughness and unapproachable cheapness. This ore, which is really pure glass or silicate of iron, in a crystallised and hence opaque condition, exists in many parts of the world, as in the columnar basaltic rock of the Palisades of the Hudson, of St. Helena, and of the famous Giant's Causeway. But all efforts to utilise it for the manufacture of glass have proved singularly unsuccessful, until the invention of Mr. Washburn. This glass ore, or silicate of iron, is to be found in unlimited quantities on the shores of Lake Superior.

The Leeds Permanent Benefit Building Society appears to be in a very prosperous state. The eighteenth annual meeting of the society was held last week, Mr. Charles Carr, president, in the chair, when the following report was presented. The balance sheet shows that 4,665 and 4-5th shares have been entered this year, and that the total number held is 16,662 and 1-5th. The subscriptions received during the same period amount to £152,934 9s. 3d. During the year there have been received on loan £39,837, 16s. 7d., and repaid £34,780 12s. 3d.; the interest paid thereon being £3,411 12s. 9d. The total amount owing upon loans is £100,744 19s.

TO CORRESPONDENTS.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the Editor, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty four Words.

Received.—L. W.—J. P.—T. J. S.—E. L. C.—H. H. B.—W. C.—B. and C.—E. A. T.—A. R.—A. M.—J. A. M.—J. H. D.—Messrs. B.—J. B. L. L.—E. W.—J. C. J.—D. S.—C. P.—J. T. B.—J. C. F. K.—R. E.—E. W. G.—W. P.—J. M. T.—R. L.—W. C.—G. E. S.—H. E. M.—T. and S.—J. and W.—W. L.—C. R.—S. W.—P. and A.—J. C.—J. T. B.—J. C.—W. B.—T. C.

George Snaith.—Will appear next week.

The church of St. Peter's and St. Paul's, Cork, illustrated in our last number, was described as the work of Mr. E. Welby Pugin, instead of from designs by Messrs. Pugin and Ashlin, architects, Dublin.

Correspondence.

THE MANCHESTER TOWNHALL COMPETITION.

To the Editor of the Building News.

Sir,—The fate of the Kilkenny cats was a tragic one, but the ingenuity of the Manchester Town Council has devised what may point a still more horrible tale. Of those far-famed but ill-advised contending feline brethren history records that their tail tips did remain after their fight had ceased; but who can say whether even a whisker of the architects whom the Manchester Council wish to set by the ears will be left when the contest they propose is over?

Firstly, the competitors are to send three elevations for 1,061ft. of frontage, to the same scale and more elaborately finished than, those for the new Courts (which were confined to outline), and two plans. The cost of these cannot prove less than £100, without considering the architect's own time at all, and if elaborate and highly finished this amount may be doubled at least. For this expenditure of money, thought, and labour no premiums whatever are offered! but only a chance of another fight against from five to eleven of the best men who presented themselves in the first, which, in this instance, £300 towards the expenses, which must be calculated at at least double that amount, though those who wish to win will probably have to spend treble if not quadruple the amount. This may be proved by reference to either of the competitions for the National Gallery or the Law Courts. As regards the final and final scrimmage, "it is the wish of the Corporation to secure, so far as may be practicable, the full evidence of all competing architects" by seeking "professional aid and advice in the final selection of the best design," yet reserving to themselves the right of following it or not; but as regards the first round, having no such wish on the subject, it merely "probable" that they "may seek professional aid," possibly to assist them to find out the trump cards which they are kind enough to ask the profession gratuitously to expose, for what purpose they do not condescend to explain, but which, unless Manchester conscience in such matters is belied, competitors will have little difficulty in imagining for themselves.

I am, &c.,

One of the Tail Tips left from the Competition of the Proposed New Law Courts.

Intercommunication.

QUESTIONS.

[320.]—FRONTAGE.—Will you kindly advise me on the following points:—A and B have purchased two adjoining plots of freehold land; the frontages being narrow, A wishes to use all his frontage. 1. Can A open out a trench for footings on B's land, providing the wall does not encroach, or must he keep within his own ground? 2. If he cannot open out on B's grounds, being within the distance can he keep the projections of the footings all on his own side, so as not to lose any ground above? 3. If he can open out, what notice will he have to give to B? 4. Will oblige me with the titles of works treating on party walls, lights, &c., in reference to freeholds or otherwise. A.

[321.]—CLERK OF WORKS.—Will you be kind enough to inform me what should be the abilities, duties, and pay of a clerk of the works, and by whom paid—contractor or proprietor of a job; and the best method for a young practical builder to fit himself for the duties?

A Constant Reader.

[320.]—MOUNTING TRACINGS.—Would any of your correspondents be kind enough to inform me, through "Intercommunication," the best way to mount some tracings, and what I ought to use for it, as I have never been able to keep them from being puffy? Ignoramus.

[321.]—SIPHON.—Will any of your readers be good enough to inform me whether there is any limit to the action of the siphon; and also the method of calculating the discharge? Is it possible for a siphon to discharge over an altitude exceeding 33ft. from the level of the water into which it is plunged? Siphon.

[322.]—CIRCLE.—Would any of your readers be good enough to answer the following query:—Adopting 113·355 as a proportion between the diameter and circumference of a circle, how long must the diameter be that will produce a circumference 1ft. over truth? William Butler.

[323.]—CUBICAL AREA.—Can any of your numerous readers supply the following information, or say where it can be obtained:—Cubical area allowed for prisoners' sleeping apartments in gaols (not convict prisons); in hospitals and asylums; in workhouses; and in common lodging-houses? H. H. B.

[324.]—DAMP FLOORS.—Some time back I converted a warehouse into a dwelling-house, by putting up partitions, &c. In the two top floors I used the old boards of the warehouse, turning the under face of the boards up in relaying them. The boards have now been laid about five months, and at present a damp strikes up to the surface of the floors, wetting the carpets laid on them. I understand that salt was kept on the floors of the warehouse. Perhaps you will kindly let me know of something which will remedy the evil, without my going to the trouble and expense of laying down new boards. Subscriber.

[325.]—CHARGE FOR DRAWINGS.—Will you please oblige me with a reply to the following through your valuable paper? A building for educational purposes is about to be erected by a number of gentlemen. My employer, who is a surveyor, has undertaken the gratuitous inspection of the same. The plans and specifications were put into my hands to prepare from rough sketches, with the understanding that I should receive some remuneration. I have completed the drawings and specifications to my employer's entire satisfaction, but my charge has been objected to. The cost of the building will be about £600. What do you think a fair charge? M.

[326.]—MEASUREMENT OF CENTREING.—In a book before me on architectural mensuration are the following marginal figures as showing the method of obtaining the circumference of semi-circular openings for the measurement of centreing, the diameter being the first dimension given. Would some of your readers be good enough to explain how the last figure, viz., 7in. is obtained? Example given—

ft.	in.	
8	2	diameter.
4	1	
	7	
12	10	the circumference

Leicester.

REPLIES.

[247.]—THE STANDARD BUSHEL.—In answer to your correspondent "Inquirer," allow me to state that the size of the bushel—19·50 diameter, 8·25 depth—given in your valuable paper last week, is not the correct size. I find that the sizes vary in many of the arithmetic tables. Nearly all of them give the contents 2218·192 cubical inches, which is the true solidity of the standard bushel. The legal imperial standard bushel is a cylinder of 18·789in. interior diameter and 8in. depth, containing (to a fraction) 2218·192 cubical inches. The imperial standard gallon contains 277·274 cubical inches $\therefore$ $277{\cdot}274 \times 8 = 2218{\cdot}192$.

J. F. Wheildon, Birmingham.

[247.]—If you make the diameter of your bushel 18½in. instead of 19½in., you will have the contents of your measure very nearly. The seller must lose very considerably by making the diameter of his bushel 19½in. W. B.

[289.]—BURNING OF CLAY.—The operation of burning clay, although not for exactly the same purpose as that mentioned by "W. K. W." may be seen on the works now in progress at Euston-road for the erection of the new Midland Railway station. There is no preparation required for the clay; it is simply dug out and thrown on a heap with fine small coal; or "breeze," as used in brick kilns, would answer equally well for fuel. It is scarcely possible to calculate from one instance the amount of fuel necessary to burn a certain quantity of clay in another, but it is a very simple matter to determine it approximately on a small scale by actual experiment.

Contractor's Engineer.

[291.] — ARCHITECTS' PUPILS. — "Provincial's" thanks to "Adelphi!" When "Provincial" went into office with so much enthusiasm and ambition, and sweet dreams of beautiful churches, towers, villas, mansions, &c., rising up like magic in all the grandeur of Gothic art, his first ordeal was to throw all those pretty dreams into the limbo of oblivion, and to subject himself to the drudgery of office work. The reality was so different to his over-rated expectation that for the time it almost made him indifferent as to his success in the profession. His governor is one of those good sound practical architects who study construction and the practicability of his design, to the exclusion, to a great extent, of the beautiful. The Building News says that "from such as these the art architecture of the future will never be enriched." It is the beautiful, then, that "Provincial" aspires to, and, while acknowledging the good counsel of "Adelphi," would be pleased to know if there is an architectural association with which he might become acquainted? There is none in the town in which he lives.

Provincial.

[294.]—ETCHING CLUB.—Etching may be done, theoretically speaking, upon any metal that an acid will affect, but copper or brass are those usually employed for the purpose. The instruments or agents used for etching are as follows:—Hard and soft varnish, prepared oil, nitric acid, needles fastened in handles, oil stone, brushes, burnishers, scrapers, compasses, ruler, a stift, and a frame and trough. Architects will do well to bear in mind that the principal difficulty to be surmounted in etching is the management of the nitric acid. Upon the proper regulation of this agent depends the whole beauty of the effect produced.

[295.]—COST OF BUILDINGS PER CUBIC FOOT.—Your correspondent's reply is a very vague one. Does he mean the cost per cubic foot of the whole building, or only of the carcase? We presume the latter. In that case it is quite impossible to give a price for a stone building, since it will altogether depend upon the distance from which the stone has to be brought. If it can be got on the ground, and is easily quarried, there will be very little difference between it and brickwork, which can be built in almost any part of England between £12 and £13 per statute rod.

[296.]—CUBING-UP WORK.—I think your correspondent is making a mountain of a molehill! There is no difficulty in measuring and cubing-up work, provided the two essential points of clearness and accuracy be complied with. I will briefly describe the plan of going to work in measuring-up, (say) a gentleman's villa. The first item is the excavation, which is measured and turned into cube yards, estimated at the scheduled price and carried to account. Should there be any concrete in the foundations it is treated in a similar manner. The whole of the brickwork is estimated at so much per rod, which equals 272 square feet of brickwork, having a standard thickness of a brick and a half, or 13½in. A statute rod also equals 306 cubic feet, or 11⅓ cubic yards. All large timbers are estimated by the cube foot; doors, partitions, and all framework in general, by the super foot; and most ornamental work by the foot run; slating, plastering, and painting are measured by the square foot, but mouldings and cornices by the foot run; the ironwork in tons; but pipes, gutters, &c., by the running foot. The summary of the measurement will stand as follows:—1. Foundations, including excavating and concrete, if any. 2. Brickwork. 3. Masonry, including all dressed stonework. 4. Carpentry, including all joiners' work. 5. Slating. 6. Ironwork. 7. Plastering, including enrichments. 8. Plumbing, painting, and glazing. 9. Papering, and internal decoration. 10. Bell-hanging. 11. Miscellaneous. Assistant.

[298.]—SEASONING OAK.—There is not the slightest question but that steam is frequently employed for the purposes mentioned by "J. Dexter," and it is certainly the most expeditious manner of accomplishing the desired result; but in all cases where a forcing method is employed to effect what, strictly speaking, requires a considerable space of time, there is the chance of evil arising. If the steaming be not carried on too quickly it will answer, but if it be pushed with too much vigour it is very apt to produce a permanent warping and distortion of the material.

J. X.

[299.]—CLERK OF WORKS.—I am sorry to disappoint the expectations of "J. B.," but he may rest assured that without some interest there will be not much chance for an outsider to obtain a berth in the manner he proposes. The Government possess a very large staff of clerks of works, who would be sure to be preferred to others, as they were in the case alluded to by "J. B."

An Unsuccessful Candidate.

[300.]—IVORY INLAY.—Will you permit me to inform "Juvenis" that it is seldom that ivory is ever shaded, as it would in a great measure destroy the peculiar value of it. When it is so done, fine lines are cut on the surface, and indelible ink rubbed into them in a greater or less degree, according to the effect required. China.

[303.]—CORNICES, WINDOW SILLS, &c.—There is no general rule upon the subject, as it depends upon the wording of the local act, which is not the same for diff rent districts. It appears to me, however, that "A Subscriber" has not much to complain of, for the setting back of a front wall in order to keep a sill within a certain distance of the roadway cannot be more than a few inches, since the difference between it and the face of the wall itself does not amount to more. Surveyor.

[306.]—WROUGHT-IRON GIRDERS AND LATTICE GIRDERS.—I do not possess the "Engineer's Pocket Book" of the same date as Mr. Luscombe, so that I cannot answer his question, but if he will send particulars of the case, with your permission, I will solve the problem for him with pleasure. L. P. C.

[307.]—MORTAR.—"T. C." may calculate as follows:—100 super yards of walling, one brick or 9in. thick, is, when reduced to the standard measurement of a brick and a half in thickness, equal to 2¼ statute yards. A rod of brickwork requires 1 cube yard of lime and 3½ cube yards of sand, so that the quantity to build the above wall will be close upon 8 cube yards of sand and 2¼ cube yards of stone lime.

[308.]—LAW OF INDENTURES.—If the bankrupt chooses to make over his apprentice to some other person while he is unable to perform his duty towards him, he can claim him again on getting his discharge, but if he does not do so, all that the apprentice has to do is to go before a magistrate and swear that his master is not able to carry out his part of the indentures and they will be cancelled.

Law.

[310.]—SMOKY BRICKS.—If "A Builder" will try a little fresh cows' dung, slightly thinned with water, and lay on two coats with a whitewash brush, he will find it answer his purpose in every respect; the plasteriog will adhere to it quite as well as to the brickwork, and if he should have any doubt as to its sticking, let him go into a cowshed and try to clean the walls. Lincoln.

[313.]—THE LAW OF APPRENTICESHIP.—"Indentures" generally comprise a clause prohibiting pupils or apprentices from working on their own account. At all events it was so in mine. ZERO.

[315.]—STRAINING DRAWING PAPER.—If "Jack" will get a drawing board with a panel to it he will not have the trouble of using paste or glue; the price of one, half imperial size, would be 7s. 6d., at any artists' colourman's. DAVID AIRD.

[315.]—As for myself I far prefer straining drawing paper with glue, and consider it anything but unsatisfactory. There is another method, where the middle of the board comes out and the paper being laid on the frame, the back is then replaced and fixed tight by two bars at the back of the frame. ZERO.

[317.]—RADIUS OF A CURVE.—In reply to "B. N." concerning the radius of a circle, in his diagram, given the three points in the circumference of a circle, from which the centre may be found by bisecting A and B at right angles and continuing the bisecting lines till they meet in the centre, no matter what the angle sides or prependicular may be. W. B.

[317.]—Impossible The marvel is, where "B. N." got his dimensions from. The tangent of a true curve must be equal. I should advise "B. N." to study trigonometry. ZERO.

STAINED GLASS.

A handsome stained glass window has just been placed in the chancel of St. David's Church, Exeter, by Messrs. E. and S. Beer. The subject is the Agony in the Garden, from a design by the late Mr. Alfred Beer; and the window is erected to the memory of Mr. Thomas Snow.

The centre window of the east end of the chancel of the new Garrison Chapel, Portsmouth, is to be to the memory of the late Lord Raglan; that to its left to the memory of the late Lord Clyde; and the third to the memory of Sir Charles Napier. The cost of the centre window will be about £75.

A stained glass memorial window, executed by Mr. Holland, of Warwick, is about to be erected in Chetwood Priory Church, Bucks, in memory of the late Mrs. Henry Bracebridge, of Moreville House. The window contains in the centre opening three subjects, viz.:—The two Marys and Joanna at the tomb (Luke xxxiv., 62 v.); the Resurrection, and our Saviour meeting Mary after his resurrection (John xx., 13 v.); in the side openings the four acts of charity taken from the words—"I was an hungered and ye gave me meat; I was thirsty and ye gave me drink; I was naked and ye clothed me; I was sick and ye visited me." The above subjects are arranged in medallions, the background being filled in with rich Early English grisaille work.

STATUES, MEMORIALS, &c.

The Cobden Memorial, Manchester.—The fine bronze statue of Mr. Cobden, recently cast in London, of which Mr. Marshall Wood is the sculptor, has been placed on its granite pedestal in St. Ann's-square, Manchester, opposite the front of the Exchange, but has not yet been unveiled. The pose of the figure represents Mr. Cobden with hand uplifted and finger pointed, in the act of addressing the House of Commons. Mr. Gladstone and Mr. Bright are expected to be present at the inauguration of the statue.

WAGES MOVEMENT.

The French bronze makers are no longer on strike.

A very large number of carpenters in Nottingham and Leicester are out of work. In the latter place, it is said, there are upwards of thirty men walking about the streets.

The strike at Stockport is gradually coming to an end, by the acceptance on the part of the operatives of the proposed reduction of wages.

The Enginedrivers.—The whole of the Brighton men have tendered their willingness to return to their duties; the strike is therefore virtually at an end. The enginedrivers employed on the Caledonian Railway have received notice of an advance on their wages to the amount of 3s. per week, and the labourers and platelayers have also been advanced 1s. On Saturday the enginedrivers and firemen on the North-Eastern Railway, excepting on the Stockton and Darlington section, gave in their notices to cease work on the 20th April. The number who have taken this step is about 1,000.

Blackpool.—A correspondent writes to us as follows:—Sir,—Would you please allow us a small space in your paper to contradict an error referring to the joiners' strike of Blackpool. "We find the masters are advertising for men at the rate of 29s. to 30s. per week, and that the society are pressing a uniform rate of wages on every man." This is all false and untrue; our present rate has been 26s. per week and downwards, which is very much below the average of our neighbouring towns. We gave notice to the masters of Blackpool from 1st of September to the 1st of March, 1867, for 3s. advance on the present rate of wages. If they have been paying men below the 26s., we only ask for the small sum of 3s. for every man according to what they paid before we came out.

Clopwell.—In the limestone district of Clopwell, a strike has been in force for some time for an advance of wages, as the lime merchants are giving the same rate for their labour as the agriculturists. They refuse to advance their rate, and the men, who would rather be employed as agricultural labourers, refuse the class of employment called "stone-getting." It is a matter of serious consideration how to keep up the supply of labour. Excepting the old hands, no men can be got to face the work.

Dewsbury.—During the past ten days most of the labourers in this vicinity have been out on strike in consequence of the refusal of the masters to advance their wages from 18s. to 19s. per week. Several of the contractors have since agreed to the advance.

Wolverhampton.—The bricklayers of Wolverhampton, following the example of the joiners and plasterers, have agreed to settle their future disputes with the masters by arbitration. The branches which still remain out of the union are the masons and the labourers. The masons display a strong antagonistic feeling to arbitration. They have given notice of a change of rules, including a rise in wages of ¾d. an hour, making 5s. 10d. a day, and the masters have expressed their readiness to submit the question to arbitration, but the masons have not replied to their employers' communication.

LEGAL INTELLIGENCE.

Interesting to Artisans.—In the Sheffield County Court, last week, a case was tried of some interest to employers of labour and the employed. A razor blade forger sued Messrs. Hunter and Son for ten guineas, for seven weeks' wages, at 30s., in lieu of notice. It appeared that the custom of Messrs. Hunter is to give and require three months' notice; and the regulation is posted up in various parts of their factory, and is printed in the wage-book which every man has to keep. The plaintiff had formerly been in their employ, and had conformed to the rule and given three months' notice in order to discharge himself. The engagement following this discharge was the one in question. The evidence was extremely conflicting. The plaintiff and his witnesses were positive that when plaintiff was engaged Mr. Hunter, jun., told him the terms were to be the same as before. On the other hand, Mr. Hunter and his witnesses swore that the plaintiff was distinctly engaged as a jobbing hand, liable to be dismissed at any time without notice, and under any circumstances to leave at last November fair, when a certain contract would be finished. The case turned upon the rule before referred to, and the fact that in the plaintiff's wage-book that rule was unexpunged. The judge gave a verdict for the plaintiff for the full amount and costs. The reason of their being seven weeks claimed for instead of three months was that the plaintiff had been required to dismiss his striker, and had been told to leave at the same time. This he was compelled to do, and the seven weeks now sued for, with the time of the striker's notice, made up the three months.

Served them Right!—Forty-one tradesmen were fined at Newington Sessions for having in their possession unjust weights, scales, and measures. The list comprised six licensed victuallers and beer retailers, four greengrocers and coal-dealers, two bakers, fourteen chandlers, two cheesemongers and grocers, six butchers, one marine store dealer, one currier, two oilmen, one confectioner, one glue and size maker, and one ironmonger.

COMPENSATION.

The New Law Courts.—At the old Insolvent Debtors' Court, last week, before Mr. Under-Sheriff James Burchell and a jury, a compensation case connected with the new Law Courts, "Beard v. the Royal Commissioner," was disposed of. The claim in the warrant was £14,410, in respect of the Temple Bar Hotel, the corner of Shire-lane, in Fleet-street, kept by Mr. Jacob Beard, as to his interest and loss on removal. The jury went to view the premises, and after a delay of nearly an hour the parties settled the matter. Mr. Hawkins said the verdict by consent would be for £2,250, and it should be known that the Commissioners were justified in the course adopted, when the claim as made was £14,410. A verdict was accordingly recorded by consent for £2,250.

MEETINGS FOR THE WEEK.

Mon.—Royal Institution.—Monthly Meeting, 2.
Royal United Service Institution.—"The Economy of Fuel, comprising Mineral Oils," by Professor W. J. M. Rankine, 8.30.
Society of Engineers.—"Pumping Engines for Town Water Supply," by Mr. H. Davey, 7.30.
Tues.—Institution of Civil Engineers.—"Memoir on the River Tyne," by Mr. W. A. Brooks, 8.
Royal Institution.—"On Botany," by Rev. G. Henslow, 3.
Wed.—Geological Society, 8.
Thurs.—Royal Institution.—"On the Antiquity of Man," by Mr. W. Pengelly, 3.
Chemical Society, 8.
Linnean Society, 8.
Fri. — Royal Institution.—"On St. Michael's Mount, Cornwall," by Mr. W. Pengelly, 8.
Sat.—Royal Institution.—"On the Antiquity of Man," by Mr. W. Pengelly, 3.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

2168. W. WELCH. Improvements in the Manufacture of Cement Compositions, and in the Method of Applying and Securing Plastic Cements to Iron and Other Surfaces. Dated August 23, 1866.

This invention consists in the manufacture of cements and methods of applying and securing plastic compositions to metallic and other surfaces. The cements are composed of siliceous, calcareous, basaltic, argillaceous, asphaltic, mineral, metallic, and sandy strata granulated or pulverised by calcination, chemical, or mechanical means. The metallic and other substances thus produced, either pure or apportioned to suit the varied practical uses, are then by the aid of vegetable or mineral liquids, acids, salts, and gaseous compounds, mixed and agglutinated into a plastic or fluid consistency, and used as ordinary cement compositions, and for imitations of stones, metals, earths, and ornamental purposes; also for electric magnetic compositions for preserving and coating of iron, wood, and other substances exposed to marine uses, whereby an insulatory waterproof protection is secured and a system of galvanism obtained for anti-fouling purposes. The object of this improvement is the practical resolve and development of the principles contained in a previous application for letters patent (No. 580), 1866. *Patent completed.*

2179. P. A. DE BERENGER. Improvements in Lime and Cement Kilns. Dated August 24, 1866.

This invention has reference to improvements in lime and cement kilns, with view of concentrating and economising the heat and enabling the said substances to be more effectually and uniformly burnt and supplied or discharged from the kiln with less labour and loss of time than by the present system, and consists of a rectangular tunnel of a straight or curvilinear form, in which a series of portable kilns of corresponding size and shape thereto are employed, so as to work upon friction rollers mounted upon channel ways formed in the bed of the said tunnel, by the arrangement of which the said limestone, cement, or other substances to be operated upon, is placed and carried forwarded to the furnace, burnt, and finally discharged in continuous succession, whereby a constant supply to or from the kilns direct from the quarry is maintained, a furnace and chimney at opposite ends of the said tunnel, in connection with circulating flues for diffusing and conducting the heat above and below the said substances to be rendered incandescent, being also employed and arranged so as to admit of the portable kilns (formed of open gratings or otherwise) being brought forward in turn and allowed to remain over the furnace unsuffitillently burnt. *Patent completed.*

2183. J. G. JENNINGS. Improvements in Water-closets, Urinals, and Taps. Dated August 24, 1866.

These improvements in waterclosets relate to closets in which the pan discharges itself by a side opening into the upright limb of a siphon trap. According to this invention the patentee makes the siphon trap with its upright limb of cast iron or lead or other metal, and separate from the pan, and he connects the pan thereto by cementing it into a socket. The valve seat is formed in the upright limb by cementing into it an earthenware or glass ring. The discharge valve has an overflow passage formed through it, and its handle passes up through a cap fitted on to the upper end of the upright siphon. The water valve is carried on a bracket, which fits on and against the upper end of the siphon limb immediately under the cap, which serves to secure it in its place, and the valve is arranged in such a manner as to be opened by raising a lever, which is so placed as to be lifted with the handle of the discharge valve. The bracket is made of a trough-like form, so that should the supply valve leak at any time the water so escaping is conducted at once into the trap. The connections between the supply valve and supply pipe, and between the supply valve and the pan, may be made by union screw couplings; this arrangement admits of the parts being very readily separated, as when the unions are unscrewed the whole of the working parts can be lifted out with the cap. As the whole of the working parts of the closet are within the upright limb and bracket above the siphon trap, the closet may be enclosed in sawdust or other material to deaden sound and to protect it from frost, when fixed in exposed situations, without interfering with the action of the working parts. Urinals he constructs, according to this invention, in a somewhat similar manner. He uses a valve with an earthenware or glass seating, by which all the pans may be emptied simultaneously, and each pan is provided with a separate overflow at the surface, by which any floating matter may escape. This invention also applies to the construction of taps suitable for the supply of water. Supply taps he constructs in the following manner, so that whatever the pressure at which the water is supplied the valve may close quietly as soon as it is left free. Within the shell or body of the tap is a valve seat, by preference bushed with earthenware or glass and a valve resting on this seat stops the flow of the water and the pressure on the back of the valve tends to keep it tight. The stem of the valve passes up through a stuffing box or diaphragm, and by a lever or otherwise can be pressed down when it is desired to draw water. Immediately under the valve is an opening, by which the valve is introduced into its place, and the hole is then closed by a screw plug. In this plug is formed a cylindrical hole which may conveniently be made true on the inside by turning it or lining it with a porcelain or glass tube cemented into its place. The spindle of the valve is continued on so as to enter this cylinder, and it has a cupped leather upon it, working watertight in the cylinder, but a small hole is drilled in the spindle to allow water slowly to pass from one side of the cup leather to the other. Then when the spindle is depressed to open the valve the cup leather descends freely in the cylindrical hole, the water passing the cup leather in this direction without difficulty; but to allow the valve to close the water is compelled to return into the cylinder through the small passage in the spindle, and the valve cannot close until all the water which was displaced in opening the valve has returned through this small passage; thus any blow resulting from the sudden closing of the valve is avoided. The stuffing box through which the valve spindle passes he forms by fixing a vulcanised india-rubber, or other flexible collar or diaphragm, on the spindle, and over this he places a washer, which is held down so as to make a tight joint by a spiral spring, which presses down on the washer, and which also serves to lift the valve into its place if the pressure of the supply should in any case be insufficient. *Patent completed.*

2195. J. F. M. POLLOCK. Improvements in Machinery or Apparatus for Pressing Bricks, Tile Corbels, or other Plaster Work. Dated August 2[illegible] 1866.

This invention consists, first, in the external arrangement and self-contained nature of the machines, the compact rectangular form of frame in which all the working parts are enclosed and protected from the action of dust or other injury, even the ends of the holes in which the shafts run being capped. Secondly, the employment of a spring or other maintaining power or accumulated force and the connection by that means of the continuous and intermittent motions. Thirdly, the arrangement of the cylinder and valve gearing beneath the die, and the means of applying direct pressure to the brick by the use of the crossheads and side rods. Fourthly, the means employed for obtaining all the self-acting motions from one shaft. And, fifthly, the independent action of the cylinder and other parts of the machine being such that very small driving power is required, the pressure given not being derived from the power which drives the gearing. *Patent completed.*

Trade News.

TENDERS.

BRIGHTON.—For Swan Downers Schools, Brighton. G. omers Clarke, architect. Quantities by Messrs. Batstone nd Hunt:—A. Baker, £2,335; H. P. Parker, £2,095; J. arnes, £2,069; Nightingale, £1,823; G. Cheesman, 1,695; Simms and Martin, £1,680; J. Kirk, £1,649; J. T. happel, £1,569.

BRIGHTON.—For new Congregational Chapel at Brighton. r. H. N. Goulty, architect. Quantities by Mr. J. Chester ansdown:—Cheesman and Co., £2,576; Anscomb, £2,570; arsons, £2,370; Simms and Marten, £2,358; Chappell, 2,244; Bland, £2,210; Nightingale, 2,185; Kemp (accepted), £1,951.

BRIGHTON.—For building foundations of a concert hall at righton. Mr. H. N. Goulty, architect. Quantities by Chester Lansdown:—Nightingale, £1,043; Bland, £993; mms and Marten, £969; Cheesman and Co, £890; nappell, £879.

CITY.—For rebuilding No. 23, Lime-street, City, Mr. James Thornhill. Mr. Charles Neilly, architect:—Smith and Son, £1,335; Carter and Son, £1,177; Pask, ,175; Webb and Son, £1,174.

CITY.—For the erection of a new synagogue, Carter-eet, Houndsditch. Messrs. Thomas Smith and Son, artects:—Eunor (accepted), £920.

CHEAM.—Proposed works at the Cheam Schools for R. bor, Esq.. Messrs. Slater and Carpenter, architects. antities not supplied:—Nightingale, £8,957; Simpson, 490; Fish, £5,946; Manley and Rogers, £5,427.

DOVER.—For the erection of a store for the Submarine egraph Company. Mr. Rowland Rees, jun., architect:—arn and Godden, £1,083 15s.; Tunbridge, £1,025; Fagg, 6 19s.; Adcock, £860; Matthews, £849; Stiff and Co., ; Richardson (accepted), £815.

DOVER.—For rebuilding the Donegal, for Mr. Alfred ngsford. Mr. Rowland Rees, jun., architect:—Adcock, 6; Tunbridge, £519 10s.; Perry, £513 17s.; Venner, 2 3s. 4d.; Fagg, £498; Matthews (accepted), £462.

DOVER.—For altering the Saracen's Head Inn, for Messrs. nes and Style. Mr. Rowland Rees, jun., architect:—Kenzie, £292; Adcock (accepted), £244 14s.

DUBLIN.—For new warehouse in Capel-street, Dublin, for srs. Hugh Moore and Co. Mr. W. Fogerty, architect. ntities supplied by Mr. Gribbon:—Kerr, £9,150; erts, £9,000; Millard, £8,975; Moyers, £8,500; kburn and Sons, £8,500; Bolton, £8,450; Nolan, 00; Carroll, £8,000; Meane, £7,500; Crowe and Sons pted), £7,337.

EMLEY (Surrey).—For national schools and master's se. Mr. T. Goodchild, architect:—W. and T. Swayne pted), £392.

AMPSTEAD.—For the erection and completion of nine ses in West End-lane, Hampstead, for Messrs. Langridge Streeter. Mr. John Butler, Architect. Quantities plied by Mr. W. B. Hays:—Welsh, £2,377; Francis and , £2,374; Lathey Brothers, £2,347; Neale, £2,166 18s.; ison, £1,995.

AYWARD'S HEATH (Sussex).—For building a residence Mr. Frederick Willand Mr. E. J. Collins, architect:— , £1,006 10s. 6d.; Lockyer, £987 16s. 4d.; Stuberfield, ; Harrison, £795.

ENTISH TOWN.—For building the Falkland Tavern, ish Town, for Mr. G. Watson. Mr. J. Pennington, itect:—Hoare and Postlethwaite, £1,795; Manley and rs, £1,690; Ellacott, £1,675; Edwards, £1,641; Lang- and Way, £1,623; Mann (accepted) £1,575.

ONDON.—For Holborn Valley Improvements for the Cor- tion of the city of London. Contract D. Mr. W. Hay- C.E., engineer. Quantities supplied by Mr. D. C. olls:—Hill and Keddell (accepted), £23,675.

EWINGTON.—For schools, residences, almshouses, &c., he Metropolitan Tabernacle Committee. Mr. James tt, architect:—In red bricks—Quenell, £7,223; Colls, 40; Sawyer, £4,945; Jackson and Shaw, £4,890; ker, £4,855; Downs, £4,800; Coleman, £4,792; Rider Son, £4,770; Tarrant, £4,725; Thompson, £4,630; (accepted), £4,500; Wells, £4,490.—Less for picked s—Quenell, £69; Colls, £100; Sawyer, £69; Jackson Shaw, £90; Croaker, £77; Downs, £50; Coleman —; r and Sons, £92; Tarrant, £55; Thompson, £130; , £50; Wells, £45.

EWPORT.—For a new infirmary in connection with the port Workhouse. Mr. A. O. Watkins, architect:—icis, £3,840; Whitaker, £3,800; Williams, £3,775; ards, £3,697; Griffiths and Thomas, £3,298; Hoskins, 8.—Infectious Wards:—Francis, £1,030; Whitaker, 20; Williams, £1,000; Richards, £981; Griffiths and nas, £920; Hoskins, £823.

ORTSMOUTH.—In the tender for the construction of the down Hill reservoir, given last week, one or two s occurred. The following are the correct figures:—est samples of bricks only—Light, £5,900; Lawrence, 50; White and others, £5,490 10s.; Simms and Marten, 4; Edwards, £5,350; Furniss, £5,195; Piner (no les sent), £5,030.

YKHAM.—For rebuilding the Crown Inn, High-street, Mr. Henry Hobbs. Messrs. Finch, Hill, and Paraire, itects:—Shapley and Webster (accepted), £1,700.

IGATE.—For proposed works at Woolmer's Farm, near ate, Surrey, for—Taylor, Esq. Messrs. Deut and Son itects:—Nightingale (Lambeth), £564; Thornton, ate, £534. Quantities not supplied.

UTHALL.—For re-draining St. Marylebone Parochial ols, at Southall. Mr. Saxon Snell, architect:—Faulk- £335; Sparrow, £325; Crabb and Vaughan, £309 10s.; son, £299 16s.; Proctor, £295; Tasker, £288; Cowley, ; Wren, £255; Pedley, £240; Gibson, £200.

TON.—For converting the Manor House, Upton, schools, for the Guardians of St. Luke's. Alterations additions:—Simms and Marten, £7,979; Morter, £7,589; Saby, £7,518; Eaton and Chapman, £7,481; Rivett, £7,373; Perry, £7,273; Henshaw, £6,967. Boundary wall and lodge:—Simms and Marten, £1,526; Morter, £1,423; Saby, £1,482; Eaton and Chapman, £1,470; Rivett, £1,420; Perry, £1,393; Henshaw, £1,393.

PROPERTY SALES.

MARCH 27.

AT THE MART.—By Messrs. Edwin Fox and Bousfield.—Freehold ten houses, Nos. 2 to 11, Waterloo-place, Clerkenwell, let on lease at £100 per annum—sold for £2,180.

By Mr. Robins.—Leasehold two houses, Nos. 255 and 249, City-road, producing £105 per annum, term 19 years unexpired, at £21 per annum, £645.

Leasehold house, No. 4, St. John-place, and three houses in carcass, Nos. 5 to 7, St. John's-place, Princes-road, Notting hill; also a plot of building land adjoining, term 95 years unexpired, at £30 per annum—£735.

Leasehold improved rent of £30 per annum, for about 21 years, secured upon No. 181, High-street, Borough—£200.

Leasehold residence, No. 1, Walpole-street, New-cross, let at £25 per annum, term 84½ years unexpired, at £4 per annum—£190.

By Mr. George Goldsmith.—Leasehold residence, No. 9, Cadogan-place, Belgrave-square, let on lease at £123 per annum, term 17 years unexpired, at a peppercorn—£1,000.

Leasehold residence, No. 37, Denbigh-street, South Belgravia, estimated annual value £70, term 64½ years unexpired, at £10 10s. per annum—£690.

By Mr. Curtis.—Freehold house and shop, No. 123, Leyton-road, Alma-place, Stratford New Town, estimated annual value, £35—£620.

Freehold 4a. 1r. 33p. of land, and two residences, situate Balaam-street, Plaistow—£2,800.

Copyhold 1a. 1r. 1 p. of land, situate in Purle's Hill-lane, Plaistow—£500.

Leasehold three houses, Nos. 1 to 3, Champion-terrace, Grove-lane, Camberwell, producing £84 per annum, term about 92 years unexpired, at £8 per annum—£645.

Leasehold premises, portions of which have been partly destroyed by fire, situate in Abbey-lane, West Ham, held for 500 years from 1724, at 1s. per annum, subject to an underlease for 61 years from 1843, at £65 per annum—£1,580.

BATH STONE OF BEST QUALITY.

RANDELL AND SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

George Neale, George-street, Camberwell, bricklayer, April 10, at 1—Charles Pedgrift, Kennington-street, Walworth, plasterer, April 11, at 2—William Sheppard, Pickering-place, Westbourne-grove, house painter, April 24, at 12—Robert Bonner, Brighton, plumber, April 10, at 12—James John Sard, Bevis Marks, gasfitter, April 10 at 1.

TO SURRENDER IN THE COUNTRY.

Edward Bowcutt, Madresfield, blacksmith, April 3, at 12—George Catton, Lincoln, builder, April 4, at 11—John Cope, Birmingham, brass caster, April 18, at 10—Edward Smith Crease, Plymouth, dealer in machinery, April 1 at 12.30—Francis Dopson, Ramsbury, Wilts, smith, April 5, at 11—Phillip Gleede, jun., North Petherton, builder, April 10, at 10—John Lee, Alnwick, joiner, April 2, at 11—William Robinson, Manchester, plumber, April 5, at 12—William Watkin, Stapleford, painter, April 10, at 11—Henry Beddows, Little Lever, wheelwright, April 10, at 10—David Brockman, Dover, labourer, April 10, at 12—George Pile Gibbs, Ilfracombe and Exmouth, builder, April 5, at 11.30—John Harvey, Fairford, Gloucestershire, builder, April 6, at 11.

PARTNERSHIPS DISSOLVED.

Nelson and Innes, Whitehall, architects—Cooper and Sleightholm, Scarborough, plumbers—Wells and Slack, Birmingham, engineers—Stone and Co., High-street, Deptford, engineers—Gotley and Co., Bristol, gas fitters.

NOTICE OF SITTINGS FOR LAST EXAMINATION.

W. H Thorn, Lower Thames-street, zinc worker, April 17—M. Roots, Shipbourne, Kent, timber merchant, April 17—W. Swatman, Elm-street, Gray's Inn-road painter, April 26—E. S. Down, Hadleigh, builder, April 29—G. Smith, Hammersmith, carpenter, May 1—G. Barnes, Grove-road, Mile End-road, slater, April 18—T. Coxton, Stockton-on-Tees, bricklayer, April 17—F. I. Salter, Yarmouth, Isle of Wight, builder, April 25—T. Emery, Wednesbury, carpenter, April 10—T. Powell, Brynmawr, contractor, April 10—E. Moor, Hall-street, Bow-common, timber merchant, May 3—J. Howlett, St. Thomas's-road, Stepney, bricklayer, May 7—E. Ashbee, Albany-street, Regent's Park, granite merchant, May 2—H. Symons, Aldersgate-street, ironmonger, May 2—W. Bailey, Finchley, builder, May 2—J. Williams, Lewisham, plumber, May 2—W. Purkiss, Hampden-street, Somers Town, builder, May 2—J. Winch, Avenue-road, Hackney, builder, May 3—J. Springfellow, South-grove, Stamford-hill, builder, May 7—D. Simpson, Aldershot, carpenter, April 17—H. Woodford, Welford, blacksmith, May 10—J. Rogers, Bridgewater, plumber, April 12—W. Juby, Cretingham, journeyman blacksmith, April 16—G. W. Francis, Luson, Devon, road surveyor, April 17—T. G. Sidgwick, Holbeach, cabinet maker, April 11—H. Sidders, Teynham, brickmaker, April 12.

DECLARATIONS OF DIVIDENDS.

J. J. Darken, Holt, Norfolk, builder, dividend 2s. 4¾d.—S. Biggs, Reading, builder, dividend 12s. 6d.—A. M. and A. Barker, Birmingham, metal dealers, dividend 3s.

DIVIDEND.

J. Robinson, Rochester-place, Kentish Town, wheelwright, April 15.

BANKRUPTCY ANNULLED.

Henry Bowman Little, Liverpool-street, builder, March 26.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9 0	£10 10	Archangel, yellow ..	£12 0	£13 0
Quebec, red pine	3 5	4 15	St. Petersburg, yel...	10 10	11 0
" yellow pine..	2 15	3 10	Finland	8 0	9 0
St. John N.B. yellow	0 0	0 0	Memel.....	0 0	0 0
Quebec Oak, white ..	5 10	6 0	Gothenburg, yellow	9 0	10 10
" birch.....	3 10	4 10	" white	8 0	8 10
" elm	3 10	5 0	Gefle, yellow.....	9 0	11 0
Dantzic oak	3 10	6 0	Soderhamn	9 0	10 10
" fir	2 0	3 10	Christiania, per C.,		
Memel fir	3 0	3 10	12 ft. by 3 by 9 in.		
Riga	3 0	3 5	yellow	18 0	22 0
Swedish	1 18	2 3	Deck Plank, Dantzic,		
Masts, Quebec red pine	6 0	8 0	per 40 ft. 3 in.	0 14	1 4
" yellow pine..	5 0	6 0	PUMICE STONE pr ton	5 0	8 0
Lathwood, Dantzic, fm	4 10	5 10	OILS, &c.		
" St. Petersburg	6 10	7 10	Seal, pale....per tun	45 10	0 ¼
Deals, pr C., 12 ft. by 3			Sperm body	140 0	141 0
by 9 in., duty 2s per			Cod	41 0	0 0
load, drawback 2s.			Whale, Sth. Sea, pale	45 0	0 0
Quebec, white spruce	13 10	22 10	Olive, Gallipoli.....	63 0	0 0
St. John, white spruce	13 0	15 10	Cocoanut, Cochin, ton	58 0	0 0
Yellow pine, per reduced C.			Palm, fine	41 0	0 0
			Linseed	37 0	0 0
Canada, 1st quality.	17 0	19 10	Rapeseed, Eng. pale..	39 0	39 10
2nd do.....	12 0	13 10	Cottonseed.....	30 0	36 0

METALS.

IRON:—					
Welsh Bars in London	per ton	6 15 0	0 0 0		3
Nail Rod	do	7 10 0	8 0 0		2
Hoops	do	8 17 6	9 0 0		
Sheets, Single	do	9 17 6	10 0 0		
Staffordshire Bars	do	7 17 6	8 10 0		
Bars, in Wales	do	5 15 0	6 0 0		3
Rails	do	6 0 0	6 5 0		net
Foundry Pigs, at Glasg. No 1 ..	do	2 13 6	3 7 0		
Swedish Bars	do	10 10 0	12 10 0		2½
STEEL:—					
Swedish Keg, hammered	per ton	15 15 0	16 0 0		
Swedish Faggot	do	10 10 0	12 10 0		
COPPER:—					
Sheet & Sheathing, & Bolts	per ton	86 0 0	91 0 0		
Hammered Bottoms	do	96 0 0	101 0 0		
Flat Bottoms, not Hammered ..	do	91 0 0	95 0 0		
Cake and Tough Ingot	do	76 0 0	0 0 0		
Best Selected	do	84 0 0	89 0 0		
Fine Foreign	do	86 0 0	88 0 0		
Yel. Metal Sheathing & Rods	per lb	0 0 7½	0 0 8		
TIN:—					
English Block	per ton	90 0 0	0 0 0		2½
do Bar	do	91 0	0 0 0		
do Refined	do	93 0 0	0 0		
Banca	do	94 0 0	0 0 0		nett
Strait	do	89 0 0	0 0 0		
LEAD:—					
Pig, English	per ton	22 5 0	22 10 0		2½
" Spanish Soft	do	19 15 0	0 0		
Shot, Patent	do	23 10 0	24 0		
Sheet	do	21 0 0	0 0 0		
White	do	30 0 0	31 10 0		
SPELTER:—					
On the Spot	per ton	22 5 0	22 15 0		net
ZINC:—					
English Sheet	per ton	28 0 0	0 0 0		
Devaux's V. M. Roofing Zinc	do	28 0 0	0 0 0		*

* And 5 per cent. discount if laid upon the new system.

QUICKSILVER	per btl	6 18 0	7 0 0
REGULUS OF ANTIMONY.			
French	per ton	34 0 0	0 0 0

The Seacombe Forge, Rivet, & Bolt Company

MANUFACTURERS OF

Bolts, Rivets, Washers, Coach Screws, Spikes, Set Pins, Tie Rods, Cotter Pins, &c.,

ALSO

ENGINEER'S AND SHIPBUILDER'S FORGINGS, SMITH WORK, AND EVERY DESCRIPTION OF SHIP'S FASTENINGS.

Works—SEACOMBE, near BIRKENHEAD.

STAIRCASE and JOINERY WORKS,

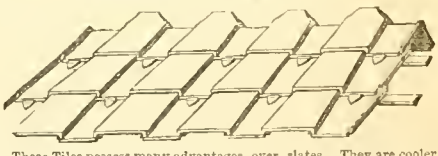
JOHN WALDEN

(Late Shop Foreman to Mr. W. SANDS, retired),

12, MAIDEN LANE, COVENT GARDEN.

Estimates on application.

THE NEW ROOFING TILES.



These Tiles possess many advantages over slates. They are cooler in summer and warmer in winter, and are less than half the weight of plain tiling. They can be laid to any slating pitch, form an ornamental roof suitable to any style of building, and can be supplied in red, white, blue, dun, and various other colours. Glass Tiles upon the same principle.—For particulars apply to the BROOMHALL TILE and BRICK COMPANY (TAYLOR'S PATENT) (LIMITED), at

COX'S WHARF,

UPPER GREEN-STREET, BLACKFRIARS, LONDON, S.

Also for

DAMP PROOF COURSE

(Taylor's Patent),

Now the SOLE property of this Company.

FOR PREVENTING DAMP RISING UP WALLS.

WINDOW BLINDS.

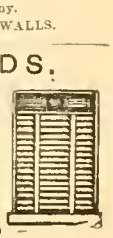
W. BITMEAD,

11, FREESCHOOL STREET,

AND

CROSS STREET, HORSELYDOWN,

SOUTHWARK.



WINDOW BLIND MAKER TO THE TRADE.

TO be SOLD, a Bargain, First-rate CARCASES of HOUSES. Best Position in London for Private Houses or Shops; four ready for Occupation.—Apply on the Premises, 3, Erskine-road, Chalk-farm.

WANTED, a Large Quantity of GRAVEL for Cementing purposes.—Address, with full particulars, to Thomas Jones, 40, Mount Pleasant, Liverpool E.

BUILDING GROUND to be LET, lease 99 years, situate Fellows-road, Haverstock Hill, N.W., close to railway station to City.—Apply, J. G. Bettison, 26, Adelaide-road, N.W.

GREEN SLATES (WELSH) of the peculiar tint so much sought after by architects.—Charles Gane & Co., Timber and Slate Merchants, Wisbeach.

CRYSTAL PALACE. — FIRST-CLASS BUILDING LAND to be LET in immediate proximity to the Palace, on advantageous terms. For particulars apply to Mr. Hart, Accountant's Office, Crystal Palace; or to R. R. Banks, Esq., 1, Westminster Chambers, Victoria-street, Westminster.

LARGE but Inexpensive WAREHOUSES or MANUFACTURING PREMISES, Yard, and Stabling, covering an area of 5,500ft., and situate in Vine-street, Liquorpond-street, near the New Holborn Improvements, To be LET.—Apply to Messrs. Debenham, Tewson, and Farmer, 80, Cheapside.

BUILDING LAND, suitable for Villa Residences, to be LET on LEASE, at Benhill, Sutton, Surrey, not far from the railway station. Advances will be made, if desired, as the works proceed. Plans and drawings and every information obtained upon application to Mr. Tresidder, 16, New Bridge-street, Blackfriars.

TO BUILDERS and Others.—CROYDON.—To be LET on Building Leases PLOTS of LAND delightfully situated in the most preferable part of Croydon. Gravelly soil. Liberal advances made to respectable builders and others. For further particulars, address, Mr. Henry Wm. Broadbridge, Architect, 3, Hartley Villas, Lansdowne-road, Croydon, S.

TO CARPENTERS and BUILDERS.—Some well-built 9-roomed CARCASES for SALE, in one of the very best situations in London for letting and selling. Lease direct from the Freeholder for a term of 99 years. Cash advanced to respectable parties (if required) to assist in finishing.—Apply to Mr. Clarkson, Surveyor, 38, Great James-street, Bedford-row, W.C.

TO BUILDERS.—To be LET on Building Lease, with advances, if required, portions of a very valuable FRONTAGE to a high road, in a favourite suburban district, 15 miles from town, where houses are in great demand, offering an unusual opportunity for a man of enterprise and small capital to speedily realise a considerable profit.—Apply to H. J. Peachey, Esq., Surveyor, 28, Craven street, Charing-Cross, W.C.

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THE BUILDING NEWS.

LONDON, FRIDAY, APRIL 5, 1867.

EASTERN ART.*

FROM the East, prefigured by the star, came wisdom from the earliest ages—the East, the cradle of mankind, the birthplace and sanctuary of religion, art, institutions, and ideas. The very immobility of the East, the absence of all progress in its sultry latitudes, has something marvellous and imposing. Sphynx-like it contemplates the rise and fall of countries, centuries, dynasties, races. Neither war nor time has triumphed over its sublime repose. Invaders, be they moral or physical, have passed away without leaving a trace, or have been assimilated into its spirit. This spirit is developed in certain types indigenous to these countries—types that have triumphed over changes of dynasty, and even of religion—dependent principally on climate, customs, and habits which the course of centuries has not modified. These types afford immense cope to the critical observer, and can easily be traced from the earliest period, but for the present we will be satisfied in examining the middle-age aspect of Eastern civilisation, and this will be most effectually done by considering its architecture, the specially representative art of the immutable East.

Architecture is at once the most beautiful and the grandest of the arts, capable of the loftiest, the subtlest, the most refined expression. Painting and sculpture, contemplated on this grand scale, are but artistic accidents. It is to the splendid perspectives of Memphis, Thebes, Cairo, Babylon, or Venice that one must look for the grandest development of architectural art, beside which the delicate details of sculpture, either as immortalised by Phidias or Milo, sink into insignificance. To bring to bear the same sentiment of the beautiful in the contour of a monument or the aspect of a vast city which is displayed in the conception of a statue or a picture is truly the very highest effort of genius, requiring an intuition and a symbolism far profounder than the mere reproduction of the human form. Architecture as an art separates itself so entirely from all other arts by its combination, formulæ, lines, and developments—it has so completely its own conception of the beautiful, that it amounts almost to an instinct, the instinct of construction, allied, one may conceive, to another and more universal instinct, that of self-preservation. This view of the subject has been little developed by writers on architecture, who generally see in early monuments but the successive modifications of ignorant ages. These architectural instincts were specially developed in the East, from whence the Greeks unquestionably borrowed the ideas of an elder and more advanced race, adapting them to the special wants and requirements of their own country.

The instinct of construction, common to animals as well as to men, is the undoubted origin of architecture. It is to be regretted that this instinct has been strangely overlooked by archæologists, who in their scientific researches have failed to observe that from the brain of man turned to the consideration of how he could shelter himself and his offspring proceeds the germ of construction. The same germ is observable more or less strongly in different animals, as well as in different races; it is regulated by the wants, the climate, and habits of the various countries they inhabit. Birds, for instance, construct their nests by a common instinct, and their calculation as to the best means of self-preservation is not to be surpassed by the most learned geometrician. The bird of passage builds her light dwelling on the ground, but the crow, an experienced mason, constructs his nest solidly for life. Ants are perhaps of all created things the most wonderful exemplification of this instinct. They raise pyramids and construct cities, where liberty of circulation, easy access by means of ladders, internal ventilation, drainage, and every other complicated accessory of construction, are skilfully adapted and modified to the various positions chosen by these marvellous little animals, whose works can challenge favourable comparison with the most elaborate human conceptions. From what does this proceed but from instinct, and, if admitted, why deny to man the same and analogous faculty? Granted, then, this faculty, some country, some race of men must have existed where it was specially developed, and where among ancient monuments the earliest specimens are to be found. Nothing can be easier than to describe the country and the race where vast monuments, like pages of the great architectural book of Time, lead us progressively, step by step, up to the civilisation of the middle ages; and again can be plainly traced back from its sudden development in Europe, and France in particular, to those Eastern lands from whence it came—perfected by the lapse of eight or ten centuries. Like Minerva springing from the brain of Jupiter, so came architecture into Europe—vigorous, beautiful, complete.

This view of the origin of architecture in the middle ages is most important in theory as reversing all previous conclusions. It was scientific and logical, formed on a special study of nature, and owing nothing to the traditions of Pagan art. Admirable as were the monuments of Egypt, Greece, and Rome, perfected and idealised by the exquisite decorations of sculpture and painting, they still betrayed certain inexperience in design and monotony in conception. Mass rested upon mass, stretching onward in lengthened lines, unable by their construction to rise into noble altitudes. The pyramids were simply rude mountains of materials, solely imposing from their size; the monuments of India and Arabia, excavations and ornamental caverns in the living rock. China, with its graceful wooden erections, offers nothing of value. Where, then, is to be found the source, the artisti cinstinct of architecture? From whence came this art, complete in boldness and grandeur. Gazing into the mists of the past, what shadowy Babel tower rises vaguely before us, terracing tier above tier to that sky which it proudly professes to reach? Chaotic is the conception, traditional are its records, but its builders were the creators of the grandest style of architecture, the first incubators of those wonders which, fully developed by successive centuries, came into Europe as a completed system. To the East, then, let us go to ask how architecture arose, how it was formed, and how developed. The period of which we would speak, although occupying a most important place in the history of art, is little known and little studied. Many parts of the East are only cursorily explored by artists and antiquarians, who generally prefer making the monuments of Egypt and Greece their peculiar study rather than the pure forms of modern Oriental art. Everything in the East is linked so imperceptibly together—art and nature are so immutable, that it is difficult to mark the transition of ancient into modern art, especially where literary annals are wanting. But a decided transformation, emanating from the East, certainly took place both in ideas, religion, and art, over the whole Western world about the time of the birth of Christ. The subsequent foundation of the City of Byzantium, and the reconstruction of the empire in the East, gave a new and very marked impetus to Eastern art. From a very early period the East was to the West what the two Americas subsequently became—a promised land of golden dreams, where liberty, riches, and peace flourished under an ever-shining sun—a nature perennially beautiful. Weary of the decrepitude, debauchery, incredulity, and baseness of the old Roman empire, Constantine, when adopting a new religion, determined to transport the imperial capital into the East, to break up new ground both in government and civilisation, as well as in faith. To liberate himself from the conspiracies against his person and the trammels on his government (constantly fostered by the opposition of the old Pagan world) he turned his eyes toward the golden East, and realised an almost visionary project by planting the capital of the world on the banks of the Bosphorus. But, strange to say, instead of introducing Western influences on the new capital, the indomitable spirit of the East imposed itself on its conquerors. From this moment dates Byzantine art, which owes nothing either to Rome or to Greece. Does the bold conception of the cupola of St. Sophia, hanging in mid-air like a lustre suspended by a thread from the Heavens, own any community of origin with the flat roofs of Grecian temples? Its fantastic ornamentation, so varied, so capriciously graceful, has no possible connection with the Doric or Corinthian orders. Neither have its mosaics, executed on a gold ground with morsels of glass, so admirably adapted to decorative art, any possible affinity with the paintings of the schools. Greece, like Rome, had at that period died out—it was forgotten, defaced, despoiled, and was now replaced by Asiatic influences destined from this time to exercise a complete influence over the Romans, ever willing to assimilate all that was noble and beautiful in art, the more readily from the entire absence of any original or creative faculties in themselves. Can it be conceived that the Romans in founding Byzantium created spontaneously the architecture of which St. Sophia is the purest type? Is it credible that in all the length and breadth of Asia, and of Persia, since the conquests of Alexander and the breaking-up of his vast empire no architecture was cherished and developed? After the destruction of Nineveh, Babylon, and Persepolis, manufactures, customs, and habits gradually returned to their ordinary channels. The old civilisation had lain dormant, not extinct, and was ready to awake into active existence by any predisposing cause. The Persian Empire, even after the death of Alexander, was a country of commerce and of industry. Babylon, for ages the centre of all the fabulous riches of the East, fed by the Euphrates and bordered by interminable quays, where ships from India and the Mediterranean ports still lay moored, yet retained traces of its former splendour. Carpets of gorgeous colour, stuffs of gold, silk, cotton, and wool, enamels, arms, glass, carving, furniture, perfumes, precious stones, pictures, manuscripts, were borne into the new Roman capital by countless caravans. Thus did the magical spirit of the East enchant and conquer the Roman settlers in the new city. Thus was practically realised the golden visions which led on the Argonauts into unknown seas and strangest latitudes, symbolised by the fable of the Golden Fleece conquered by Jason—visions which became many centuries later a kind of enchanted mirage to the Spaniards, Portuguese, and Italians. They were at last realised by Columbus and Vasco di Gamba, who—modern Jasons—sought and found the real treasures prefigured in the old Grecian fable. Let, therefore, the notion be for ever banished that the Romans created an architecture at Byzantium. The new Rome was only the platform where was exhibited before the eyes of the Western world that art and consummate knowledge of art, perfected for centuries in Persia, but unknown in Europe, by its geographical isolation, its mountain barriers, as well as enormous distance. When, therefore, Constantine established, in 395, old Rome in the new city, he found ready prepared a brilliant and finished intellectual life in marvellous harmony with the picturesque and gorgeous aspects of Eastern life. There was,

* This article was suggested by a work of M. de Beaumont.

then, in the new style of architecture inaugurated by the new city, no recollection of Greco-Roman art. The straight heavy lines characteristic of horizontal architecture were transformed into graceful curves and mantling arches, rising light and perpendicular upwards. Horizontal and perpendicular are, indeed, the best terms to apply to these widely dissimilar styles — the Perpendicular or Persian style to be studied at Nineveh, Persepolis, and Babylon, where vast halls, with conical roofs, domes, ranges of arches, towers and minarets, were supported by a forest of light pillars. This poetic architecture came ready made to the hands of the Romans, who at once adopted it in their new city, and called it Byzantine, applying it to the temples of their new faith, and accepting it as the type of Christian art. The characteristic features of the new style are specially displayed in façades, where grand effects of light and shade are produced by skilful inequalities of surface, by the light yet grandiose character of the large arches, mounting higher and higher and often terminating in a point. This truly Oriental style attained special perfection in the reign of the Emperor Basil, in whose public buildings arch upon arch, cupola upon cupola, dome surrounded by domes, offered the strongest contrast to heavy pillars supporting flat roofs and huge masses of frontispiece, requiring every adjunct and embellishment of Grecian sculpture to disguise their baldness. F. E.

(To be continued.)

THE COURTS OF JUSTICE COMPETITION.

Article XII.

Mr. E. M. Barry, like his brother associate Mr. Street, has competed for the new Courts of Justice as thoroughly as he did for the National Gallery. There is, however, a vast difference between the two A.R.A.s. Mr. Street competed for the National Gallery with the pluck of a Gothicist, to show that he could design a Gothic picture gallery, and stuck manfully to his colours. Mr. Barry competes for the Law Courts, deserting his Renaissance mistress, who has hitherto so well befriended him, for a Gothic model of questionable character. In plan Mr. Barry's scheme has points of resemblance to Mr. Scott's; thus, the outer shell or zone of buildings only carried round three sides, the side towards the Strand having no outer buildings. Within this external line of offices is a street with exit and entrance from the Strand, and within the main block of buildings in which are the courts we have an open area, and within that a central hall and dome with corridors extending laterally and enclosing open quadrangles. The great drawback both to this plan and to Mr. Scott's arrangement is the difficulty which one would have in finding any person; for a regular hide-and-seek game might be carried on every day without the slightest intention of dodging, whilst the regular dodger would find a perfect paradise in the numerous angles and ins-and-outs of the designs we have just mentioned. In the arrangements of the courts we are somewhat surprised to find that Mr. Barry has placed his Exchequer Courts on the Carey-street side. This is a manifest mistake. Another erroneous reading of the "instructions," as it seems to us, is evidenced in the management of the entrances for the *oi polloi*, which are not distinct and separate, but are arranged to serve groups of courts. "The access to the public galleries is by separate and distinct staircases, entered directly from the street. The staircases are arranged like the great circular staircase at the Chateau of Chambord. There are four of these staircases, each containing two separate sets of stairs. Staircases are also provided for the Appellate and spare courts, so that there are ten staircases for the exclusive use of the public for approaching their galleries in the several courts, which are arranged in groups corresponding to the number of the staircases." The arrangement of the Record department forms a very important and salient feature in many of the designs; but Mr. Barry having determined on a central dome, says "The provision for the documents of the Probate Court is afforded by the dome and the central mass on which it rests. This is considered a more compact and convenient arrangement than a tower or towers, which, to afford the amount of accommodation required, must necessarily be of great height." This is carrying out the principle of utility with a vengeance; and we regret it, because we feel satisfied that the architect who grapples as successfully as Mr. Barry does with his masses would have added dignity to his building by following the special requirements of the Record department. To return for a moment to the public staircases. We ought undoubtedly to give Mr. Barry praise for his "Chambord" staircases, for, although we can by no means give him the merit of having solved the problem contained in the 25th clause of the instructions, viz., to provide for mere public spectators a separate access to each court, still the adoption of the Chambord idea is far in advance of some of the competitors, who seem to have either neglected this very important part of the plan or to have been unequal to cope with the conditions. The two great questions of acoustics and ventilation Mr. Barry gets rid of in four short paragraphs. He very properly considers skylights objectionable, and has lighted his courts through high side windows. But he observes an ominous silence touching the style of his architecture, which perhaps was the wisest thing to do, considering all the circumstances; for, after giving this competitor all credit for his general disposition of the masses of his building, for the general proportions, and for the gradation of proportions, we have nothing left to do but to take leave of the design or find fault. It would scarcely be fair to those of whose works we have been free to speak our mind, were we to pass by Mr. Barry without our usual grumble; and this is all the more necessary when we consider the influence his pleasing perspective may have on those who are indifferent to detail. It is almost entirely on this question of detail that Mr. Barry's design fails. *Nominally* "the style he has selected," as the phrase goes, is the Geometrical Decorated. *Really* it is the Perpendicular of King Edward's School at Birmingham, bedizened with decorated tracery and a heap of crockets and pinnacles. Now, with the exception of the tracery forms, there is nothing in the details of the design before us to distinguish it from the most commonplace modern Perpendicular work. Of positive uglinesses there are not perhaps so many as may be found in some of the other designs, but when they do occur it seems as if Mr. Barry had really enjoyed the caricature of Gothic which is exhibited in parts of his design. What, for instance, can be worse than the heavy interior of the central hall, the cast-iron looking bridge over Temple Bar, or the clock tower close by? Then, again, the fizzy, flying-buttressed tops to the four great Chambord staircases are as bad as any of the Perpendicular fizzinesses which obtained under the Georgian geniuses, who used to design ruined abbeys to decorate their clients' pleasure grounds. We must confess to being greatly disappointed with the detailed treatment of Mr. Barry's work. It is quite unworthy of the architect of the Endell-street Schools; and we trust that when he next tries his hand on Gothic he will select his own work in St. Giles's as a starting point, rather than the meretricious Gothic of the last century.

Mr. Abraham commences his report as follows:—"In the year 1864 Mr. Abraham, who has the honour of submitting this present design to her Majesty's commissioners for the New Law Courts, prepared floor plans for the concentration of the Courts of Justice, which have since been purchased by her Majesty's Government for the use of the commissioners. It will be observed, no doubt, that those former plans are more symmetrical and regular in outline, and generally of more geometric form, than these later ones, and it may be conjectured that carelessness for ichnographic excellence or want of study has caused what may fairly be imagined a disimprovement; neither of these delinquencies, however, has contributed to this result. A new and original design was due from Mr. Abraham under his present engagement; he could not supply it by merely grafting new requirements on the old stock, so he had to disengage himself from his early ideas and cast them into a new mould of sufficient capacity to contain the enlarged view of the subject, and give to fitness, commodiousness, and practicability the pre-eminence due to them, even at the cost of an attractive outline." At the end of his report, speaking of his design, Mr. Abraham states that "he is fully aware that it is imperfect, wants finish, refinement, and much further study." In consideration of Mr. Abraham's manifest consciousness of his shortcomings, having due regard to the patience of our readers, and bearing in mind the history of the subject, and the very evident reasons why Mr. Abraham was included in the chosen few, we think we may fairly be excused if we refrain altogether from criticising a design of which we feel we could not justly say one word in praise, and as to blame anything we might be called on to say would be quite supererogatory, for neither the design nor the drawings by which it is expressed can have the slightest influence for good or bad beyond the author's immediate circle of acquaintance.

* * * * *

Our illustration this week shows the Strand front of Mr. Scott's design, which in general mass is not unlike Mr. Barry's. Where Mr. Barry uses gables in the flanks of his central projection Mr. Scott uses towers. In the design of these towers, in the exaggerations of windows in the central portion, and in the unpleasant admixture of German and Italian ideas, the general design differs not a little. The chief charm of the Strand front is the noble arcade of the ground floor, which is treated with an admirable gradation of proportion and enrichment.

WHY DOES THE CLOCK KEEP TIME?*

It may seem strange to some of the members of the Edinburgh Horological Society that one of their body should select what seems, on the first glance, to be such an absurd subject for a paper as, "Why does the clock keep time?" Many of the members we fancy may say, why it cannot help keeping time; the clock is made after careful and laborious study, combined with experience gained since the earliest ages. It is made agreeing with the most severe rules in mathematics, as tested by the most experienced of the professors of that science. It is made of the very best materials that can be procured either by the skill of man, or that nature in its prolixity can produce. It is made (so to speak) to be under the control of, we will say, a pendulum, and that pendulum of the proper length, made of materials that will either expand or contract according to the weather. It is under the surveillance of, we will say, one who is devoted to the perfection of mechanism, one who considers trouble not worth considering that will advance the science (and so it is) that he is so ardent a disciple of. We will say let all these answers be brought forward, and yet the question, "Why does the clock keep time?" remains unanswered. A pendulous body vibrates when it is suspended, so that the centre of its mass is not placed directly under the point of suspension, because then the alternating influences of weight and velocity are constantly impressing it with motion. Weight carries it down as far as it can go towards the earth's attraction; acquired velocity then carries it onwards, but as the onward movement is constrained to be upward against the direction of the earth's attraction that force antagonises and at last arrests it, for velocity flags

* Paper read before the Edinburgh Horological Society By Mr. David Spence.

when it has to drag its load up hill and soon gives over the effort. The body swings down hill with increasing rapidity because weight and velocity are then both driving it. It swings up hill with diminishing rapidity because then weight is pulling it back in opposition to the force of velocity. Weight pulls first this way, then that way; velocity carries first this way, then that way, but the two powers do not act evenly and steadily together. They now combine with, and now oppose each other; now increase their influence together, and now augment and diminish it inversely and alternately, and so the suspended body is tossed backwards and forwards between them and made to perform its endless dance. It is related of Galileo that he once stood watching a swinging lamp hanging from the roof of the cathedral at Pisa, until he convinced himself that it performed its vibratory movement in the same time, whether the vibration was one of wide or of narrow span. This traditionary tale is most probably correct in its main features; for the Newtons and Galileos of all ages do perceive great truths in occurrences that are as common place as the fall of an apple or the disturbance of a hanging lamp. The orchard at Woolathrope and the cathedral at Pisa were outlets of this kind, through which the pent-up tide of gathering knowledge burst. If they had never offered themselves, the laws of universal gravitation and isochronous vibration would still have reached the world. If we hang up two equal weights upon nearly the same point of suspension and by means of two strings of exactly the same length, we will have an apparatus at our command that will enable us to see under even more favourable conditions what Galileo saw in the Cathedral of Pisa. Upon drawing one of them aside one foot from the position of rest, and the other one yard, and then starting them off both together to vibrate backwards and forwards, he will observe that although the second has a journey of two feet, the two will nevertheless come to the end at precisely the same instant. As the weights swing from side to side in successive oscillations they will always present themselves together at the point which is the middle of their respective arcs. This is what is called isochronous vibration—the passing through unequal arcs in equal periods of time.

This at the first glance seems a singular result. One would naturally expect that a weight hung upon a string ought to take longer to move through a long arc than through a short one, if impelled by the same force; but it appears in a different light upon more mature reflection; for it is then seen that the weight which performs the longer journey starts down the steeper declivity, and therefore acquires a greater velocity. A ball does not run down a steep hill and a more gently inclined one at the same pace, neither will the suspended weight move down the steeper curve and the less raised one at equal rates. The weight which moves the fastest of necessity, gets through more space in a given period than its more leisurely companion does. Yet another surprise remains to be encountered. Hang a weight of a pound upon one of the strings and a weight of two pounds upon the other, and set them vibrating in arcs of unequal length as before, and still their motions will be found to be isochronous. Unequal weights as well as equal ones, when hung upon equal strings, will swing through arcs of unequal length in equal periods of time.

It has been stated that the motion of swinging bodies is caused by the earth's attraction, or in other words, gravity. And we find that suspended weights only vibrate in equal times when hung upon equal strings, but they continue to make vibrations in equal times, notwithstanding the diminution of the arcs in which they swing. This was the fact that caught the attention of Galileo; he observed that the vibrations of the lamp slowly died away as the effect of the disturbing force was destroyed bit by bit, but that, nevertheless, the last faint vibration that caught his eye took the same apparent time for its performance as the fullest and longest one in the series.

Gravity, which causes bodies to fall, also causes them, as we have already seen, to swing backwards and forwards when suspended freely by a string or rod from a point, and when once moved to a side to give them an occasion of falling. An instrument thus suspended has been designated by the learned name of pendulum, which is simply a weight placed on the end of a metallic or wooden rod and hung up in such a way that free sideway motion is permitted. This freedom of motion, as we are well aware, is generally attained by fixing the rod to a piece of thin highly elastic steel. A pendulum fitted up after this fashion will continue in motion, if once started, for many hours. It only stops at last because the air opposes a slight resistance to its passage, and because the suspending spring is imperfectly elastic. The effects of these two causes combined arrest the vibration at last, but not until they have long accumulated. The weight does not stand still at once, but its arc of vibration grows imperceptibly less and less until at last there comes a time when the eye cannot tell whether the body is still moving or in absolute repose.

The vibrations of the pendulum being produced by terrestrial gravitations, it follows, as a natural result, that if the force of gravitation be weakened, so will the tendency of the ball of the pendulum to fall or swing be weakened. The result is distinctly observable in different parts of the earth.

At the equator the earth bulges out to a thickness of 26 miles on the diameter, or 13 miles from the surface to the centre; and as the attraction of gravitation proceeds from the centre, the force of this attraction is consequently weaker at the surface at the equator than it is at the surface at the poles. At every part of the surface between the equator and poles there is a proportionate increase of gravity. Besides the effect produced by the greater distance of the surface from the centre at the equator, centrifugal force, which is strongest at the equator, assists in weakening the attractive force at that place.

In consequence of these combined causes a pendulum of a given length vibrates more slowly at the equator than at the poles. In proportion as we advance on the surface of the earth from the equator towards the poles so does the pendulum swing or vibrate more quickly. In order, therefore, to preserve uniformity of speed in pendulums at different parts of the globe, that is, in order that they may all vibrate in one second, their length must be regulated according to the distance of the places from the equator. Thus each degree of latitude has its own length of pendulum. From a knowledge of these laws we are enabled by this instrument not only to detect certain variations in that attraction in various parts of the earth, but also to discover the actual amount of the attraction at any given place. To compare the force of gravity in different parts of the earth it is only necessary to swing the same pendulum in the places under consideration, and to observe the rapidity of its vibrations. The proportion of the force of gravity in the several places will be that of the squares of the velocity of the vibration. Observations to this effect have been made at several places by Bent, Sabine, and other distinguished men.

It is found convenient in practice to make the direct descent of a weight the moving power of the wheelwork instead of the swinging of the pendulum, for the simple reason that the excess of the power beyond what is required to overcome the friction of the wheelwork is then employed in giving a slight push to the pendulum. This push just neutralises the retarding effects before named as inseparable from the presence of air and imperfect means of suspension. The train work in a clock, therefore, serves two purposes; it records the number of beats which the pendulum makes, and it keeps that body moving when once started. As far as the activity of the pendulum is concerned the wheelwork is a recording power and a preserving power, but not an originating power. If there were no air and no friction in the apparatus of suspension the pendulum would contrive to go as well without the wheelwork as with it. With the wheelwork it beats as permanently and steadily upon material supports, and plunged in a dense atmosphere, as it would if it were hung upon nothing, and were swinging in nothing; and also performs its backward and forward business in solitude and darkness, to the same practical purpose that it would if the eyes of watchful and observant guardians were turned incessantly towards it. Galileo published his discovery of the isochronous property of the pendulum in 1639. Richard Harris, of London, took the hint and connected the pendulum with clock-work movement in 1641. Huyghens subsequently improved the connection, and succeeded in constructing very trustworthy timekeepers before 1658. But notwithstanding all that the knowledge and skill of these horologists could do, these most perfect instruments were still at the mercy of atmospheric changes. We are all well aware that changes of temperature alter the bulk of all kinds of bodies; and that the ingenuity of man has been taxed to the utmost to find some means of removing the source of inaccuracy, to invent some plan whereby the pendulum may be made sensitive enough to discover and correct its own varying dimensions as different temperatures are brought to bear upon its material. The first successful attempt to accomplish this useful purpose was made by George Graham in 1715, who we are all well aware invented the mercurial pendulum. By the application of this compensating pendulum, clocks are now made that do not vary to the extent of a tenth of a second in a day. Soon after the invention of Graham's mercurial pendulum, Harrison, the same clever mechanician who received £20,000 from Government for making a chronometer that went to Jamaica in one year and returned in another with an accumulated error of only 1 min. 54 sec., hit upon another means of gaining the same end. Harrisson's pendulum is commonly called the gridiron, from its form of construction consisting as it does of parallel bars of copper and steel. And it is worthy of remark that the mutual action or sympathy of pendulums, while oscillating near each other on the same wall so long as they are mutually connected by a rail or shelf common to both, or so long as the cases of the clocks to which they belong are either fixed to each other or standing on the same flooring plank, is a very singular phenomenon observed by Huyghens, Ellicot, Reid, and other artists. One pendulum will even stop another it is said in such circumstances, and will cause it to resume its vibrations till it stops alternately itself. It has also been found that two clocks with pendulums of nearly equal length and power or weight, though different in their measurement of time while apart, will so vibrate in unison when thus connected as to keep time together with the most surprising accuracy till they are again separated, or till the plank connecting them be sawn asunder.

This singular but not altogether unaccountable influence appears to be not unlike that sympathy of sound between two musical instruments tuned in unison, wherein when a cord of one is struck the other, placed in a proper situation though untouched, responds or echoes back the sounds at first called forth. It is the opinion of a celebrated foreign artist that a few clocks placed as we have mentioned would communicate the motion of their pendulums to each other till they came all at last to beat at the same instant—an opinion in which Reid himself expresses his entire concurrence.

METROPOLITAN STREET TRAFFIC.

Some very interesting figures are before us in regard to the traffic of the metropolis. Sir Richard Mayne states in his evidence given before the Committee of the House of Lords on the Metropolis Traffic Regulation Bill, that in 1855, when Mr. Fitzroy's Bill passed, the number of cabs licensed was only 3,296, but it has now increased to 6,149. The omnibuses, on the other hand, have decreased; there were 1,446 then, and there are 1,050 now. The number of London cab-drivers, omnibus-drivers, and conductors licensed is more than 13,000. Sir R. Mayne thinks that the cabs have deteriorated within the last three or four years, and he makes the admission unwillingly, he says, since he attributes the change partly to insufficient supervision over them. Colonel Fraser, the City Commissioner of Police, is in favour of having two classes of cabs, one charging 6d. and the other (say) 9d., the latter class to be distinguishable at a glance by being painted of a particular colour; he adduces the case of the Metropolitan Railway omnibuses, now divided into first and second class compartments—a plan which he says seems to answer. He sees no reason why there should not be a third class of cabs, a superior carriage like those which are on hire at railway stations—cabs which might be hired by the hour at a still higher rate of fare. In relation to traffic, Mr. Scott, register of the coal market, states that more than 4,000,000 tons of coal go through the streets of London for delivery within four miles of Charing Cross in a year—about 14,000 tons a day. Mr. Robert Hanbury stated that his firm sent out 3,000 barrels of beer in a day for delivery. Within the four mile radius there are about 6,500 publichouses and 2,500 beerhouses. Formerly the publicans used to have beer in large quantities at a time, but the beer now is "very mild," and it is taken newer—in fact, directly it is brewed.

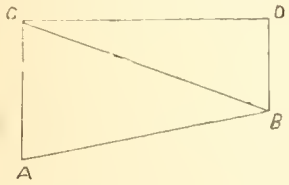
The Prussian Government has allowed a sum of 30,000 thalers a year for the completion of the cathedral of Frankfort-on-the-Maine.

ELEMENTS OF ENGINEERING.

Docks.—No. 5.

THOSE of our readers who have followed us so far, will perceive that we have concluded the description of the preliminary operations in connection with preparing the ground for the erection of the dock proper. We have now arrived at the construction of the walls or of the dock itself, and we would here remark that, although we have hitherto confined our attention to the particular class of wet or floating docks, yet much of what we have described will be also applicable to dry or graving docks. In treating, therefore, of the other descriptions we shall avoid recapitulation, and merely notice the especial features belonging to each separate class. Evidently it is immaterial whether a dam be made for a wet or a dry dock, for, *cæteris paribus*, the object is the same, viz., to lay dry a certain area for excavation. Similarly, though the form of the walls will differ, yet the same general principles apply to all. What will make bad work in one instance, will do the same in the others. The size of the dock must be regulated according to the number and tonnage of the vessels it is intended to chiefly accommodate. As a safe rule it may be stated that a wet dock having an area of ten acres will hold one hundred square-rigged vessels, and so on in proportion. In mentioning the principal points to be attended to in determining the position of the entrance to a dock, we gave some useful rules to be observed in our second article on this subject. There is, however, a very elegant and at the same time a very accurate method for determining the direction of the entrance to a dock or harbour. In fig. 11 let A B represent in magnitude and

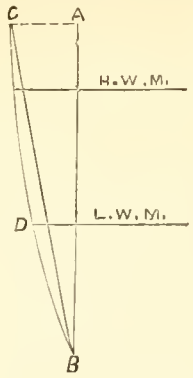
FIG. 11.



direction the rate of the current per hour, and let C D be equal to the rate at which a vessel can be worked or hauled in or out of the dock; then the line C B represents the direction, or as it is called the set of the entrance. Attention to this rule in laying out the entrance to a dock has been practically demonstrated to be imperative, for if neglected it will sooner or later occasion disastrous consequences. Both the East India and London docks have their entrances arranged in conformity with these requirements of the theory, but the West India docks have not, and a large amount of damage and loss has been the result.

All retaining walls in whatever situation they may be placed, are designed and constructed upon the same principle. They have all to resist a pressure from behind tending to force them forward, whether by causing them to slide upon their joints or to move bodily outward. Dock walls, when the water is let in, derive a support from the pressure of the enclosed fluid upon their face against the pressure of the earth behind them; but as they have to stand while building without this outward assistance, it cannot be taken into full consideration in determining their various dimensions. Moreover, as the water might have to be lowered inside the dock for the purposes of repair, it would not do to have walls which would not stand without the pressure of the fluid against their front. The face of any retaining wall may be built in accordance with one of three different contours. It may be perpendicular, as shown by the line A B in fig. 12; it may have a regular slope or batter backwards represented by the straight line C B, or it may be curved and have a curved batter or face similar to that indicated

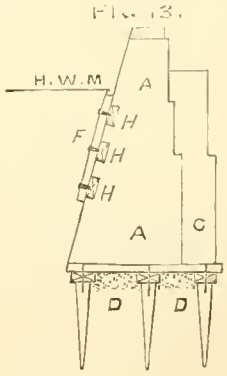
FIG. 12.



by the curved line C D B. Let us investigate these different lines of wall faces a little in detail. Except for walls possessing comparatively a very insignificant height, they are rarely made perpendicular, and therefore we may consider that walls built with a face as represented by the line A B are not admissible for the construction of dock walls. The two lines or forms in which dock walls may be erected are shown by the straight line C B and the curved one C D B in fig. 12. Of these two the former presents some facilities in actual construction over the latter. As the batter is uniform one template serves for all the stones, supposing the wall to be of that material, but the curved batter C D B is theoretically superior to the straight one C B, and is the contour usually given to the best specimens of dock walls. It is a little more troublesome to work than the other, since it does not consist of one curve but frequently has two or three or even four radii for separate portions according to their respective height above low-water mark. This curved batter is given to the face of the wall, upon the principle that the pressure of a mass of fluid upon any immersed surface varies with the height of the particular parts immersed and increases not in accordance with the line C B, but more in agreement with a compound curve C D B. Where brick is used as the material for building the walls, the curved batter can be employed with a facility equal to that of the straight one; there is no particular advantage in using the latter. Brick constitutes the material for the walls of the London docks. Stone, however, has been used for those of Liverpool, and is undoubtedly to be preferred in all instances where it can be obtained at a price not exceeding reasonable limits. Whatever the walls may be built of, the coping is always of stone in large and solid masses as will be seen in our future illustrations.

In consequence of the readiness with which the straight battered walls could be built, it will be expected that the older examples of docks were constructed in this manner, and so we find them to be. Fig. 13 represents the

FIG. 13.

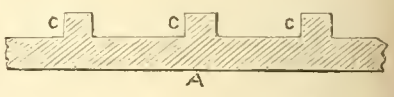


general features of the wall of the old dock at Hull, which has since been destroyed to make room for a more modern successor. Previously to its destruction it had betrayed many and unquestionable signs of weakness, particularly in the foundations, which is not to be wondered at, considering the peculiar ideas that were carried out in the shape of the piles. Instead of being made of a uniform section throughout their entire length, their top dimensions, which were 12in. by 9in., were reduced by a regular taper to 3in. square at the bottom, where the shoes were fixed on. The inner square in fig. 14 shows the shape at

FIG. 14.

the bottom; the outer lines representing a plan of the top. The consequence of this peculiar method of diminishing the strength of the timber where it was most required was, that the piles were little better than mere sticks for nearly half of their length, and totally unequal to perform their proper duty. It is difficult to comprehend how so great a waste of material should have been allowed to occur. Had there been any saving effected by the plan there would have been some little excuse, but not only was timber, but labour likewise wasted to a large amount. Referring to the figure we have longitudinal timbers 12in. by 6in. shown in section, laid upon and bolted down to the piles, and upon the longitudinals cross planking 9in. by 3in. spiked down to them. Sometimes a portion of the space D D between the piles is dredged out and filled up with concrete level with the under side of the planking, but the nature of the ground will determine when this operation is absolutely necessary. It would not be a bad precaution to do this in every instance, except where the ground is rock or very hard and clean gravel. Upon the planking, the wall A of brickwork is erected, and is carried up to about 4ft. above high-water mark, not including the depth of the coping, which is usually 1ft. in height, making a total height above high-water mark of 5ft. This is quite sufficient to prevent the banks being flooded by extraordinary high tides or by storms and hurricanes. To prevent the face of the wall being injured by vessels, fenders, as they are called, are attached to them. They are generally of oak, and are shown in the diagram by F; they are fixed to strong oaken wall plates H H, or blocks let into the wall, and bolted to it by long inch or inch and a half bolts. Counterforts are always built at the back of all long retaining walls, at the back of the abutments of bridges and all structures of masonry and brickwork. They are shown by C in figs. 13 and 15, and are not built continuously with the wall, but at intervals of about 10ft. or 15ft. apart (see plan in fig. 15),

FIG. 15.

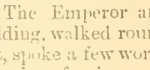


varying with the height of the wall. They may be regarded in the light of backing, and provided they be made of good sound strong work there is not the same amount of care and neatness required in their construction as in the case of the actual wall itself, although they do constitute a component part of it. The total batter or slope given to the wall is represented by the line A C in fig. 12, and denotes the distance its top is set back from a perpendicular line A B let fall upon its toe or extremity B. The latter is always denoted as so many inches to the foot, or as one in so much. Thus a batter of 1in. to the foot, that is, a set back of 1in. from the vertical for every foot in height, may be also written 1 in 12. A batter of 1½in. to the foot may be called 1 in 8. The batter of the wall in fig. 13 is 1 in 5, which is not quite 2½in. to the foot. This is a stronger batter than is usually required in simple retaining walls, but is not more than is wanted in the particular situation of a dock wall. For the sake of practical

facility we should certainly make it 1 in 6, or 2in. to the foot. Foremen and practical workmen much prefer a batter being given to them in this manner, instead of in the former. They at once understand what so many inches in the foot means; but they do not by any means so easily comprehend the same measurement when it is expressed as a fraction.

PLATE GIRDERS.—No. 2.

A GOOD practical rule for the depth of a girder is that it should be 1-12th of the span; thus a girder of 27ft. between the piers should be 2ft. 3in. in depth. This proportion between depth and length is found to be most economical as regards the weight of metal required in building up plate beams. Circumstances at times fix upon a certain depth. In such cases, being tied to a dimension, you must abide by it, but never, if you can possibly avoid it, have a girder less than 1-15th, or greater in depth than 1-10th, of the span. In some cases where the depth of the main girders are limited, the transverse girders for carrying the line of rails are riveted or bolted to the under sides of the bottom flanges. In such an example it is a good way to have the transverse ones project on each side beyond the flanges of main girders; then the T iron stiffeners with gusset plates may be brought down from the principal girders and be firmly secured to the projecting ends of the cross girders. This plan never makes a neat and good workmanlike job, and is only resorted to under sheer necessity. As a rule always rest the transverse girders on the bottom flanges of main girders, and do not suspend them as above explained. Plate girders from 60ft. to 100ft. are frequently made, and a great inducement to adopt this form is, that they are easily got at when they require re-painting. If constructed of a box form, there is a difficulty to get at the interior parts unless the bridge be of large dimensions. The plate girder, too, is preferable in many cases on account of the easy mode of riveting up and consequently cheapness of manufacture. Oxidation, or as it is commonly named rust, arising from damp atmosphere, especially where crossing streams, tells severely upon the durability of wrought iron if not kept in check by periodically coating over with paint. This is often overlooked by railway inspectors, but should always be borne in mind by the man who designs a girder, and it is well to always give the sectional areas the benefit when you find by the formulæ there are any halves or parts of inches, and make them full inches. This will be exemplified when working out a girder by formulæ in a future paper. In practice many girder makers construct their beams with the top booms or flanges of greater section than the bottom, being in the proportion of 10 to 12, or if the bottom flange has a sectional area of 10in., multiply that number by 1·20, which will give the same result. Other makers say the top member being in compression, if the rivet holes are well filled up by good riveting, the flange is not affected by the rivets, and, working upon this supposition, they make top and bottom booms of equal sectional area. Granted, if the riveting is well and properly done, but workmen who take no pride in their work are apt to scamp their work, especially if it be piecework, and occasionally rivet up with a half or rivet. Therefore we may say with all railway work give it the benefit of the doubt, and the proportion between top and bottom booms as above stated. In small girders for light building purposes there need be no increase of sectional area between the top and bottom flanges. Always bear in mind when giving the dimensions of T, L, or ⊔ iron (Tee, Angle, or, Channel iron), to measure outside the section, or as men say in the trade, "out to out." This may be made clearer by giving an example, for instance, a 3½in. by 3½in. angle iron is called an equal-sided L iron, and is thus measured



3½in.

In the next number a table of weights and sectional areas of T and L iron will be given, therefore the mode of measuring from "out to out" must be remembered. In girder work for railway bridges the pitch of rivets or distance apart from centre to centre of the heads is usually 4in., and a good size for rivets is ¾in. diameter. In very heavy girder work a larger diameter of rivets will have to be used, but for girders of from 40ft. to 50ft. ¾in. rivets and 4in. pitch will ensure a good connection between the parts riveted, which is proved every day in practice. A plate of iron punched by a number of holes disposed or pitched in any manner whatever, and strained to its breaking weight, the line along which the fracture will take place will be the line of the least sectional area, no matter whether the line is zig-zag or straight. In a plate girder, since the web forms a continuous vertical communication between the top and bottom booms, it is immaterial whether the load be placed on the top or bottom boom or any part of the web, but in practice the load is generally placed on the top or bottom members direct. When the booms are built up of several plates care must be taken to have the rivet holes punched true, so as to come direct over each other, or rymering will have to be resorted to, to make them agree. This causing the rivet hole to be larger, a rivet of greater diameter should be used to fill the place of every hole of this kind, and wherever such irregularity occurs it reduces the cross sectional area of the flange. This is another contingency which should be kept in sight as often likely to take place. To prepare plate or angle iron for the purpose of punching, after being got of the right length and width a template is made of sheet iron or wood, of the exact dimensions of the plates to be punched. On this the workman marks with his centre punch the place where each rivet hole comes. After these holes in template are drilled out it is placed on each of the girder plates in succession, and clamped or rivcted temporarily in two or three places, to prevent the template sliding or moving from the plate he is going to mark the rivet holes on. The plate is then spotted with white paint through the holes in template. After separating the template from the girder plate it is then ready for the punching machine, having each rivet hole marked on it. The template is then fixed on to another plate, the marking is continued, and so goes on to the end of the job, care being taken to alter the template or make a new one if the rivet holes in any of the plates are differently pitched. No rivet hole should be punched nearer to the edge of a plate than its own diameter. This should be strictly adhered to, or in punching the plate it may burst out at the side, the strength of the metal not being sufficient to resist the force of the punch. The surest way is to leave ⅛in. to ¼in. more than the diameter of hole, viz., if you are punching ¾in. holes you should leave 1in. of metal between the hole punched and the edge of the plate. Plate iron runs from ¼in. to ¾in. in thickness. If less than ¼in. it is called sheet iron, and is more expensive, and generally better in quality. If the reader will remember the foregoing remarks he will eventually find his time has not been wasted, for queries are constantly occurring in the getting out of girder work, where this information is invaluable, and it is the result of long-continued practice extending over many years.

We have received the following communications in reply to "Professional's" note of last week :—

"With regard to the lengths of T and L iron they vary according to the section and the capabilities of the works themselves. T iron is seldom rolled over 20ft. without an extra charge, which varies considerably, but most sections we can get rolled up to 30ft., and some even longer than that, at a corresponding increase of price. Angle iron we can get rolled up to 40ft. without an extra charge when the specification is a good one, and does not include more than a fair share of such long lengths, and at an extra price they may be rolled to 50ft., and even to 60ft., but the difficulty of carriage also very much enhances the price. In T and angle iron weight does not add any extra to the cost; the extra depends entirely upon the section and the length."

"As regards the lengths of T and L iron the following will be of service to show more fully the usual practice :—T irons are seldom rolled over 20ft. without an extra charge, but most sections can be got rolled up to 30ft. L irons, when only a moderate portion are required to be in long lengths, can be rolled up to 40ft., but if the proportion of long lengths exceed those of shorter lengths, on account of extra labour and difficulty of carriage, an extra price is charged. 'Plate girders,' or perhaps, plainer still, 'plate web girders,' being built up of a series of plates, are so called in distinction to those of rolled malleable iron girders as usually advertised."

Another correspondent at Birmingham writes :—"On the subject of plate girders I should like to say that if 'Professional' asked a boiler and girder maker what a plate girder is he would give the same definition that you did in your first article. I can see by the way the article is written the writer himself knows what a workman is, and he writes so that he can be understood. As for 'Professional' being able to get angle iron 40ft. long, I can say that if he comes to this part of the country he can get angles 60ft. long if he will pay the extra price for cartage and labour. But in constructing engineering works there is a practical happy medium; if you go beyond there is always a risk. It is quite evident there was a doubt in 'Professional's' mind when he designed the girder he mentioned, and he had to ascertain the longest length he could obtain. A great deal depends on the capabilities of the manufacturer as to the longest bars he can roll, and my experience has shown me that you should keep under 20ft. rather than over that length. I cannot help here remarking the interest taken in your Intercommunication Column by subscribers that I know in this neighbourhood. I hope you will encourage it as much as possible.

"Practice."

Archæology.

Mr. Joseph Mayer, of Liverpool, has given £50 towards the renewed excavations at Wroxeter (the ancient Uriconium) to be conducted under the superintendence of Mr. Thomas Wright, F.S.A.

For some considerable time past Mr. Howell, the proprietor of Beacon's Coffee-house, Walbrook, has been making extensive alterations and enlarging his well-known place of business, and whilst the workmen were pushing their contracts forward they had to remove a portion of the wall that in former times was the boundary of St. Augustine's Brook. This brook used to run through the street into the River Thames. Whilst removing the wall they found embedded in the brickwork several coins of Charles II., James I., and a small one of Henry II., all in silver, and, considering their great age, in a good state of preservation.

In taking down an old house in All Saints-place, Stamford, the other day, an interesting discovery was made. One end of the lintel of the fire-place in the dining-room was found to be supported by a life-sized effigy of a bishop, but without the mitre, hands, or feet. It is coloured, the vestment, in folds, being blue (symbolical of piety, godliness, and divine contemplation), and the pastoral staff red (symbolical of divine love, power, and suffering). The hands had rested on the breast, the pastoral staff being supported within the left arm. Archbishops' croziers were held by the right hand.

As appears from an article in the Russian *Invalide*, the subterranean city recently found on the banks of the Sir-Darya has been repeatedly discovered before but as soon forgotten. It is called Yana Kent—*i.e.*, Newtown—and supposed to have been constructed by the Persian tribe which, under the name of Sartes, even now forms the bulk of the sedentary portion of the population of Turkistan. Yana Kent, with several cities in that neighbourhood, is believed to have been destroyed by the Tartars on their first appearance in the country, and, besides extensive ruins, includes a cemetery at some distance from the buildings. The Kirghisian nomads now scouring that region have their own way of solving this antiquarian problem, holding that the town in primeval times was destroyed by the Avenging Spirit to punish the sins of the inhabitants. According to them, these people have been swept away from the face of the earth.

PARIS EXHIBITION.

THE nominal opening of the Paris Exhibition took place on Monday. The ceremony created little stir; indeed, there was no ceremony or pageant of any kind, no addresses or replies, no official costumes. Indeed, the affair created very little stir in Paris, and the approaches to the building, say the correspondents, were never less crowded than on Monday. The Emperor and Empress merely visited the building, walked round the most presentable parts of it, spoke a few words to the representatives of the various foreign commissions, who wore evening dress in honour of the occasion, and left, as they came, in their open carriages. It is believed that at least a fortnight or a month must elapse before the Exhibition will

be ready to be thrown open to the world. At all events, there are at present no fewer than 10,000 workmen hard at work night and day, and as may be supposed the building is a scene of noise, dirt, and confusion, not easily described.

During the time the Paris Exhibition is open the public will be admitted without special leave and without passport to visit the imperial palaces, the museums, the State establishments, and monuments. The Palace of the Tuileries can be seen when the Emperor and Empress are not resident there, and in addition the following places will be open to the public at certain specified hours:—The Palace of St. Cloud, the Palace and Museum of Versailles, the Trianon Palace, and those at Fontainebleau and Compiègne, the Chateau of the Malmaison, the Imperial Manufactures of Sèvres ware and of Gobelins tapestry, the Museum of the Louvre, the Thermes Museum, and the Cluny Hotel, the Imperial School of Fine Arts, the Sainte Chapelle, and the Imperial Church of St. Denis. The servants at all these places are strictly forbidden to accept any gratuity.

A fleet of 20 steamboats will navigate the Seine at all hours of the day, and will convey passengers at very cheap rates, the highest fare being 30 centimes, and the lowest 20. The company organised to build these boats calculate that 30,000 passengers will be conveyed daily. Six vessels, forming part of this flotilla, are anchored near the Pont des Arts, on the right bank of the river.

A huge block of anthracite, weighing 8,000lb., has arrived at Paris from New York. Anthracite is a species of coal, metallic and friable. It burns slowly, without smoking or making any smell. It is composed of carbon, silica, and iron.

The following, among other noblemen and gentlemen, have been appointed as jurors and associates to represent the United Kingdom in the International Jury. The names in parentheses are associated jurors:—

Works of Art.—Paintings in oil, Viscount Hardinge, (John Leslie, Esq.). Other paintings and drawings, Hon. Spencer Cowper, (S. Vincent, Esq.). Sculpture and die sinking, A. H. Layard, Esq., M.P., (W. Calder Marshall, Esq., R.A.). Architectural designs and models, J. Fergusson, Esq., (Lieutenant-Colonel Scott, R.E.). Engraving and Lithography, R. J. Lane, Esq., A.E.R.A., and F. Seymour Haden, Esq., F.R.C.S., (Julian Marshall, Esq.)

Apparatus and Application of the Liberal Arts.—Lord Houghton, Vice President; Baillie Cochrane, Esq., M.P., Associate Vice President.—Printing and books, George Clowes, Esq., (C. Rivers Wilson, Esq.). Paper stationery, binding, painting, and drawing materials, Warren De la Rue, Esq., F.R.S., (F. Hankey, Esq.). Applications of drawing and modelling to the common arts, R. Redgrave, Esq., R.A., (H. A. Bowler, Esq.). Photographic proofs and apparatus, Dr. Hugh W. Diamond, (Lieutenant-Colonel Gordon, C.B., R.E.). Musical instruments, Lord Gerald Fitzgerald, (Hon. Seymour Egerton, 1st Life Guards). Medical and surgical instruments and apparatus, Sir J. F. Oliffe, M.D. Mathematical instruments and apparatus for teaching science, C. Brooke, Esq., M.A., F.R.S., (Lieutenant-Colonel Strange, F.R.S., F.R.A.S.). Maps and geographical and cosmographical apparatus, Capt. G. H. Richards, R.N., (Lieutenant-Colonel A. C. Cooke, R.E., F.R.G.S.).

Furniture and other Objects for the Use of Dwellings.—Fancy furniture, J. H. Pollen, Esq., M.A. Upholstery and decorative work, Matthew Digby Wyatt, Esq., F.S.A. Crystal fancy glass and stained glass, E. W. Cooke, Esq., R.A., F.R.S., (Henry Chance, Esq.). Porcelain, earthenware, and other fancy pottery, Right Hon. W. E. Gladstone, D.C.L., M.P., (J. C. Robinson, Esq., F.S.A.). Carpets, tapestry, and other stuffs for furniture, Peter Graham, Esq. Paper hangings, J. G. Crace, Esq. Cutlery, G. Wostenholm, Esq., (C. Asprey, Esq.). Gold and silver plate, Percy W. Doyle, Esq., C.B., (G. J. Cayley, Esq.). Bronzes and other art castings and repousse work no juror allowed. Clocks and watches, C. Frodsham, Esq. Apparatus and processes for heating and lighting, Professor J. Tyndall, LL.D., F.R.S., (Rear Admiral Ryder, C.B., R.N.). Perfumery, Dr. W. Odling. Leather work, fancy articles, and basket work, J. M. Stanley, Esq., (F. West, Esq.).

The Pugin Travelling Studentship, established for the cultivation of the study of English Mediæval architecture, has this year been won by Mr. Henry Walton, of Leeds.

TRIANGULAR PORCH, UNIVERSITY COLLEGE OF WALES.

One of our illustrations this week represents the triangular porch of the University College of Wales. In December last we gave an illustration of the Castle Hotel, Aberystwith. Since then the building has passed into the hands of the provisional committee appointed to establish universities in Wales, to whom the hotel was recently sold for the sum of £10,000. As our readers are aware the design of the college is by Mr. J. P. Seddon, of London.

THOMAS GRAY, THE POET.

It may not be generally known that the only record which indicates the spot where the remains of the author of the far-famed "Elegy" lie is a small stone inserted opposite to his grave, and beneath the east window of the Hastings Chapel of Stoke Pogis Church. It seems unnecessary to say that this is hardly a fitting monument to one who has done so much to enrich the poetic literature of his country. We are glad, therefore, to be able to announce that a movement is on foot to erect a more worthy memorial to the poet. The proposed memorial it is suggested should take the form of a stained glass window, and should the funds allow it is also intended to complete the restoration of the picturesque little church beside whose wall Gray rests. The committee appointed to carry out the proposal include the Duke of Leeds, the Bishop of Oxford, and the Vicar and Churchwardens of the parish. Contributions (of any amount) may be paid to the "Gray Memorial Fund," Western Branch of the Bank of England, Burlington Gardens, W.; or may be remitted to the Rev. Vernon Blake, Stoke Pogis, near Slough.

PARLIAMENTARY NOTES.

A motion brought forward by Mr. Lowe on Friday to refer to a select committee a petition of Mr. Shiels, C.E., who alleges that the Board of Works, in the embankment of the Thames, has made use of his designs, was objected to by Lord John Manners, on the ground that his claim, if any, is against the Board, and not against the Government. After a short debate the motion was rejected by 49 to 29.

Mr. Lanyon asked the Secretary to the Treasury whether it was the intention of the Commissioners of the Law Courts to accede to the request of the competing architects to the effect that two professional men, selected by the competitors, be added to the judges. Mr. Hunt replied that the Government had come to the conclusion that it was too late to alter the arrangement in the matter which had been already made.

On Tuesday, Mr. Crawfurd asked leave to introduce a bill for the preservation of Bunhill-fields Burial-ground as an open space, and for other purposes relating thereto. The hon. member stated briefly the nature of its provisions. The Bill would leave the fee of the estate in the Ecclesiastical Commissioners, but the city of London had undertaken to repair the tombs and monumental memorials, and to maintain the burial ground in proper order as a place of public resort. The bill did not interfere with any of the matters in dispute between the Commissioners and the city of London respecting rents and other receipts. He was glad that the bill would not be opposed at its present stage, and he hoped the right hon. gentleman opposite would be able to inform the House that he would not oppose it on the second reading. Mr. Mowbray stated, on behalf of the Ecclesiastical Commissioners, that there was no intention to oppose the introduction of the measure. At present, however, he had not had an opportunity of reading the bill, and until he had done so, of course he could not pronounce an opinion upon it. Leave was then given to bring in the bill.

Mr. Layard, on Tuesday, asked the First Commissioner of Public Works, whether the buildings to be erected at the back of Burlington-house for the accommodation of the London University are to be in the same style of architecture as that edifice, or whether the report be true that they are to be in the Gothic style; whether he would give directions for the exhibition in the library of the elevation and plans of the new buildings, in order that members may have an opportunity of inspecting them: whether Mr. Pennethorne had protested against the employment of Gothic architecture, and whether he had furnished a plan of his own in the same style of architecture as Burlington house. Lord J. Manners replied that the building referred to would not be in the same style as Burlington house itself, but in Italian Gothic. With respect to the plans and elevations he had no objection to place them in the library when he received them. He believed that there was no truth whatever in the report that Mr. Pennethorne had protested against the use of Gothic architecture, nor had he furnished plans in a style of architecture in accordance with that of Burlington-house. Colonel French.—Will the noble lord explain what Italian Gothic means? Lord J. Manners.—I beg to refer the hon. and gallant member to the hon. gentleman beside him (Mr. Layard).

In the House of Commons on Friday Mr. Goldsmid reopened the question as to the rebuilding of the National Gallery. He criticized severely the vagueness of the instructions given by Mr. Cowper to the competing architects, and insisted that a breach of faith had been committed, inasmuch as a verbal, if not a written, pledge had been given that one of them should have the construction of the new building. Mr. Gregory also blamed Mr. Cowper's want of explicitness. Mr. Cowper laid the vacillation at the door of the House of Commons, which had taken the responsibility out of the hands of the Executive, and, by the mouths of Committees and Commissioners, had come to very contradictory decisions. He defended the instructions he had given to the architects. Mr. Beresford Hope and Mr. Tite, two of the Judges, repeated that the competing architects were under the impression that one of them would be employed, but Lord Elcho (another Judge) insisted that no engagement had been made with the architects. Lord J. Manners remarked that as there was no particular hurry—the land not yet having been acquired—he should consult with the Trustees before he decided what course he should take as to the new gallery.

AMERICAN ITEMS.

One hundred thousand dollars have been given (by a gentleman who withholds his name) to found an Episcopalian Theological school at Cambridge, Massachusetts.—The greater portion of the town of Bothwell, C.W., has been destroyed by fire. One hundred houses have been burned, and a large number of families rendered homeless and destitute. A telegram states that the afflicted people are flying from the town, or rather from its ruins.—George Peabody has donated 150,000 dollars for the foundation and maintenance of a museum of national history, in which special attention shall be paid to the departments of zoology, geology, and mineralogy, at New Haven, Conn.—There is in Princeton Cemetery (New Jersey) a monument to Aaron Burr, bearing this inscription:—

"Aaron Burr,

"Born Feb. 6, 1756; died Sept. 14, 1836. A Colonel in the army of the Revolution, and Vice-President of the United States from 1801 to 1805."

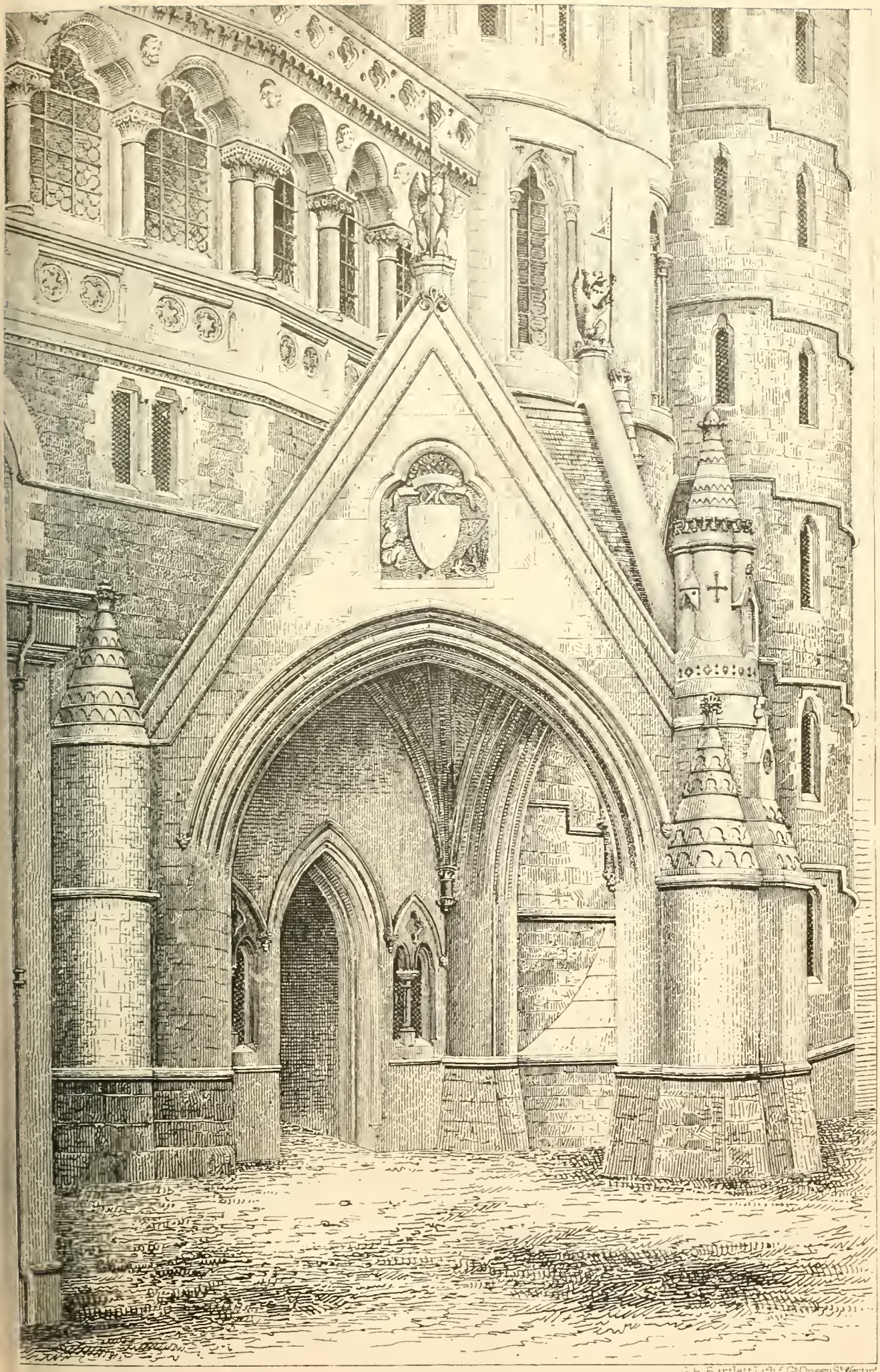
None of the people of Princeton know when the monument was brought there, or by whom. It was placed there during the night time a few years since. Whose the loving hands that erected that memorial to a brilliant, bad, unfortunate man?—The people of New York have been astounded at the recent unprecedented rise in rents. A shop in Broadway which was rented last year for 1,200 dollars this year costs 3,000 dollars. The Union League Clubhouse, which was let for 6,500 dollars, is now rented at 20,000 dollars! "Immigration" is the only reply given by proprietors in explanation of the rise.

At the meeting of the Society of Engineers, held at 6, Westminster Chambers, Victoria-street, S.W., on Monday last (W. H. Le Feuvre, Esq., president, in the chair), the following gentlemen were elected honorary members: Sir John Herschel, Bart., F.R.S., Sir David Brewster, K.H., F.R.S., G. B. Airy, F.R.S., Lyon Playfair, F.R.S., W. J. M. Rankine, F.R.S., William Pole, F.R.S., J. C. Adams, F.R.S., Robert Napier, M.I.C.E., J. Penn, F.R.S., and Joseph Whitworth, F.R.S., Esqrs.; M. Eugene Flachet, and Herr F. Grashof. Members: John C. Carruthers, W. Naylor, Adam Dixon, and Alexander Chaplin, Esqrs. Foreign members: John Skwarcow and David Magnus, Esqrs. Associates: Thomas Allcock and Thomas Hulburd, Esqrs.

G H Bartlett lith, Gt Queen

Design for the New Law Courts Strand Front.

G. G. SCOTT, ARCHITECT.



G. H. Bartlett Lith. 5 Gt Queen St Westm.

Triangular · Porch · University · College · of · Wales · Aberystwith.

SERMONS IN STONE.

"EPITAPHS, it must be observed," remarks Mr. Pettigrew, "will not admit of any severe test of criticism; their metre in the English language is often strangely incorrect. It is to the sentiment they are intended to convey that our attention should be chiefly directed. . . . The seventeenth century will be seen to present lamentable effusions in regard to the monumental inscriptions; as we advance in the eighteenth an improvement is observable, and the later specimens, if not very remarkable in themselves, are yet, at least, free from the ribaldry and folly of the preceding age." In the specimens of epitaphs already given, as well as in the examples which follow, the reader will find many of the peculiarities and characteristics of our old tombstone literature. One cannot fail to be amused by the antiquated spelling, the exaggerated language, and the quaintness of thought in which our forefathers indulged, though we know it was the habit of their age. How fond, too, they are of punning on their tombstones—a practice not to be thought of nowadays, but which was a favourite one formerly. The literature, especially the religious literature, of the seventeenth century abounds with puns and poetic conceits of every kind, some of them so poor that even the poet Close might well be ashamed of them. How solicitous friends were to say the most as well as the best they could of those "dear departed ones." Old tombstones are the record of the most irrelevant particulars, which cannot be read now without causing a smile. Whether in every instance they stated "the truth, the whole truth, and nothing but the truth," may perhaps be doubted, since this golden rule is not always observed by their successors. But "in lapidary inscriptions," as Dr. Johnson says, "a man is not upon his oath." We need hardly point out how very few specimens of really good poetry one meets with on churchyard tombstones. We give the following epitaphs without observing any chronological order as to time or place. On the tomb of Alexander Speid we have this inscription:—

> Time flies with Speed—with speed Speid's fled
> To the dark Reigons of the dead;
> With Speed Consumptions Sorrows flew,
> And stopt Speid's speed, for Speid it slew.
> Miss Speid beheld with Frantic woe
> Poor Speid with Speed turn pale as snow,
> And beat her breast and tore her hair,
> For Speid, poor Speid, was all her care.
> Let's learn of Speid with Speed to flee,
> From Sin, since we like Speid must die.

Between Ancrum and Maxton in Roxburghshire, is Lilliard Edge, which takes its name from the battle fought there in 1546 or '47, where a woman of that name signalised herself in opposing the English army, the memory of which a tombstone was erected over her grave, the remains of which were to be seen some years ago, having the following inscription:—

> Fair maiden Lilliard lies under this stane,
> Little was her stature, but great was her fame;
> On the English lads she laid many thumps,
> And when her legs were off she fought upon her stumps.

In the kirkyard of Crail, Scotland, there is a very ancient tomb, much defaced. It is of considerable height, and has a double row of small Gothic columns in front; in the attic over the capitals stands a lion. Time has made free with the animal's head, but it has furnished him with a thick covering of grey "fog," not much shorter than his natural hair, and giving him a very venerable and antique appearance. The lettering is much obliterated, but the tomb seems to have belonged to some of the Græme family. On another tomb a little below is the inscription:—

> Of dochty Douglas kynd he cam,
> And so he did well prove;
> He lived always in good fame,
> And died with all mens love.
> John Douglas.
> [The rest is illegible.]

On the wall of the same churchyard there is the following:—

> Here lyes inter'd before this tomb
> The corpse of Bailie Thomas Young,
> An honest man of good renoun,
> Three times a bailie of this toun.
> He sixteen years Conveener was,
> But now into the dust he lyes.
> The 20th of October born was he,
> In Anno 1683,
> And dyed December 6th, interr'd the eight,
> In Anno 1758.
> Then he with great composure left this stage,
> And in the 76 year of his age.
> Isabel Mairten his Spouse does ly here,
> As also doth six of their children dear.

At Fyvie, in Aberdeenshire, the heroine of the pathetic Scotch ballad, "Tiftie's Bonnie Annie," is buried. The original tombstone having become decayed, Mr. Gordon, of Fyvie, about twenty years ago caused a new stone to be put up, a fac-simile of the original. The name of the unfortunate damsel, the story of whose love is so linely told in the ballad, was Agnes Smith. The common pronunciation of her christian name was Nannie, which in the ballad is further metamorphosed into Annie. The inscription on the stone (embellished with a death's head and cross-bones, a sand glass, &c.) runs thus:—"Heir lyes Agnes Smith who departid the 19 of Janvari 1678." The story of Tiftie's Annie is commemorated by a stone figure of her lover, the trumpeter, placed on one of the turrets of Fyvie Castle, in the act of blowing his horn towards Tiftie, the home of the maiden, which is about half a mile distant. In the burying-ground of St. Andrew's Church, Peebles, there are several fine old tombstones worthy of notice. We give two epitaphs, as quoted in a local history of the place. The oldest stone is thought to be one belonging to the family of Tweedie. It bears the name of John Tweedie, bailie, who died 1699; another John Tweedie, provost, who died 1712; besides wives, sons, and daughters. There are these lines underneath:—

> A silent, scatter'd flock about they lie,
> Free from all toil, care, grief, fear, envy;
> But yet again they all shall gather'd be,
> When the last awful trumpet soundeth hie.

"This old stone, which is fast sinking into ruin, abounds in well-executed figures, emblematic of the four seasons:—A husbandman with a sheet round his shoulders in the act of sowing; a woman with a garland of flowers in her hand; a young man with a reaping hook lying over his arm; and a boy with his hand to his mouth—a significant representation of Winter." On the throuch-stone of the Hopes are two figures, male and female, carved in bold relief, dressed in the costume of the reign of William III. The date is 1704, and we read:—

> Here lie three Hopes inclosed within,
> Death's prisoners by Adam's Sin;
> Yet rest in *Hope* that they shall be,
> Set by the Second Adam free.

The death of a Donald Robertson, who was born January 1, 1785, and died June 4, 1848, is thus recorded at North Mavine, Shetland:—

> He was a peaceable quiet man, and to all appearance a sincere Christian. His death was very much regretted, which was caused by the stupidity of Laurence Tulloch, of Clotherton, who sold him nitre instead of Epsom Salts, by which he was killed in the space of 3 hours after taking a dose of it.

The stupidity of placing the name of the unlucky Laurence on the monument seems almost as bad as his own blunder. One can imagine the feelings of the poor druggist (or country grocer, more likely) on finding his name handed down to posterity under such circumstances. Some parish schoolmaster must have done this. The following grotesque attempt at wit may be seen at Annandale:—

> I Jocky Bell o' Braikenbrow, lyes under this stane.
> Five of my awn sons laid it on my wame;
> I liv'd aw my dayes, but sturt or strife
> Was man o' my meat, and master o' my wife.
> If you done better in your time, than I did in mine,
> Take this stane off my wame, and lay it on o' thine.

In the Cathedral burying-ground of Elgin there is a gravestone, bearing the date 1687, on which is recorded this quaint sentiment:—

> This world is a cittie full of Streets,
> And death is the mercat that all men meets.
> If lyfe were a thing that money could buy,
> The poor could not live, and the rich would not die.

At Dalkeith died, in 1738, Margaret Scott, aged 125. This is the sum of her many and varied experiences:—

> Stop, passenger, until my life you read;
> The living may get knowledge by the dead.
> Five times five years I liv'd a virgin's life;
> Ten times five years I was a virtuous wife;
> Ten times five years I liv'd a widow chaste;
> Now weary'd of this mortal life, I rest.
> Between my cradle & my grave have been
> Eight mighty Kings of Scotland & a Queen;
> Four times five years the Common-wealth I saw.
> Ten times the subject rose against the law.
> Twice did I see old Prelacy pull'd down,
> And twice the cloak was humbled by the gown.
> An end of Stewart's race I saw; nay more!
> My native country sold for English ore:
> Such desolations in my life have been,
> I have an end of all perfection seen.

Many other epitaphs equally interesting might be added, but for the present we bid adieu to the subject.

THE WORKING CLASSES' DWELLINGS' QUESTION.

AT the Society of Arts on Wednesday evening, Thomas Hawksley, M.D., read a paper entitled "Suggestions for a Mode of Supplying the demand of Cheap and Healthy Dwellings for the Working Classes, in conjunction with security and profit to the investor." After a few words of introduction, Dr. Hawksley remarked that some of those best qualified to judge believe that in the metropolis there are half a million of poor struggling between pauperism and self-dependence. The great evil of unfit and insufficient habitations for the poor and labouring classes has been greatly on the increase of late years, and now, from the railways advancing their termini into the centre of the metropolis, the formation of a metropolitan railway, and the taking up new ground for other public improvements, as for the building of the law courts, the difficulties have been immensely increased. Within the last quarter of a century, several associations and individuals actuated by a noble philanthropy have stood forward to do battle with this great cause of wrong and oppression. After enumerating the Improved Industrial Dwellings' Company and such like associations, Dr. Hawksley proceeded:—Unfortunately, great and valuable as the amount of work done by them is, it is but a very small portion of that which remains. There are, possibly, 8,000 or 10,000 poor well lodged in these improved dwellings; but the lowest estimate indicates that improved dwellings are wanted for 200,000 persons at least, and it is not likely that these associations will be able either to provide for so many, or to provide them on a scale sufficiently cheap for the poor, and yet sufficiently remunerative to the public to attract the investment of money for the purpose. Another difficulty that opposes their success is the difficulty of obtaining the property which, by its unfitness, has become a source of evil, and which it is necessary to improve or to clear away, and replace by suitable dwellings. Such property is often possessed by persons who have no regard for their fellow men, and consider only of the money to be screwed out of them, by providing them with lodgings which cost little or nothing to keep in order, and for which they obtain the same rent as those supplied by the associations, with every comfort. By this unprincipled course, such property may pay from 20 to 30 per cent., and by the humane and honest one only 5 or 6 per cent. It is not wonderful, therefore, that great opposition is often experienced in effecting the reforms necessary. The societies have also experienced difficulties, for example, in being able to obtain only one side of a street, when the improvements would be impracticable without possessing both sides. Sometimes the property was in Chancery; or it was held by a number of persons; or unprincipled solicitors would put in every obstruction to proof of title and of sale, in order to increase costs. Or the property was entailed, and burdened with a complication of claims; or part was held by some one abroad, or supposed to be dead; or they were met by disreputable owners with an almost vindictive demand for such outrageous prices as made all dealing hopeless. The mode of acquiring property or of enforcing its improvement, under Mr. Torrens' Bill, would appear to be unnecessarily indirect and troublesome.

The mode of acquiring the condemned property or of enforcing the improvement of it might be effected much more easily and effectively by

leaving the associations who would effect the working to obtain information of unfit premises or localities from all informants, not of course excluding the officer of health, but rather attaching the greatest importance to his information.

2. After the information received, that the association should delegate its own officer to visit the place, and with the assistance of the offier of health get up the accurate facts, and then report to his Board.

3. The association, having concluded that the case demands interference, draws up its statement, estimates, costs, &c., and then,

4. Sends a copy of its presentment to the owner of the property, and another to the Government officer appointed to control the associations.

5. The Government controller not intervening, and thereby assenting to the justice of the presentment, the association next endeavours to make terms with the owner of the property for the fulfilment of the requisite improvements, and the owner objecting to come into the undertaking, the association then cites him to appear before the justice of the peace, or the tribunal appointed to try such cases, and thus all dispute might be summarily settled, according to the rules of law and equity, in conformity with the Lands Clauses Act.

This method would probably save trouble to all parties and expense. It would require no parish rate to be imposed for carrying it out, and all the funds for every expense would form a part of the outlay of the associations, as they now do. The work would be pursued with a single eye to the public good without the impediments of local influence; and particularly this mode would obviate the necessity of selling the property within seven years, and so avoid the risk of its falling back into the bad state and management of its previous owner.

The following conditions are laid down as necessary:—

1. The removal of all the existing foci of disease, and the unsuitable poor dwellings, and the replacement by healthy ones appropriate for artisans and labourers; the improvement of those dwellings that do not require demolition; and the opening out closed courts and confined spaces.*

2. That the rent to be paid by the occupiers of the proposed dwellings shall be on a scale adapted to the requirements of the humblest artisan or labourer, and on the other hand that the nett profits on the general undertaking shall secure a minimum 5 per cent. dividend on the capital paid up.

The first condition will require for its fulfilment a large sum of money. If Mr. Torrens' estimate of £1,000,000 sterling for 35,000 houses be correct, which is about £28 10s. a head, it must require at least £7,000,000 to build dwellings for the smallest number believed to require them. But as the work will not pay the highest interest necessary to attract this capital as an ordinary adventure (the 7 or 8 per cent. laid down by the Prince Consort), what is required is to make it so desirable that some of the immense wealth of this country, waiting for investment, may be attracted to it. It is presumed that, if the Government would guarantee a minimum of 4 per cent. interest on such investments, the object would be immediately attained. To the public desiring a safe investment for their money it would be a great boon, for their property would be as safe as in Bank Consols; while tolerably certain to receive an interest of not less than 5 per cent., the Government would be responsible for the minimum of 4 per cent. What objections might the Government be supposed to interpose? In granting the boon the Government accepts no risk. Every sovereign of the money subscribed by the public would be invested in houses and land, the natural tendency of which is to increase in value, and in themselves constitute the safest property in existence. The property would be managed by associations of gentlemen undertaking the work from the highest and most disinterested motives; Government officers would be associated, who would be responsible to the Government for the property and the prudence of the management, and lastly, a nett profit on the undertaking of not less than 5 per cent. per annum would be ensured by the following plans to be discussed under the second condition.

The member for Finsbury has just carried through its second reading a bill, the intention of which it is impossible to praise too highly; the only questions concerning it are whether the mode it prescribes for enforcing the rebuilding or improvement, or the rebuilding of the condemned property, might be simplified, and made more effectual; and whether the mode of providing the means to carry out the work might not be placed on a larger and more expansive basis. The second condition requires that the dwellings should be let at a rent that the humblest labourer can pay, and yet that the whole undertaking should return a profit of at least 5 per cent. after satisfying all claims. Until the working classes become more prosperous by a diminution in the oppression and misery caused by preventible disease, it would seem that a very large majority of them, at the present rents, can afford to pay for one room only. Even in the rich parish of St. George's, Hanover-square, we learn from Professor Kerr's paper, read at this society, that of 1,500 abodes of the poor visited in that parish, it was found 8¼ per cent. of the families only had three rooms, 28 per cent. had two rooms, and 62 persons had one room only. In the poor parishes the inability to pay rent is greater still; and it would appear that the provision should be, that, the rooms being built in compliance with the requirements of health and comfort, comprising the proper allowance of light, ventilation, water supply, and other conveniences, the rent per room should be from 1s. 6d. to 2s. a week. This scale, it is believed, would provide for the wants of the poorest individual or family; and there can be no doubt that, with the improving action of their dwellings on the health and morals of their occupants, very soon each family would be able to pay for three or four rooms, and in the first instance for two at least.

The other feature of this second condition—that the undertakings should return a clear profit of 5 per cent. at least on capital, is made clearly practicable by the following feature of the plan:—1st. The purchase of the property to be by compulsory sale and reference to an equitable tribunal. By this means extortionate prices would be saved, and the greatest difficulty in building for the poor cheaply would be avoided. 2nd. Advantage would be taken of the valuable experiences discovered by the pioneers on the road, both in the form and arrangement of such buildings and in the materials used in their construction. It may be found advantageous to vary the form and arrangement of the buildings according to the requirements of the neighbourhood; and it is suggested that not only would it be found profitable in some situations to make the basements into shops, as in Mr. Waterlow's houses has been done, but also that in others it might be found to pay well to convert the flat solid roof into workshops and warehouses for the use of the tradesmen in the neighbourhood, who would be able to pay a good rent for them, and so lighten the rental of the dwellings.

* It is not supposed or intended that the whole of condemned London is to be pulled down and rebuilt at the same time. The associations would take care that everywhere the convenience of the poor would be studied, and the work, though commenced on an extensive and comprehensive scale, would be so diffused and managed, that, from the first, increased, instead of diminished, accommodation, would be provided.

TRADES' UNION COMMISSION.

THE Commission appointed to inquire into the working of Trades' Unions are now taking evidence at Park Prospect House, Westminster. The Commissioners are Sir W. Erle (president), the Earl of Lichfield, Lord Elcho, M.P., Sir Edmund W. Head, Sir Daniel Gooch, M.P., Mr. Herman Merivale, C.B., Mr. James Booth, C.B., Mr. J. A. Roebuck, M.P., Mr. Thomas Hughes, M.P., Mr. Frederic Harrison, and Mr. W. Mathews. Mr. J. H. Patteson, secretary to the commission. One of the witnesses called was Mr. Geo. Potter, the president of the London Working Men's Association, who stated that it had been in existence for about fifteen months, that he was one of the originators of it, and that it consisted of about 600 members. Mr. Potter states that the association is not devoted to any particular trade, but is a union "to procure the political enfranchisement and promote the social and general interests of the industrial classes." Mr. Potter is a member of the Progressive Society of Carpenters and Joiners, which is not an amalgamated society, but one of the local societies of the joiners. The Joiners' Association is of the common form of trades' unions. The fixed minimum rate of wages at which men are allowed to work in the trade is generally fixed by the employers and employed, according to the exigences of the trade, and not by the society. Witness was not aware that a man ceasing to be a member of the society would be subject to any interruption or annoyance from the members which the society would not discountenance. Of course there are many charges of intimidation brought against societies, but they could not be responsible for every member. Some men would, perhaps, twit a man for leaving; but as a rule such a practice is deprecated by the intelligent men of the trade. There is a Master Builders' Association of London, organised to try to keep down wages, just as on the other hand the society which the witness belongs to is organised to keep them up. The Working Men's Association takes into consideration general trade questions as they arise, and, when fit, recommends other societies to support a case; but it never advises men to strike. It generally recommends an interview with the employers, and the adoption of mutual arrangements by arbitration. If the strike has taken place, the association tries to see if any arrangement can be made between the employers and the trade in dispute. Witness believed that great improvements have followed the introduction of the short time movement. As to courts of arbitration, witness believed that in many cases they would be inoperative, in many successful and useful. There is a growing feeling among the men in favour of having some kind of boards or courts for the settlement of disputes; the men are not always so desirous to have disputes as people think; and it is not always their fault that they are not settled before they come to such extreme results as they sometimes do.

The Commissioners held their fourth sitting on Tuesday, when the following witnesses were examined:—

Mr. T. Connolly, mason, was the first witness examined in respect to the 11th rule of the Masons' Society, called the "chasing" rule, which prohibits any member from performing more than a certain amount of work in one day. The witness explained that it was a rule adopted by a vote of the whole society three years since, and was passed for the following reasons:—Some employers, when they found a man in their employ possessed of superior physical strength, had been in the habit of encouraging that man, by an allowance of 6d. per day extra, to perform as much work in one day as his strength would enable him to perform, and then expect all the other men in the shop to do the same amount. This system had been found to act injuriously to the health of the men, generally overtaxing their powers of endurance, and it was to put an end to this system that what was called the "chasing" rule had been introduced. There was nothing in the rules of the society to prevent an employer, if he felt so inclined, giving extra wages to a man of more than average skill. The society discouraged piecework as having a tendency to reduce wages, and they opposed overtime as injurious to health. The society, however, did not forbid men working overtime when the job required it, but claimed for all such overtime payment at the rate of time and a quarter, which had to a great extent done away with the system of systematic overtime formerly so common in the trade.

Mr. E. Coulson, secretary of the London Bricklayers' Society, was the next witness. He said the head-quarters of the society were in London. It had 96 branches spread over the country, containing about 5,700 members. Its reserve fund in December last was £3,200. Its annual income was about £2,700—the members paying 3d. per week. Its objects were to support men out of work, with the approval of the society, the relief of travelling members, and the burial of deceased members and their wives. The amount paid by the society for strikes during the last six years had averaged about £300 per year. There was no restriction by this society against a bricklayer using both his hands in laying bricks, or compelling him to use his trowel in one particular hand. Statements that had been publicly made to this effect were totally untrue. He had himself used both hands in laying bricks on what was called inside work, but where good workmanship was required—as in erecting an outside wall—it was impossible to use both hands in laying the bricks. The society would not dream of interfering with any man for using both hands in laying bricks. The society objected to piecework, as it occasioned work to be scamped; but there was no rule against it, neither against overtime, nor apprentices—though both were discouraged. When a job was in dispute the society picketed the premises by placing men on duty outside to dissuade men

n seeking work there pending the dispute; but did not encourage any intimidation. If a man ated the rules of the society the members uld not refuse to work with him, but he would sent to "Coventry." The society were in our of arbitration, but the difficulty was to in arbitrators in whom both masters and men uld have confidence. They had a standard or imum rate of wages fixed by the society, but man of superior skill was prevented obtaining if the employer would give it.

r. G. Howell, a member of the same society, similar evidence. He had been several years reman, and had often paid extra wages to men uperior skill, but it was a practice discouraged he employers generally. He considered him- a man of superior skill, and thought the em of having a fixed minimum of wages had ated to his advantage and to all like him.

r. C. Williams, secretary to the National ciation of Plasterers, was then examined. executive committee sat at Liverpool. The ty had 128 branches, with about 8,000 mem- The number of members had doubled in the last two years. The objects of the ty were the protection of the trade and the of the members in sickness, with a burial attached. By the protection of trade he t the shortening the hours of labour and the g of wages. Individually, he would prefer uction in the hours of labour to a rise in s, as more beneficial to the men. The society d after the interests of masters as well as of the men. He gave several instances of amongst others the case of Mr. Griffiths, in August last, was building two large hotels erystwith. The men employed on the job k for a rise of 1s. per week. The committee tigated the case, and, finding the men were wrong, requested them to resume work. nen refused, whereupon the committee sup- the builder with fresh men from Liverpool, ich he was enabled to finish his work. No h could strike without the sanction of the ittee after due investigation. If the men without the consent of the committee they not receive strike pay. The society men d under a fixed minimum rate of wages.

examination of witnesses for the day was concluded.

Chairman said if the commissioners did sire to go to Sheffield to open the inquiry as to the alleged outrages, the Home Secre- was prepared to send another commission for urpose. The commissioners thought the would be the best course, and the Chairman e would communicate with Mr. Walpole to ffect.

inquiry was then adjourned.

NOTICES OF PUBLICATIONS.

eering Facts and Figures for 1866. A. Fullarton and Co.

tle page of this book is somewhat of a ner. Instead of the above title it should been "Engineering Facts and Figures for 66 Pirated from the Scientific Journals." The onsists almost exclusively of articles taken lump from our pages and the pages of our poraries, and it sells at 6s.; or about four s much on the average as the reader would o give for the information in its original The compiler, who takes good care to is name, trades with other people's goods. s scarcely an article which he has taken in " as he terms it, from the scientific papers, at was paid for by the proprietors. But son has the effrontery to take these articles t (we speak as far as we are concerned) leave, produce them in a book form at a much rate than they originally sold for. There ways to prevent such a style of book- ; either for the public not to purchase, or proprietors of the articles so appropriated an injunction and prevent the sale of the

r of Edinburgh and their Homes. By Wil- Anderson. Edinburgh: John Menzies.

we have a reprint of a series of articles he *Edinburgh Courant*, by one of its s, and conveying the results of personal n and inquiry into the condition of the s of the poor of the Scottish capital. The y facts brought to light by the author, at the Edinburgh authorities have not themselves too soon to improve these dwellings. Speaking of the closes or alleys of the Old Town, Mr. Anderson declares "we have seen something of the worst parts of London and of the large provincial towns of England, as well as of the back slums of Dublin and Belfast, but we do not remember ever seeing anything so horribly dirty as these closes." Those who have had similar opportunities of judging will agree with him. The crying evils, as usual, are the rapaciousness of landlords in exacting exorbitant rents for the most wretched hovels, while refusing to do anything in the way of repairing the property: the want of water; and the absence of waterclosets and other receptacles for refuse. By the publication of his able articles the writer has materially contributed to help forward the projected great scheme for improving the sanitary condition of Edinburgh, which is one of the most beautiful, and at the same time one of the filthiest of cities. There is within its borders a smell, or rather a stink, which some travellers say contains the quintessence of all the stinks of all other towns under the sun.

The Year Book of Facts in Science and Art. By John Timbs, F.S.A. Lockwood and Co. 1867.

This familiar and useful annual has reached its fortieth year of publication; and Mr. Timbs, with pardonable pride, congratulates himself thereupon. In addition to the usual large mass of facts in mechanics, natural philosophy, chemistry, zoology, botany, geology, astronomy, &c., the present volume contains a carefully condensed account of the laying of the Atlantic telegraph, "the leading accomplished fact of the past year," with an account of the scientific labours of the inventor of the electric telegraph, Professor Wheatstone, whose portrait prefaces the book.

An Encyclopædia of Architecture, Historical, Theoretical, and Practical. By Joseph Gwilt, F.S.A. &c. A new edition. Revised by Wyatt Papworth, F.R.I.B.A. Longmans. 1867.

Gwilt's work is so well known to the architectural profession as to require neither introduction nor criticism at our hands. Since it was first published in 1842, it has passed through four editions. We simply note that in the new edition 400 engravings and more than 100 woodcuts have been added to the work, which also contains a brief memoir of the author, and several alterations which were deemed necessary or advisable. Mr. Papworth has performed his task with care and judgment. The "Encyclopædia" as it now stands extends to upwards of 1,300 pages, and contains something like 1,600 illustrations admirably brought out on toned paper. Altogether we have a standard work of reference on architecture.

Reminiscences of a Highland Parish. By Norman Macleod, D.D., one of Her Majesty's Chaplains. Alexander Strahan. 1867.

Few who read these reminiscences as they originally appeared will regret meeting with them in their now collected form. They are charming pictures of a district of country containing some of the most magnificent and beautiful scenery in the world, and of the every-day life of the interesting people who inhabit it—a country of which, after all, we know little, and a people of whom we know even less. As Dr. Macleod has it, the Highlands of Scotland may be said to be unknown, and yet well known. He has corrected our impressions thereof on many points, and we can only say that no one will read this volume, coming as it does from the pen of one of the most eloquent and popular divines, as well as one of the most graphic and entertaining writers of the day, without feeling a warm heart towards the Highlands. Certainly no Scotchman will.

Some few weeks ago we reproduced an article from the *Westminster Gazette* on the New Law Courts. Since then another article brimful of frantic criticism and denunciation has appeared in the pages of that journal. The writer, in fact, sees nothing in the designs to commend, and everything to condemn. His condemnations, however, being so unqualified, defeat the purpose they were intended to produce. The writer puts on his colours so thickly that they fall off. Such undiscriminating criticisms can only spring from an egotistic soil. They, in fact, partake of the general character of the criticisms of the *Westminster Gazette*, which describes itself as "Catholic, Ultramontane, Hildebrandestic," and, consequently, can see nothing good in those "torrents of tendency," as Emerson says, which characterise modern civilisation.

Building Intelligence.

CHURCHES AND CHAPELS.

It is proposed to restore the parish church of Berwick at an expense of 300 guineas.

A lady residing in Wolverhampton has given a site for a church and parsonage, together with a contribution of £2,000 for the endowment of the church.

A Birmingham paper states that £10,000 has just been placed in the hands of the bishop of the diocese, by a person who desires to remain unknown, to be devoted to the erection of new churches in Birmingham.

The foundation stone of a new Primitive Methodist Chapel at Beverley was laid last week.

Aughton.—A new church is incourse of erection here, from designs by Messrs. W. and J. Hay, architects, Liverpool. It will be in the Flowing Decorated style which predominated in the fourteenth century. It will present a chancel, nave, and aisles, and a massive tower occupying a central position at the west end, terminating with a quatrefoil balustrade, pinnacles rising at angles, the south-east corner having, however, an octagon stair turret, terminating with a pinnacle. The chancel will be 40ft. long by 23ft. wide, the dimensions of the entire edifice being 65ft. by 58ft. The material used is from the Aughton delf known as "pitch-faced courses," the interior being lined throughout with ashlar. The church will seat from 500 to 600 persons, and the estimated total cost is £6,000. The work is being carried out by Mr. Harris, of St. Helens.

Berlin.—The New Cathedral.—The long promised Cathedral of Berlin is now to be undertaken in good earnest. We last week gave the letter of King William, addressed to the Minister of Public Worship. The late Privy Councillor Stüler has supplied the drawings of the new Cathedral. Independently of the entrance hall, the body of the building will be 240ft. square, and 140ft. high. Above this will rise a cupola 190ft. high, surmounted by a spire and cross 70ft. in height. This gives a total altitude of 400ft. or just 4ft. less than that of St. Paul's. The columns of the portico are to be Corinthian, and the general character of the building is that of a vast basilica.

Beverley.—On Monday week last the foundation stone of a new Primitive Methodist Chapel was laid. The building is to be erected upon the site of the old chapel, and will accommodate 700 persons, the estimated cost being about £2,000. Mr. Wright, of Hull, is the architect, and Mr. Watson the builder.

Forden (Hereford).—A new church has just been opened in this town. It is in the Early Decorated style, and consists of a nave, north and south aisles, chancel aisles, and detached tower. All the exterior masonry is built of Whittree stone, and the interior of Bath stone, relieved in both instances with red stone from the Ruabon beds. The church was built from the designs of Mr. Nicholson, of Forden, and the works have been carried out by Mr. Gough, builder, of Bishop's Castle. The cost has been about £3,000 exclusive of the tower, which has not yet been built.

Leith.—A new chapel has been built here for the Evangelical Union Congregation. It is designed by Mr. Goalen, architect, Leith, and is to be in the Gothic style. It will have a frontage of 45ft. 8in., and a depth of sides 63ft. 6in. Sittings will be provided for 560 persons, allowing a space of 20in. for each.

Southampton.—A new church is proposed to be erected here. The architects appointed are Messrs. Bull and Monday, by whom a design in the Norman style has been submitted. The drawings have been passed by the Diocesan Society, who grant £125 towards the building fund. The dimensions of the church will be as follows:—Nave, 81ft. by 21ft. 6in.; south aisle, 13ft. wide (the north aisle will not be built at present); chancel, 30ft. by 21ft. The organ chamber on the north will have an arch opening into the chancel, and the vestry will occupy a similar position on the south. The chancel will terminate with an apse. A bell turret will rise to the height of 60ft. at the east end. The present accommodation will be for about 500 adults; 250 sittings will be free. It is anticipated that the foundation stone will be laid during the ensuing summer. The estimated cost is £2,500.

BUILDINGS.

Canterbury.—Mr. Hall, surveyor to the Local Board, has prepared plans of the proposed enlargement of the Corn and Hop Exchange. These were last week submitted to the committee appointed by the council to entertain the question, and these gentlemen came to the determination to recommend it being carried out to the corporation. The present room will be elongated 60ft., and by so doing the new room will be 126ft. long and 28ft. wide, with ten small rooms at the sides for the use of the corn factors or others. The estimated cost of the alterations is £2,300.

New Lighthouse.—The Scotch papers note the projection of a work of no ordinary difficulty, viz., the erection of a lighthouse tower on Dhuhcartach rock, which it appears the Commissioners of Northern Lighthouses are to commence immediately. The Dhuhcartach lies fifteen miles to the S W. of Iona, and is exposed to the full fury of the Atlantic Ocean. Of late years numerous wrecks have occurred on the Torrin Rocks—a formidable reef lying between Dhuhcartach and the coast of Mull—and, according to the testimony of the commanders of some of these vessels, many of the wrecks would have been prevented had a light been placed on Dhuhcartach. The rock on which the tower is to be placed is a rounded mass, about 240ft. in length and 130ft. in breadth, and is surrounded on all sides by deep water. There being no outlying reefs to break the waves, there is, even with a very slight westerly swell, a constant play of sea all round it; and the landings are likely to be attended with much inconvenience, while the distance from land (being about one-third greater than in the case of the Eddystone or the Skerryvore) will further tend to increase the difficulty. The tower, which is to be a parabolic shaft, rising to the height of 101ft., is to be surmounted by a first order fixed dioptric apparatus. The cost of the works is estimated at £56,900.

The New Millwall Docks.—These extensive works are now rapidly approaching completion. The new docks, which with the quays and warehouses in the vicinity, will occupy something like 150 acres, lie south of the West India Docks, and have been built so as to make it easy at any time for the promoters of the company by which the undertaking has been projected to form a junction with the West India system. The most southern portion of the basins of the latter is separated by a very small interval from the most northern point of the new works, and even that is now being gradually diminished. Excavations have been commenced under the direction of Mr. Hawkshaw, the engineer, to form a new basin on the south of the West India Docks. This addition to the almost uninterrupted succession of water basins now existing in the Isle of Dogs will occupy 24 acres, and has been projected principally for the reception of East India products, such as jute, seed, saltpetre, and cotton. It will at the same time afford equal facilities for ships outward bound to ship their cargoes, and will form a most important link in the chain of communication by water, which will, in a very few years, make the Isle of Dogs for ships what Clapham Junction is for railway trains.

General Items.

Mr. Tite, M.P. for Bath, has been elected by the Council of the Royal Architectural Institute as their next president. The other candidate put forward was Earl Grosvenor.

The small piece of land at the corner of Lombard-street, a site for one house, was recently let for £6,600 a year; it was sold for a premium of £70,000 and the rental, and there is now building on it a house expected to cost £70,000, and to let for £22,000 a year.

Mr. C. H. Bennett, perhaps the most original of the comic or eccentric school of English woodcut draughtsmen, died after a short illness on Tuesday. He was thirty-eight years of age.

Captain Hans Busk has just presented to the trustees of the National Gallery a magnificent picture by Nicholas Poussin. This picture, which is believed to be one of the finest specimens of that master was painted in 1641, and was purchased some years ago from the Barberini Palace for 600 guineas.

The Metropolitan police have now undertaken the charge of Hyde Park, and the Green Park. The carriage gates of Hyde park will be kept open till twelve o'clock at night instead of ten o'clock, as hitherto. Arrangements are made for the regulations of his Royal Highness the Ranger and the First Commissioner of Public Works being strictly carried out, and for preventing the crimes and disorders in the Park of which complaints have so often and justly been made. The magazine barracks in the centre of the park will be appropriated for a police station.

We have, this week, to record the death of Mr. Wm. Baddeley, at the age of sixty-one. Mr. Baddeley was well known for his devotion to the cause of suppressing fires. He was the first to publish annually an analytical record of the causes of fires. He was the inventor of the patent canvas now used by the fire brigade, and the patent hose reel. He brought out many years since a portable fire engine, which is used by farmers, and made by Messrs. Merryweather. He was connected with the "Mechanics' Magazine" during its early history. Long before the introduction of steam fire engines Mr. Baddeley consistently advocated their use, and by so doing brought himself in collision with Mr. Braidwood. He had for twenty years been an inspector of the Royal Society for the Protection of Life from Fire, but owing to ill-health he retired a few months ago, the committee awarding him £200 as a mark for past services.

Two more serious fires have just occurred in the the East. A terrible fire has burnt down a whole quarter of Constantinople including the dockyards on the Golden Horn, which are entirely reduced to ashes. The loss is estimated at not less than half a million sterling. A portion of the Royal Palace at Athens was burnt down the other day. The fire lasted five hours, and the damage done is estimated at 40,000 drachmas.

A series of beautiful oil paintings, executed in Rome, have been purchased for St. Richard's Roman Catholic Church, Chichester, in memory of the late Rev. John Wilkinson.

The artistic world has sustained a great loss by the death of M. Hittorff, the distinguished architect of the city of Paris, who died on the 25th ult. He was a member of the Institute, and member and Royal Medallist of the Royal Institute of British Architects. M. Hittorff contributed much to the embellishment of Paris, having been the architect of the Cirques de l'Empereur and de l' Impératice, of the great Church, or rather Basilica, of St. Vincent de Paul, of the fountains and pavilions in the Champs Elysées, and of various Mairies and other important buildings. His profound knowledge of classic antiquity and his various important publications, especially that on the art of polychromy as applied to monumental art, placed him in the highest rank among the writers on his art, and will leave a great loss in that department of architectural knowledge and scientific research. His last work is the noble Station of the Chemin de Fer du Nord, which even now is hardly completed. M. Hittorff was a native of Cologne.

The following gentlemen have been elected members of the Society of Arts:—Mr. Albert De Vere, 86, St. James's-street, S.W.; Mr. E. S. Ellis, The Newarke, Leicester; Mr. V. Cary Elwes, Billing Hall, Northampton; Mr. John Kirkbank, 10, Gray's Inn-square, W.C.; Mr. John Knowles, 42, Moorgate-street, E.C.; Mr. Joseph Salter Pearse, 18, Barnsbury-street, N.; Mr. Edward Potter, Marine House, Tynemouth; Mr. Henry Hopley White, Q.C., The Firs, Rectory-grove, Clapham, S.

The Society of Architects of France invite their confrères of all the world to an international conference, to be held in the month of July next, with the object of taking into consideration the methods in use in architectural education, and all questions connected with the subject, and especially to inquire into the tendency of the modern architecture of all nations.

Mr. Thomas Bonnar, jun., read a paper at the usual fortnightly meeting of the Edinburgh Architectural Association, on "Imitations in Relation to Architectural Decoration." Mr. Bonnar was of opinion that imitations were allowable so long as they were employed merely for their own intrinsic beauty and as pleasant decorations, and not with the view of deceiving.

TO CORRESPONDENTS.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the Editor, 166 Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

Received.—A. M.—J. B. W.—J. A. M.—H. E.—G. H.—T. P. and Co.—W. S.—L. and N.—A. C.—G. H. P.—H. and P.—R. S. and Son.—J. H.—W. W.—H. W.—T. R.—C. A. M.

W. K. wants to know how he can get a situation. We cannot advise in such matters, or we should have little else to do.

W. R. T.—We can only give you the inventor's address: Mr. R. Thompson, 5, St. Thomas-terrace, New Charlton, S.E.

Junior Clerk.—See answer to 296 in Intercommunication column.

S. W.—We regret that we cannot afford the space.

A Novice had better consult a lawyer.

Correspondence.

MANCHESTER TOWNHALL COMPETITION.

To the Editor of the Building News.

Sir,—A correspondent in the Building News of March 29, who signs himself "One of the Ta Tips, &c.," complains of the manner in which th Manchester Corporation propose to place the com petitors for the new townhall. From his remark he would wish it to be inferred that the coun were niggardly in their offers, and that unfair pl might be expected. In my opinion he fails to c taolish either view. In the first competition it proposed that not less than six, nor more th twelve, designs shall be selected, and to each auth the sum of £300 shall be paid. This I submit not a niggardly offer, nor is it considered so by m eminent in the profession. In the second a final competition your correspondent is equally fault. The clause or clauses which he thinks we drawn up to find out the trump-cards were n intended for any such purpose; on the contra they were inserted to prevent mere drawing maste from obtaining a prize which ought to be won a genuine member of the profession of architec Competitors may rest assured that every eff will be made to secure a decision without fe favour, or affection.—I am, &c.,

A Member of the Counci

Manchester, April 1.

DESIGNS FOR THE NEW LAW COURT

Sir,—I went to-day to see the designs for t new Law Courts, and, lo and behold! when I there I found the door closed in my face, thou I had put myself to considerable inconvenience get there! At first, for a short time, the desig were opened two or three days to the public, a from what I hear the public appreciated the pr lege, and went in hundreds to Lincoln's Inn-squa

It was then decided that the public should o be admitted every Thursday. One would h thought four days a week would have been su cient for the Commissioners to examine the sigus preparatory to arriving at a decision. I no, they must have the whole of the time, a that for four or five weeks. Of course the c venience of the public is altogether out of question. What are the great English tax-pay public to the convenience of a few commissione who may or may not saunter in and out two three times a week? As one of the public, I to utter my protest against this unnecessary clusion. It smacks of rank snobbism, and I ho Sir, you will lift up your powerful voice on bel of hundreds, and I may say thousands, who wo gladly avail themselves of an opportunity of amining in details these various designs.—I am,

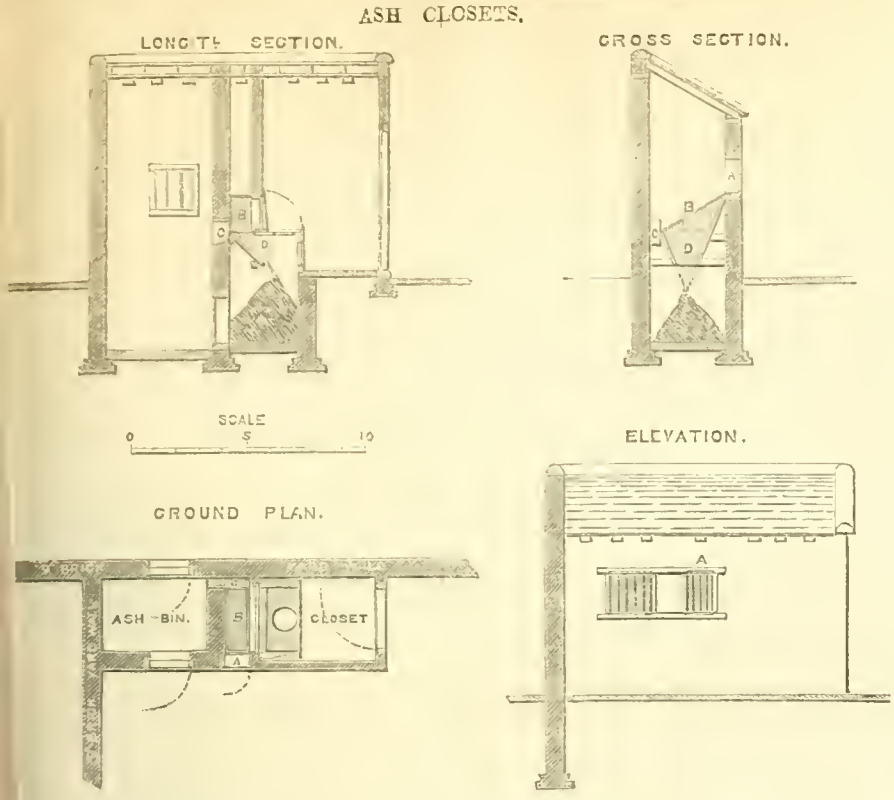
W. H. T

*** Our correspondent's protest will be utterec vain. The English public have been so long customed to Patronage and Privilege that it almost hopeless to expect a wholesome change.

ASH CLOSETS.

Sir,—The description given of an ash closet your last issue induces me to forward you traci of one that I have designed for the purpose substituting the many thousands of privies t are within this borough, which, it is almost su

ASH CLOSETS.



us to state, are not only a source of expense annoyance (each householder has to provide for oving the night soil, &c.), but also injurious to health of the inhabitants. As may be seen by rence to the drawings, this closet is of very ple construction, and can at a very slight ex- se be applied to any common privy. There g no movable machinery whatever, it is not ble to get out of repair, and requires no further ndance than that the house-ashes be emptied y through the trap-door A on to the inclined screen B, which separates the fine from the se ashes, the latter passing off through the t C into the ash bin, and the former, falling the hopper D, is thereby concentrated so as descend into the excreta, thus absorbing the ture contained therein, preventing putrefac- and the generation of those gases that prove tal to all that come in contact with them. It t intended that there should be a fixed quan- of fine ashes deposited after each use of closet, but, as before stated, that the nary house ashes be used whenever they removed from the rooms, which, as a rule, t least once every day, and experience es that this is sufficient to prevent de- position, also that the compost is a most able manure for almost any description of . Without offering an opinion on any of the y schemes now before the sanatory world for urpose of removing focal matters, I would just est, for the benefit of those towns that are de s of remedying the evil consequences atten- on either the watercloset or privy and cess- systems, to give the ash-closet system a trial, one thing I will guarantee is, that they will ert what formerly used to be a prolific cause of tution and death into a most valuable re, and that, too, at an annual saving to the ayers.—I am, &c.,

GEORGE SNAITH,
Borough Engineer and Surveyor.

nley, Staffordshire, March 26.

EMPLOYMENT WANTED.

,—I would like to have your opinion upon a ques- f serious importance to me, viz., is the building busy in London, and do you think a bricklayer that known in the City could soon get work, for I have to come to London to get employment, if possible. My for wishing to leave Liverpool is this. I was formerly cted with a large building firm in this town as head an, and afterwards as partner, but having failed in ss some time ago, and being short of capital, I can- et work that will pay me bare wages, and I cannot situation at present only as working foreman; then I I have to join the club, which I would prefer doing other town. My age is thirty years. Hoping you swer me in this week's Correspondence,—I am, &c.,

J. T. U.

e above is a fair specimen of letters which we are ntly receiving; and we insert it for the purpose of that it is impossible for us to give advice on such s. The best thing our correspondent can do is to himself of our advertising columns.

Intercommunication.

QUESTIONS.

[327.]—DISCOLOURED BRICKWORK.—About twelve months ago I had a block of dwelling-houses erected with white stock fronts. The bricklayer coloured the bricks (previous to tuck pointing) with a mixture of copperas and lime. Ever since, in dry or frosty weather, they have thrown off saline matter, so that they appear almost like whitewash and rusty iron. I have tried several ways to clean it off, but all have as yet failed. If any of your numerous readers could help me in the dilemma I should feel greatly obliged. R. B.

[328.] — DEODORISING EFFLUVIUM FROM DRAINS.—Can you or any reader of the BUILDING NEWS give information as to the method of applying animal charcoal to the deodorisation of the effluvium from drains? B. M.

[329.]—ETCHING.—The subscribers to your journal are under many obligations for the valuable information afforded them in the columns thereof, more especially to the "Intercommunication" column, from which I gain many a wrinkle. You give the materials used for etching, which I have obtained, and am now at a loss to kn w how to proceed. Therefore will you kindly inform me where to begin and how to proceed? AMBITION.

[330.]—TILE ROOFING.—I should be glad if some of your correspondents would tell me the best way to cover roofs with plain tiles. Should the tiles be bedded in mortar, or laid dry, and afterwards pointed on the inside. The roofs are on the sea coast. A SUBSCRIBER.

[331.]—SHELLS FOR CAMEOS.—I find great difficulty in obtaining shells of good colour, and sufficiently thick to make cameos of 1½in. or 2in. in diameter. I am told that the best shells are carried off to the Swiss and Italian markets. I feel sure you will do a favour to our English cameo carvers if you will make known a good market for first-class shells through your "Intercommunication" column. W. ELLIS.

[332.]—SALT IN PLASTERING.—I should feel obliged if you could recommend me any solution which would draw the salt out of some plastering on old brickwork, or if you could suggest any other cheap and efficient remedy for preventing the damp affecting paper? The plaster was composed of slaked stone, burnt lime, fresh hair, and brook sand. My impression is the sand contained the salt. E. A. D.

[333.]—ARCHITECTS' PUPILS.—As your correspondent "Adelphi" is such a good hand at giving advice, would he be so kind once more to do so, under the following circumstances:—I am an unfortunate architect's pupil, who happens to be under a master whose sole object seems to be to screw every farthing he can out of me, instead of trying to make me a credit to his office and himself. You may judge him when I tell you it was over a year before I was allowed to draw at all, and as to going to see the buildings once now and then, it was out of the question. I am now in my second year of apprenticeship, and must say I felt very much discouraged at first, like "Provincial," who I must thank for raising so important a discussion. My treatment is scarcely any better now, and it seems to me there is no hope, for my master never thinks of telling me anything himself, but leaves me to the others' kindness, and you "may guess how much interest the others take in our improvement." If he will tell me what he thinks is the best path to pursue, he will greatly oblige A SUBSCRIBER.

REPLIES.

[291.]—ARCHITECTS' PUPILS.—In answer to "Provincial's" question as to whether "there is an architectural association with which he might become acquainted," I quote the second rule of the Architectural Association, 9, Conduit street, London, W., which runs thus:—"The society to consist of town and country members, the former residing or carrying on business within, and the latter beyond, a distance of ten miles from the rooms of the association." I cannot enumerate the benefits to be secured by becoming a country member, but am sure either of the honorary secretaries of the association would be pleased to furnish "Provincial" with them. ADELPHI

[308.]—THE LAW OF INDENTURES.—I should like to know where your correspondent "Law" gets his legal knowledge from, for I find in section 170, Bankruptcy Act, 1849, that the bankruptcy of the master is a "complete discharge" of the apprenticeship indentures. The reply referred to is calculated to mislead, and therefore should be contradicted, unless the correspondent can give something reliable and of a more recent date than the quotation I have made. The Act as it stands is manifestly unjust to the master who is desirous of discharging his duty; but with that there is nothing required to be named, it is only matter of fact to be stated. W. P.

[310.]—SMOKY BRICKS.—If a builder be in the country or near a cow house he can find a cheap composition for covering sooty bricks by obtaining a quantity of cowdung and covering the bricks over with it to a moderate thickness (say ¼in.), and then plaster the work as usual; he will find no inconvenience from soot coming through to disfigure the work. I have used, and seen it used, for that purpose for the last fifteen years, during which time I have never known it to fail. ANOTHER BUILDER.

[317.]—RADIUS OF A CURVE.—If I understand "B. N," the points A and B in his diagram are tangent points on the curve A B (which is a regular one). Now two straight lines cannot meet in a point without a circle, and be tangents to that circle without being equal (I mean from the apex to the tangent point). There must be some practical error either in the curve or the dimensions taken, or the lines would be equal. If "B. N." will see where the error exists, and give the length from the tangent point to the apex of the two lines, and the nearest distance from the apex to the crown of the curve, I will give him the length of the radius he requires. E. L.

[318.]—FRONTAGE.—"A" has no right to put a foot, much less a spade, upon the land of B if the latter is not agreeable I cannot understand what "A" means by keeping the projections of his footings upon his own side. He may do this; he may build his wall in any way he likes, provided not a single inch of it is either above or below the land of B, for when a man buys a piece of land it is his from the centre beneath to the skies above. If "A" puts his footings in the land of B, and B chooses to dig in his own ground he may destroy those footings, and so bring down the wall of "A." J. J.

[319.]—CLERK OF WORKS.—A "Young Builder," to engage as a clerk of works, should be well up in:—1. Writing; 2. Measuring; 3. Hand sketching; 4. Drawing; 5. A competent judge of artificers' work; 6. Levelling; 7. Must be conversant with Peter Nicholson; 8. Well acquainted with Gothic; 9. A good knowledge of Euclid and Lindley Murray; 10. To become (if not one) a punctual subscriber and reader of the BUILDING NEWS; 11. Get printed testimonials to produce to an architect when seeking an appointment. I hope "Young Builder" is prepared, and well up in what I have stated, and that he may get a speedy engagement. The salaries, of course, are usually paid by the architect as per agreement. A CLERK OF WORKS.

[320.]—MOUNTING TRACINGS.—In reply to "Ignoramus" of last week's BUILDING NEWS, as to mounting tracings, I beg to send particulars whereby he cannot fail to have some laid as tight as a drum on calico, having done, and still do, by the following process:—Supposing the tracing 3ft. by 2ft., or any other dimensions, procure a drawing board just 1in. larger all round than the tracing about to be mounted, cut the calico of sufficient size to come over the edges of the board, dip the calico in a basin of water, and, when thoroughly wet through, rinse out, and, while wet, put on board by tacking all round the edges with small tacks, taking care, after first side is tacked, to well pull the reverse edges before tacking. Paste the reverse side of the tracing to be mounted with paste made with flour and water properly boiled, and put it on the calico, commencing by putting one end of tracing on the cloth, and gently, with a clean cloth, dab, but by no means rub, the tracing on to the same. Then, as the cloth and the tracing dry, a smooth surface of both is obtained. WILLIAM LAWRENCE.

[320.]—The best way to mount tracings is to gum them to the best Bristol cardboard. The gum must be arabic, and made very thin. D. A. AIRD, JUN.

[321.]—SIPHON.—It would not benefit this kind of querist to give what he asks, a ready made rule for a matter on whose principles he is so completely in the dark as to ask whether there is any limit to the siphon's ascending leg. If he will first inquire why the column of water in the descending leg drags over the shorter column, they having no tenacity like the parts of a chain hanging over a pulley, he will see it can only be the atmospheric pressure against each end that thus keeps them together. This pressure, then, being only equivalent to 33ft. or 34ft. or water, if the short column exceed this height it will not be dragged over. Otherwise, to find the rate of flow, he must first find the velocity a body acquires in falling freely from the upper water level to the discharging orifice (or to the lower water level, if that covers the orifice). This velocity must next be reduced in the ratio that the siphon's whole contents exceed so much of it as would reach vertically between these two levels. Thus, if it be a uniform tube, and ten times as long as the difference of levels, here will be the inertia of any given quantity of water moved by the gravity of a tenth of itself, and therefore ten times slower than its own full weight would move it. Lastly,

this must be further reduced for the friction found in multiplying the whole interior surface by a co-efficient depending on the smoothness, and given in hydraulic treatises. Edward L. Garbett.

[321.]—Certainly not in practice, but theoretically water might be raised to the height of 33ft. In practice 30ft. might be considered as the maximum height to which a siphon will raise water, and owing to leakages and one defect in construction and another, this height is not very often reached. An excellent example of raising water by siphons is at present in operation at the Midlevel drainage, but although the height is under 30ft. a pump is continually at work to keep the air out of the pipes. L. P. C.

[322.]—CIRCLE.—I make the answer 710 miles 28ft., a decidedly larger diameter than we building surveyors often have to treat. These six precious figures 113 : 355 have deservedly immortalised Metius; but it should be known that a year or two ago they have been beaten in accuracy as 74 to 1, by the equally easy and most ingenious rule of our neighbour Mr. Drach. If the querist would construct Puck's girdle round the earth, let him, from 3 diameters, deduct 8 thousandths and 7 millionths of a diameter, and then augment what remains by a twentieth of itself, and the girdle will meet within 2in.! He may now find the circle, in which Drach's rule will err 1ft. E. L. G.

[322.]—Will you allow me to state that I am quite unable to comprehend the drift of the question of William Butler. The general formula for the circumference of a circle in terms of the radius which is half the diameter is, putting C for the circumference:—$C = 2\pi r$, where r = the radius, and $\pi = 3{\cdot}41592$. How a diameter can produce a circle "over truth" is more than I can make out.

S. S.

[325.]—CHARGE FOR DRAWINGS.—"M." sends no datum for our calculation but "the cost of the building," as if he thought his remuneration should be some percentage on the outlay, like that of a C.E. or F.R.I.B.A. Permit me to inform him that, as a designer of buildings, in undertaking the same duties as these gentry, my chief difficulty is how to avoid being classed among them. I have found no objection by any employer to the following charges:—For all necessary drawings and specifications, 5s. per square of flooring, omitting walls; and 1d. per lineal foot of frontage in each story. Observe that the term "necessary" drawings excludes any of artistically varied detail, that is, I make an extra charge for designing any two things different which would serve their mechanical ends as well alike. "M.'s" employers may object, perhaps, that, even without these extras, this is a higher value than the Government or our wealthiest cities put upon what they suppose the best architectural art obtainable. For instance, the Manchester Corporation, in their town-hall designs, require about 1,700 squares of floor, which would make my charge for planning, structural, and all internal design, £425; and the frontages to be at least 1,440ft. on each of the four stories above ground, giving for external design £24; total, £449. But the Corporation expect to get complete and finished designs for £300. The £800 given for each of the Law Court designs is on about the same scale, viz., 3s. per square of floors. Well, I admit this is so—that my clients make no objection to higher pay than the nation offers to its Scotts and Barrys. But if they make none, why should I not take it? and why should not "M."? For non-professional ideas on this important subject, see Denison's "Lectures on Church Building," pages 205, 208. Edward L. Garbett.

[325.]—The general charge is about $2\frac{1}{2}$ per cent. upon working drawings. It would amount to £15.

D. A. Aird, jun.

[326.] — MEASUREMENT OF CENTREING. — In reply to "Leicester," the circumference of a semicircle = diameter × 1·57, *i.e.*, diameter × $\left(1 + \frac{5}{10} + \frac{7}{100}\right.$ or $1 + \frac{1}{2} + \frac{1}{14}$ nearly$\left.\right)$ ∴ we have 8ft. 2in. ÷ ½ (8ft. 2in.) + $\frac{1}{14}$ (8ft. 2in.) = 8ft. 2in. + 4ft. 1in. + 7in. = 12ft. 10in. The last item, 1-14th of the diameter, 8ft. 2in., is the same as 1-7th of 4ft. 1in. The practical rule is therefore to add the diameter, half the diameter, and the 14th, together.

J. M'Namara.

[326.]—In answer to your correspondent "Leicester," the semi-circumference of a circle equals 1 4-7th or 1 8-14th of its diameter.

8ft. 2in. = diameter
4ft. 1in. = 7-14th diameter } = 8-14th
0ft. 7in. = 1-14th ,, }
12ft. 10in. = 1 8-14th ,,

A Schoolboy.

[326.]—"Leicester" will find the 7in. is a 7th of the 4ft. 1in. It is only Archimedes' rule.

Edward L. Garbett.

[326.]—The answer to "Leicester" is very simple. The radius multiplied by 3 1-7th will give the circumference of the semicircular opening; in other words, 4ft. 1in. × 3 1-7th = 12ft. 10in., which is equivalent to adding the diameter, 8ft. 2in., to the radius, 4ft. 1in., and then taking 1-7th of the latter and adding all three together, 7in. being the 7th of 49in. Zero.

[Answers have also been sent by "H. P.," "W. W.," "P. F. M.," and "J. M."]

STAINED GLASS.

The projected restoration of the Lady Chapel of Romsey Abbey, in memory of Lord Palmerston, has been abandoned; but Messrs. Clayton and Bell will fill the great west window of that church with memorial glass.

STATUES, MEMORIALS, &c.

A monument to the memory of the late Mr. Mason, of Burton-upon-Trent, is to be erected in that town. The design of Mr. J. B. Clarke, of Liverpool, was selected; and the monument will be 14ft. 6in. in height, standing on a double base 7ft. 6in. square. It is to be of grey Yorkshire stone, with red granite columns at each angle. The design is Gothic, terminating with a spire, and will cost nearly £180.

The Late Mr. John Appold.—A marble monument has been recently erected to the memory of the late Mr. John Appold, F.R.S., in the church of St. Leonard, Shoreditch, in which parish he was born, and for the greater part of his life resided. The inscription, after recording his connection with the Royal Society and Institution of Civil Engineers, announces that "he dedicated his intellect, time, and means, to the application of the laws of nature to important mechanical inventions."

Some negroes in America, chiefly of the Sea Islands of Carolina, have raised among them 3,500 dollars, to build a monument to Colonel Robert Gould Shaw. On this monument will be placed the reply of the Southern soldiers to those who applied, under a flag of truce, for the young Bostonian's body: "We have buried him with his niggers."

WAGES MOVEMENT.

An "eight hour law" for labour has been adopted in Illinois. There is much agitation on this subject throughout the United States, and a law prescribing eight hours for a day's work in Government workshops has been introduced into Congress.

The strike of the plasterers' labourers at Manchester remains *in statu quo*. The plasterers of Nottingham are still out on strike.

The Scotch Enginedrivers.—The enginedrivers on the Scotch railways, following the example of their brethren in the south, are agitating for an improvement of their present position in respect of wages and hours of labour. At a recent meeting held in Glasgow, it was resolved that ten hours should be submitted to the employers as a fair day's work; and with regard to wages, a scale was agreed to, ranging from 5s. up to 7s. 6d. per day for drivers, and from 3s. 6d. to 4s. 6d. for firemen.

Barnsley.—The joiners and stonemasons here have struck work. The joiners asked some weeks ago for an advance in their wages, and a reduction of one hour per day, viz., from ten to nine hours; and the stonemasons asked for 2s. per week advance. At a recent meeting of the masters it was agreed to give the joiners and stonemasons 1s. per week advance, but the question of the reduction of the hours of labour the masters declined to entertain.

WATER SUPPLY.

The West Riding magistrates have authorised the Horsforth Waterworks Company to borrow a further sum of £2,000. The capital of the company is £8,000, of which £6,800 is already paid up.

Malton.—It is expected that within a week or two the long-hoped-for water supply will be opened for permanent use. After nine months of fighting with the spring waters of the Howardian range, the well for the supply of the waterworks system (for the towns of Malton and Norton) has been sunk to the required depth. The engine has been tried, and water has been this week pumped into the reservoir, everything working admirably. The waterworks were opened on Monday. The works have been designed by W. Easton, C.E., and the scheme has been wholly carried out by the Local Board of Health.

BRIDGES.

On Wednesday week last the Leeds Local Board held a meeting upon the subject of the erection of a new bridge across the Calder Valley. Plans have been prepared, and the estimated cost of the bridge will be about £2,000.

Steps have been taken for removing old Caversham Bridge, Reading, and a new one built in its stead. It will be constructed of wrought-iron lattice girders from pier to pier. The bridge will be over 300ft. long and 30ft. wide, and will cost about £4,500.

LEGAL INTELLIGENCE.

Architect's Commission.—In the County Court, on Friday, Mr. Charles Manton, architect, Wolverhampton, sued the Rev. Samuel Morris and Mr. Samuel Rogers for £21 8s. 6d., balance of commission due to him on account of the erection of a Primitive Methodist Chapel in Park-street, of that town. The items of the plaintiff's claim were $2\frac{1}{2}$ per cent. on £878 9s. 5d., the amount for the builder's contract, a similar commission on £98 10s. 10d., alleged extra work, and six guineas for the cost of making a detailed estimate. The defence was, as to the percentage, that the plaintiff had not done his work efficiently, and therefore was not entitled to be paid; and as to the six guineas, that no order was given for the detailed estimate. The plaintiff said that if he had not efficiently superintended the erection of the building it was the fault of Mr. Rogers, who had refused to allow him the requisite facility. The judge decided that the plaintiff was entitled to his $2\frac{1}{2}$ per cent. upon the original contract, but that he was not entitled to commission on the extra work, nor was he entitled to the extra charge of six guineas for the detailed estimate. His Honour gave judgment for £13 2s.

A Negligent Engineer.—Samuel Arnold, engineer, in the employment of Mr. Kendrick, of Greets Green Colliery, was last week summoned at West Bromwich for negligence. It appeared that on Wednesday last some men were sent to repair two engines at the colliery; after finishing the repairs, they had some beer, and the defendant left the engines of which he had charge to join the men. In each of the boilers there should have been 4ft. of water; however, when the defendant's absence was discovered by Mr. Kendrick's son, who happened to go there, there were only 15in. of water in one boiler and 16in. in the other. The steam was immediately let off, and while this was being done, defendant returned. Had the boilers remained in that state ten minutes longer there must have been a serious explosion. Arnold was sentenced to twenty-one days imprisonment.

The Lowest Tender.—Important Decision.—At the Kingston Assizes last week, the following case was decided. The plaintiff (Wickham), a builder at Farnham, had with some other builders been invited by the defendant (Wonnacott), an architect, also residing at Farnham, to tender for some repairs to be executed to a house there "on usual conditions." His tender was the lowest. It was stated by the defendant in the presence of the plaintiff and the other builders that it was the plaintiff's job, and that he must hold himself in readiness to commence the work on a certain day. The plaintiff made preparations and engaged extra hands, but subsequently received notice from the defendant that the gentleman for whom the work was to be done had decided on accepting the tender of some one else. The plaintiff claimed to recover from the defendant the expense which he had incurred in preparing for the work, contending that the defendant, by inviting tenders on the usual terms, undertook that the lowest tender should be accepted, and held himself out as authorised to employ the plaintiff. Several builders were called to prove what "usual conditions" meant; but the judge thought that they merely proved what their expectation was in tendering, not an invariable custom in the trade that the lowest tender should be accepted. The plaintiff was accordingly nonsuited.

The New Surrey Theatre.—The architect (Mr. Ellis) of this house, and Mr. West, the owner of the site, brought cross actions at the Kingston Assizes last week. The first action (Ellis v. West) was to recover the architect's commission on the outlay and numerous payments made during the progress of the works. The second was an action against the architect for negligence and want of skill. The learned judge having examined the particulars in each action, comprising a great number of items, said that they were clearly actions which no jury could try. They were, therefore, referred to arbitration.

MEETINGS FOR THE WEEK.

Mon.—Royal United Service Institution.—"On Military Breechloading Small Arms," by Captain V. J. Magendie, 8.30.

Tues.—Institution of Civil Engineers.—Discussion on "Memoir on the River Tyne"; and, if time permits, "On the Suez Canal," by Colonel Sir Wm. Denison, 8.

Fri. — Royal United Service Institution.—"On the Umbeyla Campaign of 1863," by Captain G. Fosbery, 3.

Architectural Association.—"Architecture in Northern Italy," by Mr. C. Aldridge, 7.30.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

2192. G. HUNTER and W. F. COOKE. Improvements in Machinery and Tools for Cutting Slate, Stone, Marble, and other Minerals. Dated August 25, 1866.

For the purposes of this invention the patentees employ a machine consisting of a central movable table, and over an axis firmly supported in bearings and furnished with gearing by which it can be slowly rotated. This gearing may be in duplicate on each side of the movable face; two large stones should be divided into three parts, the two outer parts being firmly supported in their respective bearings on each side of the movable table, and the centre part capable of being released from between the parts supported by the bearings and removable at pleasure. On this compound axis two disc cutters, each firmly secured by a collar or boss on its outer side or the side next to the bearings, are made to traverse. These disc cutters have their edges sockets or holders to receive cutting tools which may be such as are hereinafter described. In front of the disc cutters and below them, is the table which by screw or otherwise is made to traverse slowly in a direction parallel or nearly parallel to the face of the disc cutters. In order to face the surface of a block of stone, slate, or other suitable mineral too large to pass under the axis and collars or bosses of the disc cutters, these latter are run outward on the axis to the junctions of its supported ends with the centre piece of the axis, which latter is then removed and the disc cutters are made fast, so that their inner surfaces are flush with the ends of the supported axis, in which state they may be used either singly or separately, to face one or two blocks at a time. The block (supposing only one to be fixed) is placed on the table and firmly secured to it, except when the weight is sufficient to render this unnecessary; the table then carries the block slowly past one of the disc cutters, and the cutting tools thereon, by removing a slice from the face of the block produce a flat surface of a width equal to a diameter of the disc cutter. Cutting tools may be applied to the boss or collar at the back of the disc cutter, to cut through the rough slice of stone a clear path for the axis, or such path may be made by the breaking away of the rough slice. When it is an object that the block should not be scratched by the tools as they come round at the back of the axis, the table must travel at a slight inclination to the face of the disc cutter. They prefer, under certain circumstances, to give the longitudinal motion to the table by means of two parallel screws, each with a nut upon it; these nuts are rigidly connected together, being formed at the true end of a crossbar passing from one screw to the other. The screws are drawn together so as to carry the crossbar forward, and it then comes against pins dropped through holes in the table, and the table is thus propelled. This arrangement allows of several tables being used with one machine so that the machine need not be kept waiting whilst a stone is being adjusted on the table; as soon as one cut is complete the stone with the table can be run on to another table with a stone upon it brought to the cut. The screws are cased in tubes with longitudinal slots for the passage of the bar, and are thus protected from grit.

Patent completed.

Trade News.

P's EXHIBITION.—On Saturday last, the 30th ult., Clark and Co., of Rathbone-place, completed their nt with the Imperial Commission for fixing their self-coiling steel shutters to all the entrances of the ilg, which was closed for the first time in the pre- of the Chief of Police, to whom Messrs. Clark handed e keys of the several entrances.

TENDERS.

ey, BEDS.—For a new house for Mr. F. Levitt. ilcock, architect:—Redhouse and Brittain, £242 3s.

TON.—For building a library and turkish bath at ar of No. 4, Adelaide-crescent. Mr. Horatio N. architect. Quantities supplied:—Chessman and 710; Simms and Marten, £628 15s.; Nightingale, 47.

NDSEY.—For alteration and additions to the Public-house, Grange-road, Bermondsey. Mr. H. architect:—King and Son, £480; Tarrant, £570; d and Sons, £580; Thompson, £685; Henshaw,

—The architect for rebuilding No. 23, Lime-street, s given in our last as Mr. Charles Neilly, it should en Mr. Charles Reilly.

INGS.—For gasholder and tank at the Hastings s. Mr. T. G. Barlow, engineer. Quantities by Pain and Clark.—Tank:—Cutler, £5,948 10s.; £5,354 15s.; Newton, Chambers, and Co.; Cochrane and Co., £5,100; Balfour (accepted). Gasholder:—Cutler, £3,373 10s.; Laidlaw, Newton, Chambers, and Co., £3,125; Horton and 935; Balfour (accepted), £2,780.

IN.—For a new house and shop, for Mr. Thomas rlain. Mr. J. Shilcock, architect:—Butterfield nour, £378 10s.; Andrews and Foster, £346.

TON.—For alterations, &c., to 216, Upper-street, N. Mr. W. Smith, architect:—Warne, £1,150; 790; Crabb and Vaughan, £789; Glenn, £760; 750; Johnson, £590.

TH.—For alterations, &c., at Old Shot Tower Commercial-road, Lambeth. Mr. F. G. Widdows, :—Wheeler, £1,195; Child and Son, £965; Ennor, ichards, £770.

STLE (STAFFORDSHIRE).—For alterations and addi- Er. W. Mellard's premises, High-street. Mr. T. rchitect: W. Sutton, £1,379 14s.; Jos. Trevor, John Gallimore, £1,195.

Y.—For sewers for Wandsworth District Board of Quantities supplied by D. W. Young, Esq.:— d Co., £19,200; Baker and Co., £17,753 12s. 6d.; £17,450; Wainwright, £17,400; Hiscox and , £17,400; Avis, £17,400; Wigmore, £17,275; , £17,194; Blackmore, £17,000; Moxon and Co., ; Pearson, £14,300; Harvey, £13,877; King, Keeble, £13,100; Nott, £13,000; Mann, £12,950; Keddell, £12,900; Thrackray, £11,900

HAM (SUSSEX).—For alterations and additions to of Mr. Scott Stonehewer, J.P. Mr. Horatio N. rchitect, Brighton. Quantities supplied:—Saw- ; Nightingale, £643; Simms and Marten, £617.

DALE (STAFFORDSHIRE).—For alterations and ad- d painting to the New Connexion Chapel. T. rchitect, Newcastle:—Webb Brothers, £340; revor, £270 13s.

WARK.—For building three warehouses and a Southwark-street, for Mr. E. H. Moses. Mr. N. , architect. Quantities by Mr. Pearson:—King (accepted), £8,903.

NEWINGTON.—For ten six-roomed houses, with Lordships-road, Stoke Newington. Mr. Herbert hitect:—J. Cole (accepted), £4,000.

LD (BEDS).—For a new house and shop, for Mr. erson. Mr. J. Shilcock, architect:—Foster and , £625 7s. 6d.; Picken and Wilshere, £592 4s.; and Brittain, £550 13s. 2d.

YTHIN (MONTGOMERYSHIRE).—For new farm , &c., for H. Hall, Esq. Quantities not supplied. , architect, Newcastle:—John Cross, £1,750; and Morgan, £1,072; John Williams, £1,000; Williams, £950.

WORTH.—For the erection of new class rooms and eper's apartments, Wesleyan chapel, St. John's ndsworth. Mr. John Tarring, architect. Quan- plied:—Lathey Brothers, £790; Brighten, £789; rothers, £779 10s.; Spink, £750; Richards, £680; . £647.

PROPERTY SALES.

MARCH 28.

E MART.—By Mr. W. H. Moore.—Leasehold resi- . 29, Haverstock-hill, let at £90 per annum, term from 1855, at £15 15s. per annum—sold for £890. old house, No. 4, St. James's-terrace, All Saints'- edonian-road, Islington, estimated annual value 99 years from 1846, at £12 per annum—£280. old two houses, Nos. 55 and 56, Barclay-street, ras, producing £56 per annum—term 79½ years , at £2 10s. each—£630. old three houses, Nos. 11 to 13, Aldenham-street, ras, producing 94 per annum, terms 70 years , at £2 each—£835. old three houses, Nos. 5 to 7, Goldington-street, ras, producing £86 per annum, term similar to £2 each—£785. old two houses, Nos. 41 and 42, River-street, York- g's Cross, let at £26 each per annum, terms 99 o 1843, at £4 each—£455. old three houses, Nos. 10 and 11, Marson-street, Northampton-place, Phillips-buildings, Somers Town, £53 4s. per annum, term about 15 years unex- £5 2s. per annum—£230.

Leasehold coach-house and stable, No. 14, North Keppel-mews, Keppel street, Russell-square, let on lease at £28 per annum, term 97 years from 1801, at £8 per annum—£345.

Leasehold improved ground-rent of £19 19s. per annum (for about 16 years), arising from No. 26, Chapel-street omers Town—£140.

Leasehold improved ground-rents, amounting to £14 per annum (for about 14 years), arising from Nos. 39 to 41, Little Clarendon-street, Clarendon-square—£140.

Leasehold improved ground-rents amounting to £10 18s. 4d. per annum (for about 14 years), arising from Nos. 88 and 89, Euston-road—£120.

By Mr F. J. Sharp.—Leasehold house, No. 5, Patterson-street, Stepney, let at £20 per annum, term 70½ years from 1830, at £4 per annum—£165.

By Messrs C. and H. White,—Leasehold two houses, Nos. 4 and 5, Henry's-terrace, Ronel road, Spa-road, Bermondsey, producing £72 16s. per annum, term 70 years from 1865 at £10 per annum—£470.

Leasehold house and shop, No. 1, Henry's-terrace, let at £43 per annum, term similar to above at £8 per annum—£465.

Leasehold two houses, Nos. 15 and 16, Elizabeth-terrace, Blake's-road, Peckham-grove, producing £52 per annum, term 99 years from 1865 at £9 per annum £295.

Leasehold residence, No. 20, Westmorland-place, Southampton-street, Camberwell, let at £26 per annum, term 26 years unexpired at £10 per annum—£80.

Leasehold house, No. 30, Hill-street, Walworth, let at £19 10s. per annum, term 23 years unexpired at £2 9s. per annum—£120.

Leasehold three houses, Nos. 35 and 36, New-street, Lambeth, and No. 1, Hampshire-place, in rear, producing £42 18s. per annum, term 13 years unexpired, at £7 10s. per annum—£105.

Leasehold three houses, Nos. 5 to 7, Clarence-place, New-street, producing £33 16s. per annum, term 18 years unexpired, at £6 per annum—£95.

APRIL 2.

AT THE MART.—By Messrs. Farebrother, Clark, and Co.—Leasehold residence, known as "Ivy Cottage," No. 164, Wirtemberg-street, High-street, Clapham, let at £30 per annum, term 27 years unexpired at a peppercorn—sold for £260.

Leasehold two residences, Nos. 1 and 2, Myrtle-villas, Cottage grove, Clapham Rise, producing £60 per annum, term 66 years unexpired, at £10 per annum—£570.

Leasehold residence with shop, No. 1, Wellclose-square, producing £52 per annum, term 24 years unexpired, at £18 per annum—£210.

Leasehold residence, No. 8, Princes street, Bedford-row, let at £92 per annum, term 18 years unexpired, at £32 per annum—£260.

APRIL 3.

AT THE MART.—By Messrs. J. Baker and Son.—Leasehold three houses, Nos. 21 to 23, Wimbourne-street, New North-road, Hoxton, let at £28 each per annum, term 36¾ years unexpired, at £4 per house—£785.

By Messrs. Elgood and Son.—Leasehold residence, No. 26, Hamilton-terrace, St. John's Wood, term 67 years unexpired, at £18 per annum—£2,190.

Freehold two messuages, two stables, and coach-houses, Nos. 15, 16, 36, and 37, Great Ormond-yard, Bloomsbury, let on lease at £36 per annum—£1,040.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Henry Field, Gloucester-terrace, South Kensington, builder, April 15, at 1—James Nye, Park-street, Stockwell, engineer, April 16, at 1—John Parker, Rye Hill-park, Peckham, builder, April 24, at 12—Jonathan William Ravenhill, West Dulwich, dealer in building materials, April 24, at 1—Edward Rowland, Lant-street, Southwark, builder's foreman, April 16, at 12—George Smith Stredder, Medina-road, Holloway, stone mason, April 24, at 12—Richard Walker, Ampthill, railway sub-contractor, April 15, at 1—Robert Woodford, Biggleswade, carpenter, April 17, at 2—Stephen Hickson, Sussex-road, Notting-hill, surveyor, April 17, at 1—James Maxwell, Dunton-green, Kent, contractor, April 24, at 1—Charles Paul, Tottenham, painter, April 16, at 2.

TO SURRENDER IN THE COUNTRY.

William Clarke, Ashton-under-Lyne, marble and stone cleaver, April 11, at 12—Samuel Cooper, Whitehaven, April 8, at 10—William Danson, Salford, painter, April 13, at 9.30—John Hall and Evans Culshaw, Bolton, flaggers and slaters, April 10, at 11—Daniel Jones, Holywell, ironmonger, April 15, at 12—Robert Kay Walker, Northumberland, bricklayer, April 9, at 10—Robert Lyon, Eccleston, near St. Helens, labourer, April 11, at 11—William Mills, Edward George Mills, Frederick Thomas Mills, Hanley, parian manufacturers, April 10, at 12—Benjamin Roberts and Timothy Hughes, Oldbury, ironfounders, April 12, at 12—John Smith, Kirkdale, Lancashire, contractor, April 12, at 11—John Thomas, Leeswood, near Mold, builder, April 15, at 12—Charles Turner, Cambridge, journeyman gilder, April 15, at 2—Joseph and James Whitehouse, and Thomas Tyre, Castleford furnaces, near Normanton, ironmasters, April 8, at 11—Joseph Ainsworth, West Ardsley, mason, April 16, at 11—William Bailey, jun., Holbeachi-marsh, carpenter, April 15, at 11—Charles Beasley, Oldbury, ironfounder, April 12, at 12—William Dunn, Jonas Spencer, and Henry Rothwell, Newton-le-Willows, flint-glass manufacturers, April 16, at 12—James Gillborn, Nottingham, plumber, April 24, at 11—Hugh Hughes, Bwthmawr, Anglesey, builder, April 17, at 11—John Smith, Hoyland-common, near Barnsley, ironstone labourer, April 18, at 11—John Thomas, Pontypridd, journeyman carpenter, April 15, at 11—Thomas Tubb, Cippenham-green, Bucks, wheelwright, April 13, at 11—John Wigley, Leeds, builder, April 18, at 11.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9	0	£10	10	Archangel, yellow ..	£12	0	£13	0
Quebec, red pine	3	0	4	10	St. Petersburg, yel...	10	10	11	0
" yellow pine..	2	15	3	10	Finland	8	0	9	0
St. John N B. yellow	0	0	0	0	Memel.....	0	0	0	0
Quebec Oak, white..	5	5	6	0	Gothenburg, yellow	9	0	10	10
" birch.....	3	10	4	10	" white	8	0	8	10
" elm	3	10	5	0	Gefle, yellow.....	9	0	11	0
Dantzic oak	2	10	6	0	Soderhamn	9	0	10	10
" fir	2	0	3	10	Christiania, per C., 12 ft. by 3 by 9 in.				
Memel fir	3	0	3	10	yellow	18	0	22	0
Riga.....	3	0	3	5	Deck Plank, Dantzic, per 40 ft. 3 in.	0	14	1	4
Swedish	1	17	2	3	PUMICE STONE per ton	5	0	8	0
Masts, Quebec red pine	6	0	8	0	OILS, &c.				
" yellow pine..	5	0	6	0	Seal, pale....per tun	44	10	0	0
Lathwood, Dantzic, fm	4	10	5	10	Sperm body	140	0	141	0
" St. Petersburg	6	10	7	10	Cod	41	0	0	0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Whale, Sth. Sea, pale	44	0	0	0
Quebec, white spruce	14	10	22	10	Olive, Gallipoli.....	63	0	0	0
St. John, white spruce	13	0	15	10	Cocoanut, Cochin, ton	58	0	0	0
Yellow pine, per reduced C.					Palm, fine	41	0	0	0
					Linseed	36	10	0	0
Canada, 1st quality.	17	0	19	10	Rapeseed, Eng. pale..	39	0	39	10
2nd do.....	12	0	13	10	Cottonseed.....	28	6	35	0

METALS.

IRON:—							
Welsh Bars in London .. ..per ton	6	15	0	0	0	0	3
Nail Rod ..... "	7	10	0	8	0	0	2
Hoops ..... do	8	17	6	9	0	0	
Sheets, Single ..... do	9	17	6	10	0	0	
Stafordshire Bars ..... do	7	17	6	8	10	0	
Bars, in Wales ..... do	5	15	0	6	0	0	3
Rails ..... do	6	0	0	6	5	0	net
Foundry Pigs, at Glasg. No 1 .. do	2	13	6	3	7	0	
Swedish Bars ..... do	10	10	0	12	10	0	2?
STEEL:—							
Swedish Keg, hammered .....per ton	15	15	0	16	0	0	
Swedish Faggot ..... do	10	10	0	12	10	0	
COPPER:—							
Sheet & Sheathing, & Bolts ....per ton	86	0	0	91	0	0	
Hammered Bottoms ..... do	96	0	0	101	0	0	
Flat Bottoms, not Hammered .. do	91	0	0	96	0	0	
Cake and Tough Ingot ..... do	76	0	0	0	0	0	
Best Selected ..... do	84	0	0	89	0	0	
Fine Foreign ..... do	86	0	0	88	0	0	
Yel. Metal Sheathing & Rods ....per lb	0	0	7½	0	0	8	
TIN:—							
English Block .....per ton	90	0	0	0	0	0	2½
do Bar ..... do	91		0	0	0	0	
do Refined ..... do	93	0	0	0	0		
Banca ..... do	94	0	0	0	0	0	nett
Strait ..... do	89	0	0	0	0	0	
LEAD:—							
Pig, English .....per ton	22	5	0	22	10	0	2½
" Spanish Soft ..... do	19	15	0	0	0		
Shot, Patent ..... do	23	10	0	24	0		
Sheet ..... do	21	0	0	0	0	0	
White ..... do	30	0	0	31	10	0	
SPELTER:—							
On the Spot .....per ton	22	5	0	22	15	0	net
ZINC:—							
English Sheet .....per ton	28	0	0	0	0	0	
Devaux's V. M. Roofing Zinc .... do	28	0	0	0	0	0	*

* And 5 per cent. discount if laid upon the new system.

QUICKSILVER .....per btl	6	18	0	7	0	0
REGULUS OF ANTIMONY.						
French .....per ton	34	0	0	0	0	0

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BUILDING LAND, suitable for Villa Residences, to be LET on LEASE, at Benhill, Sutton, Surrey, not far from the railway station. Advances will be made, if desired, as the works proceed. Plans and drawings and every information obtained upon application to Mr. Tresidder, 16, New Bridge-street, Blackfriars.

CAPITAL BUILDING LAND, in the neighbourhood of Dartford, Kent, to be LET on BUILDING LEASE for 99 years, from 1s. to 2s. 6d. per foot frontage.—For plans and particulars apply to J. R. Wood, solicitor, 61, Lincoln's Inn-fields.

NORFOLK PARK ESTATE, MAIDENHEAD.—Desirable BUILDING SITES on the above Estate, commanding extensive views of the beautiful scenery of the neighbourhood, to be LET on LEASE for 99 years. Cash advanced if required.—Apply to Mr. Charles Innes, architect, 6, Whitehall.

WIMBLEDON.—FREEHOLD BUILDING LAND in Southey road, near Merton, five minutes' walk from Wimbledon station, to be SOLD or LET on LEASE; frontage 90ft., depth about 130ft.; suitable for the erection of two or three Villas. Adjoining plots covered and occupied. Roads made and drained into sewer.—Apply to G. H. L., Pembroke-lodge, Malroad, Hammersmith, W.

STREATHAM.—BUILDING LAND to be LET, at moderate ground rents, on the Crooke-Ellison Estate. Houses from £40 to £50 per annum are in great demand in the neighbourhood. A limited area at the south part of the estate, near Hermitage-bridge and Croydon-road, to be Let for houses of £25 per annum value. Plans and particulars of Mr. Gilbert, at the Estate Office, Streatham Common; or Mr. Wales, Surveyor, 8, Great Saint Helens, E.C.

TO ARCHITECTS and BUILDERS.—LIME GROVE PARK, PUTNEY HILL.—Very Desirable SITES on this Estate to be LET for building respectable private residences. It is situated on elevated ground, between the railway station and Wimbledon and Putney-heaths. There is a great demand in this locality for good villa residences, and a ready sale for them. For particulars apply to S. Wood, Esq., Architect, 10, Craig's-court, London, S.W.; or to Messrs. Baxter, Rose, Norton and Co., Solicitors, 6, Victoria-street, Westminster, S.W.

A BRICKFIELD (of the area of 80 acres) in OPERATION, and with the use of machinery of a superior description, drying sheds, &c., to be LET. Within 1½ miles of Morden, and ¾ mile of Worcester Park Stations.—Apply to Messrs. Wigg and Oliver, 7, Bedford-row, W.C., or to Messrs. Stroud, Woodville-road, Newington Green, N.

TO SHIPBUILDERS, ENGINEERS, RAILWAY CARRIAGE BUILDERS, and Others.—Dantzic OAK PLANKS, perfectly seasoned and free from sap, 28ft. average length, from 7in. to 3in. thickness—imported, 1864. Also, Crown Dantzic Deck Planks, sawn edges, perfectly seasoned, 6in. to 4in. thickness—imported, 1864. Riga Wainscot Logs and Planks, Greenheart, Sabicu, and Pitchpine timber of large dimensions.—Direct (post paid), to Mr. Welton 5, Adams-court, Old Broad-street.

TO SAW-MILL PROPRIETORS, CONTRACTORS, and BUILDERS.—For SALE, a Bargain, a FLOOR-BOARD PLANING MACHINE, in good working order, with straps and irons for Planing, Tongueing, and Grooving.—Apply to Fowls, James and Co., Sawmill Engineers, Victoria Works, Vine-street, York-road, Lambeth, London, S.

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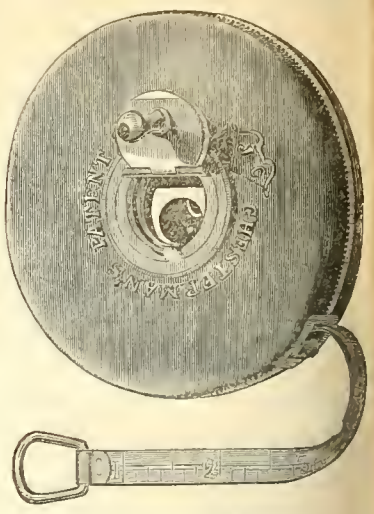

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THE BUILDING NEWS.

LONDON, FRIDAY, APRIL 12, 1867.

THE COURTS OF JUSTICE COMPETITION.

Concluding Article.

FOLLOWING the course we proposed in our third article, we have now to compare the chief merits and demerits of the several designs submitted for this very important work. First, then, the plans may be divided broadly into great hall schemes and corridor schemes. As in most things it is impossible to draw an arbitrary line which will not be overlapped on one side or the other, so also in the case before us there are plans which more or less overlap on both sides of the line, some with comparatively small halls tending towards the great hall scheme, whilst the tendency of others is evidently against the principle of a great hall. Thus Mr. Lockwood, within the area or street which separates his outer shell from his principal block has contrived to get two transverse halls connected by spacious corridors, with a central longitudinal hall. In other words three halls and two corridors. the last as large as many mediæval halls, occupy the space which in Mr. Waterhouse's or Mr. Seddon's design is devoted entirely to one huge hall. To understand this central hall question it will be as well to look at the dimensions:—Mr. Seddon's plan gives 490ft. by 80ft. Mr. Waterhouses's plan gives 478ft. by 60ft; Mr. Brandon's plan gives 365ft. by 130ft.; and Mr. Lockwood's plans gives 236ft. by 72ft. Now Mr. Garling has a central "corridor" or hall 180ft. by 30ft., and Mr. Street a hall 130ft. by 57ft. It is evident that neither of these gentlemen can for a moment compete with Mr. Seddon or Mr. Waterhouse if a monster hall is to carry the day. Still less chance have those whose designs ignore the great hall idea altogether. In plan or arrangement this competition may be said to be twofold. Messrs. Seddon, Waterhouse, Brandon, and Lockwood as the authors of the great hall schemes are separated from all the others, and if the great hall idea is allowed by the judges to supersede all other considerations, the battle will evidently be between two of the gentlemen we have just named. If, however, the monster hall should not be considered a *sine quâ non*, then the gentlemen we have just named will stand a poor chance in comparison with those who, giving up the central hall for the sake of open spaces, may happen to stand highest on those paramount questions of light and air. In such case the competition may rest between Mr. Barry and Mr. Street, or Mr. Scott and Mr. Burges. If the arguments advanced by the two last-mentioned gentlemen would prove, as they appear to us, unanswerable, the work of the judges may turn out to be much easier than they expected. Mr. Scott says, "That the fact of the Courts being placed at an elevated level prevents the possibility, without serious disadvantage, of having a Central Hall in the sense in which that term may be most naturally understood; that is to say, as a hall from which the courts would directly open, like Westminster Hall, or that designed by Sir Charles Barry for the Lincoln's Inn-fields site. This would be only practicable were the Courts on the ground floor; for, if adopted in the case of elevated courts, it is clear that little or no light could be given to the space below such hall, or to the lower storeys of the parts surrounding it." And Mr. Burges objects to the great Central Hall plan because "It introduces the public, and to a certain extent public traffic, into the middle of the building, where quiet is most essential. It is also apt to place the judges' apartments and corridor on the exterior, and those of the "bar and legal public in the interior, thus reversing the order of things, for the judges' "apartments should obviously be placed in "the interior so as to secure quiet, and to "enable them to consult with each other with "facility. . . . It most materially diminishes the areas for light and air, . . "and is a very serious addition to the expense, "if carried out on a proper scale." It is time, however, that we turned to the comparison of the designs, taking the Central Hall plan first.

Mr. Seddon.—*Merits:* All the courts enter from the central hall on the same level, simplicity of arrangement as regards the general public, broad and powerful treatment of the masses of the building, good sky line and thoroughly domestic character. *Demerits:* Confined areas, excessive height of outer zone or shell and centre building or hall, deficient light and air, shallow flat detail to façades and tunnel-like proportions to great hall, the length of which is more than six times its width.

Mr. Waterhouse.—*Merits:* Low level of floor, great hall which is on the same level as Carey-street, simplicity of arrangement, good accommodation for legal public, especially for barristers and masters, arrangement of approaches, especially carriage-way for judges, which is one of the best features of the design, separation of classes, and good bits of architecture in cloisters or corridors. *Demerits:* Want of light and air in corridors, great amount of borrowed light, noise brought into centre of building by transverse hall, for the *oi polloi* opening upwards into great hall and being a thoroughfare from the Strand to Carey-street, narrowness of general passage for the judges, glass roof to central hall upon which the fall of rain and hail would result in serious disturbance, architecture deficient in the façades, weak in composition, poor in detail, and having strange anachronisms.

Mr. Brandon.—*Merits:* Fine architectural composition in general mass with the single exception of the west façade, good detail adapted to the size of the building and its situation. *Demerits:* Deficiency of light and air, waste of space about the courts, central hall too much like a church.

Mr. Lockwood.—*Merits:* Simplicity of plan, arrangement of halls and corridors, and public entrances. *Demerits:* Narrowness of open areas, bad proportions, and worse detail. (Note the drawing of the sculpture.)

Mr. Garling.—*Merits:* Composition of Renaissance design, especially of the West-end. *Demerits:* Lack of light and air, complication of plan, extravagance of corridor, utterly bad in all his Gothic works.

Mr. Street.—*Merits:* Central hall good, both in proportion and detail, save only the wall arcade, arrangement of courts compact and close together, large open quadrangles, and plenty of light and quiet air. *Demerits:* Entrances for general public, complication of corridors, weakness of Strand façade. Some of the architecture too like ordinary Gothic warehouse building, lacking in the dignity, which is so emphatically required for courts of justice, and which we had hoped Mr. Street would have given us.

Mr. Barry.—*Merits:* Contrivance, especially as regards staircases; general massing of the different parts of the building. *Demerits:* General character Oriental not English, façades utterly unsuited for street architecture.

Mr. Scott—*Merits:* Grouping of courts compact, ambulatory or central corridor well arranged, architecture of entrance vestibule and ambulatory dignified and well proportioned in themselves, treatment of levels good. *Demerits:* Judges' corridor too exposed, Strand façade poor, especially in the centre, superstructure too much for the portal and monotony of skyline.

Mr. Burges.—*Merits:* Simplicity of plan, plenty of light, air, and quiet, minimum of staircase height, good architectural treatment adapted to the site, both in mass and detail, erring only on the right side by being a little too strong. *Demerits:* Want of study in minor details of the legal requirements, want of dignity in parts of the elevations, owing to the practical merit we have mentioned, resulting from keeping the buildings as low as possible.

* * * *

We give this week three illustrations of Mr. Waterhouse's design. We can only reiterate what we said in our issue of February 8, viz., that the towers are awkwardly designed; that those flanking the central mass of the Strand façade are but weak *slices* of towers; that the detail lacks true Gothic feeling; and that, architecturally speaking, Mr. Waterhouse has disappointed us by not even securing for this important structure anything like as much dignity which he gave to his earlier work at Manchester.

* * * * *

A printer's error occurs in the final paragraph of our article in last week's Building News. For *differs* read *suffers*.

EASTERN ART.*

THE new architecture soon made its way into Italy by the Adriatic. One hundred years after the construction of St. Sophia by Constance, son of Constantine, Ravenna, Ancona, and Venice boasted of churches in this style. From the model of St. Marco specially, all the West came to adopt it. Worked and ornamental pillars cylindrical in form now became cubic; dome and cupola accumulated on roofs soon gave Padua and Venice that peculiar aspect of Eastern cities which they still so curiously retain. Christianity and Mahometanism have equally made themselves at home in St. Sophia. The culminating inspiration of this style of architecture is founded on minute geometrical and mathematical calculation. Arcaded courts, with cooling fountains, adapted from the atrium or anti-church of the early Basilicas for the use of the catechumens or unbaptized; minarets and pointed domes, symbolising our towers and spires, passing easily from Christian worship to serve as enclosures for ablution; consecrated courts dedicated to the Caaba, and altars turned towards the sacred East. Unfortunately many writers, struck with the degeneracy of the old Empire (which came to the East but to construct a magnificent grave), associate the brilliant Renaissance of Persian architecture with the ruin of an effete race. "All architecture," they said, "disappears under a confused prodigality of ornaments and mosaic, which degenerate arts, preferred to painting and fresco cause the ruin of style." This we maintain to be a mistake. Mosaic, as a mural decoration, exceeds in sharp and striking effect either painting or fresco, both of which are far more calculated for interiors in positions where the eye can appreciate their graduated details. Pure Persian architecture, far from a prodigality of ornament, is intrinsically simple and bold, because it is founded on minute mathematical calculations. It is erroneous to compare it to Greek art, with which it has no connection; the term Greek empire has not a little contributed to this misapprehension. The Greeks of the Empire were pure Orientals differing in habits, feature, and civilisation from the classical nations. The population of Byzantium was doubtless composed of very heterogeneous elements, suddenly transplanted there by the will of conquering rulers, but it consisted principally of Persians and Asiatics. Greek was spoken, but only because like French in the last century, it was the Court language, and was therefore imposed on the conquered citizens. The

* This article was suggested by a work of M. de Beaumont. Continued from page 234.

debased taste of the Romans came to refresh and invigorate itself at the still living fountains of the East, immortal in colour and in form; and it was pure Persian, not a bastard Grecian art, that spread through Europe as Byzantine art, and became subsequently modified into the Arabian and Persian styles. Up to the time of which we speak, Christians had accommodated themselves with such Pagan buildings as best served for the celebration of their rites. The Basilica, or Hall of Justice, was hastily transformed into a church, for which purpose it was by no means adapted. Both monuments and descriptions indicate the hesitation of the early Christians in their efforts to invent an architecture calculated for a temple dedicated to Christianity. The first and material idea was the Cross, on which the Redeemer died, the special Christian symbol; but this idea was during five centuries undeveloped in all but theory, until the Greek Christians found in the Byzantine square flanked at each corner by smaller squares, an architectural adaptation of the Christian symbol. So much enthusiasm was excited by this success, that a contemporary legend affirms that the plan of the model church of St. Sophia was brought down from Heaven to the Christian Emperor. Since that period the Byzantine Greeks have never varied in this expression of their architectural language. The Latins hesitate to this very hour; sometimes adopting Gothic, sometimes returning to almost Pagan art, and always pendulating in a confusion of conflicting ideas. The period of which we are treating is in the East, and as regards Byzantine art the real Renaissance or renewal of old art by a new and modern inspiration. It is erroneous to conceive that the Byzantine style owes its characteristics to the Greek descendants of Phidias or Pericles, or to date our European knowledge of those Classic traditions to the divisions of the Byzantine Empire by the Venetians and the French. The Low Empire, as it was called, had long consigned to the graves of their creators arts to them become dead; and the Barbarians, Venetians, and French, tore down and flung into the Bosphorus those very statues brought from the shrines of Athens and Corinth to ornament Byzantium. Still, the Western conquerors, in the face of the superior civilisation of the East, were led by an inherent spirit of routine to trace all artistic beauty and authority to the Greeks and to the Greeks only, both in painting and in sculpture. The opinion of that day looked alone to the short and brilliant period of Greek art for all authoritative data. The originals were not often to be seen; but from copies and descriptions and inaccurate drawings, a system was formed supposed to be classical and correct, little suited to the climate, materials, customs, and religion of Europe. David and his monstrous school are the last development of this anomaly. The notion was, that in imitating a style which had reached the utmost limit of perfection a copy might retain the same perfection as the original, and to these stereotyped patterns all differences of creed, country, and habits were to be servilely sacrificed. Hence the Western schools of art became Pagan, while the conception remained Christian; the statue of the Virgin parodied that of Venus; scenes in sacred history were represented as types of the Parthenon. "The School of Athens" was placed opposite to "The Holy Sacrament," in the Vatican frescoes by Raphael; Christ is depicted by turns as a Pagan God, or as present among the Muses. The same discrepancy is found in the literature of that day, words and ideas are constantly in opposition. Poetry, instead of seeking its inspiration from Nature, dedicates itself to unmeaning and formal imitations of classic originals. Plagiarism is the order of this—the mediæval day—plagiarism of Greece and the Greeks, not as an accident in ancient art, but as alone constituting ancient art. But real mediæval art, as original and much more ancient than that of the Greeks, is to be sought and found in Babylon itself, whose foundation dates back to Darius, by whom it was conquered, and remaining in the power of the Persians until the time of Xerxes. A Persian architect was employed by Constantine to build his palace and the Church of St. Sophia. He was assisted by two other architects, one of whom was a Lydian, the other a native of Asia Minor. Justinian the Second employed a Persian architect to embellish Byzantium with sumptuous edifices. The entire court of the Greek empire, its pomp, titles, etiquette, dresses, stuffs, fashions, were Eastern, and borrowed from Asiatic civilisation.

It is then to Persia and the Persians, then as now, internally a nation of artists, inventive and conservative in an uncommon degree, that the real glory of the Renaissance must be attributed. How otherwise explain an architectural metamorphosis so sudden and complete, but by the adoption of a school of art which had in those countries at that time reached its utmost degree of perfection. For ages and ages cupola, arch, and every detail of pyramidal architecture had been adopted in Persia. The exigencies of the climate naturally developed a style characterised by vast halls placed in elevated positions with high arched and vaulted roofs, adapted in summer for ventilation and coolness, and in winter as a preservative against the heavy snows to which those countries are liable, and which slide off such cupolas without resting. The scarcity of marble and of stone in Persia caused the invention of bricks, and this invention of bricks and of pottery was one of the secrets of Persian architecture. From the general use of this material originated the arch and the vault; and this use and manufacture of bricks the Romans borrowed from the Persians. Ctesias speaks of brick vaults under the Euphrates; similar ones have been found at Babylon and at Nineveh. The tomb of Cyrus described by Aristobulus, the palace of Semiramis, the strong places of Persepolis and Nineveh, mentioned by Strabo, contain inscriptions (discovered in the ruins and recently translated) recording that the use of bricks dates back in Asia to the remotest antiquity.

The Persians were quite conscious what their architecture owed to this discovery, they gave its name to the month of the year in which they were dried in the sun. The expression "month of bricks" occurs in an inscription found in the palace of Sennacherib. The substitute of this light material in place of the enormous blocks employed in Greece and Egypt, naturally produced those parabolical and ogival forms which constitute the essence of Persian architecture. The lightness and smallness of the material allowed the architect to place tier above tier to an astonishing height. When even bricks became too heavy, squares of wood were substituted, as is set forth in an inscription in Sennacherib's palace. The summit of these buildings was reached, not by stairs, but by ramps turning spirally in the thickness of the walls or on the exterior, as seen at Baalbac under the Antonines. On the same principle, a horse can ascend to the top of the campanile of San Marco at Venice; and the minarets of the oldest mosque at Cairo is encircled by an external spiral ascent to its very summit. The internal decoration was rich in characteristic details; gold, silver, leather, ivory, and enamel were the materials. Both Ctesias and Diodorus, in describing the palace of Nabuchodonosar at Babylon, speak much of large mosaics in enamelled bricks, representing hunting scenes, where men and animals appear with white inscriptions on a blue ground. The walls of the Palace of Khorsabad, built of bricks, were within and without ornamented with enamelled bricks, forming both human figures and arabesques. This kind of frieze also bore inscriptions in cruciform characters, white on a blue ground; and the same ornamentation is still found in the ruins of Khorsabad. At Nineveh the frieze was farther marked by a line of yellow enamel.

The earliest inscriptions and ruins date back to an almost fabulous antiquity. Bricks have been unearthed which were employed by the ancient kings of Chaldea twenty centuries before our era. An inscription of the reign of Tiglat-pilizar, 1250 B.C., tells us that he rebuilt a temple erected 640 years before the reign of his father. All accounts of Sardanapalus III., mention the great constructions executed by him. The basso-relievo of Khorsabad, built by Sargon, the predecessor of Sennacherib, show the minuteness of detail considered necessary in each part. In the foundations of this palace are found on tablets of gold, silver, and antimony, measurements of descriptions of materials for stairs and vaulted chambers intended as hiding places for treasure, all detailed with the minutest accuracy. In a cruciform specimen preserved in London, Nabuchodonosar relates that he caused six distinct enclosures to be built around Babylon to secure the city from attack; that the walls built of brick and bitumen were impregnable; that in the great temple—the glory of Babylon—where the oracles were consulted, the chambers specially devoted to them were surmounted by a dome covered with pure gold; that the tower and the temple rebuilt by him in gold and silver, with enamelled bricks, of stone, cedar, and lenstic, the surrounding arcades, colonnades, and doors of various colours. So much for the details still remaining to us of the finished magnificence of Nabuchodonosar. F. E.

(To be concluded in our next.)

A PHILOSOPHICAL VIEW OF ART.

No. 5.—The Religious and Secular Ideas.

THE Gnostics did much to promote the realisation and embodiment of ideas prevalent during the middle ages. Their conception of a female incarnation of Divine thought, called the "Divine Sophia" or "Ennoia," highly favoured this tendency at a time they exercised so much influence in the Church. Adopting Christian ideas, they skillfully and æsthetically availed themselves of every artistic aid. Such a female ideal soon prepared the mind for the deification of the Virgin. The chasm between the Deity and man was unfelt, and a sort of polytheistic faith displayed itself. Painting and sculpture, which had, even as late as Constantine's time, been looked upon with a religious aversion, as allied to idolatry, now became general, and many of the conceptions of Paganism became transfigured and re-employed. Hence Catholic Mariolatry and saint worship assumed an important aspect. Even dogmatic definitions were applied to art during the fifth century, the Council of Ephesus defining the mode in which artists should represent the Virgin.

Monastic celibacy and ascetic practices gave a fascination to the female ideal, and, as Lecky says, the mediæval conception of the Virgin exercised a salutary influence, and was the origin of many of the purest elements of our civilisation, besides giving woman her rightful sphere of moral beauty. Thus, the early practice of collecting relics of the martyrs, and the representations of saints, led men imperceptibly to bestow an undue veneration on what originally were mere aids to worship. Image-worship attained such an aspect that a reaction set in early in the eighth century, when the Iconoclasts arose; and in the following century St. Agobard did much to repel the superstitious tendency of the age. During this period of the representation of saints and martyrs it is important to notice that imitational art itself was at a low ebb, and my readers are fully cognisant of the wretched transcripts of nature then prevalent. This low ideal was attributable to the religious

ientiment. The doctrines of Gnosticism and Manicheism that imputed evil to matter, not nly encouraged ascetic observances, but ended to idealise the ugliness of bodily form. Besides, the religious and devotional sentinent was predominant, art becoming quite subidiary and ministrative to this feeling; and, s Mr. Lecky truly observes, the æsthetic and levotional feelings are totally different. Unike early Christian art, bodily sufferings and he tortures of martyrs became the prominent onception of sanctity.

Such a low view of physical beauty narked the monastic religion between the ixth and twelfth centuries, and served to ring about a sudden reaction when occasion pened. Curiously, indeed, the Greek Church nd artists at this time became obstacles o æsthetic progress, as afterwards the antiquiies of Greece again revived art. Even as arly as the thirteenth century a change came ver the spirit of art. Nicolas of Pisa egan the change which was carried on y the Church itself and by the genius f Giotto, Fiesole, and other great artists f the Revival. A general idea for the eautiful, irrespective of religious sentiment, ervaded Europe at the first outburst of ncient learning. Hitherto, art was subrdinated to religion, whose ideal was transsed into art. Dante's "Inferno" culminated e spirit of religious terrorism, which from enceforth sunk under the essence and splenour of spiritual Christianity. Art was udied for itself alone, beauty becoming the bject rather than the religious conception.

The discovery of pagan sculpture and the nsual Italian taste for painting contributed the secularisation of art, which now ecame a marked feature. Savonarola ayed for awhile this tendency, which soon, owever, resumed a rapid progress; and Iichael Angelo tried to reform art, and to ly her to a pure religious sentiment. In chitecture, as in the other arts, the same nange showed itself. In St. Peter's, the irits of religion and intellect produced their eatest modern conception, the æsthetic prinple being uppermost. Mr. Lecky, indeed, ows with a clearness our modern Mediævals will not relish, that whenever the ideas mmon to the middle ages have become prelent, Gothic architecture has received "rapous admiration; whenever rare, it has nk into disfavour," being spoken of with nqualified contempt" by all writers of the venteenth and eighteenth centuries.

We have thus hastily sketched the concepn for art as it displayed itself under the onotheistic system of the middle ages; we e compelled to admire the independent aracter it assumed when it emerged from e ruins of the Roman Empire; how it disrded the idolatry of polytheism for an obtive Christianity, passing through a period terrorism and ignorance to the dawn of righter, industrial, and more spiritual age; d how, lastly, the spirit of Classical antiity arose from the dust of superstition and sorbed it. We might continue our sketch, d see Gothic art again spring up under new nditions, derived from an industrial and ular impulse, and the graphic pages "Waverley," bristling with mediæval senents; but we here cut short, remarking nply, in conclusion, that the decline of the of the middle ages affords to the blindness mediæval revivalists (otherwise retrogresnists) a salutary lesson, viz., the absurdity realising the conception of ugliness instead beauty, a hint highly valuable to those serable intellects who persist, against all ogress, in giving us the grotesque grimaces d features of an exploded terrorism, in put g hell instead of heaven before us.

We have seen that the various elements modern civilisation, which early in the eenth century combined to destroy the ity of thought, and even earlier, began to ate an intellectual fermentation, arose from at diversified state of society which at the disemberment of the Roman empire overspread the whole of Europe. The imagination and the intellect of man had up to that time held sway, sometimes combining, and at other times opposing each other. Till then, however, they had both failed to reconcile their respective spheres or to solve the problem of man's destiny; and this for the reason of their neglecting experience or a practical element. Religion and philosophy had been mere creatures of the imagination and intellect, often pure and sublime, but still wanting a substantial basis, and unable to accomplish their mission. The establishment of Christianity, and the extinction of Paganism opened a new era of thought—one accepting all that was exalted in the metaphysical world, and all that was valuable in the world of sense. The doctrines of the Platonic philosophy helped to form the ascetic life of the monastic ages; while the warlike zeal and chivalric spirit of the Christians arose from the defensive energy created by the early persecutions and the encroaching opinions and doctrines of other sects. The social system of the middle ages also gave an impulse to the industrial movement, while the feudal system gradually yielded under the influence of general emancipation. Elements of discord existed within Catholicism itself; heresies sprang up in the face of the most violent means for their extirpation, and as Comte observes, the spiritual and temporal powers, then necessary, became operative in the disorganisation of this particular system of monatheistic rule. Throughout the period of scholastic philosophy a struggle between these two powers is noticeable, and their existence as distinct principles became more and more impossible. Such was the constitution of this theological philosophy; it contained the elements of its own destruction; it was even shorter lived than Fetichism and Polytheism, a fact corroborative of the theory that theological conceptions decrease in duration and intensity. A critical process of thought may be traced from the commencement of Scholasticism, and we may briefly advert to it here as instrumental in bringing about a decline of religious art, a secularisation of thought, and with it a revival of ancient art and literature,

The philosophy of the Fathers, infused with Platonic notions, began to systematise and reduce to principles the doctrines of Christianity. Opposed to the Gnostics and Manicheans, the scriptural view of the Creation and the relation of man to God were the chief doctrines sought to be maintained by an appeal to philosophy; and Justin Martyr, St. Clement, and St. Augustine considered the aid of philosophy necessary in the defence of the Christian faith, while others deemed it subversive and a source of heresy. During this epoch we discover the same initial conceptions that have marked the beginning of all thought. Thus the Deity was first associated with time and space; then with a less material idea (infinite extension); the soul was first thought material, afterwards immaterial, as by St. Augustine. A more systematic philosophy was inaugurated by the schoolmen. An alliance between the faith and a rational interpretation of the dogmas of the church was endeavoured to be formed, and metaphysics and logic, under theological guidance, which was always dominant, assumed the principal functions. The phases of scholasticism are marked. First, the theological element was uppermost, an absolute Realism prevailed, Scotis Erigena blending the noblest Platonism with Christianity; in the second period Nominalism opposed itself to Realism, and Abelard and others endeavoured to lay a firm basis for theological philosophy, while the dialectic subtleties of the time became instrumental both for and against the Church. In the thirteenth and fourteenth centuries, when art attained a supremacy as the exponent of the religious conception it has never since surpassed, the Aristotelian philosophy, through Arabian influence, obtained a new looting, uniting itself more intimately with the theological system. A conflict between theology and philosophy, however, had begun, and the disputes, no less frivolous than angry, soon weakened their union, particularly as the dialectic quibbles of schoolmen ran counter to the increase of experimental knowledge. In St. Thomas Aquinas and Scotus, Realism reached its eminence, matter and form were defined as conceptions, and verbal subtleties and ontological distinctions attained in the disputes between the Scotists and Thomists an absurd extravagance. Lastly, a new era commenced. Nominalism was again in the ascendant, and found another champion in Occam, who upset existing dogmas, maintained that thought was subjective, and held views favourable to a divorce between the subjective and the objective, and to the sceptical tendency of the age.

Thus, the appeal to reason was fatal to a dogmatic faith, and the attempts of subtle dialecticians to conciliate the theological with the rational spirit were utterly futile. Such a union was then impossible. The disputations of adverse sects, and the restlessness of opinion aided in separating the religious from the secular in art as in every other pursuit. Weakened by its imperfect systems, the human mind eagerly adopted the ideas of antiquity which were at this time revived in Italy. The invention of printing, the conquest of Constantinople, the Reformation, and the social reorganisation that resulted from these great concurrent events, together with the extension of experimental science, accelerated the great secular movement. The original works of Aristotle and Plato, before accommodated to the narrow views of the schoolmen, were now disseminated widely, and their doctrines were allied to other theories—cabalism, magic, and theosophy, just as the theological or scientific impulse predominated. Hence arose a species of occult knowledge, in which natural science and cabalistic ideas were blended into a mystical system, and the theories of Paracelsus and others indicate the absurdities then entertained for lack of a more philosophical basis to rest the discoveries in chemistry and therapeutics. Experimental observations had dawned, and the minds of men, sickened by "essences," "entities," and abstruse principles, began to seek for a more scientific knowledge on safely established principles; while Montaigne and others forwarded the interests of Revelation by openly declaring all human reason uncertain, and boldly taking refuge in scepticism.

In short, the paths of revelation, reason, and experience, had been only partially pursued; the elements of imagination, reason, and revelation had yet to be adjusted before a positive and co-ordinated philosophy could be formed; and till this time arrived an intellectual confusion prevailed, one, be it remarked, also discoverable in the chaotic elements of art, especially architecture.

Throughout the ages of Polytheism art retained an equal prominence with the religious idea; in the Middle Ages the new principle of revelation made religion more independent, and art became, though highly representative and symbolic, subordinate to the religious idea. Imitational art suffered more from this allegiance than the conventional, which is explainable at once if we consider the tendency of the empiric systems of thought, which laid down principles according to current dogmata, more favourable to the expressive and abstract capacity of structural design than the direct representative office of sculpture and painting. For this reason imitational art became more symbolically than æsthetically beautiful, nothing surpassing the arbitrary and conventional treatment it received. Architecture not being a representative art, like painting and sculpture, was never, under any form of religion, prejudicially sacrificed to it; and in the works of the Spanish Moors, and indeed all art conceived under Mahometanism, in which representations of animal life were strictly prohibited, the evidence of high æsthetic power is preeminently noticeable.

The development of religious symbolism

during the Middle Ages is strikingly significant of that special phase of thought we have been sketching. What indeed, were the sacred talismans and ceremonial observances of these ages but a slight modification of Fetichism? In that stage which intervened between Paganism and the spiritual religion of a more advanced civilisation, allegory and symbolic meanings took the place of literal interpretation. The disputes on the Godhead and other theological subtleties removed to an inaccessible distance the personal character of the Redeemer from the hearts and understandings of the large mass of worshippers, and as Mrs. Jameson says:—"He became the object of a remoter, a more awful adoration, and the mind began to seek out some more material beings in closer alliance with human sympathies."* Traditional histories of saints and martyrs, as personages of exalted virtue, arose, while the emblem of the Cross, which seldom appears in art before Constantine's vision; the imputed efficacy of baptismal water, charms and amulets, clearly pourtrayed the necessity there still existed for an objective faith, which the Realism of the Church for a long time maintained.

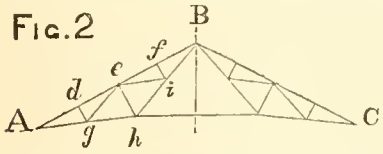
Lost in verbal perplexities of its own making, the mind of Mediæval Europe sought in art and symbolism what it could not find in the abstractions of the schools. But when the religious mission of art ceased, such modes of conveying thought ceased also, at least, their important purposes were served, and art became less the exponent of something else than its own intrinsic power. The outburst of the practical spirit of inquiry awakened by the independent researches of Bacon, Descartes, Hobbs, and others, who by different paths systematised philosophical investigation, blending the results of experience and speculation, helped to form a system of positive thought under which art is now assuming a transition phase. Architecture alone in this crisis is distinguished by a return to all previous ideas and styles; and in the next paper we will endeavour to show its course and *rationâle* under a system which, accepting the various ideas of mankind has tended ever since to concatenate them. Thus we find during the seventeenth and eighteenth centuries individual efforts to revive Empiricism, Rationalism, Mysticism, sensational and critical theories; and it was quite reasonable to expect that the ideas of artists should undergo similar transmutations.

ELEMENTS OF ENGINEERING.

Iron Roofs.—No. 4.

We purpose in the present article to set forth the practical mode of calculating the strains upon a roof principal constructed as shown in fig. 2. This form is preferable to that based

Fig. 2



upon the ordinary upright truss system, inasmuch as the former is so detailed that the struts are of minimum length, whereas the latter exhibits struts of maximum length in the interior trussing of the principal. The example here shown may be regarded as consisting of seven trusses, namely, a primary truss A B C, and in each half of the principal a secondary truss A h B, and two tertiary trusses A g e i B, the construction of the principal being of course symmetrical in regard to the central line. As in former cases we shall deal only with one half of the principal.

Let W = the load upon A B (one half of the principal A B C) then we may consider that upon each truss there is a load

$$= \frac{W}{4}$$

concentrated upon each of the intermediate struts $d\,g$, $e\,h$, $f\,i$, and a load

$$= \frac{W}{8}$$

at the apex B and on the shoe or wall plate at A. Let d = the total rise of the roof; that is to say the height of the truss at the centre, let L = A e, then will the strain upon the different parts of the main compression member A B be as follows:—

$$\text{On B.}f \text{ a strain} = C + \frac{W}{8} \times \frac{L}{d}$$

Where C = the strain brought upon the rafter by the main ties,—

$$\text{On } f\,e \text{ a strain} = C + \frac{W\,L}{8\,d} + \frac{W\,L}{4\,d}$$

$$= C = \frac{3.W.L}{8.d}$$

$$\text{On } e\,d \text{ a strain} = C + \frac{3\,W\,L}{8\,d} + \frac{W\,L}{4\,d}$$

$$= C + \frac{5\,W\,L}{8\,d}$$

$$\text{On } d\,A \text{ a strain} = C + \frac{5\,W\,L}{8\,d} + \frac{W\,L}{4\,d}$$

$$= C + \frac{7\,W\,L}{8\,d}$$

And at the point A there will be a strain

$$= C + \frac{7\,W\,L}{8\,d} + \frac{W\,L}{8\,d}$$

$$= C + \frac{W\,L}{d}$$

The value of C will subsequently be ascertained.

We must now proceed to determine the intensity of the thrusts upon the struts $f\,i$, $e\,h$, and $d\,g$; we find that the strain upon either $f\,i$ or $d\,g$ will be

$$= \frac{W}{4} \times \frac{L}{S}$$

where S = half the span of the principal.

The strain upon the strut $e\,h$ will be

$$= \frac{W\,L}{4\,S} + \frac{W\,L}{4\,S}$$

$$= \frac{W\,L}{2\,S}$$

The thrusts being produced partly by the load at the point e and partly by the loads on d and f. It now remains for us to determine the strains upon the various ties in the truss. By resolving the strains due to each part of the load it is found that the ties are subject to the following:—

The strain on $i\,e$ or on $e\,g$ is

$$= \frac{W\,L}{8\,S} \times \frac{l'}{l}$$

where $l' = i\,e$ and $l = f\,i$.

The strain upon $h\,i$ will be

$$= \frac{W\,L}{4\,S} \times \frac{l'}{l}$$

That upon i B

$$= \frac{W.L.l'}{4.S.l} + \frac{W.L.l'}{8.S.l}$$

$$= \frac{3\,W\,L\,l'}{8\,S\,l}$$

Hence the value of C will be

$$C = \frac{3\,W.L.l'}{8\,S.l} \times \frac{L}{4\,l'}$$

$$= \frac{3\,W.L^2}{8\,S.l}$$

C being thus determined, it may be replaced by its value in the previous equations, in order to find the actual stress upon the various parts of the main compression member A B.

The tension upon the bar extending from h towards the centre of the main principal will be

$$= \frac{W\,S}{2\,d}$$

and the tie A h will be required to sustain in addition to this horizontal strain, strains equivalent to those upon the bar h B. The horizontal strain will usually be slightly modified in the bar A h, because the latter is placed at an angle to the horizon, but the above value will nevertheless be sufficiently accurate for all practical purposes; and so assuming it, the strains will be

$$\text{Upon } h\,g \text{ a strain} = \frac{W\,L.l'}{4\,S\,l} + \frac{W\,S}{2\,d}$$

$$\text{Upon } g\,a \text{ a strain} = \frac{3\,W.L.l'}{8.S.l} + \frac{W\,S}{2\,d}$$

We have now completed the resolution of the strains upon the various elements of that class of roof principal shown in fig. 2; and it may here be observed that the foregoing example has not been selected as a special case, so much as on account of its exhibiting well the method to be followed in solving the strains upon any complex truss or series of trusses.

In all cases tied roofs (*i.e.* roofs which are tied at their lower extremities) exert only a direct vertical pressure upon the supporting walls equal to the total load sustained by the roof.

The trusses being placed at definite distances (say x feet) apart to support a roof on which the total load is w lbs. per square foot, and of which the semi-span is S, the load upon each half primary truss or half principal will necessarily be

$$W = w \times S \times x$$

which is the value to be substituted for W in the foregoing equations when the other quantities are known.

The strains upon each element being ascertained, the sectional areas of such elements may be easily determined by means of the following simple expressions.

Let S = the strain in tons on any tie or strut.
S' = the strain in lbs. on any tie or strut.
a = the nett sectional area of any tie or strut in square inches.

Then with a safe load the sectional area for tensile strain will be

$$a = \frac{S}{5}$$

$$a = \frac{S'}{11200}$$

for compressive strain the least sectional area should be

$$a = \frac{S}{4}$$

or,

$$a = \frac{S'}{8960}$$

Although these formulæ do not involve any consideration of the length of struts, yet it should always be remembered that each strut acts as a pillar, and that the longer it is the greater will be its liability to spring or bend, hence it is desirable always to keep the struts as short as possible; and the form of roof with which we have dealt in the present paper possesses the quality of having short struts in a very marked degree, and may, therefore, be regarded as a very good general type; and, moreover, there is actually less metal required for the construction of such a roof than for those designed on the basis of the ordinary upright truss, the saving being in some instances very considerable. In appearance also the inverted truss principal will bear comparison with the upright truss principal.

In the construction of trussed roofs of any description some provision should always be made for tightening up the ties, either by contracting their virtual lengths or by increasing that of the ties against which they react; it appears to us that the former plan is preferable.

In all descriptions of roof work, it is necessary that great care be taken in marking and punching the rivet-holes, as in the narrow bars which usually are involved in such structures the resistance to stress may materially, if not dangerously, be diminished by errors of workmanship.

In our next article upon roofs we shall proceed to demonstrate mathematically the basis and accuracy of the theory upon which are founded the various formulæ given above.

We have received the following:—In your article, "Plate Girders, No. 2," the writer recommends the top and bottom booms to be made in the proportion of 1 to 1·20. Mr. Fairbairn's carefully made experiments show that the strongest form of section requires the ratio to be at least as 1 to 1·75. If the 1 to 1·20 has been derived from more recent trials, I shall feel obliged if some information can be given respecting them, as they would indicate, I think, a general change in the quality of the metal used or the adoption of a different process of manufacture. Purlin.

Dr. Edward Ruggles, the well-known American artist, whose cabinet pictures, the "Ruggles gems," are so much sought after in the States, died suddenly on the 10th ult. aged 50.

* "Sacred and Legendary Art."

HOW TO PREVENT INFECTIOUS DISEASES.

As an instance of how human life may be preserved by sanitary measures, we may ention the manner in which small pox patients ve been treated in the parish of Marylebone. e learn from the last quarterly return of the edical officer of health, that the mumber of all pox patients treated in the Iron Hospital, ounted to 96, of whom 7 died, being one death every fourteen persons, and constituting a death te of about 7 per cent. On the other haud, find that of patients treated in their own owded and miserable dwellings, one in seven, 14 per cent. died. The contrast in favour of e Iron Hospital is here very remarkable, and ls most favourably for the treatment aod nagement there adopted. It proves also, in ery striking manner, the vital importance of cing patients suffering from small pox or any ner contagious disease under the most favourle hygienic conditions. The report goes on to :—For the purpose of ascertaining whether the ccination Act had been to any important ext disregarded, Dr. Whitmore caused inspecn to be made of the arms of most of the young ldren resident in the infected streets of the trict, and the result showed that in almost ry house, one or more of these little ones were hout the protection which vaccination affords. very large number of the houses were found to extremely dirty, and reeking with abominas of one kind or the other. Of the 101 ses contained in one street, 70 were found to uire sanitary improvements. No wonder that all pox here found a most congenial home. measures of disinfection, which the vestry e been enabled to carry out in nearly all the ses in which the disease has occurred, have n most effective, since, with hardly a single eption, no fresh attack has broken out in any se after having been thoroughly disinfected. best disinfecting agent appears to have been rine gas, but where this could not be conviently employed—as in small rooms occupied several persons—he found the carbolate of e a very valuable substitute.

'or the purification of clothes and bedding t is the best and safest disinfectant, and, the ector says it would be most desirable if, for object, some two or three disinfecting aces could be erected in different parts of the sh, in which a heat of from 200 deg. to 250 could be produced, siuce experience has ved that a lower temperature is not always essful in destroying the contagion.

BUILDING IN CONCRETE.

THIS subject assumed great prominence in the discussion upon Improved Dwellings the Working Classes, at the Society of Arts week. Mr. Edwin Chadwick, C.B., after reing at some length to the sanitary evils of rbent and damp walls, said :—The late Capa Fowke had directed his attention to some s of concrete, as an improvement upon the mon brick construction, and had had some iminary trials made with concrete made of land cement and of Scott's cement, which ved that the concrete was not from onld to one-fifth so absorbent as common brick, it might receive an almost perfectly non-abent and washable interior facing, which was reat desideratum. The material, sand or el, or breakable stone, or the slag of furnaces, procurable everywhere. There was a ledge ncrete, and walling of concrete, at the South sington Museum. He had seen some cots on the Marquis of Salisbury's estate at Hat, where he had built a church and a farmery, where a park had been walled with concrete. occupiers of the cottages and the farmer atd the dryness of the walling, which was the ntial sanitary point, and as to the economical tion, the cost was about half that of brick-

r. W. E. Newton gave some details of houses he working classes, which he is now building aris for the Emperor. Those houses were to fty-four in number, and several were already hed. They consisted of double houses, each aining apartments for six families, each ly having a living room, bed room, kitchen, separate water closet; with separate water ply for culinary and sanitary purposes. In original plans submitted by him (Mr. Newton) to the Emperor and Empress, his Majesty made some modifications, sketching them on paper himself; and the houses were being erected according to the plans thus amended by the Emperor. There were cellars in the basements, and the cost of each of these double houses, capable of accommodating six families each, was, without the cellars, £480, and with the cellars £550 per pair. The houses were built of concrete almost entirely; and he could point them to houses he had built at Norwood, in which the entire walls, floors, and roofs, were of concrete. He had even succeeded in laying a roof, of 16ft. span, and 38ft. long, not more than 3in. thick of concrete. He thought that considerable economy resulted from the use of this material, as he calculated the cost was less than half what it would be if brick or stone were used. With regard to the houses in Paris, he started with the idea of not employing skilled labour in their construction, as that would have added very much to their cost. Acting upon that idea, loiterers on the boulevards, who were willing to work, were employed to mix the concrete and fill it into the moulds at such wages as 2½f. per day. The operations were carried on in four houses at a time, and the walls of each were raised 18in. or 2ft. per day by filling concrete into a mould fitted for the purpose, into which the concrete was shovelled, and when a piece was dry, the mould was raised and the operation repeated.

In answer to a question from the chairman, he said he should not object to trust a concrete wall one third less in thickness than one of brick. He spoke of actual construction he had carried out. He had built a garden wall 100ft. long, 9ft. high, and 9in. thick, entirely of concrete, and it stood perfectly well. He would not hesitate to carry up concrete walls of houses 9in. thick and 25ft. in height.

Professor Kerr said he did not think concrete settled the question of poor men's dwellings at all. As to building a wall in concrete two thirds the thickness of a brick wall was perfectly out of the question. By the building act a wall 30ft. long and 25ft. high might be built 9in. thick; and did anyone mean to say he could build that only 6in. thick of concrete? He thought such a plan was totally impracticable.

In a subsequent communication Mr. Newton gives the following particulars of the nature and composition of the concrete he is using in Paris, viz:—One part of Portland cement (C. Francis and Sons) to five parts of large gravel stones, varying in size, from the size of pearl barley to that of peas. The fine sand is sifted or screened out, put on one side, and used for making stucco for facing the work. At this place I find it more economical to use burnt brick earth, or "brick ballast," as it is called, from which I sift out the very fine, and add one of Portland cement to eight of ballast. This makes a very hard wall. I have even reduced the cement to one in ten with perfect success. I burn the ballast myself and it costs me under 2s. per cubic yard. Therefore, if we take one yard of ballast at 2s., and 2½ bushels of cement at 1s. 10d., we shall have a cubic yard of concrete for 6s. 7d., to which add 2s. 3d. per yard for labour, and we shall find we can put up a superficial yard of 9-inch work for less than 3s.

With reference to Professor Kerr's objections he says:—One gentleman ventured to question the possibility of building a wall 30ft. high in 9-in. work. I only say that this has been done by Mr. Tall, and the houses so constructed have been sold by him at a very large profit. From the numerous experiments I and others have made in concrete constructions, I have no hesitation in offering the following challenge to the sceptics, viz., that they shall build a wall of any dimensions of common brick and mortar with or without Tyerman's bond, and I will build one in concrete; and if the concrete wall does not sustain a greater weight than the brick wall I will forfeit to them £50 and the cost of the wall, they undertaking the same liability to me should the brick wall not stand an equal test.

Mr. Newton here somewhat begs the question. He maintained at the meeting at the Society of Arts, that a concrete wall of 6in. thickness would be as strong as a brick wall of 9in. thickness. Now he says that a concrete wall would be stronger than a brick wall of the same dimensions. But how much stronger? One third? If, however, it can be proved that concrete is as strong and at the same time cheaper than bricks for building, then the question of improved dwellings for the people will be answered.

NEVER TOO OLD TO LEARN.

MOST people say that when they are old it is too late to learn; but we find that Socrates at an extreme age learned to play on musical instruments, for the purpose of resisting the wear and tear of old age; Cato, at eighty years of age, thought proper to learn the Greek language; Plutarch, when between seventy and eighty commenced the study of Latin; Boccaccio, was thirty years of age when he commenced his studies in polite literature, yet he became one of the three great masters of the Tuscan dialect—Dante and Petrarch being the other two; Sir Henry Spelman neglected the sciences in his youth, but commenced the study of them when he was between fifty and sixty years of age. After this time he became a most learned antiquarian and lawyer. Colbert, the famous French minister, at sixty years of age returned to his Latin and law studies; Ludovico, at the great age of 115, wrote the memoirs of his own times, a singular exertion, noticed by Voltaire, who was himself one of the most remarkable instances of the progress of age in new studies; Ogilby, the translator of "Homer" and "Virgil," was un acquainted with Latin and Greek till he was past fifty; Franklin did not fully commence his philosophical pursuits till he had reached his fiftieth year; Accorso, a great lawyer, being asked why he began the study of law so late, answered that indeed he began it late, but he should, therefore, master it the sooner; Dryden, in his sixty-eighth year, commenced the translation of the "Iliad," and his most pleasing productions were written in his old age. We give the names of the above out of numberless others to show that it is never too late to learn. We find nowadays that some of our greatest men study more in their old age than when they were young.

We may add that it is never too difficult to learn. Ferguson made his marvellous wooden clock, that accurately measured the hours, by means of a pen knife; Stothard learned the art of combining colours by closely studying butterflies' wings; Watt made his first model of the condensing steam engine out of an old kettle; a burnt stick and a barn door served Wilkie in lieu of pencil and canvas; Ferguson laid himself down in the fields at night in a blanket, and made a map of the heavenly bodies by means of a thread with small beads on it stretched between his eyes and the stars; while Rittenhouse, the astronomer, first calculated eclipses on his plough-handle; William Gifford worked his first problem in mathematics, when a cobbler's apprentice, upon scraps of leather, which he beat smooth for the purpose; Bewick first practised drawing on the cottage walls of his native village, which he covered with his sketches in chalk; and Benjamin West made his first brushes out of the cat's tail. Some of the very best workmen, as has been remarked, have had the most indifferent tools to work with. But it is not the tools that make the workman, but the trained skill and perseverance of the man himself. Indeed, it is proverbial that the bad workman never yet had a good tool.

PARLIAMENTARY NOTES.

In the House of Commons on Monday Mr. Goldsmid asked the First Commissioner of Works when the statue of the late Duke of Wellington, for the erection of which in St. Paul's Cathedral the sum of £20,000 was voted in 1858, was likely to be finished and put in its place? Lord J. Manners said it was a monument to the Duke of Wellington, not a statue of the Duke of Wellington, which was to be erected in St. Paul's Cathedral. He had every reason to hope that the monument would be completed in about two years from this time. He might state that in consequence of what had fallen on Friday evening from the hon. member for Bath and others, and the suggestions they had offered to him with reference to the buildings for the London University in Burlington-gardens, he had communicated with Mr. Pennethorne on Saturday morning, and requested him to make arrangements with the contractors that the progress of the works might be stayed for two weeks. He might further state that he understood the probable extra cost of changing the style of building would be between £7,000 and £8,000.

Mr. Thomas Horner, of East Morten, has been elected surveyor for the township of Morten, near Keighley.

THE OMNIUM FASTENING.

UNDER this title Mr. J. H. Roberts, of Eldon House, Peckham-road, has recently patented a serviceable invention which is shown in the engravings. It is especially intended for doors and windows, but is equally adapted for tables, cabinets, boxes, and articles of a similar kind. Fig. 1 is the hinge plate and fig. 2 the button plate, forming the two parts of the omnium fastening. In its application to a window the hinge plate, fig. 1, is screwed on to the front sash, at a sufficient distance from the edge to allow the hole in the flap of the hinge to pass freely over the button in plate, fig. 2, which is screwed on or into the back sash close to the edge. By sliding the button along the opening, as shown in fig. 3, the window is secure; to open it the movement of the button is reversed, and the flap of the hinge plate is made to turn back flat on the sash, which, however, can be made to be perpendicular, and thereby readily visible, by adopting the stop hinge plate instead of the other. The advantages claimed for this invention are security, simplicity, durability and neatness. It is superior to the ordinary window fastening inasmuch as it cannot be opened by passing a knife between the sashes, and is therefore more secure than the other. One of the chief annoyances of the old fastening arises from the liability of the spring to rust and break. This is entirely obviated in the new invention. It is particularly well adapted for doors, as it dispenses with the common bolt, which it must be admitted is an awkward and clumsy contrivance, and a very poor ornament to say the least. The utility of the omnium fastening in a variety of other ways will be evident.

Figs. 1 and 2.

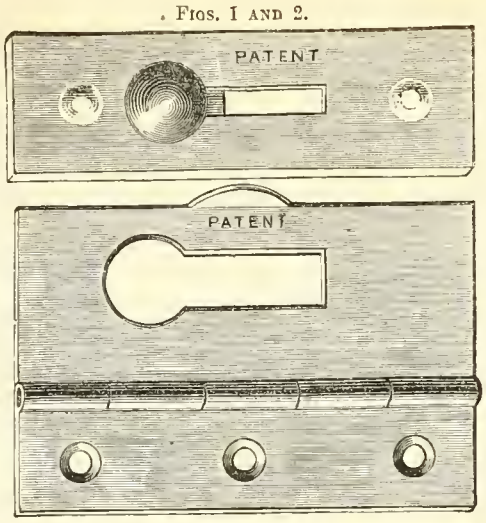
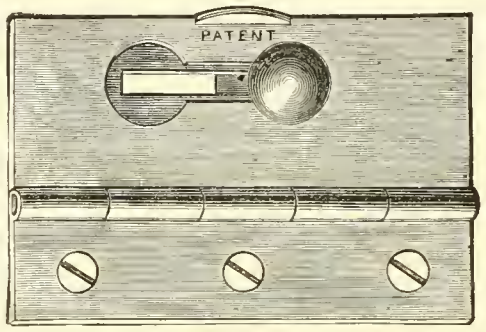
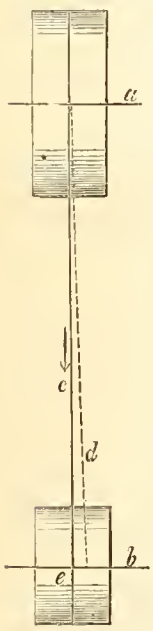


Fig. 3.



WHY A BELT WORKS FROM OFF ITS PULLEY.

A CORRESPONDENT send the following:—It may not be uninteresting to explain the reason why a belt works off its pulley when the shafts are not parallel or diverging in position with each other. I find, when a plain surface (as a stick of timber for instance) moves over a roller of uniform diameter, that every part of that surface moves in straight lines at right angles with the axis of the roller, no matter what the position of the whole mass may be in reference to that axis. In the engraving given the belt is placed in its proper position on the centres of the pulleys. The belt forms a right angle with the shaft *a*, but not a right angle with the shaft *b*, owing to the angle of divergence in the position of the two shafts. Now the belt, following the above law, will move bodily in a line parallel with the dotted line *d*, at right angles to *b*; one-half of a revolution of the belt will correct the angle at *b*, but will destroy the angle at *a*, consequently the belt will work off both pulleys, toward the ends of the shafts nearest each other. Therefore this rule may be given, that in all cases the belt should run on the pulleys at right angles to the axis of rotation, no matter at what angle it may leave the pulley (as in case of a quarter-twist belt). I have asked a great many mechanics about this, and the almost invariable answer has been: "The belt runs to the high part of the pulley;" practical demonstration being needed to convince them of their error. With all deference to our intelligent mechanics, I believe this thing, simple as it is, is yet not generally understood.



The blacks are progressing; a mulatto slave in Brazil has carried off a national prize medal for the best work of sculpture, and has also received a paper of manumission.

NEW COLOSSEUM THEATRE AND CONCERT-HALL, GLASGOW.

BAYLIS'S Royal Colosseum Theatre and Concert-hall, now in course of erection in Cowcaddens-street, bids fair in point of size and completeness of accommodation to form a notable addition to the places of public entertainment in Glasgow. The building is of rectangular form, measuring over 150ft. in length (or, including the entrance corridor, 220ft.) by 78ft. in breadth. The height from floor to ceiling is 60ft., or from under floor, below stage, to ridge-pole, 100ft. The part of the house occupied by the audience will measure 100ft. by 72ft, and the stage and scenic department is 48ft. long by 72ft. in width. It is computed to contain an audience of above 4,000 persons; and the arrangements for the comfortable enjoyment of the performances, as regards acoustics, lighting, ventilation, and commanding view of the stage from every point, have received the most careful consideration. Facilities for extinguishing fire have been duly considered. The entrances are numerous and spacious, and four supplementary exits are provided for safety in case of sudden panic. There is an additional staircase, to be used for outlet only from the upper gallery; and a corridor, 8ft. wide and 73ft. long, forms a communication between this stair and the inlet stair to gallery, both stairs being over 5ft. wide, and free from wheeling steps, so dangerous in places of amusement. All the staircases throughout the building are fireproof. The principal entrance from Cowcaddens-street, flanked with polished granite columns, and surmounted with appropriate sculpture, will lead through a wide and lofty corridor, 70ft. long, into the entrance hall communicating with the stalls and boxes. The proscenium will be in form and decoration original and striking; and the decorations of the auditory will be light, pleasing, and appropriate. In the event of more room being required on the stage from front to back, provision has been made in building the gable, so that the centre portion of it can be easily removed, and nearly 100ft. thereby added to the building. The block of which the concert-hall forms the centre will have a handsome frontage of shops along its north and west façades, measuring altogether 400ft. in length. The whole stands on a foundation of rock; and it is worthy of note that the stone used in the work (which is of durable quality) is quarried from the centre of the building. The building has been designed by Messrs. Clarke and Bell, architects, Glasgow.

LIVERPOOL ARCHITECTURAL SOCIETY.

THE fortnightly meeting of this Society was held last week, Mr. T. J Kilpin, the President, in the chair. Mr. Forrest exhibited, by means of the oxy hydrogen light, a number of photographs of ruined temples, palaces, towers, and other buildings in Cambodia, in the Kingdom of Siam, taken in the early part of 1866 by Mr. J. Thomson, F.R.G.S, of Edinburgh. The views are highly interesting, both to the architect and the antiquarian. Some of the towers are 180ft. high. There is no evidence of mortar having been used in any of the buildings, nor are there any remains of the arch, all the roofs being corbelled. The sculpture on the walls is of a remarkably rich character, and displays a great amount of artistic skill. Mr. Statham, the honorary secretary, brought before the meeting a "suggestion for the church of the nineteenth-century." The design exhibits an attempt to sketch out a form of church combining architectural effect with suitability to the purposes of modern worship and to the pervading artistic and religious feelings of the present age. Mr. Jahns then read a paper on "The Organic Coherence of the Arts."

PARIS EXHIBITION.

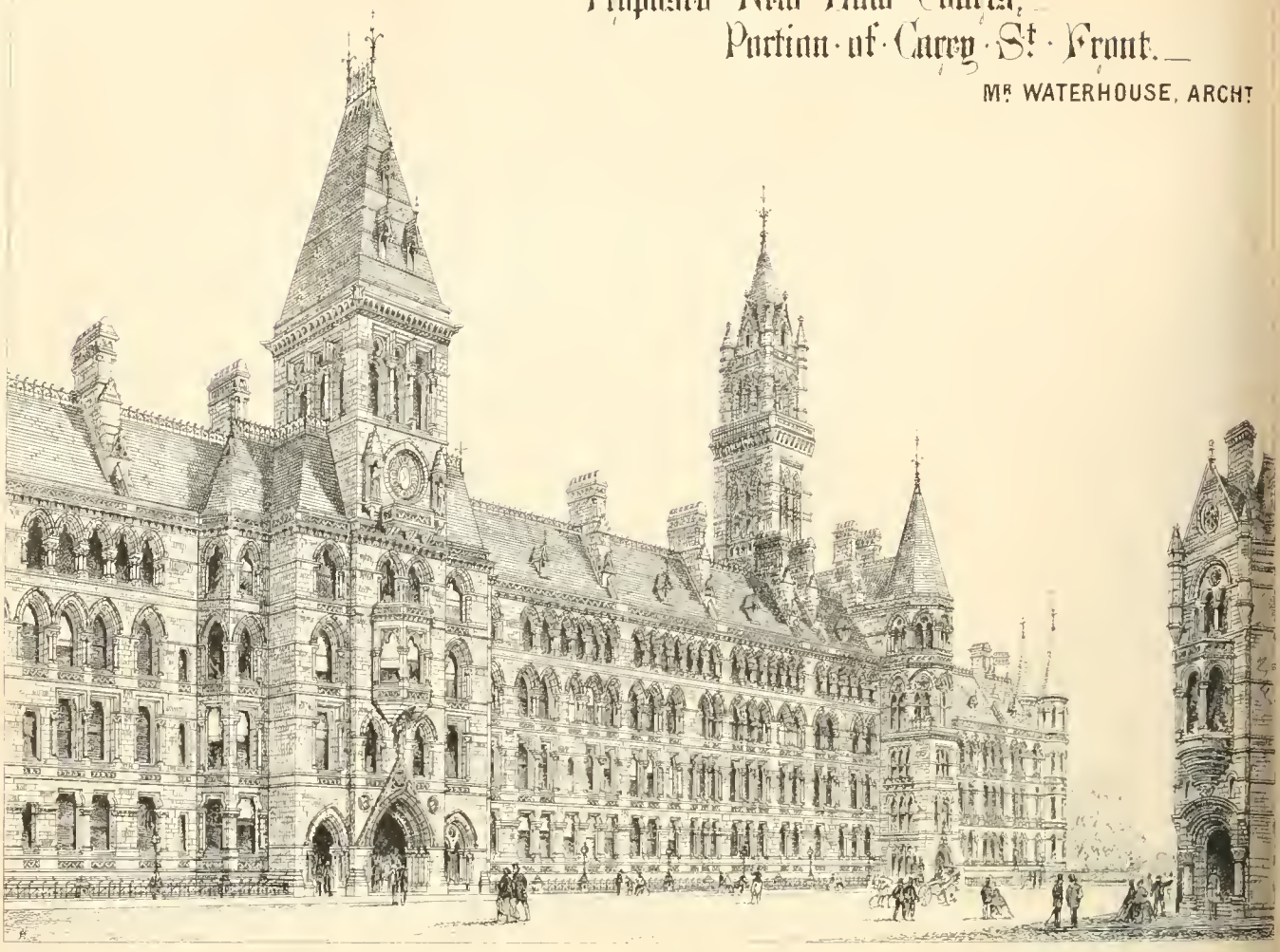
THE English Refreshment Department of the Paris Exhibition for Messrs. Bertram and Roberts, of the Crystal Palace, Sydenham, has just been completed. The interior decorations, which have been done by Messrs. J. and W. Sanders, of Guildford street, are in the Italian Renaissance style, and the whole of the work has been executed by English workmen. The most important feature is a wall screen, 66ft. long by 24ft. high, which is divided into five bays of arches on coupled columns richly decorated in black and gold. The bays between the columns are formed with inlaid mahogany, and filled in with panels of embossed glass, which is relieved from the mahogany by gilt mouldings. The archivolt is composed of black and gold intrados and extrados mouldings, panelled between with mahogany, inlaid with ebony and satin wood. Over the arches a series of inlaid panels run the whole length of the screen, which is crowned by a frieze and cornice of simple but effective design. The work has been designed by Mr. W. Young, of Stanley street, Pimlico.

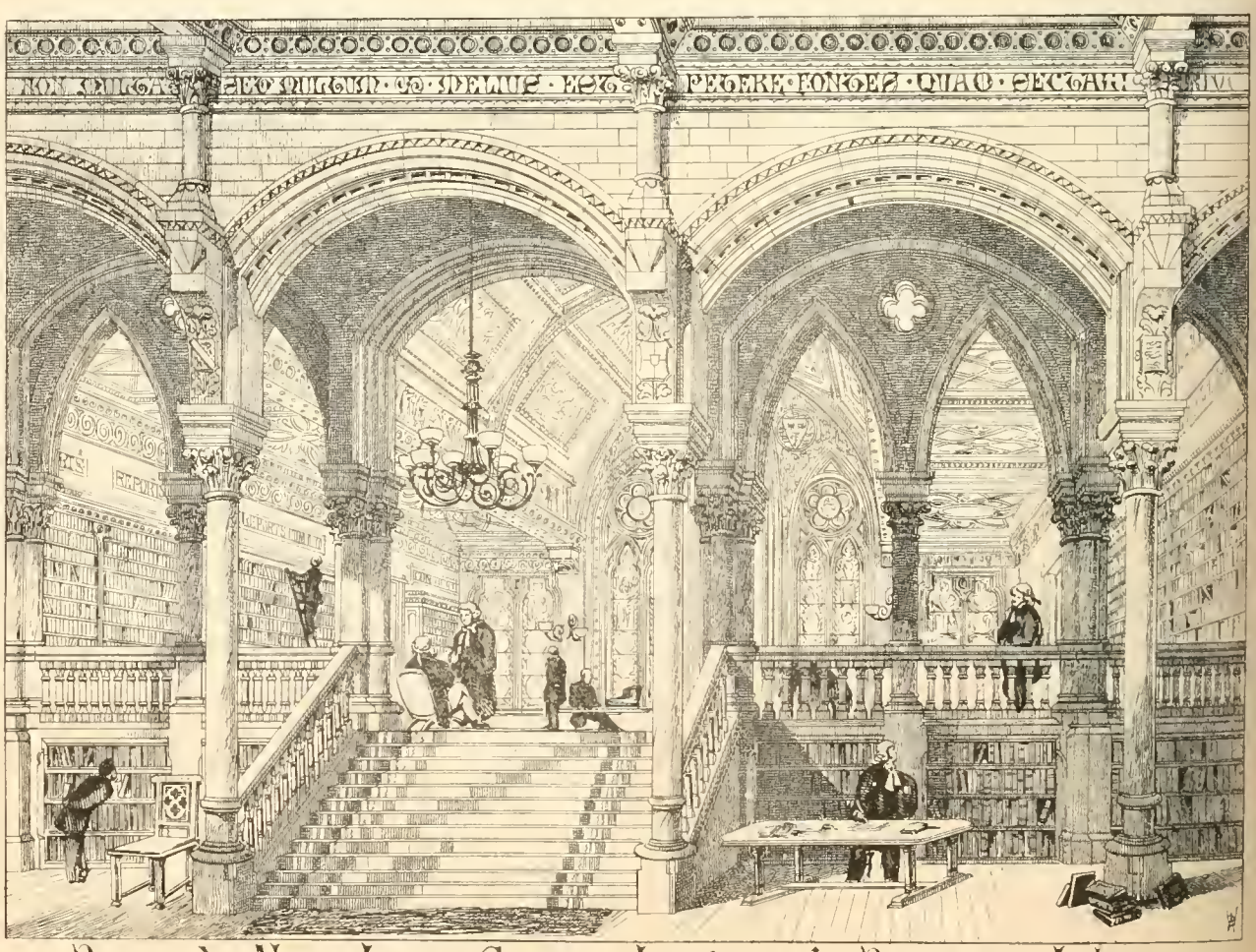
"Come if you can," writes an enthusiastic correspondent, "Come any how; any way. Never mind the sea, you will soon get over that. Do not let the absurd rumours about high prices of bed and board keep you away. You may live as cheaply here as at home, if you are content with the same fare and accommodation. I dined yesterday at a well-known restaurant in the Palais Royal for two francs and a half, and this is a correct card of what I had for my money:—Soup, turbot with caper sauce, roast leg of mutton, fricaseed fowl with mushrooms, two sorts of vegetables, bread, butter, cheese, and dessert, with a small bottle of wine! When you can give me a better dinner in your neighbourhood for two shillings I will admit that Paris is dear. I may add that the room, in which a similar dinner to the above can be had any evening, is spacious and well lit. There is a profusion of looking-glass and velvet-cushioned seats, the waiters are civil, and the table furniture of spotless purity. Lodging is just as reasonable. A friend of mine has a very comfortable bed-room on the ground floor, in a respectable house, for fifty francs per month (ten shillings per week), within ten minutes' walk of the most fashionable quarter. Of course, if you like to walk into the first trap set for you by some obliging fellow-countrymen settled here, you may expect to pay for the luxury of his company. In Paris you may spend a hundred pounds per month for lodgings, and you may get a bed for a franc."

The Emperor of the French has, it is said, sanctioned a curious experiment. A Parliament of workmen, consisting of 302 delegates, elected by all the trades of France, is to assemble in Paris during the Exhibition, to discuss all kinds of questions connected with their work. Official rooms have been assigned them, and they are, it is said, to be allowed considerable freedom of debate.

Proposed New Law Courts, Portion of Carey St. Front.

Mr. WATERHOUSE, ARCHT.





Proposed New Law Courts, Interior of Barristers Library.

Whiteman & Bass Lithographers, [illegible]

RECENT DEATHS.

WITHIN the last fortnight two men, equally distinguished in their respec-ve walks—the one in music, the other in rt—have passed from among us to the sincere orrow of all who knew them; for they have eft the world poorer for their loss, though icher and better for their having lived. lfred Mellon, the musical conductor, died a the 27th of March, at the age of 46; and harles H. Bennett, the artist, on the 2nd inst., the age of 37. The deaths of both these ifted men were natural, as the phrase is, but ey were premature, and both occurred at an e which experience has shown to be par-cularly fatal to notable characters. As with rtain months—the month of April for ample—there would seem to be a singular tality attaching to the two periods of life we ve mentioned. A greater number of cele-ated men have died in April than perhaps any other season of the year. Lord Bacon, ron, Buffon, Collins, Chatham, Chaucer, wper, Donizetti, Defoe, the Duke of Marl-rough, Fielding, Franklin, Goldsmith, Han-l, Heber, James II., Sir W. Jones, Sir G. C. wis, Mirabeau, Sir Robert Peel, Raphael, scoe, Shakespeare, Lord Somers, the Duke Sussex, Sir David Wilkie, Professor Wilson, d Wordsworth all died in this month. It ght be shown that April has been remark-le for its fatality also to celebrated women. is well known that Burns, Byron, Raphael, Mozart died at the age of 37, and Spenser, ldsmith, Pitt, and Thomas Hood at the age 46. A long list might be added of eminent n to whom 37 and 46 were the grand cli-cteric of life. It will be found, too, we think, t very recent years furnish more instances this—instances of public men who have d "before their time,"—than any other age produce. While it is true that the general rage of life is extending, while it is true t intellectual pursuits are, under certain ourable circumstances, conducive to longe-v, it is no less the fact that within the last ade nearly all our hardest workers, the n who have accomplished most in their day l generation, have passed away before reach-the age of 50—the majority of them, indeed, ore 45. As usual the greatest number of tims have been literary men, more par-larly members of the newspaper press, and sts, scientific men, and physicians. If we ce back a few years, taking the period from 1859 up to the present year, we find literature the names of Bayle, St. John, and shington Wilks, journalists; and Alexander Sith, the poet, who died at 37; Frank Fowler, the age of 30; Robert Brough, the dramatic ter, at 32; John Hamilton, the journalist, 38; Thomas Buckle at 39; and Albert Sith at 43. We might add Artemus Ward, se recent loss, at the age of 33, is still fresh the public mind. Few men have gone ough a greater amount of work than these. ll of them have not left lasting monuments eir labour and genius, like Buckle, and author of the "Life Drama," all e indefatigable workers. Thackeray and fessor Aytoun were only 52. In art we e lost C. H. Bennett at 37, Alfred Newman, A. Solomon at 39, Godfrey Sykes at 40, n Leech at 47, John Thomas, the sculptor, 49, and, greatest of all, John Phillip at 49. eral of our younger artists from whom great gs were expected, but who have neverthe-left us some of the fruits of their genius, e died at a still earlier age. Paul Gray only 24, while John Lawless and Tom ten were but 30 when their hour had e. Of these bright youths it may truly aid that their sun went down while it yet day. At the age of 37 Captain Speke, African traveller, met with his cruel death, at the age of 46 Captain Harrison, of the "Great Eastern," was accidentally drowned. eral Stonewall Jackson fell at the age of and at the same age died John Fowler, the ntor of the steam plough, the victim of ssive and unremitting mental exertion. Another useful inventor in a different sphere, and a valuable public servant, Captain Fowke, was only 42 when he was suddenly cut off, and Captain Colt, the inventor of the celebrated revolver pistol, was but five years older at the time of his death. The age of 44 has been unusually fatal for public men of late. At this age died the Prince Consort, also Dr. Heinrich Barth, the African explorer, and Mr. Harcourt Vernon, M.P., for Newark, and this year, within a few weeks of each other, Mr. Culling Hanbury, M.P. for Middlesex, and Dr. Brinton, the eminent physician. Medical men have generally been longer lived than the members of other professions—if we except perhaps statesmen and soldiers—but still we have to regret the loss of some of our most distinguished physicians at a comparatively early age. In addition to Dr. Brinton we may mention the names of Dr. Bentley Todd, who died at the age of 51, James Miller, the well-known Scottish surgeon, at 52, and Dr. Scoresby Jackson, Professor Goodsir, and Dr. Jeafferson at the ages of 33, 52, and 56 respectively. The roll also includes Adelaide Proctor, the poetess, the brilliant Herbert Coleridge, grandson of the poet, and secretary of the Philological Society, who was not more than 30, the Sultan of Turkey (38), James Lowe, the critic, about the same age, Lord Braybrooke, well-known as an antiquarian (41), Dr. Villiers, Bishop of Durham (48), Dr. Donaldson, the great scholar (49), and Mr. Fairholt, the archæologist, aged 53. Among statesmen the most noteworthy early deaths within the period have been Lord Herbert, who had just completed the half century, and the Duke of Newcastle, who was three years his senior. Our great statesmen, however, with the exception of Cobden, have, as a rule, departed full of years as well as honours.

The present has been called a high-pressure age, and the description is applicable enough. Never before were men so busy as they are now, never did men accomplish so much individually and collectively as now. The age is terribly in earnest, and work, work, work, is the universal watchword. Leisure has become a sort of tradition. Who thinks of leisure? Nobody has "a minute to spare." However, the question may be asked, Are we not in danger of overdoing the thing? Have we not too many instances now-a-days of men sacrificing themselves on the altar of sheer labour? It is a question whether, as civilisation advances, men grow happier, or even more comfortable and contented. The wear and tear and worry of our fast living are so great that men break down in the middle of the race. The weakest go to the wall first, and those who are blessed with good stomachs hold out the longest. Unfortunately as it happens, our hardest workers—our swiftest runners—are too often stronger in the head than the stomach, and have not enough physical stamina to carry them to the end of the journey. We live in deeds, not years, and "count life by heart throbs."

HOW THE SANITARY ACT OF 1866 WORKS IN ST. GILES.'

IN the exercise of legislative powers conferred by the Sanitary Act of last year, the Board of Works for St. Giles's district have issued a series of minute regulations affecting all the houses "let in lodgings or occupied by members of more than one family;" that is, according to the last census tables, about two-thirds of all the houses in that densely-peopled district. In virtue of these regulations, the Board will issue to all lodging-house keepers a ticket showing the number of persons permitted to sleep in every given room, and without such ticket or licence no person is to be permitted to let lodgings. The Board state that they will in no case sanction less than 400 cubic feet of space for each person, and will require all lodging-house keepers to reduce the number of occupants until the required space be allotted. They will further require a thorough limewashing of the entire building no less than four times every year. Floors are to be washed twice a week, cellars to be cleaned once a week, and limewashed as often as the Board may require. Ventilation is to be under the direction of the Medical Officer of Health. Water is to be provided at the rate of 15 gallons a day for each inmate. Waterclosets are to be provided outside every house in the proportion of one for every twenty inmates. Yards, areas, and private courts are to be paved with flag paving. Every owner residing at a distance is obliged to appoint an agent residing in the neighbourhood to see that these regulations are strictly carried out; and as a further means of enforcing them power is given to the officers of the Board to visit any "house or room" in which they may suppose them to be infringed, at any hour of the day or the night. It is rather remarkable that opposition to these regulations should come from so practical a sanitary reformer as the Earl of Shaftesbury. But it happens that his lordship, as President of the Society for Improving the Condition of the Labouring Classes, has been for many years engaged in the endeavour to improve this very district. The dwellings for families in Streatham-street, the single men's lodging-house in George-street, and the renovated dwellings in Wild-court, Drury-lane, are all affected by these new regulations. The improvements actually exhibited in these buildings have been quoted for many years past, as models of what ought to be done towards the sanitary improvement of various kinds of dwellings, and the greatest credit is due to his lordship and the society of which he is president, for these practical and sanitarily successful efforts. But their usefulness will be entirely destroyed, if the attempt to enforce the Board's ideal of sanitary perfection be persisted in. With great difficulty the Society has been able to improve these dwellings so as to let them at very moderately remunerative rents; but these new requirements, his lordship states, will compel them, not only to evict 100 out of the 360 inhabitants of Wild-court alone, but to raise the rents of the whole of their property by no less than 30 per cent. By thus vitiating every conclusion of financial success, the Board will place insuperable obstacles in the way of those who might be inclined to imitate the Society's excellent models, and all hopes of further improvement in that direction must be abandoned. If so great an enemy of overcrowding as Lord Shaftesbury will be compelled to evict 100 out of 360 tenants,* how many may we expect that others will have to evict? If he, who is indifferent to pecuniary profit, must raise his rents 30 per cent. so as to avoid pecuniary loss, how much will other landlords whose only aim is profit, be compelled to raise theirs? The mere issuing a regulation that so much space is to be provided will not cause it to be done. The Board may require the reduction of the number of inhabitants to their standard, but, added to the many evictions of late years, where can the houseless wanderers betake themselves? Rents are already as high as the poorer inhabitants can bear; surely a policy that makes them higher must be impractical and unwise. When opposition comes, backed up with such facts from such a quarter, it is time for the Board to consider whether, in their zeal for improvement, they have not overshot the mark. They legislate as though nothing were easier than to say it must be so, and *(presto)* the thing is done. In Utopia it might possibly be, but not in London. In this work-a-day world all attempts to enforce conditions which, however desirable in the abstract, are not practicable under existing circumstances, only place unnecessary obstacles in the way of earnest and practical men; and so far from effecting their professed object, they form a hindrance to amelioration, and a bar to judicious efforts at radical improvement.

* The inhabitants of Wild-court were 1,000 in number before the improvements carried out by the Society which Lord Shaftesbury presides over.

GOTHIC FURNITURE.*

RECENT REVIVALS.

GOTHIC revivals in furniture, as in architecture, differ widely among themselves in date and style. Pugin, among the earliest of leaders was the latest in manner. He was an enthusiast for advanced decorative forms, which our living zealots in the cause might now decry as florid and corrupt. His designs for Gothic furniture, for iron and brass, gold and silver work, are allied to Perpendicular and Tudor types. Two volumes of photographs, from sketches recently published, for the most part show like predilections. The designs of Mr. Pugin are vastly more ornate than the forms at present favoured by furniture manufacturers and their thoroughgoing patrons. Chairs, cabinets, and sideboards, as drawn by Pugin, partook of the elaborated detail of the decorated style in architecture. No space is left bare, repose is not permitted to any member of the composition; the panels are pierced with window tracery; Catherine wheels are turned in the piers of bookcases and sideboards; trefoils, quatrefoils, and the like, fill up spare corners; the back of a chair is a gable which carries finial crockets and pinnacles; the top of a bookcase is finished as a parapet against a sky, divided into battlements, decorated with pierced open work, or the Tudor flower. To my mind there is exquisite beauty in these domestic Gothic works, as elaborated by Mr. Pugin; and where expense is no object, and there is a possibility of carrying out the whole of a house in consistency and completeness, I cannot but deem the result gained eminently artistic and agreeable. The imposing effect which Pugin obtained in the Houses of Parliament, few even of his opponents will call in question. Yet, to quote Mr. Gladstone in the Commons, the decoration has been overdone, and certainly the verdict of the country is, that the cost was exorbitant. At any rate the public and the profession, since the zenith of Pugin, have gone back to earlier, simpler, and less costly styles. The Gothic mania, it must be admitted, is specially addicted to extremes; and, like bigots for rituals and Gregorians, Gothic lunatics are pushing their faith and practice to extremes. But let all such "pernicious nonsense" pass; it certainly will not last; the time cannot be distant when these vagaries shall be hated as heartily as now they are loved. Happily it is not needful here to dwell on what may be subject of regret, for in the application of Gothic to daily uses, we readily find much of reasonable truth and unsophisticated beauty. The point worthy of remark is, the contrast of Pugin's Gothic furniture with that which is now the rage. Pugin's style was often as late as that of Henry VII.; the Gothic furniture we meet with in the chief art-factories of London dates back a couple of centuries earlier to the reigns of John, Henry III., and the Edwards. This is justly deemed the best period, at least for Gothic in stone. Salisbury and Lincoln Cathedrals, Westminster Abbey, York, and Beverley Minsters, which belong to this era, contain some of the choicest details and purest developments of Gothic art. It would seem not unreasonable, then, that our designers and manufacturers should take as models the best examples of the best period.

A difficulty, however, deters the adoption of early styles, in the simple fact that five centuries ago there was of domestic furniture but a scant allowance, and of the little that might have once existed but few remnants survive to our times. In certain country districts the most ancient woodwork may be the village stocks! And some, indeed, of the modern Gothic furniture which has fallen under my notice might almost have been taken from such models, so utterly rude is its construction, so archaic its form, and so indifferent do its sharp angles show themselves to the unfortunate people who may have occasion, as lawyers would say, "to have, hold, use, occupy, possess, and enjoy" the fixture, with its easements and appurtenances. But, to speak seriously, the paucity of early domestic, or even of ecclesiastical furniture, presents obvious difficulties to designers which have led to error. What is not known becomes matter of conjecture, and in the absence of forms and facts, a wide field is open to caprice. I cannot believe, notwithstanding the ribaldry in which Gothic carvers were wont to indulge in stall seats, that the grotesque styles which latterly have obtained currency are consonant with the spirit of that stone-wrought tracery which is altogether lovely. Certainly may be seen in London shops grotesque furniture more in keeping with a beer-cellar than with the drawing-room of an English gentleman. Quaintness, queerness, and artistic ugliness should, to quote the words of Mr. Gilbert Scott, be used sparingly as grains of garlic for a piquant dish. Doubtless it may be admitted that the more there is of spirit and of force in design and execution the better; but Art, like greatness in human character, never shows more strength than in moderation. Extremes, especially extremes of ugliness, indicate something wrong. Early Gothic examples are on the side of beauty, and certainly have little fellowship with the unsightly and grotesque work of many of our modern revivalists.

But, though ancient examples of Gothic furniture are not so numerous as could be wished, they suffice to show the detail treatment and general spirit that inspired mediæval art-workmen. The table in the Chapter-house, Salisbury, which, belongs to the middle of the thirteenth century, may be quoted chiefly in illustration of the assertion that furniture of this date is too simple and rude for the increased luxury of the present day. The coronation chair, Westminster, also of the thirteenth century, received, as was natural in a work for regal service, greater decoration. Architectural details are in the woodwork pronounced. On the sides still remain quatrefoils and arcading of trefoil arches, and instead of the chamfer, beyond which our modern revivalists seldom go, mouldings, the pride of Gothic Art, are carefully cut. This chair, together with the glorious *retabulum*, may likewise teach the method and the manner in which Gothic woodwork was gilded and painted. There are here assuredly delicacy in detail and a sense of beauty which the painters of modern furniture would do well to emulate. When Gothic men were rude, it was from necessity, not as with our men, from affectation. True artists must always do their best, and reach forward to perfection. The commonest carpenter and painter of the twelfth and thirteenth centuries did as well as he was able: from our artists in days of Government schools of design more must be expected. Among early woodwork few specimens can show a more lovely piece of surface decoration than a certain "chest from Clemping Church," engraved in Shaw's "Ancient Furniture." The work is of the thirteenth century—of the same date as the triforium in Westminster Abbey. A comparison of the arcading in this chest with the arches in Westminster would suggest the conclusion, in itself probable, that furniture lagged behind architecture in period of development. The Glastonbury chair, though simple and with little ornament, comes down to a comparatively late date. This work, which finds at the present moment a *replica* in almost every London shop that affects the Gothic, is not earlier than the beginning of the reign of Henry VIII.; in other words it dates no further back than the sixteenth century. Of the preceding century there are well-known examples, both in England and in France—among which should be enumerated the remarkable chair and sideboard of St. Mary's Hall, Coventry. In these examples we bid good-bye to the austere and bald styles too frequently now copied with aggravation, and have in their stead a full and free ornamentation, compounded of arches, quatrefoils, and foliage. The comparative paucity of Early Gothic furniture has naturally set people on the search for foreign examples, and our designers, as our architects, have from France supplied gaps and deficiencies in historic developments. The Hotel Cluny is specially rich in Gothic woodwork. Shaw has copied from a MS. in the Imperial Library, Paris, a buffet of the fifteenth century, of the superlatively ornate style now seldom seen, save in the designs of Pugin. Du Sommerard, in his "Arts of the Middle Ages," engraves a noble episcopal chair of the fifteenth century, which bears on its back a grandiose composition of the Madonna in glory. Also, he publishes, of the same century, a "buffet," or "dressoir," for the exposition of relics—a work in design and execution of utmost finesse and delicacy. The stalls in Amiens, are as woodwork not surpassed in the whole world. Examples might easily be multiplied from Viollet-Le-Duc's volume. Altogether our Gothic revivalists have much to learn from France. It is, indeed, generally admitted that French Gothic furniture was supreme in delicacy of detail and finished execution—just the qualities which may best correct the rudeness to which it is the pleasure of our English designers now to revert.

I can scarcely conceive a task more agreeable for a gentleman of means, taste, and leisure than to set himself to the consistent decoration and furnishing of a Gothic villa. He will thus pleasingly exercise and extend his historic reading and knowledge of England's national Art. Not a few persons of cultured intellect, moved by ideas which range beyond common routine, have given themselves to this domestic dilettanteism. To artists especially the sphere thus opened to original conception and pretty conceit is peculiarly congenial and tempting. The knowledge painters possess is sufficient to save them from mere shop products. They can make their household furniture portions of themselves, creatures of their own brains. And when, as often happens, a brotherhood has grown up, one artist can design the wood, another paint the panels, and another contrive the metalwork. Such instances are known to exist, and I trust it is no violation of confidence to adduce examples which have come directly or indirectly to my knowledge. It is scarcely a secret that the Messrs. Skidmore were engaged by Mr. Birket Foster to execute for his house sundry articles of Gothic furniture, and we have seen both at Messrs. Hart's and Mr. Wilkinson's photographs of a piano designed for the same artist by Mr. W. P. Burton—the panels to be painted by an artist friend. The design of a bed, we believe, was suggested by a cot wherein lies little Nelly in the frontispiece to "Old Curiosity Shop" It will be remembered that the exhibition of the Water-Colour Society a year ago contained cherubs' heads, painted by Mr. Burne Jones for a piano which now adorns his dwelling. Several Gothic pianos may be met with in art factories, and among others is one specially rich with inlays now at Messrs. Erard's, part of a suite of Gothic furniture designed by Mr. C. Bevan for Mr. Titus Salt. This costly piano has decorative material and bright colour, after the manner of the ancient *tarsia*. The woods now used in like works, at Messrs. Herring, for example, and elsewhere, consist of satin wood, pollard oak, tulip wood, purple heart, hare wood, &c. Embossed and illuminated leather carries out the enrichment consistently; and sometimes in sideboards and bedroom furniture encaustic tiles are appropriately introduced. Such combinations may be seen at Mr. Seddon's. This treatment tends to take from Gothic its nakedness and barrenness. Works thus wrought become articles of luxury. A suite of Gothic furniture, prepared by Messrs. Cox and Son for a gentleman in the Temple, may be quoted as an example of the style deemed the right sort of thing for the *elite*. The material is polished deal; the period Early English, as marked by simple trefoil arches and corresponding detail. The chamfering and notching are picked out in brown and other colours, heightened with gold where enrichment is specially desired. The coal-scuttle, fireirons, fender, and grate, ewer and basin, are designed in keeping with the period. The iron receives appropriate enamel decorations. Pugin's great principle of honest and visible construction has been observed throughout. Messrs. Harland and Fisher also give themselves with success to the design and manufacture of Gothic furniture and fabrics. Specially would we mention a mediæval carpet, the pattern whereof has been taken, on the suggestion of Mr. Burges, from a painting by Van Eyck. The tone is low and rich, as of ancient pictures on old glass. This is a point which Gothic people prize. In our search for novelty and originality we have come again and again upon the name of Mr. Burges. This well-known architect has played a prominent part in revived art manufactures after the Gothic style. The cabinet designed by him and decorated with grotesque paintings illustrative of the "Battle of the Wines and Beers," exhibited in the Mediæval Court, in 1862, and now in the Kensington Museum, has since obtained not a few imitators. The confidence implied in social intercourse alone prevents us from describing interesting and valuable Gothic works, in wood and the precious metals, familiar to us in the chambers of Mr. Burges. This sketch of what is doing were incomplete without mention of a Gothic piano and cabinet, which reliable rumour tells us have been painted in characteristic devices by their owner, Mr. Marks, an artist whose pictures in the Academy are mostly accentuated by mediæval quaintness and directness. The panels of the piano are sacred to serio-comic muses, and a fish swims out at one end, and a beetle crawls in at the other. Up the legs of the cabinet, it is said, curious creatures creep. On these works may be read, "John Marks made me." To show how wide is the diversity permitted to Gothic

* From the *Art Journal*.

rniture, we may quote as a concluding example cabinet executed by Mr. Crace. Instead of int, is an inlay of woods. The forms are re-ed, the details delicate, and the whole compo-ion has an elaborated Gothic beauty which ıgin would have loved. Such work cannot be eap; the cost is said to be over £300: but ough beauty is often no dearer than ugliness, a ırk of Art must always be estimated not by its cuniary cost but by its real artistic value. ch things cannot be subjected to mere com-ercial considerations.

J. Beavington Atkinson.

REPORTS ON PUBLIC WORKS.

HE chief engineer of the Thames Embankment has just presented his usual report on the pgress of these works, from which it appears that regards the portion of the Northern embankment lween Westminster and Waterloo Bridges, 16ft. of the low level sewer, 2,477ft. of subway, 25ft. of small drains, and 320ft. of the West-istsr steamboat pier have been constructed. stward of the pier 720ft. of the river wall has n brought above Trinity *datum*, and 115ft. of t parapet formed thereon. Progress has also n made with the Charing cross steamboat pier l the Adelphi landing stairs. The works in nection with the Waterloo and Whitehall Rail-y tube are proceeding, and works have been cted to the value of £1,200. The total value works done under this contract amounts to £6,826 As regards the contract between Vterloo Bridge and Temple Gardens, satisfactory gress has been made with the Temple steam-b pier. The river parapet has also progressed, the total value of the works completed, £3,017. The Abbey-mills pumping station is going on in a satisfactory manner, the boiler-ses are being put together, and excavations to extent of 36,500 cubic yards have been made, 2,184 rods of brickwork laid. As to the Sthern embaukment, the works are proceeding t satisfactorily, and the total amount of work pleted is of the value of £100,000, of which £00 represents the progress made in the past th. Last week a return was issued of the and prospective outlay for fortifications at Psmouth, Plymouth, Pembroke, Portland, Gresend, Medway and Sheerness, Chatham, Der, and Cork. The total estimated cost of the ks was £6,995,000; the amount expended up to ne beginning of the present year, £3,491,872; the number of guns that will be required, about 2,0; the estimated cost of armaments for the ks, £1,883,722; number of artillerymen, 9,841; ber of infantry, 22,441; cost of land, £64,761; total expenditure to beginning of the ent year, £4,556,633; and amount required to mplete, £2,438,367.

Building Intelligence.

CHURCHES AND CHAPELS.

e church of St. Michael, Trowley, has lately e restored under the superintendence of Mr. Clarke, F.S.A., at a cost of £3,596.

resident Roman Catholic lady, has, it is said ribed £1,000 towards the completion of the of the Roman Catholic church, Bath. The pi is now being erected.

new Congregational Church was opened on lay at Ashton in-Mackerfield, near Wigan. church is one of a number built out of the i-atenary Memorial Fund, and has been ed at a cost of £4,000. Upwards of £1,000 is amount has been contributed by Messrs. s, colliery proprietors of St. Helens.

Rest Hill.—The new Congregational Chapel e Stanstead-road, near Catford Bridge, was ed on the 2nd inst. It is a Gothic building, what after the Byzantine type, and will ac-odate about 500 persons on the ground the internal dimensions being 74ft. long, 5f wide, and 37ft. high in the centre. The are built of Nutfield stone, set random, and d with blue mortar. Bath stone being used e windows, doorways, string courses, and s; and Portland for the front steps. The is waggon-headed in form, divided into by the principal rafters, purlins, &c., and is boarded diagonally, and varnished; the centre board of each panel being ornamented with various designs stencilled in oil. The roof trusses are strengthened by cast-iron ornamental arched ribs finished ultramarine; some portions being relieved with vermillion and gilding. The pewing is open, of selected yellow deal sized, and twice varnished, but not stained. The total cost of the building is £3,150. Mr. Fuller, of Finchley-place was the architect, and Messrs. Staines and Son of Great St. Helens, the builders.

Ireland.—A new series of schools, from the designs of Messrs. Pugin and Ashlin, are about to be erected for the Christian Brothers, at St. Paul's, Dublin: and the same architects are also engaged on the following works:—Churches at Tralee, Ballyhooly, Brosna, Skibbereen, Ferrybank, Strodbally, and Carrickbeg. Convents for the Christian Brothers at Drogheda, and Westland-row, Dublin. A domestic chapel for — Power, Esq., Bellevue, County Waterford: and the restoration of the chauntry of the Earl of Westmeath, County Westmeath. A chapel for the Sisters of Mercy at Cloriakarty, and an orphanage for the same order at Kinsale.

Stratford.—On Thursday week the new Congregational chapel, which Messrs. Myers and Sons have been engaged the last few months in erecting in the Grove, Crescent-road, was opened for public worship. The chapel is from the designs of Mr. Rowland Plumbe, Tokenhouse-yard. It is in the free Italian style, and is built of white and yellow brick and Bath stone. The front consists of a bold portico, which has eight columns running from the basement to the top surmounted by carved capitals and a massive entablature and pediment. On the east is a tower surmounted by a stone spire carried up to the height of about 130ft. The building is capable of holding 1,500 persons. It contains a fine organ by Messrs. Bevington and Sons. It is estimated that the cost of the entire undertaking exceeds £13,000.

The Borough.—New Synagogue.—The members of the Jewish community have erected in Albion-place, Walworth-road, a new synagogue which was consecrated on Sunday. The building is in the Italian style, the front being a substantial portico of the Doric order. Two doors from the vestibule give access to the floor of the synagogue, which is calculated to afford accommodation for 200 or 250 persons. In the centre, occupying the whole breadth between the aisles, is the platform on which the service is performed. The reading desk is covered with a richly embroidered cloth of purple velvet, and the smaller desk placed upon it is fringed with amber silk. The steps leading to the sanctuary are of polished marble, and from the approach to a semi-octagonal recess, flanked by Corinthian pillars and covered by recessed arches, on the outer of which is the inscription, "Know before whom thou standest," in Hebrew; the interior being roofed with amber glass, which sheds a mellow golden light in front of a rich curtain of purple velvet, on which is embroidered a gorgeous wreath of gold surrounding an inscription in Hebrew, embodying a prayer that the Lord would hear worshippers in the house, the whole being surmounted by a jewelled crown. The galleries which run along the two sides and the western end of the building are supported by light iron pillars, and, like the platform, are surrounded by an ornamental iron railing in a framing of varnished deal. The ceiling is divided into coffers by richly ornamented beams, which are supported upon trusses. The galleries will accommodate about 200 ladies, the whole synagogue thus affording room for about 450 persons in all. Adjoining the synagogue, which is placed diogonally on its plot of land, are the houses for the ministers, and a school for 150 boys, with suitable accommodation for teachers, &c. The whole work has been designed and superintended by Mr. N. N. Collins.

Worcester.—The parish church of St. Nicholas has undergone restoration, and was reopened on Monday. The alterations were to some extent those suggested by the architect, Mr. Hopkins, who proposed to extend the edifice eastward, to enlarge the chancel, and to remove the organ from its present position in the west gallery to a chamber at the east end. Mr. Hopkins also designed and recommended an open roof, but none of these suggestions were carried out. However, the church has been entirely reseated, the gallery front and the pews being removed, the roof renovated, and the windows reglazed, &c. Messrs. Wood and Son, of Worcester, carried out the contract.

BUILDINGS.

Following the praiseworthy example of Mr. Peabody, Mr. A. T. Stewart, the great dry goods merchant of New York, has purchased a large plot of ground in New York for the erection of houses for the poor.

Burslem.—The corner stone of the New National Schools at Sneyd, Burslem, was laid last week. The new building will consist of boys school 60ft. by 20ft. with class-room 20ft. by 12ft. The girls school will be 50ft. 20ft. with class-room or infants school 20ft. by 15ft. Accommodation will be provided for about 400 children. The cost of the building, fixtures, &c., will be about £1,400. The building will be of red and blue bricks, and covered with ornamental tiling, surmounted by a bell turret. The architect is Mr. Dain, and the builders are Messrs. Bennett and Brindley. The Earl of Macclesfield has generously given the site which is in Nile-street.

Calcutta.—After four years' discussion the foundations of the Imperial Museum and the Calcutta University have been laid. The University will make College-square worthy of its name, and be an ornament to the northern or native section of Calcutta. The museum will worthily occupy the finest site in Chowringhee—in front of the Small Cause Court. It is estimated to cost £80,000. It will be as large as the Natural History department of the British Museum. With an imposing frontage of an Italian style, the building will stretch back in long galleries around a quadrangle which may afterwards be covered in and form a room as fine as the reading room of the British Museum. The rooms will be unusually lofty for the accommodation of the requisite galleries. One side will be devoted to the Geological Survey and Museum, and the other to the collections of the Bengal Asiatic Society, which form the nucleus of the new museum. Mr. Granville and the builders must not throw away this opportunity for giving the finest site in Calcutta an appropriate public building.

Cambridge.—The new building erected for the Cambridge branch of the London and County Bank was opened recently. The building, which is in the Tudor style, is built of white brick with Bath stone dressings. It is 60ft. in height, and has a frontage to Trumpington-street of 49ft. and 85ft in Bene't-street, the main entrance being at the corner of the two streets, the banking room is 39ft. each way. The architects of the building, which it is estimated will cost about £10,000, are Messrs. Francis Brothers, Old Broad-street, London, and the builders, Messrs. Myers and Sons, of Lambeth.

Macclesfield.—A new infirmary is about to be built at Macclesfield, it will be a plain substantial building and will cost about £12,000. Alterations and additions to the town-hall in the above town are also to be forthwith commenced at a cost of £5,000. Mr. James Stephens, of Macclesfield and Manchester, is the architect selected to carry out both the above-named works.

General Items.

Last week the first church bells founded in Birmingham for upwards of a century, were run into their moulds at the manufactory of the Messrs. Blews, in New Bartholomew-street. All other kinds of bells are made in Birmingham by tens of thousands yearly.

The removal of another City church is intended — the church of St. Mildred, at the eastern end of the Poultry. For many years past it has had no congregation. By the removal of the church a large space will be obtained for the improvements which have long been required in that neighbourhood.

The Lancashire and Yorkshire Railway goods warehouse at Huddersfield has been burnt to the ground. The pile of building was one of the largest and finest in the town, and the damage is put down at £70,000. The cause of the fire is not stated.

The peal of bells for the new Townhall clock, Preston, have now been fixed. The large or striking bell weighs 4 tons 15 cwt. 3 qrs., and the cost is about £7 per cwt. The bell gives out a fine powerful sound.

Among the new American improvements for the manufacture of gas, may be mentioned that of introducing petroleum with lime water into the retorts when charged with coal. It is claimed that the cost of the gas is 30 or 40 per cent. less when made in this way than made with coals only.

A Pike's Peak miner, writing to a Minnesota (U.S.) paper, says the miners are much discouraged in that region. "They have to dig through *a solid vein of silver four feet thick* before they reach the gold." We sympathise with them.

The ancient Castle of Pfeffingen, known to Swiss travellers as one of the most picturesque ruins in Switzerland, has lost its principal tower, which fell to the ground on the 22nd. ult.

The surveyor of the Board of Works under the Government, has given instructions for taking down the houses on the western side of St. Martin's-le-grand, at the southern end, for the purpose of clearing the ground for the enlargement of the site of the General Post Office. The Post-office authorities have paid into the hands of the City Commissioners of Sewers the sum of £12,650 for the land in Newgate-street required for the purpose, and most of the tenants of the entire block have been compensated, so that the work of clearance will now proceed without delay.

At a recent meeting of the Association of Foremen Engineers, it was resolved to hold the institutional meetings in future at the London Coffee House, Ludgate hill, instead of at the Parr's Head, Doctor's Commons. Mr. Cleminson read a paper on the "Tractive Power of the Locomotive Engine." He described the pecularities of the various descriptions of locomotives at present in use and, commended that known as "Fairlie's Patent," as best available for steep gradients and sharp curves, now so much introduced in new lines for the sake of economy. An interesting discussion followed, in which Messrs. Haughton, Stabler, Keyte, Fishwick, Sykes, and Mr. J. Newton, the chairman, took part. The question will be rediscussed at an early future meeting.

The Directors of the Halifax Permanent Benefit Building Society are to be congratulated that they have successfully passed through their first cycle or period. The report and balance sheet, as read at the annual meeting held at Halifax last week, show that during the year the sum of £8,069 7s. 10d. had been paid to 50 members, whose shares had thus been completed. The receipts for the year had been £93,419 10s. 9d., showing an increase of 120 members and 186 shares upon last year. The total number of shares taken up since the establishment of the society was 17,264, and the total receipts £448,778. Though £365,866 has been advanced by the society on security of land and buildings, yet there has not been a loss of a single sixpence to the society.

A dinner was given on Saturday last, by Mr. Gilbert Scott, to the men engaged at the Prince Consort Memorial, as an expression of his satisfaction with the manner in which the work has been carried out. Mr. Kelk's manager of the works was commissioned to provide a suitable dinner for the men. The repast consisted among other good things, of roast beef and plum pudding, cheese, pipes and tobacco, with ale and porter *ad libitum*. After dinner, Mr. Coad, inspector of the work under Mr. Scott, was elected to the chair, when toast and song went the round. Among the toasts proposed and heartily responded to, were the healths of Mr. Scott, the architect, Mr. Kelk, the contractor, Mr. Coad, and Mr. Cross, the manager of the works. The proceedings terminated at an early hour, when the men departed, one and all acknowledging that they had spent a jolly afternoon.

After the many evidences of capricious taste recently exhibited by ladies in their high heeled boots, their expanded skirts, and long dresses dragging in the dust or mud, their fantastically small bonnets, and their ludicrously big chignons, we are not surprised to hear that small gutta percha ears are now worn by ladies whose ears are coarse and excessive, the natural ears being easily concealed under the heavy masses of false hair now so much in vogue. It looks as if fashionable ladies entertained an unconquerable hatred of realities. They are become so accustomed to shams in dress, that they shrink from no absurdity, hence the new fashion of false ears. Mr. Ruskin maintains that shams in architecture impairs national life. Query: Can ladies indulge so extensively in fashionable falsities without becoming hollow-hearted.

On March 23, there was a large fire in New York, destroying the Winter Garden Theatre, the Southern Hotel, and several adjoining buildings.

A few items of general interest reach us from New York. With the beginning of mild weather building operations have been commenced in New York, surpassing in extent those of any former period. Something like eight million dollars will be expended in new buildings, among the handsomest and most costly of which may be named the American Jockey Club House, A. T. Stewart's dwelling house, the new *Herald* office, and the Metropolitan Savings' Bank on the Bowery.—One by one the old landmarks of New York are disappearing. Fast on the heels of the cutting-down of the old stuyvesant pear tree on Third Avenue, came the destruction of St. John's Park, and now the Astor House, a building almost historic, so long and universally known, is to be vacated by the Stetsons, and altered for stores and offices. This last is, undoubtedly, good in a commercial view, for no building in the city will yield so large a revenue.—A new winter garden is be at once begun on the site of the old one. It is believed that the losses incurred by the destruction by fire of the old building amount to 250,000 dollars, and the risks are divided among a hundred insurance companies.—In shoeing horses that are employed upon the pavements of Boston, a cushion of india-rubber has of late been placed between the shoe and the hoof, with very satisfactory results.—The building which has for many years been the great meeting place of the American democratic party, Tammany-hall, has been sold for 150,000 dollars, and is about to be converted into a newspaper office.

Last month a bill passed the United States House of Representatives, authorising the Commissioner of Patents, to appoint from time to time such additional principal examiners and first and second assistant examiners as may be required to transact the current business of the Office with dispatch, not to exceed four additional of each class; also, a solicitor of the Patent Office, with a salary of 3,000 dollars, and fixing the salary of the first assistant examiner and disbursing clerk at 2,000 dollars, and the librarian (who also acts as translator) at 2,500 dollars. This measure will secure for inventors a more prompt and energetic disposal of their cases.

Obituary.—Among the obituary notices of the past week, the decease of a distinguished naturalist is announced — John Prideaux Selby, of Twizell House, Northumberland, aged 87. Mr. Selby was the author, among other works, of a superior work on British Forest Trees.

NOTICE.

Friday next being Good Friday, *the* Building News *will be* PUBLISHED *on* THURSDAY, *the* 18*th inst., at the usual time. Advertisers are, therefore, respectfully requested to forward all Communications not later than* 5 *o'clock on* WEDNESDAY *evening.*

TO CORRESPONDENTS.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the Editor, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Wednesday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

Received.—A. G.—W. L.—T. R.—M. and Co.—H. W.—J. J.—O. N. S.—W. H. C.—F. U.—J. B. L. L.—H. W.—W. E. L.—W. H. R.—E. W. G.—S. and M.—J. F.—P. H. N.—J. and T. H.—W. H. L.—R. H. B.—J. H.—E. W. J.—J. W.—J. and Sons.—J. E.—C. F. H. and Sons.—W. G.—M. and Co.—W. S. H.—H. and C.—W. F. J. W—F. E.—C. J. A. D.—T. T.—M. T. S.—H. G.

R. B. (Glasgow) is thanked for his letter.

Architects' Pupils.—"Adelphi" will answer "Subscriber" next week.

W. H.—You should write more legibly, and particularly proper names.

W. B.—Yes, Mr. Tite was president of the Institute before. Of course there is no rule to prevent him or anyone else being re-elected.

Correspondence.

MANCHESTER TOWNHALL COMPETITION.

To the Editor of the Building News.

Sir,—In reply to a "Member of Council," I submit that notwithstanding that some men, "eminent in the profession" may not so consider it, the offer of the Council is, though perhaps not comparatively, still in point of fact, a "niggardly offer;" for no direct premium is proposed for a vast amount of work in the first competition, while the second competition—for the labour in which alone the pecuniary terms might suffice—is an obnoxious scheme, in consequence of the preliminary exposure of the competitors' "trump cards" which it entails. This, whether intended to be unfair or not, is manifestly open to be so made; and although I will not cast a doubt on the asserted purity of the motives of the Council, the profession cannot forget the curious coincidences, to say the least, by which in each of the Great Manchester Architectural Competitions the prize, in each case, fell to men who were not only Manchester men, but said to be related to the Chairman of the Council. Now, Manchester may, of course, have really engrossed all the talents, and that any but such was not the critical verdict of the time; and that any but a Manchester man, with or without friends on this Council, should prove victor on this occasion, *credat Judæus*. Your correspondent, however, who has considerable means of judging of the view of his professional brethren, is able to state that his opinion on the subject is shared by all those whom he has met, and he believes that the result will prove it to be so. A strike of the architectural profession against this ruinous and degrading system is urgently needed, and it only wants combination on their part to put it down as effectually as has been done by the sculptors. Let all "the eminent men" shelve such offers in special pigeon-holes of their bureaus devoted to "*insults*," and leave it to clerks out of employ to respond, and we should soon hear the last of them. Depend upon it, such would be the course adopted by the members of any other trade or profession who were asked to expend sums nearly equal to the value of the work proposed, in order to save the committees the trouble and responsibility of selecting, *and giving proper instructions* to one among them to carry them out.

I am, &c.,

"One of the Tail Tips &c."

STAINED GLASS.—A NEW PROCESS.

Sir,—An entirely new invention needing some explanation, and thinking it not unlikely that some notice will be given in your invaluable publication of the stained glass exhibited in the Paris Exposition this year, I venture to call your attention to and briefly explain the nature of some specimens I exhibit, catalogued Group 3, Class 16, No. 13. This refers more particularly to a window in the testing house in the park, which, while presenting translucently the ordinary effect of stained glass, the design will be found to be traced in gold and colour, so that when it is illuminated on the inside it is still an object of decoration, though the light of day has ceased to permeate it—a desideratum when you consider how unsightly stained glass windows usually are, viewed internally by artificial light. The heraldry of the window in the testing house will be found on inspection to be treated in its proper colouring, both for the day and night effect. Another example of my invention, suitable for ecclesiastical purposes, exhibit in the grand vestibule of main building in which, opaquely, the figure of a saint is treated in gold on a red screen, though, owing to some mistake, it is not catalogued. There are two processes by which I produce this novel effect. The one exhibited consists of a permanent mosaic of coloured pot metals without leading, the junction or edges being covered by the figure or design traced in gold or colour, and protected from atmospheric influence by an external glass, the whole cemented into a metal frame of convenient sized panels, partaking of the nature of ordinary saddle bars. Another, and perhaps preferable method, is to contain the mosaic between two external sheets of glass. My excuse for troubling you being the interest you take in the progress of decorative art, I am, &c.,

Philip H. Newman.

46, Rathbone-place, April 6.

THE "PUGIN ROOF."

SIR,—Among others, I have visited the Church of the Franciscans at Peckham, it having been set before us as a model by the anonymous writer in the *Westminster Gazette* and the *Standard*; and being also curious to see what was described in the communicated account of the opening of the church as a fine specimen of the "Pugin roof." I find simply an unflattering version of the roof originally designed by me in competition with Mr. A. Pugin and others for the Catholic Cathedral at York in 1859. Plagiarism is common enough, not so, however, a boastful calling-attention to its result. This latter fact induces me to ask you to publish the circumstance.—I am, &c.,

S. J. NICHOLL.

126, Marylebone-road, April 9, 1867.

Intercommunication.

QUESTIONS.

[334.]—REPAIRS.—In the Metropolitan Building Act, part 1, section 9, it is stated that any alteration or addition to old and new buildings, except that of necessary repairs, shall be subject to the regulations of the Act to the extent of such alteration or addition. Now, supposing I have a house, the length of the wall being 35ft., and the height 40ft., the Act requires the two topmost stories to be 8½in. thick and 13in. below; but in the event of my wishing to add another story at some future time how does the Act apply? If the extra story is considered as an addition, according to section 9, the Act appears to allow of it being built, but if the house with the story added is taken as a whole (the height of the building being increased) the old walls will not be thick enough to conform with the table of illustrations on page 11 of the said Act. I should be glad if any of your readers can explain this apparent contradiction, and also whether the Act would apply in an equal measure to a room formed in the roof? J.

[335.]—GIRDERS.—I will feel obliged if "L. P. C." will show me, by common multiplication and division, how to find the required dimensions of a wrought-iron box girder, a lattice girder, and a cast-iron girder, the width of opening 35ft.; also the weight each will bear, and the safe load for each? If "L. P. C." can inform me of any work on the above similar to a Ready-reckoner, so that one might see all at a glance for any required girder, I shall be extremely obliged. F. H. L.

"A Ready-reckoner" for engineering would be the destruction of the profession, and is simply an impossibility. I will, however, endeavour to give your correspondent as much information respecting the subject he asks for as can be done in the space at my disposal. He has not, however, given one important item in the calculation, viz., the load the girder is intended to carry, for a girder of 35ft. span can be made and proportioned to bear any amount of load. Supposing, however, that we wish to construct a cast-iron girder of the above span to carry 1ton per foot run, which is a usual assumption in railway work, the first thing to find is the amount of metal, or the number of square inches at the centre of the girder, as this is where the tendency to fracture is greatest. Let the depth of the girder be 3ft., and supposing we put one-sixth of the crushing weight of cast iron upon every square inch of 7 tons, then to find the area at the centre we have the following equation, $A = \frac{W \times L}{8 \times D \times 7}$, or in words, multiply the total weight in tons upon the girder by the length in feet, and divide the product by eight times the depth multiplied by the number of tons put upon a square in. of the material. In the present instance, the operation is as follows:—35 × 35 = 1225, and dividing this by 8 × 3 × 7 = 168, we obtain $\frac{1225}{168}$ = 7·3 square inches. This is the amount of metal required in the top flange of the girder, and since the bottom flange must be to the top as 6 to 1, we shall require 44in. in the latter. The girder in elevation should be of a parabolic form, or otherwise there will be an enormous waste of metal, as it is manifest that the same amount of metal is not wanted near the ends as at the centre. From this example "F. H. L." may see that it is out of the question for me to answer the rest of his communication, as I have already trespassed upon your valuable space to a very considerable extent. The rules for wrought-iron girders are not quite so simple, as I cannot be learned or applied in the slap-dash manner your correspondent thinks. If "F. H. L." wishes to be further informed upon the subject he may forward me his address. A wrought-iron girder with the same amount of metal in the flanges, will be five times stronger than a cast-iron, since the tensile strain of the former material is much greater than that of the latter, and also a greater percentage of it may be put upon one square inch of weight than of cast iron.—L. P. C.]

[336.]—SKYLIGHTS.—In my letter which appeared in the "Intercommunication" column of the BUILDING NEWS of the 22nd ult., the word lap is taken as caps, thus rendering my inquiry almost unintelligible. Perhaps the writer is not so distinct as it should be, however, I should be much obliged if you would kindly correct the error, as I have no doubt it was owing to the above that no reply appeared in your last week's issue. ENQUIRER.

[337.]—MARBLE LETTERING.—Their was a question some time ago that I should have been glad to have seen answered; it was the proper mixture of black to be used for painting the letters on marble and stone in cemeteries, to stand the weather. I should also be obliged if I can be informed of the best cement and cement to be used among black and gold marble?

J. NORTHERN.

[338.]—FREEHOLD LAND.—Can any of your readers inform me whether there is a society formed that will buy for you, wherever you like, freehold land, by the payment of so much per month as purchase money; and if so, where situated? G. M.

[339.]—FREESTONE.—Will you favour me by answering these questions:—Is Clipsham old freestone the strongest freestone in England; and is it the best stone to stand the weather as a freestone? BUILDER.

[340.]—BRICK VAULTING.—Would some generous reader of the BUILDING NEWS inform me the manner of finding the proper shape of the bricks at the groins, and how they bed and bond with each other, supposing no groining rib is employed? P. L. EASE.

[341.]—SEA WALLS.—In the article on docks, in last week's BUILDING NEWS, a reason is given for building dock walls with a curved batter. Perhaps some of your readers will inform me whether any advantage is gained by giving the same curved batter to sea walls, which the sea seldom reaches, except in gales, when it dashes up it in some parts? J. T.

[342.]—CARVING.—Would some of your readers advise me as to whether a practical knowledge of stone carving is likely to be serviceable to an architect, and if so, how I am to proceed to acquire that practical knowledge? J. T.

[343.]—RIDGE TILING.—Can any of your readers tell me what is the best description of material for bedding and pointing blue Staffordshire ridge tiling when used to a slated roof? IMPROVER.

[344.]—COLOURING CEMENT.—Could any of your numerous readers inform me, through the medium of your paper, the means of colouring Portland or Roman cement various colours, such as black, red, blue, &c.? I want it to stand all weathers, and not run or stain Bath, Portland, or other stone. As I have ornamental insertions cut in the plain face of stone about ⅜in. deep, and it has to be filled in in various colours, perhaps some of your readers know something that would answer better than cement coloured. J. P. S.

[345.]—BATH STONE.—I regard it almost as a national calamity that Bath stone, which so frequently possesses so many excellent qualities, should in so many instances decay. I have frequently seen two stones side by side in the same building, when one of them is perfectly sound and the other falling to pieces. I want to know whether this arises altogether from different structures of the two stones, or whether the difference in any way arises from the manner of cutting the stones? J. P. G.

[346.]—BRICK WALK.—Will some of your readers be good enough to give a little insight on the measurement of brick walk footing walls, chi-breast arches, &c.; also the proper way of booking the same as per ruled margins, &c.? A. S.

[347.]—DISENFECTANTS.—I should be obliged if any generous reader would inform me of the best disenfectant for rooms or houses where small-pox exists. HYGEINE.

[348.]—LITHOGRAPHY.—I am a pretty good draughtsman on paper, and also on wood, and should like a little information on the manner of putting drawings on stone in ink and in chalk. I wish to know how to prepare the stone, and also how to prepare the ink, so as to prevent the latter from running. Any information on this subject would be appreciated by yours, I'LL TRY.

[349.]—ARCHITECTURE AND GEOMETRY.—I would feel greatly obliged if you would let me know, through the medium of your paper, where I can receive lessons on architecture or geometry, either privately, or in a class.

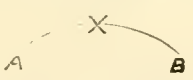
A LONDON STONEMASON.

[350.]—BLUE LIAS LIME.—Any reader who has a few minutes to spare, and a disposition to inform an inquiring brother, would oblige by informing me of the best means of telling blue lias or other limes. APPRENTICE.

[351.]—THE ANASTACTIC PROCESS.—I see in the last number of the *Ecclesiologist* an engraving executed in the anastactic process. I am not charmed with the style of execution, but as it looks different, as it certainly bears a different name, I, and perhaps others, would like to know something about the *modus operandi*. JACK.

REPLIES.

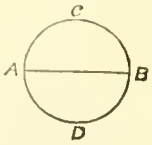
[317.]—RADIUS OF A CURVE.—You made a mistake in representing my solution of that query. There were three points in the curve given by "B. N.," marked



I desired him to bisect A × and × B, and to continue the bisecting lines till they met in the centre of the circle (you say bisect A B). Zero is under a mistake, the angular lines are not given as tangents. W. B.

[318.]—FRONTAGE.—I must apologise for not expressing myself more clearly, I refer to party structures, and beg to lay a case before "J. J." The act says "The projection of footing on each side of wall shall be at least equal to one-half of the thickness of the wall at its base." B having refused to allow A to touch his ground, A requiring to carry up an 18in. wall, starts his trench at the exact boundary line, thereby setting his wall back, and losing 1ft. 2in. of frontage. B shortly afterwards sells his plot to C. C, wishing to build a wall same as A, proceeds in the same manner, losing, as before, 1ft. 2in. of frontage, thereby leaving a space of 2ft. 4in. between the party wall. What I want to know is, would the authorities object to the footings being all on one side of the party wall, under the circumstances; or whether there is any remedy, as a refusal would utterly destroy the value of many frontages in towns, or of estates set out by the various land societies. A.

[322.]—As 113 : 355 so is 1 diameter to 3·14159265358979 circumference. Truth and 1ft. + to 3·14159265358979 = 4·14159265358979 . ∴ A C B D



+ ·318309 = A B 1·318306216001512465 11 length of diameter required. WHEILDON, Birmingham.

[327.]—DISCOLOURED BRICKWORK.—The speckled and rusty front of "R. B.'s" house is only one of the many hundreds similarly circumstanced. It is very remarkable that men of common sense will allow themselves to be cheated and deluded by tricky workmen, practising their daily labours by "tuck pointing," which, if done ever so well, is really nothing but worthless sham work. A man might as well get the buttonholes of his coat worked with coloured threads, and call it beautiful, as to harbour sham tuck pointing on his walls. Our forefathers pointed their brick walls with the same mortar it was built with, some of which are extant now. We have far better means than they had, and why should sham work be longer tolerated? In "R. B.'s" present case, I would, however, recommend him to scrub off all the "colouring," and give the brickwork two coats of strong muriatic acid wash, afterwards washing off same with clean water. REALITY.

[327.]—In answer to "R. S.," burnt umber, yellow ochre, turps (ground), then placed into the copperas fluid to the quantity and tint required. J. S.

[328.] — DEODORISING EFFLUVIUM FROM DRAINS.—Let "B. M." throw down chloride of lime continually in his drain, the chemist will tell him how to mix it. I would recommend "B. M." to ascertain if his siphons are defective, if they are void of water it will account for the bad odours ascending. REALITY.

[329.]—ETCHING.—"Ambition" wishes to know how to use his materials for etching; go to a bookstall and try to buy a book on the subject. I have, as a general rule, adopted the above plan when I wanted to succeed with anything, and would recommend "Ambition" to go and do likewise. R.

[Edward Wimbridge's answer to "Ambition's" question in our next.]

[330.]—TILE ROOFING.—To "A Subscriber," bed your tiles in cement, or well prepared fine coal ash mortar. REALITY.

[330.]—Plain tiling should be laid in good crushed mortar, the laths to be 3½in. from top to top of each tile; giving the tiles well soaking in water forms close joints, strength, durability, and proper gauge. J. S.

STAINED GLASS.

A diaphanic coloured window has just been completed by Mr. Kealey, jun., for Washingborough Rectory, Lincoln. The ground is blue, and on it are four human figures, a coat of arms, cross keys, with fancy border all round.

DODBROOKE.—Messrs. E. and S. Beer, of St. Bartholomew-yard, have just erected a painted window in Dodbrooke Church. The window—a four-light one—has been placed at the east end of the sacred edifice, and is intended as a memorial of Miss Prestwood Pearse and her sister. The talented designer was the late Mr. Alfred Beer. The subject represented is the Adoration of the Magi. In the central compartments appear the Virgin, with the infant Jesus on her lap, an angel above pointing to the star which has guided the wise men to the birthplace, and two of the eastern kings in the act of adoration. The third king—an Ethiopian—is seen in the division on the left, and Joseph is described in the division on the right. All the other figures are skilfully managed. The two Magi nearest the Virgin—one kneeling, the other standing—regard the child with loving reverence, and the countenance of the Ethiopian king expresses adoration and awe most effectively. The dresses of the Magi are splendid, as is befiting eastern princes, and the offerings they are presenting are elegant and costly-looking. Rich canopies surmount the figures. The base is decorated with Eucharistic emblems, and exhibits inscriptions.

STATUES, MEMORIALS, &c.

A statue, in marble, of Andrew Marvel, the patriot, and M.P. for Hull during the time of the Commonwealth, is now being completed by Mr. Keyworth, jun., of Hull and London, for presentation to the Corporation of Hull by Mr. Winship.

THE COBDEN MEMORIAL.—On Friday a meeting of the committee was held at Manchester. The total receipts have reached £4,693. To Mr. Marshall Wood, sculptor, £2,200 had been paid; a balance of £300 remained due to him. Other expenses would leave £2,018, of which sum £1,250 had been set apart for the Chair of Political Economy, at Owen's College, and the rest, £768, would be expended in prizes for that class. It was resolved that Mr. Gladstone, should be requested to perform the inauguration ceremony. Mr. Gladstone, we believe, is unable to attend the inauguration of this statue, which is fixed for Easter Monday, in consequence of having to go to Paris in connection with the Exhibition. The inauguration will therefore be conducted by Mr. George Wilson, formerly chairman of the Anti-Corn Law League.

WAGES MOVEMENT.

The enginedrivers on the North-Eastern Railway, resident in Darlington, on Wednesday night intimated that they would not go to work on Thursday morning. They are now on strike.

The bricklayers employed by Mr. W. Moss, contractor, in the erection of new workshops at Crewe, for the London and North-Western Railway Company, struck work on Wednesday morning. They require an advance of 6d. per day, to be equal with others employed in the locality. There is some hope of the dispute being settled.

Blackburn.—The painters of Blackburn are on strike for an increase of wages. The joiners of the same town have submitted their nine hours movement to arbitration. The strike in the iron-trade at Blackburn still continues, but the masters have got nearly full supplies of men from other towns.

Cardiff.—Trade here is generally slack, there are a number of men of all branches of the trade walking about unemployed. In addition to the dispute with the carpenters, a demand has been made by the masons, amongst which body dissatisfaction seems chronic.

Edinburgh and Glasgow.—The surface men on the Edinburgh and Glasgow section of the North British Railway, to the number of one hundred, have struck work on a question of wages. About four months ago the wages were reduced from 15s. to 14s. a week, and on the greater portion of the system the shilling was recently restored, but on the western section this concession has been refused. Hence the strike.

Hull.—It is stated that nineteen master joiners here have consented to give their men the Saturday half-holiday, and consequently a considerable number of men have returned to work. Upwards of 200 men are, however, yet on strike.

Hull.—On Monday week the joiners here "turned out" on strike. During the past week or two negotiations have been going on between the masters and the men, in reference to a demand made by the latter that they should have a half-holiday on Saturday without any diminution of pay. Last year the bricklayers struck for the Saturday half-holiday, and ultimately obtained it, and since then the joiners have been agitating the question. Last week the masters offered to pay the men 6d. per hour, or 5s. per day, the men to have the half-holiday on Saturdays; and in winter, when the days are shorter, they would pay 6½d. per hour. These terms, however, the men, at a meeting held on Thursday last, declined to accept. All the joiners' shops are now closed, except a few, where the masters have agreed to the men's terms until a permanent arrangement can be made.

Scarborough.—The carpenters and joiners' strike came to an end on the 4th inst.; the men who had been out have resumed work. They have obtained an advance on previous wages of 1s. per week, and two hours less time. The total time now being 54½ hours per week.

WATER SUPPLY.

Aberdeen.—From a final statement of accounts between the Commissioners of Police and Mr. E. Gibb, the contractor of the new Waterworks, it appears that the original contract price was £103,999; extra works had been allowed to the amount of £11,073, making £115,072; payments, to the amount of £100,100. Of the remaining sum, there was retained during the year of maintenance by the contractor the sum of £5,199, leaving a balance due to the contractor at present of £9,772. The average quantity of water entering the works daily, it was reported, had been 3,000,000 gallons, of which 2,000,000 gallons daily had passed down the aqueduct. The engineer estimated that the quantity actually supplied to the town was about 1,500,000 gallons daily; equal to 22 gallons per head per diem to a population of 68,000—part of the suburbs and higher-lying districts supplied by the upper-service reservoir not having received a supply at the date of the report. The large storage reservoir had been leaking considerably, but the quantity so leaking had been greatly diminished; and it was the opinion of the engineer that it would almost take up of itself.

The Loch Katrine Water.—"The analysis of the Loch Katrine water supplied to Glasgow," says the Registrar-General in his last weekly return, "shows 0·3 of hardness; in London, that of the New River Company shows 16·8; of the Kent Company, 20·0; of the other companies intermediate degrees never ranging higher than 18·4. The impurities in the rivers and other sources of the London supply are gradually decomposed; and although the original quantity of sewage or its equivalent was considerable, in nearly all cases, it is satisfactory to find that in the last month this matter was converted into comparatively harmless compounds. The original amount of contamination in the Loch Katrine water was *nil*.

Water for Rome.—A letter from Rome in the *Moniteur* says:—"A very important work will be commenced in a very few days; that of conveying to Rome the old Marcian water, formerly so renowned for its pure quality and the height of its level. The sources are in the town of Arsol, about thirty-one miles from Rome. Sixty millions of litres will be poured every twenty-four hours on the culminating point of the mountainous part of the city (Al Monti). The concession of this great undertaking dates from 1858. An Anglo-Roman Company with limited responsibility had to furnish the necessary funds; it could not succeed, and was replaced by an anonymous Belgian one, called General Company of the Waterworks, which completed the required capital, and offered to provide and lay down metal conduits. If no unforeseen obstacle intervenes, the water will be at Rome in two years."

LEGAL INTELLIGENCE.

Are Exchange Flags Public or Private Property?—At a meeting of the Liverpool Water Committee on Monday a letter was read from the directors of the Exchange News-room asking for a supply of water on the flags for the purpose of allaying the dust in summer and of removing the snow in winter. It proposed, either that the Water Committee itself should do this, or that it should allow them (the directors) to do it, supplying the water free of charge. A discussion ensued as to whether the flags were private or public property, several members contending that they had no right to comply with the request as this was private property, and others (including the chairman) were of opinion that the flags were public property and ought to be watered by the committee in the same way as the streets. The matter was ultimately referred to the water engineer to report upon, though that gentleman expressed himself decidedly opposed to it.

Important to Engineers.—At the Liverpool Assizes on Monday, a case of considerable importance to engineers came before Mr. Justice Mellor. The administrator of the late Mr. W. Stubbs, C.E., Liverpool, sought to recover a sum of money, alleged to have been due to the deceased as salary, from the Holywell Railway Company. It appeared that at the construction of the Holywell Railway the deceased had been engaged as engineer for fifteen months, to receive £500 as remuneration. The money was to be paid quarterly by instalments of one-fifth. At the end of the first quarter the money was paid, with £10 as travelling expenses, according to previous agreement. No more money was drawn, and at the end of the third quarter Stubbs died. It was therefore now sought to recover two quarters' salary and travelling expenses. For the defence it was urged that the deceased was engaged to do certain specified work, but he had died before the most important part of the work was done. Witnesses were called on both sides, and while on the one hand it was contended that Stubbs's services were worth £300, on the other it was urged that the £110 already paid fully compensated him. A verdict for the plaintiff was returned for £160, £10 being for expenses.

The Metropolis Building Act.—Messrs. Simms and Marten, builders, of Laurence Pountney-lane, City, appeared at the Greenwich Police-court, on Saturday, to answer a summons at the instance of Mr. Snooke, district surveyor of Rotherhithe, charged with a contravention of the Metropolis Building Act. Defendants had erected a stable, with a loft over it for the storage of hay and straw, and the question was whether they were not bound to make the walls 13in. instead of 8½in. thick. Defendants contended that 8½in. would be thick enough, but prosecutor said that such a building required 13in. walls. The magistrate held that such workshops and stables did not come within the buildings described in the Act as requiring 13in. walls. Summons dismissed.

MEETINGS FOR THE WEEK.

Mon.—Society of Engineers.—"On Pumping Engines for Town Water Supply," by Mr. H. Davey; and, if time permits, "On Water Tube Boilers," by Mr. V. Pendred, 7.30.

Tues.—Institution of Civil Engineers.—"The Suez Canal," by Colonel Sir W. Denison, 8.

Wed.—Aeronautical Society.—General Meeting for reading and discussion of Papers upon "Aerial Navigation and the Flight of Birds," 8.
Geological Society, 8.

Thurs.—Chemical Society, 8.
Linnean Society, 8.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

2206. T. DAVIS. An Improved Method of or Apparatus for Ventilating Dwelling-houses or other Buildings. Dated August 17, 1866.

The patentee claims the use in various forms and manners, as set forth, of what is here styled a "perflator," in combination with the "perhaustor," and the occasional use (where necessary) in conjunction with these of a gas-burner, or other rarefying agent, to give additional force to the current of air, so as to draw off from the room or apartment the foul, heated, or contaminated air contained therein. *Patent completed.*

2208. J. PROCTOR. Improvements in Chimney-pots or Terminals. Dated August 28, 1866.

This invention has for its object the construction of a chimney-pot or terminal that shall effectually prevent a down draught. For this purpose the inventor forms or fixes inside such pot or terminal two or more sloping plates or projections, situated at any convenient distance one above the other. These plates or projections spring alternately from opposite sides of the pot, and project upwards at any suitable angle, each one passing somewhat beyond the centre line of the pot, so that the edge of the one above overhangs the one below. At the part of the pot from which these plates or projections spring, apertures are formed in the sides of the chimney-pot, so that any wind entering the top of the chimney will be caught by and made to pass down the upper surfaces of the projections or plates, and will thus be conducted out through the before-mentioned apertures; and, in the same way, air entering through the side apertures will pass along the sloping surfaces and be conducted up, through the top of the pot, into the open air again. By making the edge of the upper plate overhang the one below, it will be evident that all or nearly all the wind will be caught and guided out, as described. *Patent abandoned.*

2240. J. H. JOHNSON. An Improved Pavement for Roads, Streets, and other Thoroughfares. (A Communication.) Dated August 30, 1866.

This invention relates to the manufacture and use of a cheap and durable artificial paving block suitable for paving roads, streets, and other thoroughfares, and consists, essentially, in the combination of three distinct elements which are so united together by powerful pressure in a mould as to form a solid block. These elements consist of fine concrete or artificial or other stone or burnt clay, in the form of a tile or slab, which constitutes the base of the block, and gives weight or ballast thereto. Upon this base is laid, while in a plastic state, a schisto bituminous compound, composed, first, of that class of mineral known to geologists as schist (preference being given to slate), which is to be employed in a powdered or finely divided state; second, siliceous sand; third, resinous, bituminous, pitchy or tarry mixture. These ingredients in any suitable proportions are to be well mixed and incorporated together whilst in a heated state, and the compound thus obtained is then readily to be introduced into the mould. In this schisto-bituminous compound, which is made to cover not only the top but also the sides or edges of the concrete or stone block, there is embedded a cast or wrought iron or steel plate cap or grating, and when cast iron is used, it is preferred to cast in chills for the purpose of hardening its surface. *Patent completed.*

Trade News.

Messrs. Clark and Company, of Rathbone-place, have received instructions to fix their patent self-coiling steel shutters to close the entrances to the new opera house, Vienna.

TENDERS.

Bath Easton.—For the addition of new south aisle to, and reseating of, the parish church of Bath Easton. Mr. Frederick Preedy, architect:—Long and Jones, £1,950; Jno. Russell, £1,742 14s.; Bladwell, £1,742; Mealing, £1,694; Wm. Russell, £1,667; May, £1,550; Rawlings, £1,540; Birth and Son, £1,532; Morgan and Lovell, £1,460; Mercer, £1,458; Hibbard and Long, £1,430; Newman and Silver (accepted), £1,422; Greenman and Son, £1,349.

Burton-on-Trent.—For the erection of public-house, stabling, &c., for Mr. C. Tull. Robert Grace, architect:—J. Lilley and Sons, £806; Copeland and Co., £781; Wileman and Wigley, £688; T. Lowe and Sons (accepted), £681; Brassington and Bolton, £675; J. Hadfield, £665.

Clifton.—For Hill's Almhouses. Messrs. Chas. F. Hansom and Son, architects. Quantities by J. A. Clark, Bristol:—Part 1. Excavator, bricklayer, mason, tiler, and plasterer. No 1. Ornamental brickwork. No. 2. Hanham stone. No. 3. Local stones. Part 1:—J. P. Stephens, No. 1, £2,851; No. 2, £2,362. Wilkins and Sons, No. 1, £2,485; No. 2, £2,385; No. 3, £2,435. Jno. Thorn, No. 1, £2,570; No. 2, £2,274; No. 3, £2,244. Beaven and Son, No. 1, £2,450; No. 2, £2,180; No. 3, £2,150. Part 2. Carpenter and joiner, plumber, glazier, painter, and ironfounder:—E. Lewis, £927; Eastabrook and Son, £888; J. C. Harris, £880. For the whole, in the various materials as above stated:—J. W. King, No. 1, £3,900; No. 2, £3,700; No. 3, £3,675. Heal and Marsh, No. 1, £3,900; No. 2, £3,559. J. Diment, No. 1, £3,718; No. 2, £3,400. Warren and Son, No. 1, £3,629; No. 2, £3,320. Davis and Son, No. 1, £3,550; No. 2, £3,470. Part 1 and 2:—Beaven and Son, Eastabrook and Son (accepted), No. 1, £3,358; No. 2, £3,068; No. 3, £3,038.

Clifton.—For the Congregational Church, Clifton Down. Messrs. Chas. F. Hansom and Son, architects. Quantities by J. A. Clarke, Bristol:—For the whole:—J. Diment, £9,082; Jno. Thorn, £7,598; J. Davis and Son, £7,560; R. Wilkins and Sons, £7,326; Eastabrook and Son, £7,296. For Part 1, viz., excavator, waller, bricklayer, and mason:—J. P. Stephens, £4,977; Jno. Thorn, £4,530; Beaven and Son, £4,243; R. Wilkins and Sons, £4,247. For Part 2, viz., plasterer, slater, painter, and glazier:—White and Richards, £925; F. Mansfield, £870; Lewis and Sons, £772; C. Hill, £721; J. Bussell, £695. For Part 3, viz., carpenter and joiner:—J. and F. Foster, £2,302; Harding and Vowles, £1,970; Davey Brothers, £1,943; Eastabrook and Son, £1,935; J. Bennett, £1,454. Accepted tenders:—No. 1, Wilkins and Sons, £4,227; No. 2, Lewis and Sons, £772; No. 3, Davey Brothers, £1,943; No. 4, Tuckey and Son (plumber), £110; No. 5, J. Williams (smith), £170: total, £7,222.

Essex.—For alterations to a house, Buckhurst-hill. Mr. J. H. Rowley, architect:—Rivett, £893; Bayes, £878; Burrows (accepted), £840.

Fetter-lane, City.—For alterations, &c., to the Falcon Tavern. Messrs. Bird and Walters, architects:—M'Lachlan, £915; J. Brown, £910; E. Brown, 895; Newman and Mann, £895; Ebbs and Sons, £884; Williams and Son, £874; Kelly Brothers, £813.

London.—For works at the House of Correction, Coldbath-fields. Mr. F. H. Pownall, architect (supplementary estimate):—Henshaw (accepted), £27,000.

Marylebone.—For purchase of old laundry at St. Marylebone Workhouse. Mr. H. Saxon Snell, architect:—Crabb and Vaughan, £132; Smyrk, £140; Williams, £145; Bunn, £150; Tatum and Stovin, £161 10s.; Harris, £173 13s.; Ewin, £192 15s.; Emanuel, £206; Bennett, £210; Blunt, £220.

Marylebone.—For the erection of hoarding and party wall of new Chronic Wards, St. Marylebone Workhouse. Mr. H. Saxon Snell, architect:—Crockett, £345; Stephens and Watson, £335; Wills, £321; Nightingale, £298; Johnson, £287; Brown, £253; Crabb and Vaughan, £229.

Redditch.—For partially taking down, rebuilding, and enlarging, church of St. Luke, Headless Cross, near Redditch. Mr. Frederick Preedy, architect:—Espley, £1,590; Scriven (accepted), £1,311.

South Norwood.—For the erection of five houses at South Norwood. Mr. J. W. Dennison, architect:—Holledge, £1,442; King, £1,422; Bell, £1,365; Fischer and Martyn (accepted), £1,100.

Wandsworth.—For brick and pipe sewers, Putney, for the Wandsworth Board of Works. Mr. J. Niblett, surveyor. Quantities supplied by Mr. W. D. Young:—Oliver and Co., £19,200; Baker and Co., £17,753 12s. 6d.; Thirsk £17,450; Wainwright, £17,400; Hiscocks and Williams, £17,400; Aviss, £17,400; Wigmore, £17,275; Robinson, £17 194; Blackmore, £17,000; Moxon and Co., £16,803; Pearson, £14,300; Harvey, £13,877; King, £13,820; Keeble, £13,100; Nott, £13,000; Mann, £12,950; Hill and Keddell, £12,900; Thackray, £11,900.

Wentworth.—For taking down and rebuilding nave and porch, and restoring tower, of parish church of Wentworth, near Ely. Mr. Frederick Preedy, architect:—Freeman Brothers (accepted), £781 10s.

Westminster.—For rebuilding the Crown Tavern, Tufton-street. Messrs. Bird and Walters, architects:—Stimpson, £2,131; E. Brown, £2,180; Williams and Son, £2,107; Newman and Mann, £2,057; Betty, £1,998 15s.; Fox, £1,970; Kelly Brothers, £1,931; M'Lachlan, £1,890.

THE BUILDING NEWS.

LONDON, THURSDAY, APRIL 18, 1867.

THE TRADES' UNIONS COMMISSION.

WHATEVER may be the result legislatively of the present inquiry in connection with Trades' Unions, one thing is evident, the labours of the Royal Commission will put the public in possession of a vast amount of information of a most important and valuable kind with regard to the organisation and the working of these combinations, in their relation to masters and men, and to the public at large. We have already noticed a portion of the evidence taken before the Commissioners, and officially issued by them, and we shall recur to it from time to time as it appears. Being necessarily of a very voluminous and blue-book character, it would be impossible to give here anything like a verbatim report of the evidence. We shall therefore content ourselves with laying before our readers a synopsis of the examination of the principal witnesses, stating, as far as possible, the salient points brought out in the inquiry. The latest batch of evidence issued deals with operative masons and operative bricklayers, and will be found particularly interesting. Mr. Richard Harnott was examined on behalf of the Friendly Society of Operative Masons, of which society he is the secretary. The society was established in 1833, and has 278 branches in England and Wales, but none in Scotland. The gross total of men in the society last November was 17,762, and its income for the twelvemonth ending the 30th of that month amounted to £17,746 4s. 11½d., the general fund in hand at the last audit being £12,334 0s. 8½d. The benefits of the society are payment of a weekly sum when out of work, for trade purposes, and funeral and sick benefits to those members who subscribe the weekly sum of 3½d. to the sick fund in addition to the 4d. a week to the trade fund. The object of the society in the trade department, as was stated, is to protect the members from all encroachments by employers, as well as to maintain the rate of wages generally. In the various lodges, when the members wish to better themselves, either by way of advancing wages, or of reducing the hours of labour, it is the rule to give the employers notice to that effect. If the employers refuse the application, the men suspend work. The witness denied that the society was constituted to compel employers to pay all workmen alike; they had no such rule. A member if he is not "a competent man," may work for lower wages than the rate which has been sanctioned for his district, but if he is a competent man he is not free so to work. If he does he subjects himself to a fine of so much a week so long as he continues to work at the lower rate, and is excluded from the society while the fine remains unpaid. The society does not recognise piece work, and any member who takes it is subject to the same penalties as the man who works below the fixed wage. Neither does it recognise overtime, except in cases of emergency, which it was admitted very often arise in the building trades. The men, however, are not allowed to work overtime without the consent of the lodge, and if a master wants work gone on with quicker than usual the men consult their lodge, and give their employer an answer in a week, the work meantime going on as usual. As to apprentices the workmen in a shop regulate the number a master may keep. If the workmen think the master has too many they complain to the lodge, and generally a delegate goes from the lodge and tells him. If the master refused to entertain the views of the men there would, the witness supposed, be a disturbance in that case, adding, however, that there had never been a suspension of labour in consequence of that. In reply to Mr. Roebuck the witness said the trade interfered with apprentices and improvers because their labour interfered with the labour of the journeymen. Mr. Roebuck then asked, "Why should you interfere with me when building a cheap house so as to prevent me building it at a cheap rate?" The witness answered, "The question is certainly rather a powerful one. I can only say the custom is adopted throughout the trade." "Therefore you," Mr. Roebuck rejoined, "for the purpose of benefiting the journeyman injure the proprietor?" To which the witness answered, "I do not know about injuring the proprietor; there are stated rules." Mr. Roebuck.—"Rules do not govern these things. Should I not, as proprietor, have to pay a good deal more money in consequence of your rules?" Witness.—"Yes, decidedly." Mr. Roebuck.—"And do you not think that would be an injury to me?" Witness.—"I do not know; perhaps it would not be so much an injury to the master as the other is to the workman." Mr. Roebuck.—"Do you think it an advantage to gain money?" Witness.—"Yes." Mr. Roebuck.—"But do you think it a disadvantage for me to lose it?" Witness.—"Yes." Mr. Roebuck.—"Therefore your rule goes to my disadvantage?" Witness. — "To that extent certainly." The society has a rule which provides that a man shall not work too fast, "chasing," as it is called. A workman infringes this rule when he does what is termed beyond the average quantity of work in a day; he must keep his work to that of others, so that they shall not have to "chase" after him to keep up to him in the quantity of work done. At the same time it was maintained that there is nothing either in the practice or rules of the society to prevent a very efficient and skilful workman making the best of his labour. The effect of the "chasing" rule witness considered was to perform efficient work. To the question:—"Supposing the case of a man who is stronger than most men, who is also more skilful than most men, and who can with perfect ease to himself produce more stonework and better stonework, say in a day, than most men can, and can do so without momentarily exerting himself, does the rule prevent a man from so working or not?" The answer was, "Certainly it does." The next question was, "I want to know whether you consider yourself a better judge of the man's capacity for work than the man himself?" To which the witness replied, "We consider that we know what he ought to do." "What do you mean by that?" Answer.—"A fair average day's work." The infraction of this rule subjects to a fine, and if the fine be not paid the man is put in the "black list," containing the names of men who have worked in opposition to the society, which list is distributed over the country, the result being that the man will have a difficulty in obtaining work until he makes his peace with the society. It was also elicited that stonemasons would not allow a professed bricklayer to lay stone at all; while, on the other hand, stonemasons do not interfere with brickwork. Each trade keeps itself to itself as a rule. It was proved that the trade had struck in August last in consequence of a labourer being put to work on stone, though the master was willing to take his work, because he had never served his time at the trade at all. The witness, in conclusion, said that they found their rules to work well; their effect has been to promote a mutual understanding between employers and employed, and to put an end to the frequency of disputes in the trade. He believed that the effect of the society had been to improve the skill, energy, and social position of the workmen. Owing to its operation there are many places where the hours of labour have been reduced to nine hours, the effect of which has been to throw more work upon the trade by increasing the number of hands to be employed, and to allow men the opportunity of leisure to attend mechanics' institutions and the like.

Mr. Thomas Connolly, a stonemason, and one of the Trades' Delegates Conference, who was present at the examination of Mr. Harnott, wished to make a statement to the Commission. His testimony for the most part was in corroboration of the statement of the previous witness. With reference to the "chasing" rule, Mr. Connolly said that the rules are made by the men themselves; they are not made for them. This rule was introduced because if an employer met with a man who combined great muscular strength with skill and gave him 6d. a day extra wages, that man got ahead of his fellow-workmen, and induced them to over-exert themselves, therefore he was directed not to exert his extraordinary power. Witness admitted that there could not be any very great difference of skill among workmen, that is skill requisite to do a building, and being asked, "Then, if there is no such great difference, why do you interfere?" witness answered "For our own convenience." "For your own profit you mean?" "Yes, those rules are made for men not for masters; we do not take masters at all into account in the arrangement of the matter; we merely look upon them as men who step in with their capital and want to get the greatest profit they can out of their capital, and we want to get the greatest profit we can out of our labour." If a non-union man working with union men were to disregard the society's rules and work as fast as he chose, the society men, it was acknowledged, would not work with him. Entering somewhat fully into various questions connected with the unions, Mr. Connolly said he thought that the society numbered about three-fourths of the masons in England, and it was so progressive that in a short time he considered there would be very few outside it, "so completely are working men beginning to see the advantage that accrues to them from the union. They can see, for example, that here in London last year and the year before we were enabled, without any sacrifice on our part, but respectfully putting our case before the employers, to advance our wages 1d. per hour—that is to say, 10d. a day. Men are beginning to understand that if they have not a good organisation and a fund at their back they may apply to their masters in vain to advance their wages." He was of opinion that if the law would protect the funds of the union, it would remove a great deal of what other people considered coercive acts upon the part of the union. With regard to arbitration he thought an arbitration board, such as Lord St. Leonards suggests, would be a useful thing, though he would not make the board's acts binding. Referring to the last strike in London, witness said he knew that they would have been very glad to have abided by whatever decision the arbitrators came to in that matter; but he still thought that those strikes in London, though they cost the men a great deal of money, were not without their fruits, because the masters, "seeing how inconvenient it is to deal with men who are determined to make sacrifices on behalf of a principle, hesitate very much before they infringe on their liberty." In answer to several questions touching the working of defective stones, the witness acknowledged that if the men had a bad stone in the shop they would endeavour, in the interests of their employer, to work it as best they could, "and perhaps if the clerk of the works was near we would cover it of our own accord, which is certainly a very natural thing. If you happen to have a stone which has a vent in it (perhaps you may have caused the vent yourself by your awkward work), if you saw the clerk of the works coming you would probably cover that up till he had gone away." Question.—"Then you would not prevent bad stone being put into a building?" Answer.—"We are not there to consider the interests of other parties, if we can outwit the clerk of the works. It is just the same thing as occurs in almost all the works of life: if one can be a little sharper than another he gets the advantage." Question.—"But the result in this particular ques-

tion is that as far as the mason is concerned bad work will be put into the building?" Answer.—That is why a clerk of the works is appointed. He is considered to be a judge, and it is his fault if a bad stone is allowed to come in." In the case of a mason who succeeded in getting a bad stone into a building, he would not, as we read the witness's evidence, be brought under reproach by his fellow workmen for the action, though "some highly moral men might object to it." It was not a question of honesty in witness's opinion. With reference to societies meeting in public houses, Mr. Connolly's opinion was that nothing in the world would be more advantageous to trade societies than if they could find some means of meeting other than in public houses. The morals of the men would be very much benefited, and their deliberations would be more thoughtful, if they could hold their meetings elsewhere. These two witnesses completed the inquiry, as far as regards the stonemason's branch of the building trade.

ENGLISH BRICKS.

In two articles recently published we referred at some length to the manufacture and strength of bricks. There are certain matters which were then left out of consideration upon which we propose saying a few words now. Brick has of late years taken its proper position in our architecture—a position for which it is well fitted. Some of Palladio's finest examples are of brick. The cortile of the Caritá at Venice, and that portion of the beautiful Palazzo Thiene at Vicenza which was executed, are famous examples of the highest development of brick architecture. Of course, in a country like our own, where our clays are of so varied a character, it is necessary to use our various coloured bricks with discretion. The colour of the mortar for the beds and joints should also receive consideration. There can be no doubt that red bricks will look well when set in red mortar—cream-coloured bricks being set in ordinary mortar. The tints may be given to the mortar by pounding brick refuse and using it for sand in the making of the mortar; and the variety of tone can easily be given by grounding smiths' ashes in lime, and by other equally common materials. It is found that the addition of mineral colours is strengthening.

The light brownish yellow bricks used almost universally in London—a colour given to the bricks by the ashes of the coals, which, in uniting with the peroxides of iron, form a sort of yellow ochre—have long been preferred on account of their pleasant appearance; but their light colour soon gains a different hue from exposure in the smoky atmosphere of the metropolis. Our bricks, too, are so roughly made that soot clings to them; and as the pores soon get filled, the appearance of the front is easily spoiled. It is useless to say that induration, or coating the pores of the brick, may be done; the fault lies with the manufacturer, and until we can procure bricks with smoother surfaces—glazing will always be too expensive, even if it were desirable to glaze ordinary bricks—our house fronts will continue to be dull and heavy in appearance. Meanwhile, it rests with the architect to relieve this dulness by the judicious use of varied-coloured bricks. Why should there not be different-sized bricks that could be worked in with ordinary stocks? There can be no doubt that there would be an advantage in possessing bricks of other sizes than those ordinarily used; and since the Act of Parliament which restricted bricks to a certain size has been repealed, it seems strange that advantage has not been taken of its repeal. A suggestion was made a few years ago that bricks 13½in. by 9in. or 9in. by 9in. would afford a good opportunity for a sunk ornament being stamped and filled in with clay of another colour, and burnt together; and this plan might be capable of a variety of modifications. Of terra-cotta as a means of ornamentation we have so frequently treated that it is unnecessary to say anything about it in the present article, except that it is a material that demands attention and improvement. We are convinced that the attention which has been given to its manufacture of late years will result in its becoming a favourite means of relieving our London fronts, and it is for this among other reasons that we would recommend those who are engaged in the manufacture of the material to do their best to improve it.

We frequently receive for our "Intercommunication" department questions relative to discoloured or smoky brickwork. The replies which have been made to those questions are various, and show not only the diverse means of doctoring bricks, but what a great blessing it would be if we could obtain bricks that did not require the application of any such remedies. We remember a curious instance of smoky bricks which was published a few years ago. A gentleman's house was erected of bricks from half-a-dozen houses 150 to 200 years old. After twenty years the dirt from the old bricks had eaten through the plastering in the two best rooms of the house, spoiling the paper in a few months, making the place look as if the walls were damp, which could not have been the case since the house was well cemented outside. The owner thought of knocking off the present plaster, then nailing slate laths upright against the wall, and lathing and plastering over them, but the expense and trouble were sufficient to induce him to try other and less difficult expedients. In this case, thin sheet lead or tin-foil might have been used to good purpose; but dilemmas are mostly caused by the rapid discolouration of bricks in new houses, a discolouration which frequently occurs within a twelvemonth.

The blue bricks of Staffordshire have of late years been most extensively used, and their manufacture is an increasing one. The best clay in this country for making common bricks is to be found in Staffordshire. The blue Staffordshire bricks have the appearance of a glazed surface, but, as is well known, it is not glazed at all, as the colour is the result of a chemical change produced on the iron of the clay and silica at a high heat. It has been proposed to produce bricks of the same character by staining them; but glazing should be procured by burning, and the glaze should be as indelible and as much a component part of the brick as is the case with blue Staffordshire bricks. The following suggestion has been made for this purpose, but whether it has been adopted by anyone, we do not know:—"After the bricks are cut and rubbed, wash them with water sufficient to remove all dust from them, and when dry apply the staining and pigment for fixing and glazing the same, as used by potters; and then subject them to a burning in an oven, the same as used for burning painting, &c., on china; or in a pottery kiln may answer the same purpose." It is believed that in certain parts of England blue bricks are produced by throwing salt on the fire the last time fuel is put on before closing the fireholes, and by sprinkling powdered ironstone over the brick before burning.

The Patent Architectural Pottery Company stated a few years ago that the only building materials really glazed and coloured, as Maroon, Celeste, and Mazarine blues, pink, orange, buffs, drabs, &c., and the only ones proved to be perfectly impervious to wet, dirt, gases, smoke, &c., are those manufactured by themselves under Bale's patent.

Best white bricks are obtained from Cambridgeshire, Suffolk, Dorsetshire, and Devonshire. The general colour of bricks is, however, red, and as Derbyshire clay is remarkably free from pebbles and lime, and as great care is taken in the tempering and grinding, the bricks are unusually good. They are of an intensely reddish colour. Stourbridge firebricks, and those also manufactured in such large quantities at Hawarden, in Flintshire, are of excellent quality, and are extensively used for the construction of furnaces. In Dublin, bricks are made from Mr. R. Bell's patent, for arches, tunnels, and vaults, in such shapes as to bind the work so that it would be impossible for the mass to be riven asunder. The bricks are formed with projections or tongues across or along one surface, and with grooves on the corresponding side, and with the aid of a small quantity of mortar or cement they fit or bind together the upper with the lower layer, and tie each other longitudinally and crosswise, so as to prevent any lateral or transverse deviation occurring in the work. [See Building News for 1863, p. 217.]

Hollow bricks have so many and such obvious advantages that they have come into very extensive use. The hollow on the beds of bricks was intended to prevent the brick when laid from "riding," or being supported in the middle instead of at the edges. It should, therefore, be made on the lower surface of the brick instead of the upper, as it is ordinarily. It is believed that a hollow on both surfaces might be an improvement, but the process of finishing the moulding by striking the clay does not admit of it. For ventilation hollow bricks are admirably adapted, and thus their sanitary advantages are obvious.

EASTERN ART.*

About six centuries before Christ, the Hebrews gave us abundant details of their architecture; but these inhabitants of Judæa, narrow and prejudiced in character, never raised themselves from the actual to the ideal, and have left behind them no single monument of ceramic or sculptured art, not even a medal or a carved stone of native workmanship. When they desired to build the temple of Jerusalem they were obliged to import artists from Tyre or Persia. Before the captivity of Babylon their sacred books are almost silent respecting everything pertaining to art. But no sooner had their feet rested on Persian ground than a notable change is observable. Hard and unimaginative as they had hitherto been, and insensible to the seduction of art, the luxuries, splendour, and architectural glories of their conquerors fascinated them. "Babylon," says Jeremiah, "is a cup of gold in the hands of the Lord. She has made drunk the world. The nations have drunk of her wine and are troubled." No longer is Jewish literature crude and dry. The prophets set themselves to describe the statues, stuffs, and jewels of Babylon like archæologists. Specially striking is the language of Isaiah, giving us precious artistic details of Babylon; and of its monuments, at this moment of greatest splendour, Ezekiel is not less explicit. He speaks of the idols which peopled the temples representing the human form so accurately as only to require the power of speech and movement to make them living. Again, let it be repeated, the inhabitants of the vast countries of Persia are instinctively gifted with artistic feelings. In their language God is called "the Architect;" the same name is given to the parents, and the child is called "what is constructed." Do not these expressions strongly represent the natural instinct and special genius of the whole nation? This instinct, natural to the soil and climate—developed, progressing, perfectioning—was often transformed, and at times almost destroyed, by the consequences of great battles, when nation replaced nation, Assyrians, Medes, Greeks, Parthians, Romans, Arabs, Crusaders, and Turks. Still it raised itself again and again revivified and reproductive, and proved in Ispahan in 1710, under the Sultan of that period, of what wonders it was still capable. Where, either in Greece, Rome, or Egypt, are there palaces on the same gigantic scale, raised on successive terraces of 200ft.,

* This article was suggested by a work of M. de Beaumont. Concluded, from page 250.

ach reached by flights of stairs 60ft. high, up which ten horses can mount abreast, built mid groves of the rarest trees, cooled by ubbling fountains, ornamented by domes overed with gold and silver, and surrounded y elegant colonnades, framing as it were the djacent city of luxurious gardens, really deerving the name of "hanging Paradises"?

It is useless to enter into further details to rove the originality of the Persians as rchitects. Their ideas spread more or less ver the East, from Nineveh and Babylon to usa, Ctesiphon, Bagdad, Damascus, and spahan. In Byzantium the architecture was rst generally developed and studied by Europeans; hence its name—Byzantine. Ineed, Persian art owes to this very fact f being adopted by the Romans its subsequent umense influence over the whole civilised orld, Persia, like China at the present time, ving been up to that period isolated from xternal influences and enclosed within its wn national limits. But about the fourth ntury of the Christian era the Persians adually engaged themselves in close comercial relations with the Byzantine Romans, e luxurious court of the emperors creating ready and valuable market for their various dustries. Constant intercourse between the untries caused the artificers of Byzantium become acquainted with the secrets of arts d sciences handed down from the magi of l. They learnt to turn arches and vaulted ilings, to create and combine geometrical tterns so as to form arabesques of animals, ants on capitals, pillars, and flat surfaces, d as well as all the mysteries by which the rial cupola was solidly supported as well as quisitely ornamented. This architecture came not only the architecture of new me, but also the architecture of the Arabs, ien in 637 they overran the city and conrted many, either by force or persuasion, to hammedanism. These half Arab, savage, norant fanatics, a nation of shepherds and nderers, possessed no germ of the civilisan belonging to a settled life. Of art they re utterly ignorant. Dwelling in the desert ir tents were their only homes, their flocks their riches. When called by Mahomet to lertake the conquest of the world, these educated, but by no means stupid tribes, re all at once thrown into the centres of most refined civilisation, at Byzantium, al in Egypt, Persia, and Syria. It was obvsly politic in their rulers to maintain se savage shepherds in their original state barbarous ignorance, and the name of their geral, Omar, is justly associated with ery species of wanton destruction. Still, a certain sense of involuntary admiratin and astonishment was felt by these narally quick and intelligent fanatics the wonders of art and riches they we expected ruthlessly to destroy. Aer the defeat of the Persians by Oar, the Arabs lay encamped on the banks o he Tigris, opposite Ctesiphon (anciently Seucia), the capital. The Arab historian, Aulfeda, gives a vivid description of the eit produced on his countrymen by the nificence of the city—the square towers at pointed minarets, architectural terraces, gen domes, and solid walls rising opposite tir camp, framed in the glorious Eastern s. The riches contained in that city, the wdrously beautiful monuments decorating it he bazaars, temples, and palaces, tax his pers of description to the utmost. He says, in kind of despair, no volume could conta the details. Still he tells us somewhat of hese vast accumulations of Eastern magnificice which specially impressed the barbaric nd of the Arabs, and describes a certain aet sixty feet square, representing a garden of owers. Every flower was formed of precis stones interwoven in a tapestry formed of arabesques in pure gold. Omar, who ifted to despise all civilisation, and appeed when conquering the world dressed in an Arab shepherd, dreaded the effect of this marvellous luxury on his followers. To him was offered this wondrous carpet, but he refused the gift, and caused the beauteous texture to be cut up in as many pieces as there were subordinate chiefs in his army. One single piece of the mutilated carpet as big as a man's two hands was sold for twenty thousand drachms of gold. Persia, although conquered by Omar, was not destroyed. The eastern provinces of Mesopotamia remained still free, and there civilisation and the arts found a refuge. Even those cities subjugated by the Arabs lost not all tradition of the arts they had cultivated for so many ages. The brute force of the fanatic Mohammedan failed to impose its ignorance on this polished people. The struggle would have ended in the Arab conquerors becoming, like the Romans, intellectually conquered by the civilisation of the Persians had the Omaric rule been of longer duration, but it swept over the East like a devastating whirlwind, terrible but brief. The descendants of Abbas and Ali, driven out of Arabia by the persecution of Omar's successors, took refuge in Persia, and prided themselves on mastering all the culture that country could afford; initiating themselves into the secrets of science, art, and philosophy, as taught in the schools founded by the great Chosroes. From these princes descended Alroun al Raschid, the most popular as well as the most celebrated among the Caliphs. Under such enlightened rulers the old Arabic prejudices passed away, and national monuments arose rivalling the ancient edifices. Gradually Persian art made way for itself again, and spread (thanks to the influence of the Arabs) over a much more extended surface than it had ever before occupied. In India, China, and Spain, from the Ganges to the Guadalquiver, Persia henceforth became avowedly the centre from whence shone all rays of artistic enlightenment. If a great architect were wanted he is found in Persia. When Abderame, King of Cordova, built an Alcazar and mosque in that city he summoned great artists from Persia. The Persians in enlarging their circle of influence remained as much masters of art as in the time of Constantine. Saint Sophia, spreading its great shadow over the city, at once the pattern and glory of all other mosques, is as essentially the inspiration of a Persian artist of bygone centuries as are the kiosque fountains, courts, and palaces of our own day under the actual sultans our contemporaries. Of the universality of Persian art we may look from Byzantium, past and present, to India at the present time, where it is developed in a still higher degree, both of perfection and of splendour. Placed in a country nearer its original cradle, and admirably adapted by the luxuriance of the soil and ever brilliant skies, with its gorgeous accompaniments of Oriental heat and cold, to develope its grandest features, Persian architecture here assumes its boldest and most fantastic forms. The baths, palaces, mosques, and tombs found in almost countless numbers in the cities of Delhi, Lahore, and Agra, are absolutely perfect as specimens of style. The tomb of Sadj Mahal, erected by Shah Djihan to the memory of his favourite Sultana, is still called the "wonder of the world." What untravelled European can understand a palace where the frieze is formed of lapis, agate, turquoise, sapphires, and ruby, representing arabesques of flowers in the most delicate detail? Such fairylike wonders, more akin to the fabulous tale of Aladdin than actual nineteenth century life, strike the cold imagination of the West as simple exaggeration. But to judge of these glorious possibilities let travellers visit the land where they actually exist, where sun, climate, and customs all unite to harmonise them with the surrounding horizon. Then and there the wonderful fertility of the imagination which conceived such monuments can alone be appreciated. From the rules of this architecture, and from the guiding of these glowing imaginations, the purists of the fifteenth century have driven us, giving us in its stead the cold abstractions of Grecian art. Have we gained or lost by the exchange?

Deanery, Clifton. F. Elliot.

JAPANNING AND VARNISHING.

Japanning is the art of covering bodies by grounds of opaque colours in varnish, which may be afterward decorated by printing or gilding, or left in a plain state. All surfaces to be japanned must be perfectly clean. Paper should be stiff for japanning, such as *papier mache*. The French prime all their japanned articles; the English do not. This priming is generally of common size. Articles that are thus primed never endure as well as those that receive the japan coating on the first operation. When they are used for some time they crack, and the coats of japan fly off in flakes. A solution of strong isinglass and honey or sugar-candy makes a good japan varnish to cover water colours on gold grounds. A pure white priming for japanning for the cheap method is made with parchment size and isinglass, laid on very thin and smooth. It is the better for three coats, and when the last is dry, it is prepared to receive the painting or ornamental figures. Previous to the last coat, however, the work should be smoothly polished. When wood or leather is to be japanned, and no priming used, the best plan is to lay on two or three coats of varnish made of seed lac and rosin, two ounces each, dissolved in alcohol and strained through a cloth. This varnish should be put on in a warm place, and the work to be varnished should, if possible, be warm also, and all dampness should be avoided, to prevent the varnish from being chilled. When the work is prepared with the above composition and is dry, it is fit for the proper japan to be laid on. If the ground is not to be white the best varnish now to be used is made of shellac. This is made in the proportion of the best shellac five ounces, steeped in a quart of alcohol and kept at a gentle heat for two or three days and shaken frequently, after which the solution must be filtered through a flannel bag, and kept in a well-corked bottle for use. This varnish for hard japanning on copper or tin will stand for ever, unless fire or a hammer be used to burn or knock it off. The colour to be used with shellac varnish may be any pigment to give the desired shade. To form a hard perfect white ground is no easy matter, as the substances which are generally used to make the japan hard have a tendency by a number of coats to become dull. One white ground is made by the following composition:—White flake or lead ground up with a sixth of its weight of starch, then dried and mixed with the finest gum ground up in parts of one ounce gum to half an ounce of rectified turpentine mixed and ground thoroughly together. This is to be laid on the article to be japanned, dried, and then varnished with five or six coats of the following: two ounces of the whitest seed lac to three ounces of gum anima reduced to a fine powder and dissolved in a quart of alcohol. This lac must be carefully picked. For a softer varnish than this, a little turpentine should be added and less of the gum. A very good varnish, and not brittle, may be made by dissolving gum anima in nut oil, boiling it gently as the gum is added, and giving the oil as much gum as it will take up. Although this varnish is not brittle, it is liable to be indented with strokes, and it will not bear to be polished, but if well laid on it will not need polishing afterwards. It also takes some time to dry. Heat applied to all oils, however, darkens their colour, and oil varnishes for white grow very yellow if not exposed to a full clear light.

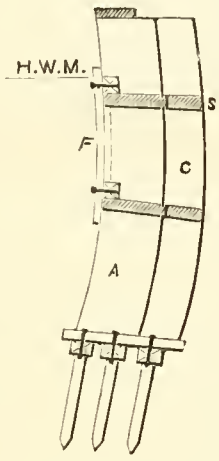
Barrels are now constructed in America very ingeniously without being formed with staves. Thin strips of white oak are wrapped spirally round a mould of any required size, and representing the interior of the barrel, each layer crossing the preceding diagonally, and all of them being firmly attached to each other with a suitable glue or cement. Fourteen layers are found to give very great strength. The heads are formed in the same way. Barrels may thus be made with great economy and speed; they are very light, and are not liable to leakage. They are used specially for coal oil.

ELEMENTS OF ENGINEERING.

Docks.—No. 6.

It has been remarked by a standard authority, that the value of some books and treatises upon various subjects is more of a negative than a positive nature, and that they instruct the reader what he is to avoid rather than what he is to adopt. In many instances, the one information is quite as valuable as the other. The example of a dock wall given in our last article was selected with the express intention of imparting this description of information to our readers, and having shown the results of constructing so inefficient a structure and the manner in which it finally gave way, we may now pass on to a description of a wall embodying more exact principles of scientific knowledge, but still not yet arriving at the best form or disposition of material. In all constructions, whether of timber, stone, iron, or other material, there is always a certain amount of latitude permitted to the particular ideas or taste of the designer, but there is also a limit beyond which he must not stray. However fanciful or erratic his pencil may be, he must never allow it to delineate proportions not in harmony with the principles laid down by theory for the strength and stability of every class of engineering and architectural erection. Fig. 1 represents an example of wall differing in many essential points from the one previously described; and insomuch as it is based upon a superior method of building, we will briefly allude to its distinguishing characteristics. The first point that will immediately strike the observer, is that the rectilineal batter is discarded and a circular one substituted in its place, which as the wall is of brick can be done with advantage in every sense. The back also is concentric with the front, and is not built vertically as in the former example. All the bearing piles immediately under the wall itself are 9in. square, but those underneath the counterfort C are 8in. square, since they have less weight to support. If the stratum into which the piles are driven is of average quality for forming a good foundation, about 20 tons of direct pressure may be put upon each of them; but it must be borne in mind, especially with respect to alluvial soils, that there is also a considerable lateral pressure to be guarded against, which is more dangerous in its action than even an excessive vertical load would be. To bear the above weight with safety the piles should not be less than 10in. square at the least part.

FIG. 1.



Although the plan of tapering away good timber which we alluded to in our last should never be permitted, yet, if the timber naturally tapers a little, or if by so doing a good sound pile can be got which would otherwise be thrown away, there is no danger incurred by reducing the diameter by a small amount toward the shoe end. At the same time it should never be fined down to a less diameter than 6in. by 6in., and not then unless there is a valid reason for so doing. Sometimes a row of sheeting piles is driven down in front of the bearing ones. The usual plan is to drive them down before driving the others, upon the principle that the ground becomes harder by forcing piles into it, and therefore the better adapted for resisting the bearing piles which are afterwards driven. Notwithstanding that this assumption rests upon very good authority, it is exceedingly questionable whether it is of much practical utility. Frequently the effect of driving a number of piles in close succession and proximity to one another, is to cause the ground to become pulpy and springy; and, in fact, to counteract the very result it is supposed to accomplish. Sheeting piles for dock walls, when they are used as described, may be 6in. by 2in., and unless the ground is too hard, they may be driven without shoes, but the heads must always be hooped. Their points should be cut at any obtuse angle, and it will harden them against any sudden shock to char them well previously to driving. In Fig. 1 the bearing piles are not driven vertically, but have a cant of 2½in. to the foot. Their direction should, as nearly as possible, coincide with that of a tangent to the curve of the face of the wall at the bottom, so that the direction of the pressure should be transmitted unaltered to the foundations. Upon the bearing piles are bolted the longitudinal baulks of Memel or Danzig; and again, upon the latter 3in. planking is laid, which forms the sole or bed for receiving the superstructure. The wall represented in fig. 1 is 30ft. in total height from top of piles to under side of coping. It is built of brickwork; but has two through courses of stone set in it shown in the fig. by S S. These stone courses are for the purpose of giving a better hold to the fender F, which is bolted to a couple of teak blocks which are fastened to the stones; the latter also serve to strengthen the wall. The fender F is of oak 12in. square, and in addition to being secured to the blocks, is also let 4in. into the solid brickwork, so that its total projection is 8in. from the wall face. The thickness of the brickwork A in the wall proper is 6ft., and is constant throughout the whole height; that of the counterforts C is 4ft. and is similarly uniform. The counterforts are placed 15ft. apart from centre to centre, and the coping, which is one solid stone, is 4ft. in breadth by 15in. in thickness.

Looking at the section of this wall we notice two important points; in the first place, the sectional area is uniform, and, secondly, there are no footing courses, the wall being started at once from the timber flooring. When the top of the bank of earth supported by a retaining wall of any description is horizontal, as is universally the case with dock walls, and when the section of the wall is uniform as in the example before us, the condition of stability is easily ascertained. In fig. 2 let A F E C represent a rectangular wall in every respect except the curvature of the front and back, similar to that at B D E C, and let T equal the thickness of either of them and H their height. H will therefore equal A C. Make g g^1 the position of the centres of gravity of the respective walls and put m to represent a constant. When the batter of the wall is straight, that is, when C B is a straight instead of a curved line, we have $T \times m = \frac{A\,B}{2}$ and when the wall is curved, as in fig. 1, we find $T \times m = \frac{2\,A\,B}{3}$. On the supposition that the line C B is a portion of a parabolic curve, we therefore see that the strength of a wall with a curved batter is to that with a straight one as ½ : ⅔. It is not absolutely necessary to ensure this increase of strength, that in practice the face of the wall should be strictly a parabola, which would be an awkward and troublesome curve to work to, but it may be made circular, since within certain limits the difference between the two is too small to occasion any appreciable error. Walls built with a curved batter should have the joints, whether of masonry or brickwork, to radiate square to the face, as shown in fig. 3. The object of this is to cause the pressure to be brought evenly and fairly upon the base, instead of tending to cut it across in an oblique direction. For the same reason the footing courses themselves are set square to the face line, thus enabling the theoretical conditions of stability to be more effectually fulfilled. Another very important duty performed by the through stone courses S S (see fig. 1) is the bonding together the wall A and its counterforts C. It is clear that unless a wall and its accompanying counterforts form part and parcel of the one structure, the latter is little better than backing, and might just as well be replaced by so much earth; but when they are, on the contrary, well bonded together, which can only be properly effected by through courses, the stability and strength of the wall is considerably increased.

FIG. 2.

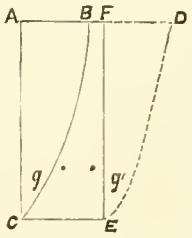
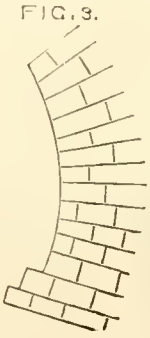
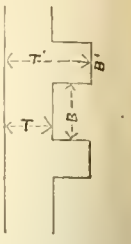


FIG. 3.



It may be demonstrated mathematically that in a wall in which the counterforts are properly bonded, the strength is the same as if the thickness of the wall were increased to that of a mean between its own dimensions and that of the counterfoil. In fig. 4 let T equal the thickness of the wall and T' the total thickness of both wall and counterfort; make B equal the length of wall between two consecutive counterforts in the clear, and B the breadth of a counterfort. The strength of the wall, making H = the height of both wall and counterfoil, and M the moment of stability of the wall, and M' that of the wall and counterfort, will be equal to $\frac{M + M^1}{B + B^1}$. But using the same notation as before, and putting W for the weight of a cubic foot of masonry or brickwork, we have $M = m \times W\,H\,B\,T^2$ and $M^1 = m \times W\,H\,B^1\,T_1^2$ and consequently $\frac{M + M^1}{B + B^1} = \frac{m\,W\,H(B\,T^2 + B^1\,T_1^2)}{B + B^1}$ which is equivalent to the moment of stability of a wall having a uniform thickness of the mean between T and T'. It is commonly imagined that a great saving of material is effected by the employment of counterforts; but such is not the case. There is undoubtedly in the majority of instances a slight saving, but not to the extent commonly supposed; and in many cases it would be preferable to increase the thickness of the wall and make good backing do the duty of the counterforts. In the construction of docks, as well as of all retaining walls, it is very difficult to give a general rule for their thickness, but it may be considered that the thickness at the bottom should range from $\frac{H}{2}$ to $\frac{H}{3}$. The precaution should always be taken whenever any superstructure is raised upon piles, to so arrange the levels that the timber should never get uncovered by the water, for there is no description of timber in use that will long stand alternate wetting and drying. Most timbers last well when totally and constantly immersed in water, and in repairing and underpinning dock walls, Memel fir has been found as sound as the day it was put in. As a rule the larger balks show least symptoms of decay, the planking frequently being partially destroyed. The same appears to hold good in the case of iron, as spikes and the smaller bolts are generally found to be very much corroded and eaten into; but the larger specimens are but slightly injured. The oak fenders, particularly towards the upper part, wear very rapidly, and the same may be said of the brickwork at the same part of the wall face. We shall give one more example of dock walls, and then pass on to a consideration of the accompaniments and accessories connected with the erection of works of this nature; but we shall not treat of any but those the construction of which is inseparable from that of docks themselves.

FIG. 4.



ROADS—THEIR CONSTRUCTION, REPAIR, AND MANAGEMENT.

Mr. Baldwin Latham, C.E., the engineer to the Croydon Local Board, has just issued a report on the construction, repair, and management of the roads in that parish, which is well deserving the attention of similar bodies elsewhere. Mr. Latham points out that as the rapid increase in the population of Croydon necessarily increases the amount of wear and tear on the main thoroughfares, and also annually brings an increased length of roads to be repaired at the cost of the ratepayers, the question relating to the management of the parish roads demands the serious attention of the Board; in order, on the one hand, that they may have the roads under their jurisdiction kept in the best possible order, and, on the other hand, that they may be maintained in good condition, with a due regard to economy. On both these points Mr. Latham gives his Board a great deal of valuable information and practical advice. As much of what he says is of considerable public importance as well as of general applicability, we make no apology for quoting largely from the report:—

In order, says Mr. Latham, to arrive at a correct conclusion on the various matters connected with roads, a knowledge of both mechanics and mineralogy is requisite; the one to determine the best

ode of construction, and the other, to make a oper selection of the best materials to be employed.

One of the greatest mistakes committed in road-aking, is the constant heaping on of materials in e centre of the road, until they have become ite rounded and considerably higher in the ntre than they are at the sides. It must be mitted that, in order to secure efficient drainage the surface of the road it is requisite that the ntre should be somewhat higher than the sides; it the amount of elevation actually required for e purposes of securing efficient drainage is much s than is generally supposed; and the object ould be so to perfect the means of drainage as do with the least possible elevation. Apart m the question of drainage theoretically, the st road, and the one least liable to wear and r, would be a flat one with a level cross section; on all roads that are rounded, there is but one rtion in which vehicles can stand upright, and it is the centre of the road; consequently, a ater amount of wear and tear takes place than en the road is flatter, and vehicles can verse it in all directions. In a very con- c road, when a vehicle is not travelling in the ntre, the load is unequally disposed and the hicle has a constant tendency to slide down the lined plane, which tendency promotes the id destruction of the road.

With regard to the new roads constructed in parish under my direction, I have caused m to be made with a cross section, having uniform rate of fall from the centre of roads to the water tables of 1 in 30; experience shows that this is quite suffi it for drainage purposes, and at the same e is not so great a fall as to injuriously affect wear of the road; and, seeing that this form road answers so well, I shall recommend that, he alteration of any road, or in the construction ew roads within the parish, this sectional form adhered to.

n undrained road is one extremely expensive naintain; and even when constructed of the t materials it is impossible to keep it in good oer and condition; on the other hand, roads le of very inferior material, when due regard been paid to the drainage or the means of ping it dry, may be kept in good condition. re are two descriptions of drainage requisite rder to keep all roads in good condition—first, t mode of freeing the surface from water, and, nd, the mode of ensuring a dry foundation. order that a road may be free from water on urface constant attention must be paid to the e of repair; and every step must be taken for aring a smooth surface. The water tables ald be kept free from obstruction, and a suffic t number of gulleys and drains, at convenient lances, should be provided in order to carry off t water as quickly as possible. The materials ning the surface of a road should be of suffiently impervious character to resist the pene- tion of water; if the materials are not ciently impervious the combined effect of ver and traffic will be sure to loosen the mate ns of the road. It is of equal importance that y road should have a dry foundation, for you r perfect the surface drainage, and yet the road be destroyed from the water rising from w or from adjacent grounds. In many of the ds of this parish, laid out on a gravel subsoil, preparation for sub-drainage is required; but, other roads constructed on clay soils that in moisture, a proper system of under drainage ld be attended with good results; and I ld recommend that all roads having a subsoil clay should be under drained. Attention ld be paid to the hedges and trees in order revent their injuriously affecting the roads.

s a material for the construction or repair of roads flint may be classed as one of the st; it is very hard, but extremely brittle, and oon reduced to sand under the wheels of icles. The excess of silica in a road stone is a dback to its useful application, as its glass-like ure renders it brittle and consequently friable. t contains about 98 per cent. of silica, about half per cent. of lime, and a small portion of nina and iron. It breaks with a perfect con- idal fracture, with sharp cutting edges. The d reduction of flints, under heavy traffic, to d, apart from the destruction of the material itself, is really a great element in causing the re breaking up of the road in wet or frosty ther, as the sand forms a pervious covering for foundation of the road; consequently the fall is absorbed, and, passing to the foundation of the road, loosens all the material, and may even soften the original foundation below the road metal; so that it is next to impossible in a wet season, and under heavy traffic, to keep a flint road in order.

Although flints are the worst of materials for forming the surface of a carriage-way, yet, from the nature of the material when set as in concrete, they form the best foundation you can possibly get for any road. The hoggin, or small gravel separated from the largest gravel, is a useful material for the construction of footpaths; the drawbacks to its use are, its liability to be destroyed and converted into mud by the action of frost and wet, or in summer time the disagreeableness of loose and shifting material brought about by an excess of drought.

Chalk is a material of itself not well fitted to form a road, and must therefore be classed with those of the worst order for the construction of roads. The great drawback to the use of chalk in road-making is its absorbent character; as one-third the bulk of chalk, when fully saturated, consists of water, or (putting it in another form) one cubic foot of chalk will retain two gallons of water. The effect of this absorbent property under some circumstances is beneficial, but, as a rule, in an uncertain climate similar to that of this country, it cannot be well recommended; as the effect of this property of absorbing water is such that, in time of frost, the water in the chalk is expanded, and consequently the chalk is disintegrated, and the materials composing the road are rent by the resistless power of the expanding water; the succeeding thaw converts the mass into a state of paste; and, when in this condition, the traffic completes the destruction of the road. Chalk may be used with advantage for the foundation of a road where it is placed at such a depth as to be out of the reach of frost; and in such a position its absorbent properties may be of use, by retaining the water that would otherwise pass to the foundation of the road, and render it soft and yielding. Chalk may sometimes be used with advantage, when reduced to a pulverescent state, for assisting in binding roadways constructed of gravel, or rounded pebbles, which of themselves can never set to form a smooth road surface without some binding material; but its use for this purpose must in all cases be judiciously exercised, and will not be required in any case where the gravel is of a loamy character. As both flint and chalk are of themselves unfit for road-making, yet when the chalk is burnt into lime and mixed with gravel or flints, it forms one of the best foundations for a roadway.

Kentish rag, when used alone, is but little better than gravel; and, when used in conjunction with pebbles, is not equal to flint and pebble. The Kentish rag is a member of the lower green sand formation, and is by nature a limestone. Limestones, as a general rule, do not form a good material for macadamising roads, by reason of their affinity for retaining water, and, consequently, must lead to the destruction, in times of frost, of a road repaired with it. Ironstone, like Kentish rag, is procured from the lower green sand formation; and consists of the indurated iron sand of that formation. As a material for the repair of roads it is not of sufficiently durable character ever to take a very high rank. It is brittle, and too weak to resist the crushing action of the wheels of vehicles.

The materials best adapted for the construction of roads of great traffic are those belonging to the igneous crystalline rocks; the best of these materials are granite, syenite, and trap rocks. Granite, so called from its granular construction and aspect, is a compound of quartz, felspar, and mica, arranged in distinct grains or crystals. The structure of granite is irregular and amorphous, varying from compact rock to a coarse and loose aggregation of primary crystals. Its value as a material for the construction or repair of roads varies with its formation. As a rule, the smaller the crystals the better is it adapted as a material for the repair of roads. Syenite is a species of granite, and is generally called granite; but, more properly, the term granite is applied to those unstratified rocks consisting of quartz, felspar, and mica, with little or no hornblende; while the term syenite is applied to those rocks, consisting of quartz, felspar, and hornblende, with little or no mica. The durability and hardness of granite and syenite may be estimated by the preponderance of quartz and hornblende. Felspar and mica are the destructible portions of granite, as they contain potash, which under favourable circumstances tends to promote the destruction of the material. The several ingredients can be pretty nearly estimated by observation. Quartz is present, either in the form of clear colourless, or gray crystals; hornblende, of dark green or black crystals; mica, of glistening scales; felspar, of opaque compact crystals, of a white, yellowish, or flesh colour. From these observations we can draw our conclusions that, in the absence of mica, the darkest coloured granites will be found to be the best; and experience has long established this fact, that, of the granites used for road purposes, there is none of greater value than the dark granite procured from Guernsey. So far as experiments have been made in Croydon, it appears that granite is nearly three times as durable as broken flints under the same circumstances; but, as its cost is only twice that of flint, it follows that granite is the cheaper material for the repair of all roads of great traffic. This seems now to be such a well-established fact that, year by year, as the traffic has increased in the suburban districts of London, the local materials have been superseded by Guernsey granite. Although granite, by the length of time it wears, has shown itself to be the cheapest road material that can be used, yet the saving in cost of material is not the only saving. It may be laid down as a rule, that the amount of material put on a road for repair represents the mud and dust that has been swept up and carted away; so that by the use of a better material you will not only save in the cost of the material (from its being more durable and less expensive to repair), but you will save directly by not having so much mud and dust to sweep up and cart away.

Greenstone is a term applied to those trap rocks that are composed of felspar, augite, and hornblende. It differs from syenite from the preponderance of hornblende over felspar; and the consequent smaller proportion of potash (which is a great agent for the destruction of all silicious stones); and, as it has already been shown, in the case of granite stones, that the preponderance of hornblende is the test of the value of those stones for the purpose of road-making, it follows, as a natural consequence, that greenstone will be superior even to granite as a material for the construction and repair of roads. It has also another advantage over some granites, which is, that while it forms a hard smooth surface it never wears so as to be slippery.

This material is procured in large quantities from Penmaenmawr, in Carnarvonshire. The following table from Dr. Fairbairn's "Useful Information for Engineers" will show at a glance the nature and quality of this stone:—

	Crushing stress in lbs. per square inch.
Penmaenmawr stone	16893
Basalt (Whinstone)	11970
Granite (Mount Sorrel)	12861
,, (Argyleshire)	10917
Syenite (Mount Sorrel)	11820
Sandstone (strong Yorkshire, mean of nine experiments)	9824
Limestone (compact, strong)	8528
,, Magnesian	7098
,, ,, (weak)	3050

The superiority of Penmaenmawr stone to resist the crushing action of the wheels of vehicles is fully demonstrated by the foregoing table. Indeed, this stone and Guernsey granite are, in my opinion, the best description of stone that can be used for the repair of the roads. The cost of the Penmaenmawr stone at the quarries is 2s. per ton, unbroken, or 4s. per ton, broken.

In order to secure a good and lasting road, next in importance to the selection of the materials is the mode of applying them. The great advantage of Macadam's system depended upon the angularity of the pieces of stone of which the roads were constructed, which, consequently, dove-tailed together, as it were, and soon formed a hard smooth surface. The size of the stones required under given circumstances may vary slightly; the stones of roads of great traffic may, with advantage, be larger than those for roads of little traffic; but there is a limit to the size of stones; as, where they exceed a certain size it is not so easy to ensure the construction of a road with a smooth and even surface. For roads of the greatest traffic the stones should not exceed in dimension a cube of 1·62in. Macadam determined the size of the stones used for making his roads by weight; and he always stipulated that no stone should exceed 6oz. in weight, and instructed his inspectors to carry a small pair of scales, in order to ascertain the weight of the stones, and see that they did not exceed the stipulated

weight. According to Macadam's rule, a stone of 6oz. would be a cube of 1·6in., or, measured diagonally, would be about 2¼in.; a stone of this size would pass through a 2½in. ring, and in future, I should recommend that for roads of great traffic, the stone should be broken so as to pass through a 2¼in. ring, and for roads of little traffic to pass through a 2in. ring. The mode of applying the materials is of equal importance with the size and shape. In all cases of broken stone roads, before fresh materials are applied, the road should be slightly roughed or raised, in order to secure the cohesion of the new and old materials. For the repair of all roads, with whatever materials, it is a great mistake to put on too much at once; as the effect of a thick coat is destruction to the material; a movement takes place, and the stones grind against each other, get their angles rubbed off, and then it becomes more difficult to bind. In no case should any coating on a road exceed one stone in thickness, and, if this rule is adhered to, the stones will rapidly work into position without injury or destruction; in cases where one coating may not be sufficient it will be well to put on what is required at two or three different times, letting each coating get nearly solid before the others are added. During the whole of the period roads are under repair, constant attention should be paid to them, and by repeated raking the surface must be kept uniform; unless attention is strictly paid to this direction, an uneven surface is sure to be the result. The best season of the year for the repair of roads is the autumn, and the whole of the materials requisite for the repair should be delivered in time to be put on before the winter; of course, in the case of roads with great traffic it is impossible to lay down any general rules for their repair; and, although one time of the year may be more favourable than another, yet the exigencies of the case may demand that repairs should be made at other times. The great rule should be never to let a road get out of condition. The rolling of roads is attended with great advantage, as it greatly assists the material to set, and ensures an uniformity of surface. In rolling broken stone roads, a roller of 3 tons weight should be first used; and this weight should be gradually increased until it reaches 10 tons. Care should always be taken in rolling, that an excess of horse power be used, or otherwise the feet of the horses will do permanent injury to the roads. In France rollers worked by steam power are used, and the roads are sanded and watered during the operation. It has often been urged in this country that the same system should be adopted; the reason for its not being adopted is simply this, that all roads which are allowed to become consolidated under the ordinary traffic are much better, and more lasting, than those brought to a surface by artificial means. In fact, the use of materials scattered on a road, for the purpose of binding it, has a great tendency to injure the road; as the interposition of inferior materials between the stones does permanent injury by rendering the roads more absorbent, and consequently more easily abraded by heavy traffic. With judicious watering and rolling, and the application of thin layers of material, a road may be rapidly brought to a good surface, without the intervention of any binding material. I should recommend you to purchase a roller, 6ft. in diameter, and capable of being weighted up to 10 tons.

A NATIONAL WORK.

THE *Chatham News* gives some very interesting particulars regarding the vast national work now going on at that place, viz., the Chatham Dockyard extension, which, when completed, will make Chatham the greatest naval arsenal in the world. The new works, which our contemporary describes as Titanic, will be constructed on the swampy tract of land contiguous to the present dockyard—having formerly a considerable creek running through it navigable for vessels at full tide and cutting off a large piece of soil from the main land, constituting it St. Mary's Island. Already may be seen the rudiments of the works, the gigantic extent of which may be gathered from the following particulars:—The present dockyard cover 90 acres—the extension works will occupy 380 acres! One basin alone will be more than one-third the size of the whole of the present dockyard. There will be three basins, with each 30ft. of water at high water neap-tides. The repairing basin will occupy 21 acres; the factory basin 20 acres; the fitting-out basin, with a lock, 33 acres. These basins will be mainly made from the old creek; but at the lower end of the works 80 acres will be recovered from the Medway for the great basin, the lock, quays, buildings, &c. Communicating with the repairing basin will be four immense docks, each 500ft. long. The factories for this dockyard of the future will cover a space 1,000ft. by 540ft., or about 14 acres of buildings. As may readily be imagined the mere preparations for the carrying out of these works are on a great scale. Thus, running over the marsh in various directions are already miles of firm road; there are 8 miles of rails laid down, over which waggons and locomotives pass. The brickfield on the island is probably the largest in the world—at any rate, the most complete. Mr. E. A. Bernays, the civil engineer in charge of the whole works, is a brick manufacturer on a great scale. The materials for the bricks consist of 2-5ths of clay from the island, 2-5ths of Burham clay, and 1-5th of Aylesford sand; to these are added 1in. of ashes to every 2½ft. of clay and sand. There are six brick-making machines, each worked by a steam-engine; and these machines each turn out a total varying from 20,000 to 35,000 in a day. The brick-making is almost entirely executed by convicts. To dry the bricks taken from the machines there are 8½ miles of hacks; the damp bricks are not protected in bad weather by straw. All the hacks are covered with roofs, and so protected at the sides and ends that rain cannot get at the bricks, while there are ample contrivances to expose the bricks to the sun and air in fine weather. The bricks are burnt in kilns—there are 22 kilns, each capable of taking 125,000 bricks. By the care bestowed in making the bricks and by burning them, not in clamps, but in kilns, there are no spoilt bricks—the whole mass is equally good—strong serviceable first-rate bricks. There are now 8,000,000 bricks, which were made last year ready for use on the works—10,000,000 altogether were made. This year 15,000,000 will be made. These bricks will be used by the contractors, who will take them at a fixed price. The Portland stone used by the contractors will also be supplied by Government, being quarried at Portland by convicts. What granite is required the contractors will themselves supply. At first the work at St. Mary's was done by convict labour with a small addition of free labour. But it was apparent that, however well the convicts worked, if the dockyard extension was to be made available for our navy in a reasonable time, a different system must be adopted—portions of the work must be executed by contract. Still, a great deal was done by the convicts and the small number of free labourers who were placed at the disposal of Mr. Bernays. Roads and railways were made—millions of bricks produced—some excavations performed—thousands of feet of quay wall or stone embankment were constructed round the island on the river side, (there will be 10,500ft.)—the massive foundations for the factories were laid, and much other work executed.

When it was resolved to proceed at a greater speed with the work, the first contract was obtained by Mr. Antonio Gabrielli, a gentleman who had executed extensive works at Melbourne and at Malta. The first contract for our dockyard extension was on a scale commensurate with the whole enterprise; it was for £750,000. For this sum Mr. Gabrielli has undertaken to complete one basin, make two docks, and the entrances for two more, in three years from April, 1867, and to complete the second smaller basin in four years from that time. After this contract will follow others. Ere long, we believe, tenders will be issued for raising the great factories, of which the foundations are made, so that they may be ready for use when the first basin and two docks are completed. The two other docks will be constructed later, and probably no long time will elapse before the great fitting-out basin will be let to a contractor. Thus before many years are past we may expect to see the dockyard extension in actual use for our navy. At present some 1,300 men are employed on the works. Of these 750 are convicts—their total should be 850, but about 100 recently left here for Western Australia, and their places have not yet been supplied by an addition of prisoners from other places. Besides these 750 convicts, Mr. Bernays has under his control some 300 free artisans and labourers. Mr. Gabrielli has something like 300 people already employed on his contract; but when all the preliminary preparations have been made, and the contract works are in full operation, it is supposed that the contractor will have 1,500 to 2,000 people at work. Probably half the amount at which the first contract has been taken will be expended in the wages of labour—a matter of no small importance to the people of Chatham and its neighbourhood; of course, when the new dockyard is in work, there will be a great accession to the total of dockyard employés. To make the new dockyard fully available for our largest ships, it will be necessary to dredge parts of the river below the fitting basin, to get a sufficient depth of water for the ships either leaving the dockyard or coming into it for repairs. In connection with the dockyard extension, the parish of Gillingham will obtain a great boon in the new landing-place, to be given to them in exchange for their old quay, taken for the dockyard. They will have a magnificent quay, a slipway, an embankment, and a landing pier. The wharf or quay will be 532ft. long, and 100ft. wide. The parish will make a capital exchange; the new works will cost £30,000 to £40,000. Messrs. Ball and Son, of Strood, are the contractors.

DESIGNS FOR NEW LAW COURTS.

OUR double page illustration this week represents a part of the detail drawing of Mr. Burges's proposed design for the new law courts. Having recently given an elaborate criticism of this design there is no necessity to enlarge on it now. We may remark, however, that it would have been well, we think, if every other competitor had been obliged to send in a similar drawing. We should then have been able to ascertain how far each man was really competent to carry out a building of this importance. Any one, as Mr. Burges says in his report, can "supply any number of perspectives that may be desired," because there are always men to be found who will do the said perspectives for a consideration; but it is very different with a detail drawing of this description—such an one must be done by the architect (shall we say artist?) himself. In a fortnight's time we hope to give a street view of Mr. Burges's design.

FULHAM PALACE CHAPEL.

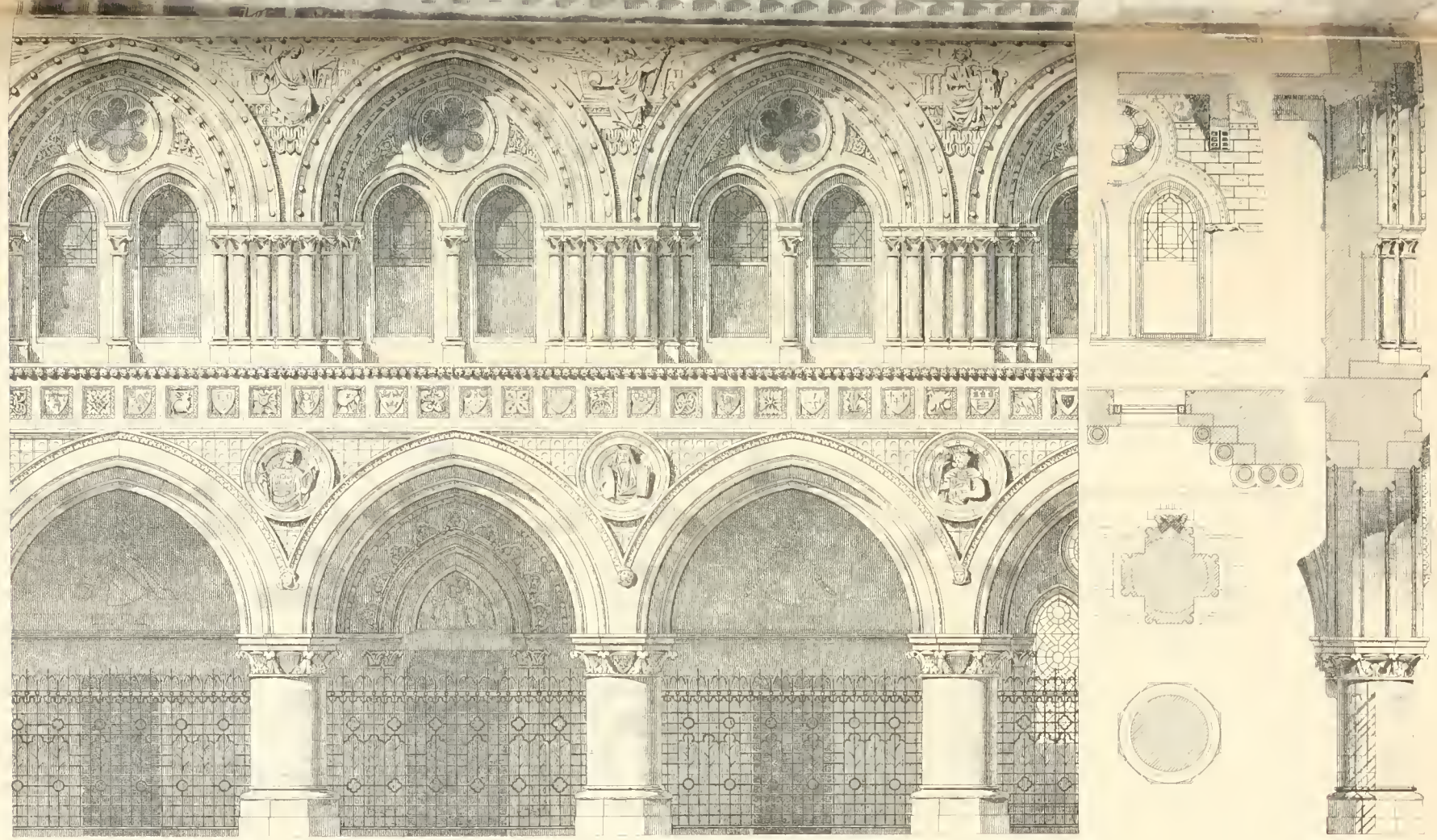
FULHAM Palace Chapel has just received the adornment of a handsome mosaic at the east end. The cartoon was made by Mr. Alexander Gibbs, of 38, Bedford-square, London, under the direction of the architect, Mr. Butterfield. The mosaic was executed by Salviati and Co., of Venice and London. The subject represented is the Adoration of the Shepherds at Bethlehem. It is treated throughout as a surface, without any attempt at perspective, so as not to interfere with the architectural idea of a solid wall. The central figures are those of our Lord in the manger, the Virgin Mary, and St. Joseph. The shepherds occupy the space on either side. In richness of colouring and elaboration of detail the whole design abounds, the drapery being in most instances diapered or fringed with gold or other delicate colours, in a manner which adds considerably to the finish and general effect. The background is a cool blue, studded with gold stars and relieved with horizontal lines.

PARIS EXHIBITION.

There is in the park a model crèche, where infants may be left by mothers visiting the Exhibition. Those who have the welfare of the working classes at heart, and especially those who reside in manufacturing districts, will do well to examine this simple but useful philanthropic establishment.

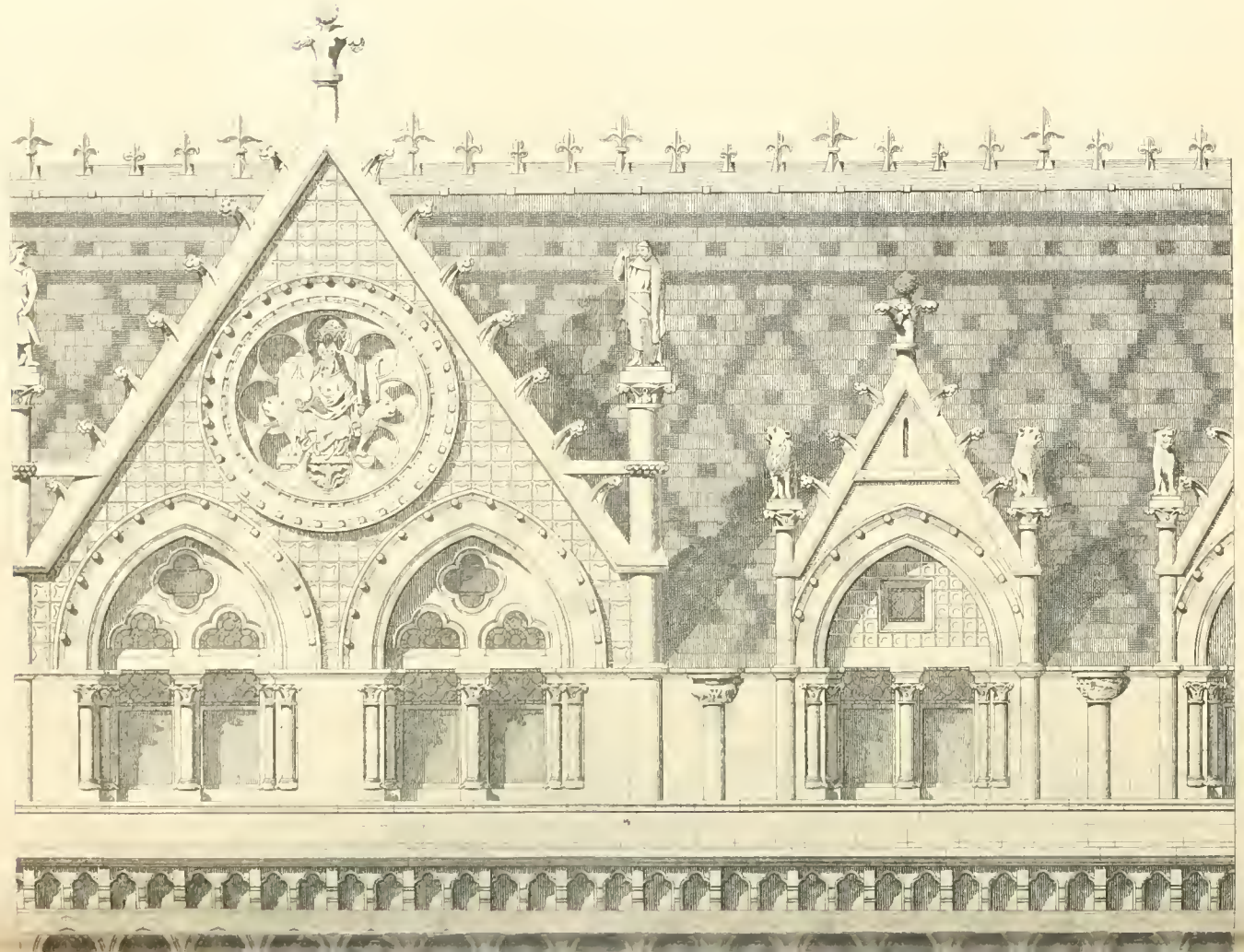
Men of business will be glad to know that the post and telegraph offices in the park are now in full operation. The regulations of the former are the same as at the principal district offices in the city; that is to say, letters can be posted till a quarter to six, or, with additional stamps of 20 cents or 40 cents, till six or a quarter past six. As regards telegrams, notice is given that the country and class or section must be added to the name of the exhibitor or his agent to ensure delivery.

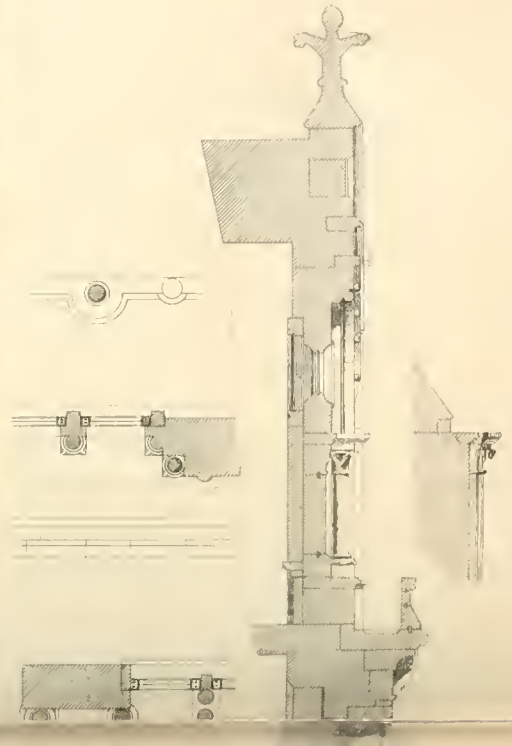
An unexpected discovery has been made in Cheshire, namely a seam of coal 10ft. thick which was struck last week on the property of the River Dee Company, at Queen's Ferry.



E Abbott Lith

Design for New Law Courts. BY W. BURGES. Detail of Part of Strand Front.





THE AMALGAMATED SOCIETY OF CARPENTERS AND JOINERS.

TRADES' Unions are daily taking a firmer and deeper hold of working men. It may e a bitter draught to swallow, but such is the act. The latter part of last year a mighty cry rose from the papers that the trades' unions were uining the country, that they were driving rade to France, Belgium, and other countries; nd almost immediately on the opening of 'arliament a commission was appointed to iquire into the action of these unions. Mr. 'ladstone, however, in the first speech he elivered in the present session of Parliament nocked the wind out of the statement with a ingle sentence. He showed that though last ear was a year of depression and disaster, of ittle plague and commercial failure, our foreign ade was not only buoyant but that it was many illions in excess of any preceding year. An. iually significant fact is discernible in the asticity of the revenue of the year, which is been more than two millions more than is anticipated. Whatever influence trades' ions may have exerted it is abundantly evint that they have not driven away the trade the country. It is not, however, our purse at the present moment to examine into e action of these unions, but merely to give passing glance at the present condition of e Amalgamated Society of Carpenters and iners. We see from the seventh annual reort of this society, which has just reached us, it it is making secure and rapid progress in the elements which constitute a healthy osperity. In December, 1860, the society isisted of 20 branches, which numbered 618 embers, and had £321 of funds in hand. In ery subsequent year it has added to the mber of its branches, its members, and its nds, as may be seen from the following ble :—

Date.	Branches.	Members.	Funds in hand.		
			£	s.	d.
1860	20	618	321	3	2½
1861	32	650	593	12	0½
1862	38	949	849	8	10
1863	53	1,718	2,042	11	3
1864	81	3,279	4,566	10	0½
1865	134	5,670	8,320	13	7
1866	187	8,002	13,052	4	3½

These figures are very suggestive, and full significance. We believe that some of this osperity is due to the counter action that been put forth by the General Builders' sociation, which boasts of its especial organ whose chief mission appears to be to curt the power of trades' unions. Organic actin has been met by organic action. The n have been putting forth additional efforts the protection of labour, and the masters e been putting forth additional efforts for l protection of capital; one class cannot very wl blame the other in looking after its own rspective interests, though both classes may fi. fault with each other in the means empyed.

The nett expenditure for the past year shows lt £2,524 were paid for "trade privileges," vatever that may mean; £2,246 for "sick benefit;" £1,334 for "donations and travelli expenses;" £362 for "tool benefit;" £ 0 for "accident benefit;" £379 "as grants fru the contingent fund." These figures, to s the least of them, indicate an extensive w king machinery, and are a record of much earnest work. There is a very interesting ble showing the number of deaths and the cses of death since the formation of the sciety. The average age at death of the me members is 36½ years, and the average of th female members is 32½ years. But the mt important table which the report contas is that which states the advantages that we gained in wages and working hours ring 1866. From that table we learn that in 8 towns an advance of wages has been obtained, in 11 towns a reduction of the hours of labour, and in 26 towns both advantages have been obtained. In these 85 towns it is stated that the members have received advantages in wages varying from 3d. to 5s. 2d. per member weekly, with reductions of working hours varying from half an hour to five hours and a half weekly. The nett gain is summarised in the following way :—The average gain in the 85 towns which contain 6,509 members has been 2s. 3½d. per member weekly, or £6 0s. 3d. per annum, amounting in all to £39,038. Deducting £2,600 as cost to the society, and £2,500 as amount of wages lost by members during "suspension of work," leaves a nett gain of £33,938 for the year. Such is the balance of profit realised by the society in 1866, according to the report. No wonder, then, that members flew in and the funds increase. We can say nothing about the accuracy of these figures. We merely take them as they are presented to us, and can only say that the rapid growth of this society is a remarkable sign of the times.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.

AT the usual fortnightly meeting of the Edinburgh Architectural Association, Mr. Alexander Miller in the chair, Mr. William Beattie read a paper entitled "Hints on Masonry." Mr. Beattie gave a sketch of the manner of building as practised by the earliest nations—Egyptians, Assyrians, Greeks, and Romans—and also by the mediæval builders, noticing the defective nature of some of their rubble-work, instancing as an example of it the fall of the tower of Chichester Cathedral a few years ago. He then referred to the different kinds of building as practised by ourselves, describing the peculiar characteristics of each, and also mentioned the different varieties of stone at the command of modern architects, giving us the power of rivalling, or even excelling, all previous builders. The different methods of dressing the stones were also described; and a stone was exhibited having these different kinds of work wrought upon it. Remarks were made by various gentlemen present upon the points touched on in the paper, and a hearty vote of thanks to Mr. Beattie closed the proceedings.

ARCHITECTURAL INSTITUTE OF SCOTLAND.

A GENERAL meeting of the Architectural Institute of Scotland was held last week in the Society of Arts Hall, Edinburgh, Mr. John Sessels, architect, in the chair. Mr. George Seaton, advocate, read "A Notice of the Monastery of St. Catherine of Siena, near Edinburgh." The small remaining fragment of the monastery was now inclosed within the four substantial walls of a house in St. Catherine-street, one of the new streets of the Grange estate. The establishment was supposed to have been founded in the fifteenth century by "Lady St. Clair of Rosline, Countess of Caithness," and was consecrated to St. Catherine of Siena, or Sienna, in Tuscany, who was famous for her "vows of chastity" and her "marriage to Christ." The monastery, or rather convent, of Siennes shared the fate of the Scottish metropolis in 1544, at the hands of the English invaders. After the reading of this paper, Mr. J. Thompson exhibited, by means of the oxy-hydrogen light, a number of interesting photographs of ruined temples in Cambodia, and a paper on the subject was read by Mr. James Gowans. The ruined temples described are situated on a plain lying to the north of the lake of Cambodia, in the heart of a forest. The principal antiquity of the interesting locality is what is called the Great Temple, a building of enormous extent, measuring 1,100 yards in length by 1,080 in breadth. The entrance to these temples is invariably on the west side. Another characteristic is the square form of the buildings and their square pillars. They are generally built, too, in three tiers. Speaking of the Great Temple, Mr. Gowans mentioned, as a noticeable peculiarity, a conformity throughout the building to the number seven—the windows, pillars, and so forth, being all arranged in sevens. This remarkable temple is built of freestone, and without mortar of any kind, the stones being secured by metallic fastenings. Another observable feature about these temples is the frequent representation of angels in the sculpture. Battle scenes and armies on the march, of which Mr. Thomson gave some excellent views, are also largely represented. It was remarked that looking at the proportion of horse to rider, the horses in those scenes were of very large size, whereas the horses of modern Cambodia are very small. Another noticeable circumstance is, that in the sculptured elephants about the Great Temple the tusks are turned upwards, while in the elephants of modern Cambodia the tusks are turned downwards. In concluding his paper, Mr. Gowans raised the question as to the origin of these temples, the architecture exhibiting both Grecian, Roman, and Indian characteristics. Mr. David Kinnear, architect, in the course of some remarks, said he had no doubt whatever that the temples were Asiatic in their origin. At the close, on the motion of Mr. Kinnear, a hearty vote of thanks was awarded to Mr. Thomson for his excellent views, obtained, as they had been, at the expense and risks of a personal visit to Cambodia. Some discussion followed the reading of Mr. Gowan's paper, Messrs. J. Dick, Peddie, and David Macgibbon, architects, objecting to the geometric views held by Mr. Gowans, and ascribing the building to Asiatic origin.

SEFTON PARK, LIVERPOOL.

IT will be in the recollection of our readers that about a year ago the Town Council of Liverpool, after long discussion, sanctioned the purchase of a large piece of land at the southernmost extremity of the borough, and belonging to the Earl of Sefton, for the purpose of forming a new public park for the benefit, more especially, of the inhabitants of that quarter of Liverpool. We may state, however, that at each of the three extremities of the town there is to be a new park—the north is to have its Stanley Park; Newsham House Estate is now being converted into a park for the benefit of the eastern residents; while the projected Sefton Park will be situated, as we have said, at the south end, and will be looked upon by the Liverpudlians as their Hyde Park. The land occupies 375 acres, and was purchased by the Corporation for the sum of £250,000. About 200 acres are to be appropriated to the park, and the remainder sold as sites for gentlemen's villas. In November last, the Corporation, upon the recommendation of the Improvement Committee, decided to offer two premiums for the best plans for laying out the park, viz., a first premium of 300 guineas, and a second premium of 150 guineas. The following conditions and suggestions were sent to intending competitors :—

"CONDITIONS.—1. Each competitor must furnish a plan to a scale of 176ft. to the inch, complete sections, detailed specification, a bird's-eye view, a report explanatory of the design, and an estimate of the cost of carrying out the work, as well as of his own expected remuneration in case of being employed therein. The estimate must include all works incident to the laying out of the park, including the roads, surface drainage, ornamental water, &c., but should not include works consequent on villa residences, such as main drainage, gas, or water mains. 2. All plans must be deposited in the office of the Town Clerk, at the Town-hall, on or before February 1, 1867, carriage paid. 3. All premiated plans, sections, drawings, &c., to become the property of the Council. 4. The winner of either of the prizes will not necessarily be employed to carry out the work; but in the event of his being so employed, the amount of the premium will be deducted from his charges. 5. All drawings or plans to have the name and address of the competitor in the right-hand corner.

"SUGGESTIONS.—1. That a road 75ft. wide, either straight or very slightly curved, be carried from the point A to the point B (see plan), and treated as a boulevard. (The road referred to ran from Prince's Park Corner to a point opposite the entrance at Fulwood Park.) 2. That the plots available for sale as sites for first-class villas, to an extent of about 160 acres, be arranged along the margins of all roads, where practicable. 3. That an ornamental water, sufficient for boating and aquatic sports, be provided. 4. That at least one good cricket and review ground be included in the plan. 5. Also, botanic gardens of an area of from 12 acres to 20 acres. 6. Also, private grounds and gardens, of which the residents in the park villas should have keys. "E. R. ROBSON.

"Architect and Surveyor to the Corporation of Liverpool."

In reply to the invitations to compete, twenty-nine plans have been sent in, and these are now displayed in the large ball-room at the Town-hall, awaiting the judgment of the Improvement Committee and the Town Council. The following are the names of the competitors, and the cost at which they estimate the work indicated in their plans can be carried out :—

	NAMES OF COMPETITORS.	ESTIMATED COST.		
1.	William Wortley, Liverpool	£92,168	1	8
2.	Edmund Andre, Paris, and Lewis Hornblower, Liverpool	85,000	0	0
3.	William Henderson, landscape gardener, and David Walker, architect, Liverpool	123,500	0	0
4.	Gay and Swallow, Bradford	75,000	0	0
5.	R. W. Barnes, Manchester	89,504	0	0
6.	Hans F. Price, Weston-super-Mare	100,000	0	0
7.	Rev. James Bateman, Congleton	62,983	6	8
8.	Alexander Black, Falkirk	27,285	0	0
9.	Francois Duvillers, Paris	29,000	16	3
10.	Rogers & Marsden, South Lincolnshire	33,609	18	0
11.	A. Stansfield and Sons, Todmorden	37,516	19	2
12.	Henry May, Bedale, Yorkshire	13,062	0	0
13.	Charles Eastwood, Luddenden Foot	97,000	0	0
14.	Thomas Mercer, Liverpool	156,687	0	0
15.	Thomas D. Barry, Leamington	109,350	0	0
16.	Reinhart Jahns, Liverpool (two plans) First plan	48,929	0	0
	Second plan	17,919	0	0
17.	Alexander M'Kenzie, London	110,192	8	0
18.	J. S. Tyerman, Liverpool	97,978	1	0
19.	Maurice Young, Godalming, Surrey	62,262	15	5
20.	J. A. Mason, Burton-on-Trent	25,000	0	0
21.	J. Hart, Bradford	51,000	0	0
22.	John Barnett, Shiffnal	56,045	0	0
23.	J. A. Hall and George Middleton, Liverpool	98,299	16	9
24.	J. H. Hirst, Bristol	100,000	0	0
25.	J. W. Cottee, Chelmsford	158,835	0	0
26.	Joseph Newton, London	54,666	4	10
27.	John Gibson, jun., London	55,964	4	9
28.	D. Brade, London	108,880	0	0
29.	Edward Milner, Sydenham	122,560	0	0

We quote the following opinion of them from the *Liverpool Mercury* :—"It is not our intention to attempt to prejudge the decision of the Committee. In matters of taste, it is notorious, there are always vast differences of opinion, and what one man esteems the perfection of beauty may be looked upon by another as the essence of ugliness. The different plans, as might be expected, exhibit the greatest possible variety of treatment. Some of the competitors seem to have a preference for straight lines, and others for curves. Some of the plans resemble a series of geometrical figures, and one in particular looks as though the author had taken a Decorated Gothic window and transferred the tracery to his design; while another is made to look very picturesque with numerous thick clumps of noble trees, which it would take about a century to rear. Several of the competitors seem to us to have committed the mistake of laying out the park as though it were a building estate, and the villas are dotted all over the ground instead of being confined to the outskirts. It is satisfactory to notice that the local competitors stand exceedingly well as compared with the 'strangers;' and, with scarcely an exception, the designs sent in by Liverpool men are of a very meritorious character. Some of the plans are prepared in an exceedingly handsome manner, though of course mere prettiness of drawing and colouring ought not to influence the judgment. Messrs. André and Hornblower, for example, have illustrated their scheme by a series of well executed pictures, besides a large portfolio of drawings exhibiting different features in the plan. They make provision for a deer park, a review ground, a cricket ground of 10 acres in extent, archery and croquêt grounds, a lake of 12 acres (surrounded by a drive), a botanical garden (with conservatory), children's playground, &c. There would be cascades and waterfalls upon the stream running through the grounds, Moorish kiosks and rustic bridges, an ornamental windmill upon an elevated site from whence to view the surrounding country, handsome pavilions upon the cricket and other grounds devoted to special sports, fountains in the gardens, two restaurants for different classes of visitors, a pavilion near the centre for a band of music, a model sheepfold, a shepherd's house, and other erections of a rustic and ornamental character. This sketch will indicate to some extent the character which the park would assume according to one of the more elaborate designs. There are others of a simpler nature, which have economy to recommend them. Mr. Newton, of London, sends a larger number of coloured drawings than any other competitor, and some fragments of the design show to great advantage on paper. On the other hand, Messrs. A. Stansfield and Sons (Todmorden) have scarcely done themselves justice by not sending in a coloured plan. Mr. Wortley, in his plan, devotes a considerable space to ornamental waters. He introduces two lakes, one of 20 acres in extent, and the other 5 acres, the latter being intended for skating. He allows 18 acres for the Botanic Gardens. One of the chief features of Messrs. Henderson and Walker's design is a large central pavilion, in front of which runs a terrace half a mile in length and 100ft. in width. They make the 'boulevard' 90ft. wide. The design of Mr. Tyerman, curator of the Botanic Gardens, exhibits, as might be expected, much taste and ingenuity in laying out the space appropriated for the gardens."

OLD AND REMARKABLE TREES OF SCOTLAND.

THE capabilities of a place as to amenity and climate cannot be better tested than by noticing the size and age of the trees which it bears. In this light the little publication of the Highland Society with the above title, becomes extremely interesting, and those who contemplate becoming proprietors of land in the Highlands, or only occasional residents there, will be surprised at the enumeration here given of very aged and large trees in our highest latitudes, and even in the Hebrides, where, in general, trees can scarcely now be got to grow at all. We shall confine our references just now to Inverness-shire and the counties to the north of it—the first trees in the number before us being specimens of the horse-chesnut. Two fine trees of this species are noticed as occurring at the manse of Kilmorack, near Beauly. Their age is from 130 to 150 years—the height of one being 25ft., girth 7½ft.; and of the other, the height 45ft., girth 9ft., and the spread of their branches from 30ft. to 40ft. A tree of the same kind also occurs in the Duke of Sutherland's garden at Dunrobin—the length of bole being from 20ft. to 40ft.; girth, at 4ft. above the ground, from 5ft. to 8½ft., and the age over 200 years. Of the Spanish chestnut, a fine healthy tree is mentioned as in the cherry park at Inverary—80ft. high, 19ft. in girth, at 3ft. from the ground; contents, 600 cubic feet—and as being 250 years old; and two other trees of the same species at Castle-Leod, in Strathpeffer, respectively 25ft. and 55ft. high; girth at the base, 25ft. and 18ft.; spread of the branches of each about 249ft., and the ages of each about 300 years. A healthy Spanish chestnut is also recorded as standing at an elevation of 45ft. above the sea, near the house of Tongue, in the north of Sutherlandshire—the length of bole being 10ft.; girth, 4ft.: and age, 40 years.

Of the elm, several large trees are mentioned as occurring in the North which were evidently planted in policies; but no notice is taken of several magnificent specimens which are native, and occur in the fastnesses of many rocky rivers and burns in the North Highlands, such as we could point out on both sides of Loch-Ness and on the rocks overhanging the waters of Foyers and Inverfarigaig. These localities undoubtedly show the elm to be a native of the "North Countrie," and near them will also be found very large stems of native holly and ash. References are given in the book before us to large planted elms on the lawn at Sunart, Strontian, on the property of Sir Thomas Miles Riddell; at Cullen House (Earl of Seafield); to several in a decaying state at Castle-Stuart (Earl of Moray), in the parish of Petty of from 100ft. to 120ft. in height, each with a spread of branches of 50ft., and being above 200 years old; and in the Island of Skye, exposed to the Atlantic gales, a vigorous tree is recorded as situated at Talisker (Macleod of Macleod), in the parish of Bracadale, which is 70ft. high and 9½ft. in girth; and another, in the parish of Snizort, at Kingsburgh (Lord Macdonald) 44ft. high, 6½ft. in girth, and at an altitude of 200ft. above the sea. The most noted elms in Ross-shire are twelve vigorous trees at Balconie (Miss Munroe), parish of Kiltearn, each from 40ft. to 50ft. high, girth 5ft. to 8ft., and being from 210 to 400 years old; another at the manse of Kincardine, on the Dornoch Firth, 200 years old, with no marks of pruning; while at Brahan Castle (350ft. above the sea), another elm, in a decaying state, occurs, 41ft. high, with a girth of 18½ft. at 2ft. above the ground, and which continues almost as thick for 6ft. farther up. Even at Stornoway, in the Lews, several large elms are mentioned, which flourish at an altitude of between 50ft. and 100ft., and are more than 100 years old. The Dunrobin gardens and an adjoining glen, and the House of Tongue, in Sutherland, also boast of several fine elms, whose ages range from 150 to 200 years.

Of the beautiful lime tree (*Tilia Europæa*), whose introduction to Britain we likely owe to the Romans, no examples are set down as in Inverness-shire, though we think a very fine and large one exists in the old Catholic burying-ground at Dumballoch, near Beauly Bridge, and if we mistake not some others at Beaufort Castle and Belladrum. Only one tree, 50ft. high and 12ft. girth, is given to Ross-shire, at the mansion-house of Balconie; but we think other fine specimens might have been quoted, as at the lawns of Castle-Leod, Tarbat House, Invergordon and Balnagown Castles.

Of the British oak, a most meagre list is given of those flourishing in the North; only one locality—that of the Meads of St. John on the Findhorn—being noted for Morayshire, while no mention whatever is made of the oak forests of Darnaway and Cawdor, and of the numerous large oaks both in native woods and planted stems scattered over the adjoining districts to the north. Burns's oak at Kilravock, under which the poet composed some verses on his visit in 1787, is the only Inverness-shire locality noticed, and but four examples are set down for Ross-shire, and two in Sutherland at Skibo and Tongue.

Of the plane tree, one 70ft. high and 13ft. in girth, about 500 years old, occurs in the burying-ground of Beauly Priory, and several trees at the manse of Petty and at Castle-Stuart (Earl of Moray) from 60ft. to 80ft. high, and the age of which is above 200 years; but no planes are mentioned as to be seen farther north. The sycamore seems to be more hardy, and a large one occurs at the manse of Kilmorack, and others at the places already mentioned in the parishes of Bracadale and Snizort, Inverness-shire; and at Balconie, Newhall, and Braham Castle in Ross; and two others at Skibo Castle and Dunrobin in Sutherland. Skibo is again given as a locality for a fine walnut tree, and the manse garden at Kilmorack, in Inverness-shire, for another, and we think Castle-Leod and the old mansion house of Foulis might have been set down for Ross-shire. In fact, the walnut thrives so well in the northern counties, that we are convinced many more habitats for large sized trees of that beautiful wood might have been traced out

It is very odd that no notice is here taken of large willows in the North, with the exception of one 70ft. high at the manse garden of Kincardine, and of several upwards of 100 years old in the parish of Stornoway, in Ross-shire. We believe specimens as large could be mentioned by the dozen.

The yew tree (*Taxus-baccata*). This subalpine tree or shrub is undoubtedly indigenous to Scotland, where it usually grows on the north sides of slaty mountains and under the shade of large deciduous trees, especially the oak. The banks and islands of Lochlomond are its most celebrated localities; but in the latter the tradition is that they were planted by King Robert Bruce. The age of the "Fortingal Yew" in the churchyard there, according to the calculations of Decandolle, is from twenty-five to twenty-six centuries, and its stem measured 56ft. in girth when entire. No examples of the yew are given for Elgin, Inverness, or Ross, and two only are mentioned as in Sutherland. The great old yew at Knocky, on the southern bank of Loch-Ness, overlooking the entrance to Glenmoriston, we think should have been mentioned, especially as it is traditionally known as the tree from which the Clan Fraser in Stratherrick used of old to cut their bows, when bows and arrows stood for muskets. In the western glens and fastnesses of this county we also believe there are many large and old yew trees.

The sites of the ancient religious houses still contain some very large apple and pear trees; but here only one apple is noticed as in the orchard of Beauly Priory, now in a decayed state, 30ft. high, and which was planted in the fourteenth century. The same locality and the old gardens at Phopachy and Glenconvith might have also been assigned (which they are not) for several very old pear trees, chiefly small achans; but the only mention here given by the Highland Society of famous old Scottish pears is that of one in the manse garden at Banff, known as "The Minister's Tree," "The Shirramuir," "Byron's Pear," and "The Banff Chaumontelle." Lord Byron's name adheres to it from the pranks he used to play in robbing the minister's garden when he and his mother resided at, or paid occasional visits to, Banff in his very young days.

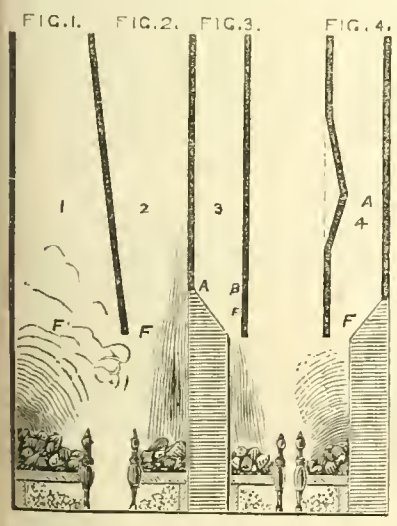
We have said enough to commend this curious compilation to the notice of our readers, and our only regret is that it is not fuller, and that it does not give a sketch of the distributions and abundance of many more of our ancient and native forest trees.—*Banffshire Journal.*

THE CONSTRUCTION OF CHIMNEYS.

THE object of a chimney is to conduct the products of combustion from a fire inside of a ouse and discharge them into the atmosphere utside. In performing this function it also secures supply of fresh air to the fire to promote and upport the combustion of the fuel. The principle pon which the draught of a chimney is secured nd regulated is based on the difference in the pecific gravity of the hot air and smoke arising om the fire, and the cold air of the atmosphere. he heated products of combustion, being lighter han the outside air, ascend by their expansive rce, and at the same time the colder air deends and flows into the fire to supply the place the ascending current. It is thus that an outard current is maintained from a fire, otherwise e smoke and carbonic acid gas would remain in e apartment in which the fire is maintained. he ruling feature of a chimney is to control the pansive current of warm air and smoke, so that force will be maintained to overcome the pressure of the atmosphere outside and thus maintain outflowing current.

Chimneys are deservedly held to be worthy of gh rank among the great blessings of modern ilisation. It is now very well ascertained that ch contrivances were unknown to the ancients. e Romans performed their cooking and heating th chafing dishes. There are no chimneys in e houses of Herculaneum and Pompeii, and but v if any chimneys are to be found in the present y on the houses in the warmer districts of Italy. the thirteenth century chimneys were unknown England; each family made their fire in a hole the middle of the floor, which was covered when inmates retired to bed. It is supposed, ough not clearly established, that chimneys re first used in the hilly and colder portions of roy and Piedmont, and from thence the impvement was communicated to France, Gerny, and England. Chimneys are still unknown ong savage races of men. In cold weather they ke their fires on the floors of their huts, and only exit for the smoke is a hole in the roof. ch rude dwellings are usually filled with smoke, ich is the cause of frequent inflammation of the s, and among barbarous white tribes it colours ir skin a rich amber hue, rivalling that of a oked ham. Several of the rude races of thern Europe have skin as yellow as those of natives of Southern Africa, all caused by peat oke. When well scrubbed with soap and water permitted to reside for some months among lised people, who have chimneys in their uses, these races become as fair as any of the glo-Saxon Celtic family.

here is considerable practical science involved the construction of chimneys. It is well known t many of them smoke, and the plague of a oky chimney is put in the same category with a "olding wife." Among the first who treated the ject of chimneys in a philosophic manner, that wisest and most practical of American



osophers, Franklin, who published a treatise he subject in 1785. This essay was followed one on the same subject by Count Rumford. se two authors have laid down the principles n which all chimneys should be built, and the ompanying figures illustrate how the draught be controlled (as described by an old correspondent) in chimneys which have open fires below on andirons and grates. Chimneys are frequently built in leg houses on the plan of fig 1. The fire being built upon the hearth, it has abundance of room to enter the chimney at the flue F, but the hole at the top being small, compared with the flue F, there is no room for the warm air and smoke to get out of the way of the cold air rushing in below, and it will be continually puffing out into the room. On the other hand, if the plan be reversed, as in fig. 2, and the chimney increases in size upward from the flue to the top, the draught will be excessive, and the greater part of the heat will go up the chimney, as in an air furnace. A medium between these two plans at fig. 3 will create a regular and not excessive draught. In fig. 3, the flue is (as it should be) the smallest place in the chimney. In ascending from the flue upward, in the course of about 1ft. the chimney should widen, or rather deepen off to about two and a half times the width of the flue. If we suppose the flue to be 4in., in ascending 1ft., the distance from the inside of the front at B to inside of the back at A should be 16in.; and then if we suppose the width of the fireplace to be 3ft., the calibre of the chimney on the inside at A B will be 36 square inches. And the calibre should not be less at any point above than at A B. There will be room for all the smoke which enters the flue to pass upward without impediment. The chimney may be brought into a different shape, so as to make it appear well at the top, but still the number of square inches in the calibre should not be lessened. Thus in the case of the chimney, supposed to be 360 square inches at A B in fig. 3, it may be 16in. by 24in. in the inside at the top, or 384 square inches—a not unusual size of chimney tops. On the other hand, if there be any curvatures or projections which impede the smoke in its passage upwards, as in fig. 4 at A, such circumstances will have a tendency to prevent the proper draught of smoke, especially in bad weather.

WATER AS A DISINFECTANT.

THERE are two classes of disinfectants. By one class offensive odours are destroyed, by the other they are simply absorbed. Of the latter class the most powerful and universal disinfectant is charcoal. So far as we now recollect there is not a single substance which on being filtered through charcoal will not be deprived of its flavour and odour. Spirits distilled from various fruits and grains are mingled with volatile ethers which give them the flavours of the peach, apple, grape, rye, wheat, &c., from which the spirits are made. But if the liquor is filtered through charcoal, its flavour is removed, and it becomes rectified spirits —tasteless and inodorous alcohol and water. It seems to be the nature of all those delicate compounds which affect our olfactory nerves to nestle into the minute pores of charcoal, and to cling there with great tenacity. The substance coming next to charcoal in its power of absorbing various odours is water. Water absorbs its own volume of some gases, and more than six hundred times its volume of others, varying as shown in the following table:—

One cubic foot of water absorbs of	Cubic feet.
Sulphurous acid gas	43·78
Sulphide of hydrogen	2·53
Carbonic acid	1·06
Nitrous oxide	0·76
Oxygen	0·65
Hydrogen	0·46
Hydrochloric acid	480·00
Ammonia	670·00

The volumes given are those which water will absorb at a temperature of 64·4 deg. Fah., except the last two, for which the temperature is 50 deg. The offensive odours most frequently encountered are those of ammonia and the sulphide of hydrogen, both being always produced by the decay of animal matter. The power of water to absorb these gases prevents meat decaying in a large body of water—the carcase of a horse in the harbour, for instance, from giving off any odour. The power of water to act as a disinfectant can be made available in many circumstances; it is especially useful in chambers of the sick, as a dash of water in any vessel standing in the room will render it inoffensive.

The finest steam coal in the world is said to be that found near Pekin, where there is a coalfield of 300 square miles in extent.

Building Intelligence.

CHURCHES AND CHAPELS.

The Roman Catholics are about to build a church at Oxford for the accommodation of the Roman Catholic students who are now admitted at Balliol, Christ Church, Exeter, and Lincoln colleges.

On Sunday last, the church of St. Matthew, Liverpool, was reopened, after having undergone considerable interior renovation.

On Sunday last a new Synagogue was opened in connection with the Polish Hebrew congregation in Newcastle.

Croydon.—The plans for the restoration of the parish church of St. John, recently destroyed by fire, are completed and approved of by the committee. Although the tower and side walls will remain, there will be a considerable alteration in the interior aspect. The committee hope that in about a fortnight they will be in a position to invite competition for the rebuilding. It is intended to invite tenders from about twelve firms of experience in church architecture. There is a probability of a much larger fund being required than that at present at command, which amounts with the insurance to a little over £26,000.

Reading.—The committee for the restoration of the dilapidated but fine old church of St. Lawrence feel themselves in a position to make arrangements to solicit tenders for the execution of the work; and there is no doubt that the work will be commenced this summer.

Stockton-on-Tees.—On Thursday week the Congregational chapel was reopened by the Rev. J. Parsons, of York. About 20ft. has been added to the length of the building at the west end, giving accommodation for 280 more sitters, and at the same end, a circular tinted window has been inserted. The cost of the alterations, which have been under the direction of Messrs. Pritchard and Sons, of Darlington, will be about £500.

Building, Enlargement, and Repairing of Churches and Chapels.—The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held its usual monthly meeting on Monday, the 15th inst., at the Society's House, No. 7, Whitehall, S.W., the Right Rev. the Lord Bishop of Lichfield in the chair. Grants of money were made in aid of the following objects:—Building new churches at Howden-Pans, in the parish of Wallsend, Northumberland; Killingworth, in the parish of Long Benton, near Newcastle-on-Tyne; and Perry-street, in the parish of Northfleet, near Gravesend; rebuilding the church at Wendy, near Cambridge; enlarging and restoring the churches at Waustead (Christ Church), Essex, and Westhampnet, near Chichester; re-arranging the seats and restoring the churches at Bletchley, Bucks; Normanby, near Market Rasen, Lincoln; Stapleton, near Shrewsbury; and Wrexham, Denbighshire. A grant was also made from the mission and school church fund towards building a mission church in the new district of Dartmeet, in the parish of Lydford, Devon. The society's income to March 31 last was less by £1,501 11s. 3d. than in the previous year; though during the twelve months just ended it expended more in grants by £1,410 than in the year preceding. His Grace the President has appointed Friday, May 24, for the annual general court, to be held at the Society's House, 7 Whitehall, S.W., at two p.m.

BUILDINGS.

It is proposed to erect new schools at Merthyr, to accommodate 1,000 children, at a cost of £3,500.

Lenham.—A new Literary Institute was opened on Friday last. The building itself is most desirably situated in a central position in the town, and is both a handsome and commodious structure adapted in every way to the purpose for which it was erected. It consists of a large lecture hall 60ft. by 25ft. arranged with a view both to taste and utility. It is 25ft. high, with an open-roof, and is well lighted and ventilated. Connected with the large hall is a reading-room, and a well-fitted library with convenient offices.

Prestwich.—New Workhouse.—The increase in the population of Prestwich, and the limited accommodation afforded by the present workhouse, have led the guardians of that union to determine the erection of a new workhouse. For this pur-

pose a plot of land has been purchased at the Bongs, near Crumpsall, having an area of over 18 acres. The building will be a cheap brick structure, treated something after the Italian style; and it will afford accommodation for about 350 inmates. The building will be arranged into three distinct groups—one for probationers and inmates suffering from skin diseases; further to the rear will be the main building, and behind that the hospitals. The arrangements will be geometrical; for every room or arrangement of rooms on the side of the house occupied by the men there will be a corresponding arrangement on the side appropriated to the women. The main building will be two stories high, and will present a frontage of about 300ft. The natural irregularities of the ground will permit of the building standing on a terrace 6ft. high, and it will thus be thrown considerably higher than the front block, and make a picturesque *ensemble*. Behind the centre of this main building will be the dining hall, 66ft. long by 28ft. wide, and affording accommodation for 100 of either sex; the story above is to be occupied by the chapel. The extreme rear of the workhouse is to be devoted to the hospitals, and the plan decided upon is known as the pavilion principle, similar to the hospital at the Withington workhouse, but with a few improvements in matters of detail. There will be four pavilions, two for each sex, and each two stories high, affording an aggregate accommodation for 128 beds. The pavilions will be more than 100ft. from each other, and the intervening space will be occupied by walks and gardens for the convalescent. The convalescents will also have a dining-room specially provided for them. Each ward will be 44ft. long, 24ft. wide, 14ft. high, and accommodate 12 beds, allowing 88 superficial feet for each patient, and a cubic breathing space of 1,200ft. Ventilation will be effected by means of the windows. The beds will be arranged singly between each window, and not in couplets as at Withington. The exterior appearance of the hospital will accord with the rest of the building, and the sky-line at each corner of the pavilions will be broken by low-roofed turrets, which are practically water tanks, similar to those in the main building. It is said that the drainage of the workhouse will form a subject of some difficulty with the guardians; but the present idea is to utilise it, and throw it upon the farm. A part of the contract for the foundations and levelling has been let, and the building will probably be completed about the autumn of next year. The architect is Mr. T. Worthington, of Manchester, who was also the architect for the pavilion hospital at Withington.

New Shelbourne Hotel, Dublin.—This new hotel, which has just been opened, is situated on the north side of St. Stephen's Green, Dublin, having a frontage thereto of 126ft., and to Kildare-street of 176ft. The height from floor of basement to ceiling in lucerne story is 92ft. In the basement story of main building are two spacious dining-halls, one for the visitors' servants and one for the hotel servants; also lavatories and bath rooms, and sitting and sleeping rooms for the domestics. The entrance hall is 38ft. by 19ft., with corridors leading right and left; on the right are the gentlemen's and ladies' coffee-rooms, the former 52ft. by 26ft., with the additional space—26ft. by 10ft.—gained by the projecting bay window; the latter is 49ft. by 26ft.: both apartments can be formed into one by folding up the large doors separating them, thus gaining a room 101ft. long. On the right of the hall are the telegraph office, manager's room, ante-room 42ft. by 24ft., with lavatory and waterclosets; gentlemen's reading room 49ft. by 26ft.; also public drawing room, 48ft. by 28ft., with the additional space gained at bay window same as in gentleman's coffee-room. The style of architecture of the exterior is Renaissance. The walls are of red brick, with dressings of Portland; the principal feature being the porch and bay windows, the latter rising to the height of the two principal stories, the top of which is approached from the rooms, and forms a splendid position for viewing public processions, &c. The area is protected by a very handsome balustrade of scroll pattern in cast iron, with four granite pedestals supporting full-sized bronze figures of Egyptian maids holding the glass urns for gas lamps. The cost of purchasing the old hotel was £14,000, and the adjoining premises and some ground at the rear £4,500, which, together with the cost of the new building and fittings, makes the total outlay over £80,000. The Lord Lieutenant, to show his approval of the spirited enterprise of the proprietors, Messrs. Jury, Cotton, and Goodman, paid a visit previous to the opening, and was received by them and conducted through the building by the architect, Mr. John M'Curdy, and the builder, Mr. Samuel H. Bolton.

General Items.

A large body of the parishioners of Calne having seceded from the church on account of the ritualistic proceedings in the parish church there, determined on erecting a new Free Church for their worship. Plans having been invited in a limited competition those sent in by Mr. W. J. Stent, architect of Warminster, Wilts, were selected, and the work will be proceeded with at once. The church will accommodate 400 adults. Large schoolrooms will be erected in the rear, connected with the church by an arcaded covered way.

Mr. Reuben Young, a respected resident of Nottingham, died last week, aged 74. Some of his sacred compositions are well known and still sung in the various choirs throughout the country. Half a century ago he may be said to have first successfully lighted Nottingham with gas.

The famous Lindall Hotel, St. Louis, regarded as the largest and finest hotel in America, was totally destroyed by fire on March 31. The building was erected at a cost of 900,000 dollars, and the loss is estimated at fully 1,600,000 dollars. There were four hundred guests at the hotel, but all happily escaped, though many lost their personal effects. The hotel is to be at once rebuilt by a joint-stock company.

Mr. E. Dresser Rogers has given the following notice of motion in the Court of Common Council: "That in consequence of the constantly increasing traffic, it be referred to the Bridge House estate committee to obtain plans at once for the better accommodation of foot passengers passing over London Bridge."

While demolition and reconstruction continue the order of the day in Paris, great pains are being taken to make those parts of the City not given over to the builders clean and bright. With this view, a novel method has been lately introduced of cleaning all the stone ornaments by means of jets of steam and boiling water.

A new bridge is to be built over the Niagara River at Buffalo according to the designs of Mr. T. W. Kennard. It will be constructed in spans of 250ft., supported on piers constructed with iron cylinders filled in with ashlar masonry, and surrounded by cribs loaded with broken stone. The total weight of each pier will be 5,317 tons. The superstructure will consist of wrought-iron trussed girders, and it will carry a railway and road side by side.

The Directors of the Crystal Palace Company having recently by circular asked the proprietors for their consent to obtaining a bill to raise fresh capital for the restoration of the burnt portion of the building, and for other matters, have in reply received assents representing £641,605 (out of a total share capital of £1,163,070), and dissents representing £176,520. With the view to promote harmony in the company, the directors have since announced their determination to suspend further proceedings with the bill during the present session.

At a sale of photographs which has just taken place in New York, one of William Penn fetched 15 dollars; of Edgar Poe, 11 dollars; of George Washington, 25 dollars; of Beethoven, 13 dollars; of Robert Burns, 70 dollars; of Lord Byron, 75 dollars; of Samuel Taylor Coleridge, 11 dollars; of Napoleon Bonaparte, 43 dollars; of Marshal Ney, 7 dollars; of Robespierre, 9 dollars; and of Mirabeau, 7 dollars 75 cents.

Some workmen were engaged in lowering the water in the Cæsar basin at the thermal establishment of St. Alban Isere, France, when suddenly a sort of detonation was heard underground, and the spring began to boil, emitting gas bubbles with great regularity. Since that day effervescing drinks have been made in vast quantities from the abundant supply of gas. The mineral water has also become much stronger.

Lately whilst excavations were being made at Pompeii, the workmen discovered a bronze vase, hermetically closed, and enveloped in a thick crystallised crust. The interior of the vessel was found to contain a considerable quantity of water. Some persons present ventured to drink some of the liquid, and all agreed in pronouncing it clear, fresh, and of remarkable softness. The water in question must have been preserved for nearly 1,800 years.

The report of the executive committee of the Yorkshire Fine Art and Industrial Exhibition, just printed, deserves a word of notice. From this document it appears that the guarantee fund of 388 citizens amounted to £6,000, of which 2s. 5d. was paid before the opening of the exhibition and had since been returned with 5 per cent. interest; that the value of the articles exhibited could not be less than £250,000, most of which were ensured; that £487 3s. 10d. was the highest day's receipts, and that the gross receipts during eighty seven days opening of the exhibition were £13,822 19s. 1d. This amount contained some curious items. £900 had been received from the sale of ribands manufactured in the exhibition by a jacquard riband loom from Coventry; £556 from persons who entered the exhibition theatre to witness a fairy fountain and photographic views; and a halfpenny each had been received from 90,000 persons who had left their sticks and umbrellas at the doors on entering. The number of daily visitors to the exhibition varied from 875 to 12,703, and the total number who entered the place was 380,591, or an average of 4,374 daily. The medals and certificates for exhibitors had just been received and would at once be distributed. It was recommended that the surplus should be devoted to the purchase of a building suitable for a permanent exhibition of art and industry, assistance towards which, it was suggested, might be obtained by soliciting subscriptions or creating shares at a moderate rate of interest.

A fine example of an Anglo-Saxon sword was exhibited at the Society of Antiquaries' meeting, Abingdon, last week. The sword was found in June, 1831, at Reading, about 2ft. or 3ft. below the surface of the ground. When found it was about 1ft. longer than it is at present, and was bent into the curve of the ribs of a horse, the skeleton of which was upon it, just as if the fall of the horse had bent it. The sword was double-edged, and the point was central; when found, the hilt, which was ivory, was in very good condition, but the greater part almost immediately crumbled away. The bones of both man and horse were quite perfect. Mr. Kemble, in a communication to the Archæological Institute, showed that the ceremony of immolating the horse of the defunct warrior on the grave of its master was observed in Germany as late as the latter half of the last century. This weapon is a fine example of the craft of the Anglo-Saxon swordsmith. The pommel and guard are formed of a metal resembling pale copper, inlaid with silver, the former being ornamented with what appear to be imperfectly-executed figures of men and animals. The grip is small, and could not have been designed by one accustomed to the handicraft. It is worthy of observation that the guard is much worn by chafing, as if the weapon had long ridden on the hip of its owner.

According to Liebig, the quantity of soap consumed by a nation would be no inaccurate measure whereby to estimate its wealth and civilisation. Political economists, indeed, will not give it this rank; but whether we regard it as joke or earnest, it is not the less true that, of two countries, with an equal amount of population, we may declare with positive certainty that the wealthiest and most highly-civilised is that which consumes the greatest weight of soap. This consumption does not subserve sensual gratification, nor depend upon fashion, but upon the feeling of the beauty, comfort, and welfare attendant upon cleanliness; and a regard to this feeling is coincident with wealth and civilisation. The rich in the middle ages, who concealed a want of cleanliness in their clothes and persons under a profusion of costly scents and essences, were more luxurious than we are in eating and drinking, in apparel and horses. But how great is the difference between their great days and our own, when a want of cleanliness is equivalent to insupportable misery and misfortune!

TO CORRESPONDENTS.

OUR READERS.—We shall feel obliged to any of our s who will favour us with brief notes of works con- ated or in progress in the provinces.

ters relating to advertisements and the ordinary busi- f the paper should be addressed to the EDITOR, 166, street. Advertisements for the current week must the office before 5 o'clock p m. on Thursday.

RICE.—The BUILDING NEWS inserts advertise- s for "SITUATIONS WANTED," &c., at ONE LING for the first Twenty-four Words.

CEIVED.—J. N.—W. J.—G. S.—S. R. and Son.— J.—H. and B.—G. H. G.—J. D. and Son.—L. R. T. W. P.—W. S.—C. L. E.—M. H. and Co.—J. G.—T. E. D. and Co.—G. T. R.—J. B.—F. H. L.—J. B.— I. L.

H. T.—Write to Messrs. Spon, Bucklersbury, or to rs. Lockwood, Stationer's Hall-court, London.

Correspondence.

MANCHESTER TOWNHALL COMPETITION.

To the Editor of the BUILDING NEWS.

R,—Will you allow me to indicate a point or on which "One of the Tail Tips," and "A ber of the Council" appear to me both right both wrong! The Manchester Corporation iven no proof, that I can see, of niggardliness; they have, by "slap-dash" and extreme ghtlessness, rendered a good townhall impos- to their city, unless they can bring them- s to reconsider some points of their pro me. The offer of £300 is quite enough for they really want from each man in the d competition. Their error there is simply ling this, through ignorance, a complete de- The sum would not be enough for a com- design; but they have no use for a complete n from each of the chosen competitors, and ertainly not get one, whether offering £300 or 0. In fact I doubt if they could get them fully completed by offering more money; think they offer this to too many. From to six would have been a better limitation ir number than from six to twelve. But are trifles.

ir grand mistake—always excepting the one common to all England, and which, as s it stands, bars out all real architecture, t for ever and for ever—the expecting it contractors' partners, from men who see g absurd in superintending an outlay and paid percentage on that same outlay—next I say their first great peculiar mistake is quirement of what your correspondent calls layer showing his trumps to the rest. I do ink this arose at first from anything but thoughtlessness. We cannot ascribe to a who could devise that notable scheme for g both contests anonymous, "it being un- od that architects shall not adopt the same or motto in the second as in the first com- n" (the finished design to be unrecognised e it has a different motto from what it bore unfinished!)—we cannot surely ascribe to hinkers any wickedly deep design. No, they ly never saw, any more than children at hat to claim "to exhibit the whole of the s" is simply giving the gratuitous use of ll to their chosen architects or architect. rse, however, this has been pointed out to and the question is, have they not thereupon d it as rather a fluke, and a good thing to ere in? The following answer, given to one quired whether they meant to stipulate ight to exhibit the preliminary as well as ished and bought designs, looks very like

[COPY.]

S,—In the absence of the town clerk I am d by the Mayor to acknowledge your letter erday's date, and to inform you that the ation, as stated in the instructions, reserve selves the right to exhibit the whole (in- of course of the preliminary sketches) of signs. It is not, however, by any means that such a course would be taken. It is kely that the inspection in the first place preliminary designs will be limited to mem- the Corporation, and that a public exhibi- ll take place of the finished and premiated sent in for the final competition.—I am, ir obedient servant,

(Signed) JOHN ROWBOTHAM.

This, you see, it is not probable we shall make any use of your studies for nothing, but we reserve to ourselves (for it seems they can "reserve" what they have not got) the liberty to do so, should we or our architect think them worth using. This is far cleverer than anything in the printed instructions. But now, if the notion is that the more drawings the finally chosen architect can see of other men's studies, the better, surely there must be men in Manchester capable of seeing how utterly this outwits itself. It is the common mistake of being too clever by half. True, it would be better for a town to get the free pick of many real studies than of a few; and more advantageous to get some for nothing than to buy them; assuming this could be done. But do not you see that there's the rub? Can they be so got anywhere? "Sketches" are not necessarily studies, and which does Manchester want? In announcing that the unsuccessful shall not simply lose their work, but see it (if worth using) appropriated by the successful—that, in short, all real, all valuable work discoverable shall be used if possible for nothing, you simply warn off all real workers—you make it, indeed, worth every sham worker's while, every adventurer who can get random plans and showy drawings produced, to take a draw in your lottery; but by the same act you render it worth no man's while to risk real study, science, or skill! No amount of premiums could alter the case. More money offered would only bring together a more bewildering mass of probably wilder and more random projects—not one real studied design. What is wanted is some reconsideration of these child's play "instructions," and at least a pledge that the council do not "reserve to themselves the right to exhibit" any but their own property.—I am, &c.,

ONE READY TO COMPETE BUT NOT TO GAMBLE.

SIR,—With every reliance on the good faith of the framers of the conditions in this case, I would suggest that there is a certain amount of ambiguity surrounding some of the more important points of that document, which, if removed would go far to ensure that "full confidence" on the part of competitors which the corporation appear to desire.

First, it should be distinctly provided that proper professional assistance be called in for the preliminary selection, as it stands to reason unless the best six, or best twelve be selected in the first instance, the after competition must be a farce. Besides, the preliminary drawings being but plans and elevations to a 16th scale, it would require a careful professional examination to arrive at a proper judgment of their merits. Not wishing to exclude the corporation altogether from a voice in the selection at this stage, I would propose, as the number of designs to be selected in the preliminary competition is limited to twelve, that an eminent architect be instructed to report, and make a selection of the six which he considers the best; that this selection remain sealed until a committee of the corporation pass judgment in a similar manner, independent of the architect, and record the mottoes of six which, in their opinion are the best; that so many of these latter as have not been selected by the advising architect be added to his list; and that the authors of these designs be the competitors in the second competition. Professional adjudication I understand to be already guaranteed for the after competition.

Second, that the requirements in the second competition be distinctly stated. It is to be presumed that the committee must have had a certain number and scale of drawings under their consideration, to enable them to fix a sum as a remuneration for them. Why not allow competitors to have an equal opportunity of judging whether this sum is a sufficient one? for at present the phrase "finished and complete drawings" (italicised in the conditions), indefinite as to numbers, scale, and everything else, is quite sufficient to suggest working plans and details ready for placing in the hands of a surveyor or builder.

Third, the conditions do not make it clear whether or not it is intended to exhibit the preliminary designs. If the exhibition of these be considered necessary, I would suggest that the twelve selected ones be sealed and retained by the corporation, to be exhibited afterwards with the more developed design; to ensure the identity of the latter with the first sketch. A better course would be, that the exhibition of these designs be confined strictly to the adjudicators, and that the selected ones be returned immediately to their respective authors.—I am, &c.,

A WOULD-BE COMPETITOR.

"THE PUGIN ROOF."

SIR,—Your correspondent, Mr. S. J. Nichol, has endeavoured to play a part, which I venture to believe he will hardly be equal to sustain. He appears in your pages as the injured originator of a style of roof, the principle of which I have adopted at Peckham and elsewhere; and I have no hesitation in saying that, had his memory been better, or had he looked further, he would have said less. The facts of the case are these. In 1859, Mr. Nichol, myself, and several other architects, competed for the Church of SS. Peter and Paul, Cork. My original drawings, which were exhibited both in Cork, and at the Architectural Exhibition in London, show the design now called in question. This fact, I humbly submit, is sufficient to clear me from the charge of "plagiarism." The first time I saw Mr. Nichol's drawings was some months after the competition had taken place, when both designs appeared in the same exhibition. I was then somewhat struck at seeing that the same principle had been adopted by Mr. Nichol, but knowing him to be an architect of some original power, I imagined at the moment that we had both hit upon the same idea. It never occurred to me that he might possibly have seen my church in Eldon-street, Liverpool which was designed two years previously, and actually carried into execution towards the end of 1858, almost two years previous to the competition. In order that there may be no misunderstanding, I transcribe copies of two letters from the builders who tendered for the church alluded to, both of which bear out and verify my statement. The tracing spoken of shows the double back principal.

(1)

13, Everton-crescent, Liverpool, April 15, 1867.

E. W. Pugin, Esq.

DEAR SIR,—In reply to yours just received, I beg to say that the tracing you enclose is from the drawings from which I estimated in the early part of 1858. It is also a fact that the same principle of roof was carried out in the latter part of the same year by me in your church in Eldon-street, Liverpool, where it is now to be seen.

I am, &c.,

HUGH YATES.

(2)

118, Walton-road, April 15, 1867.

E. W. Pugin, Esq.

DEAR SIR,—In reply to your letter received to day, I beg to state that the tracing enclosed therein is from the drawing from which I made an estimate for the erection of a Catholic church in Eldon street, Liverpool, in the year 1858. I can certify that the same principal of roof was carried out by Messrs. Yates and Hughes, in the above-named building shortly after.—I am, &c.,

JOHN HENRY MULLEN.

After your readers have perused the above, probably I shall be the only person who will not be lead to the conclusion that Mr. Nichol simply describes his own *modus operandi*, whilst most unjustifiably attaching to it my name.

I am, &c.,

E. WELBY PUGIN.

1, Oxford-street, Liverpool, April 16.

Intercommunication.

QUESTIONS.

[352.]—ELECTRO ON STONE.—Will any of your correspondents inform me if there is any process, electro or otherwise, by which a coating of metal may be made permanently to adhere to stone? ENQUIRER.

[353.]—ARCHITECTURAL LIBRARY.—Will you kindly inform me if there is any library containing engineering and architectural works in London, as I wish to study some, and the price of them is generally so expensive? S. G. H.

[Our correspondent has certainly not been an attentive reader of Intercommunication, or he would have known that there was no private architectural library in London. There is an admirable art library at South Kensington Museum, which can be visited by subscribers. There is a smaller one connected with the Architectural Association, which S. G. H. can easily avail himself of. See Mr. J. D. Mathews's letter in BUILDING NEWS, No. 620.]

[354.]—BELGIAN VAULTINGS.—I should be greatly obliged to any reader of the BUILDING NEWS who could say whether the bricks used for the vault fillings (between stone ribs) in many Belgium fifteenth century works, as Antwerp steeple and the whole cathedral of Mons, are solid or hollow, and if hollow, could give any particulars of their dimensions. E. L. G.

[355.]—FURNACE CHIMNEYS.—I am about to erect a furnace chimney. I should, if possible, like to be informed of the data by which to determine the height furnace chimneys for different purposes should be built. SMOKE.

[356.]—STRENGTH OF WALLS.—Can you or any of your readers inform me whether there is any rule for determining the strength of walls according to the size of the building, viz.:—Suppose there is a building to be erected consisting of one large room 60ft. long and 40ft. wide, 15ft. to wall plate, with an open timbered roof without any tie-beam, is there any rule to ascertain the strength of the walls required to support this roof? An answer to this will greatly oblige your obedient servant, Muscle.

[357.]—ENAMEL ON LEATHER.—Can any one inform me of a simple method of putting a white enamel on leather without impairing its flexibility? Decorator.

[358.]—PAVING ROADS.—Can any of your readers inform me of the best means of preventing or mitigating the noise arising from paved roads. Paving is in all other respects superior to macadamising, and I am sure if any of your scientific readers can suggest any means whereby this one drawback to paving can be lessened, they will confer a great boon upon the community. Zeno.

[359.]—CUBE.—You will oblige me by answering the following question:—What is the cube of a stone the length of which is 3ft. 4in., breadth, 9in.; thickness, 2in.?

A Constant Subscriber.

[The cube of 3ft. 4in. × 9in. × 2in. = 40in. × 9in. × 2in. = 720 cube inches = 5-12ths of a cube foot exactly.]

[360.]—FACTORY CHIMNEY SHAFTS.—I shall feel obliged if a kind subscriber will inform me the usual batter on a foot, or say for stacks varying from 150ft. to 250ft. high.—Truro, Street.

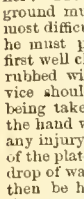
REPLIES.

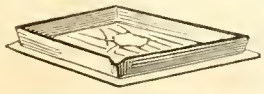
[322.]—CIRCLE.—In answer to William Butler I employed a decimal too few, but his meaning was surely plain enough. How long must a diameter be that, when increased as 113 to 355, it may give a foot more than its true circumference? It is a question of simple division, and 113 : 355 is *not* as 1 to the figures "Wheildon" states:—

As 113 : 355 so is 1 to (355 ÷ 113) = 3·1415929203893805
But circumference ÷ diameter = 3·1415926535897932

Leaving difference = nearly ·0000002668
And 1 ÷ ·0000002668 gives 3748126, the diameter required in feet. My former answer, 710 miles 28ft. was too great by 42ft. E. L. G.

[329.]—ETCHING.—"Ambition" having obtained the materials necessary, he must proceed in the following manner:—The drawing to be etched being ready, the etching ground must be laid on the plate, and as this is one of the most difficult operations connected with the art of etching, he must proceed with great care. The plate should be first well cleaned with spirits of turpentine, and afterwards rubbed with a piece of dry calico and whiting; the hand vice should then be screwed on one side of the plate, care being taken to insert a piece of paper between the grip of the hand vice and the polished side of the plate, to prevent any injury to the surface. Having done this, hold the back of the plate over a clear fire until sufficiently hot to make a drop of water hiss when thrown on the back; the plate will then be hot enough for laying the ground; if it is too hot the composition will smoke; it is then burning, and should the etching be done on a burnt ground it would chip on every line being drawn. The proper heat being attained, rub the ball of composition (this must previously be tied up in a piece of fine silk, see diagram) backwards and forwards on the plate until a sufficient quantity is left thereon; the dabber must then be used to dab the ground evenly all over the plate until every part of the surface is covered, after which take the wax taper and smoke it, care being taken not to blacken the ground too much, as the flame will burn it, the burnt parts appearing dull, whereas, if properly done, the surface appears shiny until the plate is cold. The plate, having been allowed to get quite cold, take a tracing of the proposed subject (traced with a moderately soft pencil) and having damped the back of it with an almost dry sponge, fix it on the plate with some pieces of bordering wax, and placing a piece of bank post over it, rub it down with the burnisher, being careful not to rub too hard or the ground may be injured; when the pencil outline has been thus transferred in reverse on to the copper, the tracing may be removed, and the subject is then ready for the etching point. This mode of rubbing down is only suitable for small subjects, large ones having to be taken to a copper-plate printer, who will pass the tracing through the press. The point is used just as you would use a pencil, taking care that at each stroke it removes the composition. When the drawing with the point is completed, it is ready for biting in; this is another ticklish operation. Firstly, paint round the edge of the copper plate (close up to the etching) with Brunswick black, made tolerably thin by the admixture of a little spirits of turpentine, and allow it half an hour or so to dry; this causes the banking wax to cleave readily to the plate, and prevents the acid from acting upon any scratches that may have been made upon the margin. Next take the banking or bordering wax, immerse it in warm water, and, when soft enough, draw it out in the form of a ribbon about an inch wide, and placing it round the edge of the plate, press it down with a piece of hard wood (box or ebony) kept wet to prevent it sticking, taking care to leave no aperture by which the acid might escape, and a spout should be formed to pour off the acid when required (see diagram). The next thing to be thought of is the mixing of acid. Take of nitrous acid, one-third; water, two-thirds; this being a very good strength for ordinary purposes. The plate being ready to receive the acid, pour it on, and allow it to remain about ten minutes for the lighter tints, care being taken to brush off the bubbles of gas as they appear with the end of a feather; after pouring off the acid, rinse the plate with cold water and dab it dry with a piece of fine linen. When the most delicate tints have been bitten in sufficiently, they must be painted over with a Brunswick black and a camel-hair brush, and allowed to dry; then repeat the biting as above for a quarter of an hour or so, in fact, keep on stopping out and biting until all the various depths have been gained. When the plate is sufficiently bitten it should be washed and dabbed quite dry as above, and held to the fire, when the border of wax may be removed; the composition can then be cleanly washed off with spirits of turpentine. If it should then be found too light, the plate must be rebitten in the following manner:—A transparent ground must be laid thus—clean the plate with turpentine and whiting as before directed, then carefully heat it, rub on the bare parts of the copper to melt, then dab the melted composition a little to get some on the dabber, and dab the parts you wish to be darker very lightly until the surface between the lines is entirely covered. This ground is of course not smoked like the first ground; the parts which do not require rebiting should be stopped out with Brunswick black, and the biting may then be repeated as in the first place. It is, of course, impossible to go thoroughly into the art of etching in the limits of "Intercommunication," but I have endeavoured to give "Ambition" an insight into the art, and I have no doubt that practice will give him the rest, but he must not expect to succeed with the first or second attempt, nor let failure dishearten, as it is only by perseverance he can ever hope to be proficient. Edward Wimbridge.





[336.]—SKYLIGHTS.—Laps are an abomination; let your pane of glass be the whole length of sash, well bedded in whitelead putty, and copper sprigged to sash. Complete it by painting four coats in oil. Jacko.

[337.]—MARBLE LETTERING.—In answer to J. Northern the best black mixture for standing the weather is shellac dissolved with spirits of wine, coloured with very black finely ground. The following is the best mode of applying it:—When the letters are cut make the stone warm by placing it before a fire, or by holding hot irons over it; then apply the paint. The heat and spirits of wine will cause the shellac to enter the pores of the stone, and thus become firmly attached to the marble. This should be done before the marble is polished. When cleaned and finished the letters will have a brilliant polish on them. I have tried on statuary and veined marble (with success), cement for stopping black and gold marble:—Melt fine orange shellac, taking care not to burn it, then add white putty powder, which will give a colour like the marble. The marble must be made hot, and the stopping put in with a hot iron, taking care that it is not too hot, or it will discolour the stopping. I have used this kind of stopping for thirty years, and always found it to answer well; it takes a good polish.—J. Murphy, Penzance.

[339.]—FREESTONE.—Seeing the question about Clipsham freestone, I think a few remarks on the subject will be of benefit to the building trade. I have used this stone in different good jobs these last forty years, and it is one of the best for standing the weather that can be got. The Clipsham and Ketton stones are, I think, the best; but the Kettou is more than double the price of the other. If you want large blocks the Clipsham may be put in trucks at the Bytham station, at 1s. 6d. per foot. If architects would only use these stones, there would be far less decay in our buildings than now; and if our London architects doubt its durability, they have only to go down in the district and see the old churches and cathedrals that were built of this stone. A Builder.

[340.]—BRICK VAULTING.—P. L. Ease coolly asks for what would take at least one page of engraving to explain, and may be found in "Peter Nicholson," or any common book of that kind. But groins of brick or cut stone, without groin ribs, are a perfect type of those vile artificial difficulties of which any rational man must wish, even more than Dr. Johnson did of the difficult music, "that it were impossible,"—things in which good workmanship is supposed to be shown by going out of your way to make them weak, ugly, and wasteful. Let me advise P. L. Ease to supply groin ribs, if he requires but a few yards of them, in stone; but if he has more, to get bricks made 3in. thick, as deep as at least 1-40th of the diagonal span, or 1-30th if it be not Gothic, but in no case less than 6in., wedge formed, chamfered below and rebated above. If the whole rib be built of these it will be struck from one centre, and the vaults require to vary from a true cylinder, as Gothic ones do; but if they are to be very near cylindric, and are equal, the rib should be three centred, its lower radii, upper radius, and span being as 12, 29 and 48, and the bricks will serve for the upper curve, but the short lower ones be better of stone, and corbelled out with horizontal joints only. Nothing, perhaps, exposes more ludicrously the crass ignorance and barbarism of our present engineering than the universal building of the lower parts of arches with radiating joints instead of horizontal. Mr. Street, in his book on Spain, falls foul of some Arab arches for being built right, which he calls "barbarously," when he is himself the barbarian all the while, not to know why they were so built, and by his own mediæval countrymen just as much as by Arabs—namely, to give the piers a tendency to fall together if there were no arch; what our engineers would make part of the outwardly thrusting arch being thus made on the contrary inwardly thrusting, and so the most effective, the only *active* part of the butment, for want of which our sciencemongers would have to throw away in pure waste far more than this same material as *passive* buttress! This is the main reason why so many vaulted works have stood these six or seven centuries with not half the butment the railway men would blunder their dupes into, and then brag of "modern science." Propose to day such a work as Angers Cathedral nave, or even St. Mary's, Ely, and "modern science" (in ignorance probably that there they stand) will pronounce them impracticable! I doubt if an engineer in England would attempt a copy of the south porch to the nave of Le Mans, or even a quarter its scale (if you passed it as a new design) without piers twice as thick. The extrados or whole top curve of no arch, whatever its form, ought ever to be quite so wide as the opening beneath. All work superincumbent on the piers may then be built before the radiated part of the arch is inserted. E. L. G.

[340.]—Purchase P. Nicholson's work on vaulted arches. Jacko.

(342.]—CARVING.—A practical knowledge is required in carving as well as any other part of your profession. As to how he is to acquire knowledge, go to a statuary's yard and make some agreement for learning; then the same with the wood carver. W.

[345.]—BATH STONE.—In answer to this question, relating to the decay of Bath stone, I beg to say that the difference alluded to is to be seen in stones cut from the same block, and on inspection "J. P. G." will see the sound stone is laid on its bed, the decayed stone not on its bed. G. T. W.

[346.]—BRICKWORK.—Purchase Antony Nesbit's mensuration book—5s. is the price of it—which seems to me, is what you require; although you say "Brick Walks," &c., which must be printers' errors. Jacko.

["A. S." should have written more distinctly.]

[347.]—DISINFECTANTS.—The best disinfectant for houses, rooms, clothing, &c., contaminated with any contagious disease is chloride of lime and vitriol, mixed and applied in the following manner:—A teacup full of chloride of lime put in a basin or dish, and placed on the floor at the door; pour into this lime a teacupfull of vitriol, at the same time stirring it up with a stick. A chemical action instantly takes place, the chlorine flying off in vapour, fumigating every nook and corner of the house. Birds, cats, &c., should be removed from the house before the above is applied.

J. Duthie, 4, Peel-terrace, Preston.

[347.]—Coffee is a deodoriser, and it possesses this property in so remarkable a degree that it deserves to be better known. It is portable, easy of access, and may be easily applied in the following manner:—Take a small ladle, or a large iron spoon, or a common shovel, in fact, will do, and heat it to redness. Just as the redness is going off put into the ladle about a teaspoonfull of freshly-ground coffee, and carry it about the room, gently waving it to diffuse the smoke. It may be used in sick rooms, in waterclosets, in cellars, or anywhere else where a deodoriser is required.

[347.]—A small quantity of black oxide of manganese, and a small quantity of spirits of salts, put in a teacup and placed on a hot brick in the centre of the room, and stir the same occasionally.

W. Clark, Sewer's Office, Guildhall.

[347.]—Dr. Whitmore, in his last quarterly report on the sanatory condition of Marylebone, says the best disinfecting agent is chlorine gas, but where this could not be conveniently employed, carbolate of lime is a valuable substitute. W. T. T.

[348.]—LITHOGRAPHY.—"I'll Try" must first obtain the necessary materials for drawing on stone, which are as follows, viz.:—Lithographic ink (Vanhymbeck's is the best), lithographic chalk, No. 1, 2, 3 (Lemercier's), light crayon holders, a scraper, a broad camel hair brush for dusting the stone, a few fine sable pencils, some lithographic pens (nibs not crowquills), a pair of parallels, and a case of mathematical instruments. Having procured these go to a respectable lithographer, who will supply a stone either polished (for ink work) or grained for chalk. Next, having selected a subject, make a careful tracing of it, which, when done, fasten down to the stone with a little gum at the corners, taking care that it is placed on the stone the reverse way to what you desire it to appear when printed; then insert between the tracing and the stone a piece of tissue paper, rubbed over on one side with red chalk powder, with the red side next the stone; then take a tracing point and go carefully over every line of the tracing; having done this the tracing may be removed, when a perfect outline in red will be found upon the stone. It is now ready for lithographing. If it is proposed to do it in chalk all that requires to be done is to sharpen a good supply of No. 1 chalks, and put in the outline with them, the same as if drawing merely on paper, though "I'll Try" must not imagine for an instant that he will find it quite as easy. When outlined he may proceed to shade, still using No. 1 for most of it, No. 2 being only required for the depths. It must be borne in mind that lithographic chalks must be cut the reverse way to a lead pencil, that is to say, they must be cut from the point, not towards it. Having finished the drawing it must then be taken to the lithographer to be proved, and I have no doubt that "I'll Try" will be very much disgusted with the result, but he must not be disheartened at a few failures in the beginning. If it is proposed to make an ink lithograph, then when the red outline is on the stone, a little of the ink must be rubbed up in a saucer with a little soft water, the ink being rubbed on the dry saucer, and a little water being added, it must be rubbed with the finger until the ink is all dissolved, care being taken that it is not too thin. Then proceed to outline with a ruling pen, &c., just the same as in inking on a drawing on paper, and finish with the sable pencils and lithographic pen. When finished it must be taken to be proved. Great care must be taken that no grease of any kind is allowed to get on the stone. It must not be touched by the hand on any portion where the work is, as it would probably print a black spot. "I'll Try" had better try in ink first, as chalk is more difficult, and requires great practice. Edward Wimbridge.

[350.]—BLUE LIAS LIME.—The following is a good way to test blue lias lime:—Let two or three cubical inches of the stone be calcined in a crucible, then pound the same and make it with the assistance of water into a stiff paste, form it into a ball and immerse it in a glass of water. If it be hydraulic it will set under water so as to resist the pressure of the finger in a time varying from twenty-four hours to a fortnight or three weeks, according to the nature of its composition, and if it be of good quality it will in a month be as hard weak limestone. W. R. B.

[350.]—The apprentice should go, when at leisure, to a lime wharf, where his master purchases his lime, and I am sure every information will be given; and also other materials for similar use, which will probably be of vital importance to him. Jacko.

[351.]—THE ANASTATIC PROCESS.—This process consists of any design being made on paper with prepared ink, chalk, or any other material of an oily nature, being transferred from the paper to a metal plate, from which any number of impressions can be produced. The original

wing or writing having been made, it is subjected to vy pressure on the metallic plate, whereby a reversed simile is obtained; and after the plates have been pre-ed by a second process, which prevents the adherence of in the blank spaces, the impression is inked up with inking rollers, and printed from in the ordinary man-

Of course, the character of the work depends as much on the artistic execution of the drawing as the process printing. We have seen some good specimens of static printing from the press of Mr. S. H. Cowell, which, which have been sent us during the past week, we have never seen anything of the kind equal to first-s lithographic drawing; and we think it would be al-t impossible, if not altogether so, to produce fine detail ilar to that, for instance, in our lithographic illustra-t of this date by the anastatic process.

51.]—The anastatic process has this advantage, t "Jack" could make a drawing upon any piece aper with anastatic ink, and this drawing being taken the printers he could have a hundred copies in the course few hours in exact fac simile, the drawings being. sferred to zinc, and printed as an ordinary zincograph-reat many persons are thus enabled to get effective mul ications of their drawings who would be quite at a loss ey had to draw them on stone.

Edward Wimbridge.

STAINED GLASS.

AWKHURST.—A stained glass window has just been ed in the south aisle of the parish church here, to the mory of the only son of Mr. E. G. Hartnell, of Elford. window consists of three lights, and in each is repre-ed an instance of faith as displayed by a Roman cen-on. This is the fourth stained window which has been ed in this church since 1863.

INGSTOWN (Ireland).—A memorial stained glass win-is in course of erection at the Mariner's Church, gstown. It is by Wailes, Newcastle-on-Tyne.

OCKBRIDGE.—The interior of the new church at kbridge is to receive the embellishment of another ned glass window. It is to be introduced shortly by the r of Mr. Thomas Attwood, with the consent of the in-bent, in memory of his nephew, the late Mr. William ood, whose untimely and lamented accidental death place in the neighbourhood of Melbourne, Australia.

STATUES, MEMORIALS, &c.

is proposed to erect in Leamington a memorial, in the of a public drinking fountain, to the late Mr. John Hi man, at a cost of about £300.

statue is about to be erected to the memory of Sir Ri rd Steele, at Carmarthen, in which town the worthy kn t died in 1727.

ning's statue in New Palace-yard, Westminster, in the course of a few days be removed from its pre-ite (the spot on which it stands being required by the Mopolitan Railway) to an obscure vacant piece of d in the rear, in close proximity to the Westminster ons House. The statue is by Westmacott.

o out of the four statues intended to decorate the al tower of the new Record Office in Fetter-lane have fixed in their places. These are Queen Victoria and mpress Matilda. The statues, which have been ably executed by Mr. J. Durham, A.R.A., are above ze, and are placed under a canopy that stands above rapet. On the two remaining sides of the tower will laced statues of Queen Elizabeth and Queen Anne, of which are nearly ready.

MORIAL TO THOMAS STOTHARD.—It is proposed that t be executed by Mr. Weekes of the late Thomas rd, and placed in the National Gallery, by the side ilar memorials to deceased British artists. Stothard's eful and classical designs," in illustration of standard rs, it has been thought by numerous admirers, entitle tist to the memorial now proposed. Several sub-ons have been already received. Mr. William Smith, pper Southwick-street, Cambridge-square, acts as ry treasurer and secretary.

STUE TO JOSEPH MAYER.—The Liverpool Town Coun-their meeting on Thursday, passed a resolution to a statue to Mr. Mayer in St. George's Hall, in com-ration of his taste, munificence, and public spirit in thing to the public of Liverpool his fine collection of an, Assyrian, and Anglo-Saxon art treasures. We that Mr. Mayer is willing to place his collection of t gems, one of the most valuable and interesting in ntry, also at the disposal of the town if a site can be ed which shall be in all respects suitable.

WAGES MOVEMENT.

ices from the United States inform us that nume-trikes are taking place among the working classes in rth.

ironstone miners in the neighbourhood of Falkirk enoy have had their wages reduced about 3s. per At Denny a number of the men have declared the reduction and have stopped work.

strike of quarrymen at Barnsley continues without ns of an early settlement. Nothing has yet been ith regard to the demands of the masons, which to operation on the 1st of May.

trike on the North-Eastern Railway still continues, 1,500 men being "out." The directors have been te in obtaining new men to take charge of many of gines, but there is still considerable confusion on o and branch lines. Summonses have been issued many of the drivers who are on strike for leaving ithout notice.

ESALL. — The stonemasons employed by Mr. F. the contractor for the restoration of the parish struck work on Monday, the 1st inst. Up to that ey had been receiving 27s. a week, leaving off work past five at night and at four on Saturdays, and they demanded 30s. a week with the same hours, except on Saturdays, and on that day they wanted to leave off at one o'clock. Several meetings were held during the week, but no arrangements could be made until Saturday, when they agreed to accept Mr. Cobb's offer of 29s. a week and the hours demanded.

WATER SUPPLY.

The long-vexed question of water supply for Canterbury has at last been settled; the directors of the Canterbury Gas and Water Company having at a recent meeting determined on taking advantage of the increased powers conceded to the company by Parliament, and on carrying out the work themselves.

Dartford.—The Local Board of Health and the Kent Waterworks Company have been conferring for some time past on the subject of the purchase of the waterworks by the latter body. At a meeting held the other day, the chairman of the company stated that they were now willing to purchase the works from the Board at the price named (£3,000), but they objected to pay the expense of obtaining an act of Parliament to empower the Board to sell the works. After a lengthy discussion, it was agreed, subject to the approval of the Directors of the Waterworks Company generally, that the purchase money should be £3,000, as above stated, and that the Waterworks Company should pay the further sum of £250, being half the estimated cost of obtaining the act of Parliament; that the water for extinguishing fires in the town be supplied gratuitously; the water used in watering the roads be paid for under a contract; that the water for flushing the sewers in the town be furnished gratuitously; the Board of Health to reimburse the Waterworks Company for all outlay in putting down pipes in new districts, previous to the completion of the purchase; the purchase to be completed within one month of the passing of the act of Parliament; the £250 not to be paid unless the act of Parliament be obtained.

LEGAL INTELLIGENCE.

The Law of Libel.—Sir C. O'Loghlen's bill has been amended by the select committee. The responsibility for a libel in a speech at a public meeting is still thrown upon the speaker, and not upon the newspaper reporting the speech and publishing an explanation or contradiction of the libel if required; but it is now proposed that the speaker shall not be responsible unless he shall, upon application, refuse or neglect to publish a full apology in some newspaper circulating in the part of the country in which the meeting was held. An alteration has also been made in that part of the bill which prohibited a private prosecutor indicting for libel unless it is published with intent to extort money or procure an official appointment; it is now proposed that there shall not be such an indictment unless the defendant has been bound by a justice to answer the charge, and the prosecutor bound with sureties to prosecute. It is also provided that if he fails to prosecute or to obtain a verdict he is to be liable to pay the defendant's costs, unless the judge at the trial certifies that there was reasonable cause for preferring the indictment. In actions for libel a plaintiff obtaining a verdict with damages under 40s. is not to be entitled to costs unless the judge certifies that the libel was wilful and malicious.

MEETING FOR THE WEEK.

Fri.—Architectural Association. — "Some Practical Notes on the erection of a Country House," by Mr. H. Curzon, 7.30.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

2238 T. GALL. Improvements in Machinery or Apparatus for Working Stone, or Cutting and Working Mouldings thereon. Dated August 30, 1866.

This invention consists in the use or employment of a series of chisels or cutting tools formed suitably to be fixed in a tool head or frame, in such manner that their cutting edges or points can be set to form the moulding required to be worked on the stone. The tool head is capable of moving on slide frames placed either vertically or in any other convenient position or direction. A steam hammer is employed to strike the tool head for actuating the chisels, or for producing a cutting effect on the stone placed under operation, and the tool head is caused to rebound from the stone by the action of springs. *Patent completed.*

2245 A. DE LA GAUTRAYE. The Preservation of Wood. (A communication.) Dated August 31, 1866.

In performing this invention the logs or pieces of wood are to be immersed during less or more time in a bath purposely prepared; that bath must be kept boiling until complete penetration of the wood. Such penetration is obtained by this liquid solution without pressure or any other means, mechanical or not. In a recipient made of wood or metal, or of masonry, no matter its shape, but of course appropriated to the dimension of the wood to be penetrated, a volume of water necessary for the immersion is caused to boil. In the meantime each of the ingredients that are to be combined in the bath is dissolving in separate vessels. Once dissolved they are poured in the boiling water, and the liquid is kept boiling until the end of the penetrating operation, which varies from two to six hours, according to the volume and the essence of the woods to be penetrated. After the ingredients composing the baths have been put together in the boiling water, the inventor agitates the mixture and soaks the wood in it. The composition of the bath is as follows:—per 22 gallons of water—sulphate of copper, 12lb.; potash, 3lb. 5oz.; alum, 7oz.; basalt, 1lb. 2oz.; solution of lime, 1lb. 11oz. *Patent abandoned.*

2263 H. A. BONNEVILLE. An Improved Smoke-Consuming Fireplace. (A communication.) Dated September 3, 1866.

This invention consists in doing away with the opening or passage through which the smoke is allowed to escape in fireplaces actually in use; in disposing the grate which receives the fuel in an inclined plane from the back of the fireplace forward; in introducing the fuel, when the fire is kindled, by one or more apertures at the upper part of the fireplace; in placing under, and at a certain distance from the grate near the top of the ash receptacle, a partition of brickwork or fireclay, which might contain the boiler in the fireplaces of steam engines. The said partition is made to assume the same direction as the grate, which is that of an inclined plane from the back of the fireplace forward, and is provided in front, facing upwardly the said fireplace, with an opening so as to give passage to the flames coming from the fireplace, by which means the said flames are deflected downwards, and pass through the said opening under the grate into the space above the ash receptacle, where the smoke is consumed, and escapes, not above the fire-bridge, as in ordinary fireplaces, up the chimney, but below the fire-bridge. *Patent abandoned.*

2281 C. CETTI. Improvements in the Construction of the Ceilings of Buildings. Dated September 5, 1866.

This invention consists in using with the ordinary joists a series of supplementary joists for carrying the ceiling of the room, instead of connecting the ceiling to the joists carrying the flooring. *Patent abandoned.*

2300 J. LOCKHEAD. Improvements in the Arrangement and Construction of Machinery or Apparatus for Sawing Timber. Dated September 7, 1866.

This invention consists in applying additional guides or steady pins to the top of circular saws, in order to control and prevent vibration or warp in the revolution of the saw or saws during the process of cutting timber. *Patent abandoned.*

2320 C. BATHOE. A new or Improved Composition to be Employed in Architectural Mouldings, and for other Useful and Decorative Purposes. Dated September 10, 1866.

This composition consists of ordinary putty mixed and incorporated with plaster of Paris, chalk, or other form of lime, meerschaum, steatite or talc, and metallic oxides combined in a powdered state with boiled linseed oil. This composition is highly applicable to the mouldings of picture frames, and may be employed for many other useful and decorative purposes, such as for turned balcony and other pillars or columns, and all purposes for which marble, serpentine, and scagliola have hitherto been used. *Patent abandoned.*

2323 W. E. GEDGE. Improvements in the Manufacture of Calcareous Bricks or Artificial Stones. (A communication.) Dated September 10, 1866.

These calcareous bricks or stones are materials of variable dimensions, the basis of which is lime and sand, with the addition of the detritus or waste of other materials, such as stone or brick. They are made on the spot, of any dimensions, in blocks of any shape, hollow or solid, for walls, partitions, vaulted roofs, and other constructions; they may be matched according to plan, bear rabbets or moulding, and, by means of ochre, receive any required colour. The said calcareous bricks or stones are manufactured by the two processes described in the specification, the details of which we cannot produce here. *Patent abandoned.*

2330 R. BENNETT. New or Improved Modes of Obtaining and Transmitting Motive Power, and in the Machinery or Apparatus Employed therefor. Dated September 10, 1866.

The essential feature for this invention consists in alternately increasing and diminishing the area of the piston and cylinder, or pistons and cylinders or acting surfaces at the ends of their strokes (or at the time the crank is turning the two "dead" centres in a line with the axis of the moving piston or cylinder), so as to act upon and move the actuating surfaces for the time being with a proportionally greater force in the direction of motion than in the reverse direction, equal to the said difference made or caused in the area of the actuating surfaces and the pressure of steam acting thereon above that of the atmosphere, and by this means keeping the direct pressure of the steam or other fluid power employed constantly acting within the cylinder or cylinders, as the case may be, without any great or essential escape of the acting fluid or heat therefrom. *Patent abandoned.*

Trade News.

TENDERS.

Glasthule (Ireland).—For erecting the new Roman Catholic Church, Glasthule, near Kingstown. Messrs. Pugin and Ashlin, architects:— Messrs. Hammond, £5,537 4s. 1d.; Messrs. Beardwood and Sons, £5,412; John Nolan, £5,484; J. Freeman, £5,484; J. M'Cormack (accepted), £5,237 3s. 5d.

Kent.—For two houses at Eltham, Kent. Mr. D. Bland, architect. Quantities supplied by S. Shrubsole:—Crabb and Vaughan, £1,260; Nightingale, £1,176; Walker, £1,100; Thorpe, £1,067; Day, £1,043; Soper, £1,033; Wise, £800; Greene, £751.

Peckham.—For building a public-house in the Albert-road, High-street, Peckham, for Messrs. Day, Nookes, and Sons. Mr. Elkington, architect:—Stapley and Webster, £1,398; Eustace, £1,393; Tarrant, £1,379.

St. Pancras.—For St. Pancras Workhouse enlargement. Mr. E. C. Robins, architect. Quantities supplied by Mr. Snell. New wards and chapel:—Crabb and Vaughan, £11,950; Gribble, £11,068 18s.; Marsland and Sons, £11,170; Crocket, £11,180 10s.; Lathey Bros., £10,691; Lovatt, £10,215 10s.; Newman and Mann, 9,997; Abraham, £9,983; Scrivener and White, £9,887; Keeble, £9,980; Nutt and Co., £9,797; Kirk, £9,833 8s.; Thackrah, £9,750; Saley, £9,800; Chapple, £9,393; Hart, £9,220; Henshaw, £9,225; H. and E. Kelly, £9,194; Rigby, £9,145; Palmer, £9,837 2s.; Langmead and Way, £9,090; Brass, £9,080; Manley and Rogers, £8,990; Nightingale, £8,888; Mann (accepted), £8,375. Lengthening Wards:—

Crabb and Vaughan, £980; Gribble, £1,455 10s.; Marsland and Sons, £1,000; Crocket, £911; Lathey Bros., £897; Lovatt, £828 19s. 6d.; Newman and Mann, £874; Abraham, £822; Scrivener and White, £831; Keeble, £735; Nutt and Co., £875; Kirk, £811; Thackrah, £800; Saley, £719; Chapple, £741; Hart, £730; Henshaw, £687; H. and E. Kelly, £709; Rigby, £735; Langmead and Way, £739; Brass, £711; Manley and Rogers, £704; Nightingale, £777; Mann (accepted), £650.

Staines.—For alterations and additions to the Congregational Chapel, Staines, Middlesex. Messrs. W. G. Habershon and Pite, architects. Quantities supplied:—Wilcox, £2,794; Oader, £2,447; Nightingale, £2,345; Nye, £2,196; Cawland, £2,165.

Woking.—For house at Woking, Surrey. Messrs. E. Habershon, Brock, and Webb, architects:—Bird, £5,450; Nightingale, £5,184; Simpson, £5,018; Carter and Son, £4,991; Sabey, £4,980; Patman and Fotheringham, £4,896; Wallis, £4,750; Harris, £4,400; Warne, £4,250; Day, £4,160; Manley and Rogers, £3,917.

PROPERTY SALES.

April 15.

At the Mart.—By Messrs. Pullen, Horne, and Eversfield.—Leasehold residence, known as Stockleigh House, North-gate, Regent's Park, with coachhouse, stabling, grounds, and gardens of about two acres, term 81 years from 1822, at £10 per annum—sold for £3,220.

By Messrs. Hudson and Son.—Freehold 9a. 0r. 26p. of marsh land, situate in the parish of Plumstead—£1,000.

At the Guildhall Coffee-House.—By Mr. Whittingham.—Freehold two cottages, situate at Hornsey—£1,050.

Freehold building, accommodation, and orchard land, fronting Park and Dry Hill-roads, Tunbridge, Kent—lot 86, £115; 87, £115; 88, £115; 89, £115.

April 16.

At the Mart.—By Messrs. Debenham, Tewson, and Farmer.—Copyhold and leasehold premises, No. 12, Narrow-street, Ratcliff, producing £130 per annum, term 40 years from 1855, at £5 per annum—£3,050.

By Messrs. Spillman and Spence.—Leasehold two houses, Nos. 42 and 43 Evelyn-street, Deptford, producing £50 per annum, term 23 years unexpired, at £5 15s. per annum—£410.

Leasehold six houses, Nos. 56 to 64, Campden-street, Kensington, let at and of the value of £231 10s. per annum, term 72 years from 1851, at £4 10s. each house—£1,360.

By Messrs. Dowsett and Chattell.—Leasehold house, No. 26, Harmood-street, Chalk Farm-road, let at £29 per annum, term 81 years from 1820, at £5 5s. per annum—£245.

By Mr. Joseph Salter.—Leasehold four houses, Nos. 10, 12, 14, and 16, Islip-street, Kentish Town, producing £139 per annum, term 81 years unexpired, at £6 6s. each—£1,080.

Leasehold two residences, Nos. 62 and 63, Harmood-street, Kentish Town Road, estimated annual value £60, and a workshop in the rear of the annual value of £25, term 37½ years unexpired, at £22 per annum—£460.

Leasehold seven residences, Nos. 79, 81, 83, 40, 42, 72, and 74, Islip-street, Kentish Town, producing £277 per annum, term 90 years from 1859, at £58 16s. per annum, and sold (subject to mortgages) for £2,290.

Leasehold six coach-houses and stables, situate in Wolsey-mews, Kentish Town, producing £90 per annum, term 90 years from 1858, at £18 18s., and sold (subject to mortgages of £600), for £650.

Leasehold residence, No. 9, Chester-road, Highgate New Town, let at £36 per annum, term 99 years from 1865, at £6 per annum—£350.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Percival Ashton Batchelor, Northumberland-street, Strand, gas engineer's assistant, April 25, at 2—Frederick Chadwick, Westminster Chambers, Westminster, architect, April 29, at 2—William Clark, Liverpool-streeet, Walworth, timber merchant's manager, April 29, at 12—Benjamin Joseph Gee, Balaclava-road, Bermondsey, builder, April 25, at 1—Elliott Goslett, Langford-road, Kentish Town, journeyman carver and gilder, April 25, at 2—Henry Hubbard Lovett, Litcham, Norfolk, ironmonger, April 29, at 12—Edward Morgan, Edgware-road, carriage builder, April 25, at 2—William Henry Price, Sutton, builder, April 29, at 2—George Cutler, jun., Wenlock-road, City-road, gasholder maker, May 8, at 12—John Muddelle, Westminster Chambers, Victoria-street, contractor, May 8, at 2—Francis Weller, Portsmouth-street, Lincoln's Inn-fields, builder's foreman, May 1, at 11.

TO SURRENDER IN THE COUNTRY.

William John Cook, Weston Common, Hants, bricklayer, April 22, at 12—Henry Crapper, Attercliffe, near Sheffield, plumber, May 1, at 12—Thomas Harding, Newcastle-under-Lyme, journeyman painter, April 27, at 11—John Holden, Walsall, journeyman plumber, April 27, at 12—Richard Lythe, Great Broughton, near Stokesley in Cleveland, blacksmith, April 29, at 11—Owen Morgan, Liverpool, joiner, April 26, at 11—William Oakley, Sheffield, anvil manufacturer, May 1, at 12—William Bray, Plymouth, cabinet maker, May 1, at 11—Isaac Davis, Kingswood, Gloucestershire, carpenter, May 3, at 12—William Down, Merton, Devon, wheelwright, May 2, at 12—William Flatt, Holbeck, painter, May 9, at 12—Reuben Griffin, Hull, painter, April 27, at 11—William Johnson, Stokesley, journeyman blacksmith, April 29, at 10—William Lyon, Liverpool, carver, April 26, at 3—Robert Sherhod, Darlington, builder, April 27, at 10—William Henry Soper, Torquay, coach builder, May 1, at 1.

BATH STONE OF BEST QUALITY.

Randell and Saunders, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[Advt.]

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

Timber, duty 1s per load, drawback, 1s.

Teak .....load	£9	0	£10	10	Archangel, yellow ..	£12	0	£13	0
Quebec, red pine	3	0	4	10	St. Petersburg, yel...	10	10	11	0
" yellow pine..	2	15	3	10	Finland	8	0	9	0
St. John N.B. yellow	0	0	0	0	Memel.....	0	0	0	0
Quebec Oak, white..	5	5	6	0	Gothenburg, yellow	9	0	10	10
" birch.....	3	10	4	10	" white	3	0	8	10
" elm	3	10	5	0	Gefle, yellow.....	9	0	11	0
Dantzic oak	3	10	6	0	Soderhamn	9	0	10	10
" fir	2	0	3	10	Christiania, per C., 12 ft. by 3 by 9 in. yellow	18	0	22	
Memel fir	3	0	3	10	Deck Plank, Dantzic, per 40 ft. 3 in.	0	14	1	4
Riga.....	3	0	3	5	Pumice Stone per ton	5	0	8	0
Swedish	1	17	2	3	Oils, &c.				
Mast, Quebec red pine	6	0	8	0	Seal, pale....per tun	44	10	0	0
" yellow pine..	5	0	6	0	Sperm body .....tun	123	0	0	0
Lathwood, Dantzic, fm	4	10	5	10	Cod	41	0	0	0
" St. Petersburg	6	10	7	10	Whale, Sth. Sea, pale	44	0	0	0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Olive, Gallipoli.....	64	0	0	0
Quebec, white spruce	14	10	22	10	Cocoanut, Cochin, ton	58	0	0	0
St. John, white spruce	13	0	15	10	Palm, fine	41	0	0	6
Yellow pine, per reduced C.					Linseed	36	0	0	0
Canada, 1st quality.	17	0	19	10	Rapeseed, Eng. pale..	38	0	0	0
2nd do.....	12	0	13	10	Cottonseed.....	27	0	34	10

Metals.

Iron:—								
Welsh Bars in London .. ..per ton	6	15	0	0	0	0		3
Nail Rod ..... "	7	10	0	8	0	0		2
Hoops ..... do	8	17	6	9	0	0		
Sheets, Single ..... do	9	17	6	10	0	0		
Staffordshire Bars ..... do	7	17	6	8	10	0		
Bars, in Wales ..... do	5	15	0	6	0	0		3
Rails ..... do	6	0	0	6	5	0		net
Foundry Pigs, at Glasg. No 1 .. do	2	13	6	3	7	0		
Swedish Bars ..... do	10	10	0	12	10	0		
Steel:—								
Swedish Keg, hammered .....per ton	15	15	0	16	0	0		
Swedish Faggot ..... do	10	10	0	12	10	0		
Copper:—								
Sheet & Sheathing, & Bolts ....per ton	86	0	0	91	0	0		
Hammered Bottoms ..... do	95	0	0	101	0	0		
Flat Bottoms, not Hammered .. do	91	0	0	98	0	0		
Cake and Tough Ingot ..... do	76	0	0	0	0	0		
Best Selected ..... do	84	0	0	89	0	0		
Pine Foreign ..... do	86	0	0	88	0	0		
Yel. Metal Sheathing & Rods ....per lb	0	0	7½	0	0	8		
Tin:—								
English Block .....per ton	90	0	0	0	0	0		2½
do Bar ..... do	91	0	0	0	0	0		
do Refined ..... do	93	0	0	0	0			
Banca ..... do	94	0	0	0	0	0		nett
Strait ..... do	89	0	0	0	0	0		
Lead:—								
Pig, English .....per ton	22	5	0	22	10	0		2½
" Spanish Soft ..... do	19	15	0	0	0			
Shot, Patent ..... do	23	10	0	24	0			
Sheet ..... do	21	0	0	0	0	0		
White ..... do	30	0	0	31	10	0		
Spelter:—								
On the Spot .....per ton	22	5	0	22	15	0		net
Zinc:—								
English Sheet .....per ton	29	0	0	0	0	0		
Devaux's V. M. Roofing Zinc .... do	28	0	0	0	0	0		*

* And 5 per cent. discount if laid upon the new system.

Quicksilver .....per btl	6	18	0	7	0	0
Regulus of Antimony.						
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3rds do	48	0	48	0	68	0
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Best do	92	0	96	0	100	0

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From		To		4ths.		3rds.		2nds.		Best.	
in.	in.	in.	in.	s.	d.	s.	d.	s.	d.	s.	d.
6 by	4	9½ by	7½	12	3	13	3	16	0	18	0
10 by	8	14 by	11	13	3	14	6	17	3	19	0
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THE BUILDING NEWS.

LONDON, FRIDAY, APRIL 26, 1867.

SEFTON PARK COMPETITION, LIVERPOOL.

TWENTY-NINE sets of plans have been submitted in response to the advertisement issued by the corporation, offering to the producers of the two best the sums of £300 and £200 as premiums, and hinting, but by no means promising, that the most successful competitor should be employed to superintend the carrying out of his plan. The terms in which this part of the programme of the corporation is set forth, are, first—That the competitor should append to his estimate "the remuneration demanded in case he should be employed," and that "the designer of either of the prizes will not necessarily be employed to carry out the work, but in the event of his being so employed the amount of the premium will be deducted from his charges." Here at the outset we find the primal cause of the unsatisfactory nature of this competition, and an explanation why it is that we see so little good and so much mediocre work exhibited. An immense amount of labour is displayed, and very little else; many of the plans being utterly impossible from the physical conditions of the site, and others soaring oftily into those realms where castellated architecture on an unsubstantial basis is profitically cultivated; whilst amongst those whose efforts are worth serious consideration there seems to have been a very wide diversion of aim. To one a "park" represents a building speculation dotted everywhere with "neat villas," like a young Malvern rolled flat; to another, a tortuous maze with rather more walks than turf; whilst a third is imbued with gorgeous visions of a creation derived from the back of the old Coliseum in the Regent's Park. Very few indeed comprehend that turf and trees make up the *summum bonum* of English landscape gardening, and that the function of the artist here is to nurse nature and not smother her. Wide asunder as are the various views of what a suburban park should be, still further removed are the estimates entertained of its cost. Too wildly romantic to be for a moment seriously considered is this portion of the competition, and when we say that the area is nearly 400 acres, and that the sums set forth as sufficient to convert it into a park vary from £13,000 to £150,000, it will show how little this portion of a landscape-gardener's duties are understood by the competitors in general. We believe that from £250 to £300 per acre will be required to carry out any of the schemes set forth, and that any reduction below this sum must be an impossibility. Some of the most pretentious of the plans submitted would far exceed this amount, and the corporation may at once abandon any belief beyond this, that all figures are fallacious, and the plans must be considered utterly irrespective of the amounts purported to be their estimated cost. These remarks will show, without further comment, how the indefiniteness of the instructions has operated. Good men acquainted with the nature and value of such works have refrained from competing, fearing that their ideas would simply serve as the groundwork for the borough architect and borough engineer to operate upon, and the utmost they could hope for would be a chance of the premium. That this will now be the result is almost a certainty, for second and third-rate men have competed with men of no rate whatever, and we have no hesitation in saying that not one plan sent in could be carried out without very great modification. With these general remarks we will proceed to the individual examination of the plans sent in.

No. 1 is by Mr. W. Wortley, of Liverpool, and beyond its position in the list is worthy of no further comment.

No. 2, by M. Edmond Andrè, of Paris, and Mr. Hornblower, of Liverpool, demands considerable notice, more, perhaps, for the admirable manner in which it is set forth than for its intrinsic merit as a design; it has, however, many very excellent qualities, and is decidedly amongst the best submitted. The park proper is kept well to itself, a surrounding road cutting off the part allotted for building on. The park contains cricket-grounds, aviary, botanical garden, deer park, archery and croquet-grounds, and even a small prè-catalan for children; it is the Jardin des Plantes and the Bois de Boulogne rolled into one. Careful sketches of all the accessories of a French recreation-ground, including marvellous kiosks and Quixotic windmills, are elaborately bound in an album accompanying it, and there are many clever bits about this design; the fountain is beautiful in composition and drawing, and the entrance-lodges are highly commendable; and the general get-up of the colour plans and bird's-eye perspective in their quiet cool tone is very grateful amidst such masses of emerald green as the major part of the drawings present. The great fault of this design is the want of grand leading lines; ovoid curves of all sizes are everywhere, but good leading lines meeting at *rondes pointes* are painfully absent. A visit to Cirencester and a stroll in Lord Bathurst's park there would have done good to the English competitor, and a reminiscence of Versailles improved his French *confrère*.

No. 3, by Messrs. Henderson and Walker, of Liverpool, has an air of general awkwardness about its lines which is not compensated for by its beautifully got-up bird's-eye view.

No. 4, by Messrs. Gay and Swallow, of Bradford, has a good general arrangement, but a large square botanical garden, in a position unsuited to it, mars this design, and the treatment of the water is very objectionable.

No. 5 (Mr. R. W. Barnes, Manchester) is sadly too much cut up, leaving no grand open spaces. Among the eccentricities indulged in is a fort for Volunteer attack (which, by-the-bye, is not singular to this design), and an observatory. Villas intrude into the park itself and destroy its value as a recreation-ground; whilst the condition of those houses which overlook the fort during an Easter Monday's bombardment could only be complacently contemplated by a glazier, and induces one to look upon the abundance of cotton wool in Liverpool as a merciful dispensation of Providence.

No. 6 (Mr. Hans F. Price, Weston-super-Mare), presents a design in which houses swallow up the best parts of the park, and the roads are laid out with the object of getting approaches to these rather than to develope the site as a park for recreation.

No. 7 is by the "Rev." James Bateman, of Congleton. As the work of an amateur we forbear to criticise it; yet there are worse designs sent in by those who style themselves C.E., or Landscape Architects. Mr. Bateman states that he competes for no selfish gain, but in the hopes that he may win a premium and devote it to building a school in his parish. As becomes a clergyman he is hopeful, but may we raise the point for his consideration that in thus endeavouring to rob another's vineyard he may be doing evil that good might ensue?

No. 8 (Mr. Alexander Black, Falkirk) is a plan for building sites and not a park.

No. 9, by Mons. Duvillers, Paris, shows the park formed into an irregular semi-ellipse, cutting off a very large proportion of the ground and devoting it to bricks and mortar, having in the midst of this a regular Champ-de-Mars—gravel, and nothing else. A very large and extensive parade of botanical knowledge is made on the margin by way of reference to the various shrubs proposed to be planted, and which is so minute as to even include the precise position of the tufts of annuals.

No 10 (Messrs. Rogers and Marsden, Louth) not only surrounds the park by houses, but cuts it in two by a long strip of them, dividing the cricket ground and review ground from all the rest, and the other part cut up into pathways with most labyrinthine assiduity.

No. 11, by Messrs. Stansfield and Sons, Todmorden, presents a plan, in outline only, of very great merit, and had this received the attention bestowed upon many worse efforts, it would have forced itself into notice as one of the best designs in the room; unfortunately, it does not comply with the condition of competition as to the mode of setting itself forth, but its great merits commend it to consideration.

No. 12, by Mr. Henry May, of Bedale, is vermiculated to madness; the contemplation of such "bye paths and crooked ways" is too much for our feelings, and we therefore pass on to

No. 13, by Mr. Eastwood, of Luddendenfoot, whose principal boundary to the park consists of the back road to his villas! The design for the gates and pavilion here exhibited is something marvellous. We did not think that even a gardener could nowadays have done anything so bad.

No. 14, by Mr. Mercer, of Liverpool, is a clever design very artistically set forth; the general arrangement of lines is very good and dignified, and, despite the too great mixture of the building land with the park proper, it is a design of much more than average merit, and with a little rearrangement would make one of the best submitted.

No. 15, by Mr. T. D. Barry, C.E., of Leamington, is a remarkably poor design, though from the noise this gentleman has lately been making in sewage matters, we had expected to have seen something at least worth looking at.

No. 16 (R. Jahns, Edge-hill, Liverpool). The park in this design is too circumscribed by buildings which are proposed to be erected in hollow squares having internal gardens, a mode not much in favour in the north, where too much land is as yet unbuilt upon to induce people to put up with this pretence of nature. There are some good lines in the general conception of this plan, which presents many points from which divergent vistas might be obtained—a feature lamentably neglected by the generality of the competitors. The architectural features are conceived after too severe and pseudo-classic a model to find much favour out of Germany, but are models of careful drawing. One of the peculiar eccentricities of this design is a triangular bridge leading three ways to nowhere.

No. 17, by Mr. Alexander M'Kenzie, presents many good points, an outer boulevard surrounding the park, into which the houses do not intrude.

No. 18, by Mr. Tyerman, of Liverpool, is a very carefully considered design presenting many features of great excellence, and the position and arrangement of the botanical garden are well worthy of attention. Whatever design may ultimately be chosen, this portion of Mr. Tyerman's design must be carried out, and had Mr. Tyerman associated himself with some of the many eminent architects in Liverpool there is little doubt but that a very high position would have been secured for their joint production. A want of architectural skill and feeling is manifested not only in his design for the buildings on the site but in the arrangement of the leading lines, and which mars this otherwise very excellent design.

No. 19, by Mr. Maurice Young, of Godalming, is laid out with considerable skill, the buildings being in this case also kept external to the park, advantage being taken of the irregularities of the boundary line of the property to mass the surrounding buildings very judiciously. This feature is noteworthy, and will be useful in carrying out any of the plans.

No. 20, by Mr. Mason, Burton-on-Trent, might have been better if it had not been so

bad, *i.e.*, with more thought the same idea would have been made useful.

No. 21, by Mr. Hart, Bradford, is a good simple outline arrangement, with actually nothing in it; and anomalous as it may appear, this is one of its greatest merits. It is quite refreshing to find some one who does not grovel in the dust of roads. Unfortunately, what arrangement of roads there is, is bad.

No. 22, by Mr. Barnet, of Shiffnal, consists primarily of an L-shaped pool, and all the roads following the outline thus made; the design for the gates is the best portion, and with this we somehow seem to be familiar, and hail it as a remembered face.

No. 23, by Messrs. J. A. Hall and G. Middleton, Liverpool, contains a square botanical garden in its midst, and water everywhere; it is a small Canada for lakes; there is an upper lake and a lower lake and a T-shaped lake Alexandra, and altogether so cut up that a walnut shell fleet would look quite imposing on it. As for the arrangement of the land, that is considered on the principle of a building speculation, and not that of a park for recreation.

No. 24 (Mr. T. H. Hirst, of Bristol). This is a plan of considerable merit, recognising the value of straight lines meeting at certain points, though it is somewhat doubtful if they are arranged in the best manner to suit the exigencies of the visitors or the configuration of the ground; but the plan is well worthy of note. Its architectural features are abominable, and statues of a lady and gentleman in the costume of the period, appropriately mounted on donkeys, crown the entrance gate piers.

No. 25. For this plan Mr. J. W. Cottee, of Chelmsford, asks £5,000. We think we may safely say he won't get it.

No. 26 is one of the best-considered and the most largely illustrated designs submitted. It is by Mr. Joseph Newton, London. The general arrangement is good, the houses well separated from the park, and the massing of the water into one lake at the lower end is the most judicious of any of the water treatments exhibited. One of the most remarkable features in the scheme set forth by Mr. Newton is the erection of a large hotel and sanatorium connected to the greenhouses by long corridors with glass lights, "removable in summer and heated to a Madeira temperature in winter," which may be all very well to do, and doubtless very comfortable so long as you are in it, but which we protest against as being out of place in the centre of a recreation park for the public. There is also in connection with this design a very elaborate and complete arrangement of winter gardens, stovehouses, &c., for the cultivation of all the plants in the world. This portion of Mr. Newton's scheme seems to be arranged by Messrs. Weeks and Son, and when pruned and dressed by an architect would form a very fine building, having a frontage of about 1,000ft. This design is very carefully worked out in all its details, and many of the drawings illustrating it are exceedingly clever.

No. 28, by Mr. D. Brade, of London, has a main boulevard surrounding the park, on which abut terrace on terrace of houses. The general arrangement of the park itself is good, but too much cut up by small roads.

No. 29, by Mr. Milner, of the Crystal Palace, is of remarkable similarity to the last mentioned in general arrangement, but is greatly superior to it from the absence of too much road making and a greater dignity of general treatment.

This completes the list, and we cannot take our farewell of the drawings without regret that in so much there should be so little. One thing is quite apparent, that the old race of landscape gardeners is extinct and that no new species has succeeded them; so little combination or knowledge of effect is seldom shown with so much labour; and it appears to us that the only course the corporation now has is to award the premiums to the two best and call in some superior aid to give their town a park. We believe that Mr. Nesfield has been requested to adjudicate upon the present plans, and we hope that in future when the corporation of Liverpool require the aid of architects or landscape gardeners, they will definitely state their intentions as to the ulterior proceedings they intend to take. Had they stated that the successful competitor would be employed at a certain percentage on the outlay, better men would have competed, and the result would have been more satisfactory than it now is. We fear it is impossible to teach our senators wisdom.

TRADES' UNIONS' COMMISSION.

It would be well, we think, if certain writers who, as a weekly contemporary has it, "are watching the evidence before the Trades' Unions' Commission, but without writing on it except when it begins to tell against the men," would not be in so great haste to settle the question before it has been half stated. We do not write as the prejudiced advocates of either the masters or the men in this matter. For ourselves we want to see fair play, and we consider that at the present stage of the proceedings any strong expressions of opinion one way or another ought certainly to be avoided, while any attempt to prejudice the case of the men on the one hand, or the masters on the other, is manifestly unfair. The *Times*, for instance, did not feel itself called upon to remark upon the proceedings of the Commission until it thought it could say something damaging against trades' unions, which it was enabled to do by having first published what were meant to be, and of course presumed by the public to be, impartial reports of evidence, but which were simply garbled and one-sided statements. Any of our readers who will take the trouble to compare the reports as officially issued with the reports given in the "leading journal" will at once see that the members of trades' unions need expect little sympathy from the quarter of Printing House-square. These statements in the *Times*, and the editorial deliverances on them, have been and are being extensively copied into country newspapers; and this important question is made to assume an aspect which, to say the least, must necessarily prejudice the minds of a large number of persons who have no better means of judging of the real facts of the case. What it is desirable for everybody interested in the matter to know is "the truth, the whole truth, and nothing but the truth." We are glad to see that one of our contemporaries, at all events, has had the manliness to point out that the view taken by the *Times* is notoriously one-sided and unfair as regards these trades' combinations. The *London Review* of last week says:—

"Everyone knows that witnesses go before commissions to prove particular things, and it is the duty of those commissioners who are not persuaded of the justice of their object to take care that they should not prove those particular things if cross-examination can invalidate their evidence. We only hope, therefore, that when the masters come before the Commission, they will be treated as uncompromisingly as the men have been by Mr. Roebuck. That rough-tongued *quondam* Radical has certainly exhibited an amount of *animus* which must have produced, if anything could, impressions most adverse to the unions. When he questioned Mr. Applegarth, he found he had to deal with what is called at the bar "a good witness" on the other side. Mr. Applegarth was master of the social prejudices of which Mr. Roebuck is the interpreter, and being an exceedingly clever, ready man, was prepared for the member for Sheffield at all points. Mr. Harnott, on the other hand, the masons' secretary, is obviously a man simply content with his business, and not caring what was thought of its operation upon other interests. He calmly suffered himself to be posed repeatedly by Mr. Roebuck on points reflecting on the unions from the public point of view, content to reply, "I don't know about that," and not supposing it to be in the least necessary to prove that what his society did for the benefit of its members was not in a large view beneficial to society. It is this evidence that the *Times* has selected very characteristically for the subject of its first leading article on the Commission, and we are not surprised that it should deduce unfavourable conclusions from it. . . . . The inference drawn by the *Times* from the evidence before the Commission is that 'generations may fail to repair the moral and social consequences' of the economical errors of trades' unions 'in the development of a tyrannical spirit and the destruction of kindly relations between employers and employed;' but no one would derive this impression from impartially reading the questions and answers, and we can only conclude that the *Times* either anticipates the evidence of the masters, or assimilates the evidence to its prejudices. . . . We are content to leave the matter for the present (concludes the *Review*), assured that the one-sided attempts of the *Times* will not bias the judgment either of the Commissioners or of the public on a question which can only wholesomely be dealt with in a very different spirit."

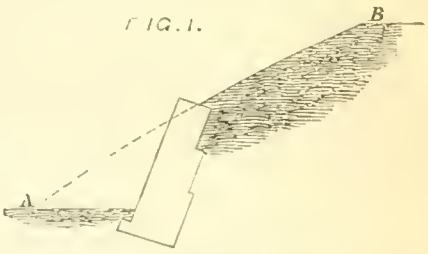
We resume the evidence with the examination of Mr. Edwin Coulson, the secretary of the Operative Bricklayers' Society. This witness stated that his society, of which he had been a member for fifteen years, was a general society, having 96 branches, and numbering 5,700 members, the funds in hand up to December last being about £3,200. The increase of members last year had been 700, and the increase of funds £500. The trade purposes of the society are to support members in travelling from town to town, to support them when out of work, and to pay for the burials of members and their wives. The payment for burial does not extend to the children of members, "our contribution being but 3d. per week." There is no sick fund, but it is in contemplation to introduce all the benefits as soon as possible. The money expended on strikes does not amount to more than £300 to £400 a year; the men have generally succeeded in obtaining a satisfactory advance of wages without any protracted strike. No member in a district can enter upon a strike without the consent of the whole of the society, and the executive in many instances have in this way prevented strikes arising in districts. Generally the causes of the strikes have been attempts by the employers to force on the men rules with reference to hours of working and rate of wages which they considered objectionable. A man estimates what he can do in a day, and then a general average is taken of what amount of bricks a man can lay, or whatever the kind of work is he may be put to.—Asked: Is the rate of the profit of the employers at all taken into consideration?—Of course, every man feels that it is his duty to do a fair, honest day's work, and that he ought to be paid what he considers to be a fair equivalent for his labour. The men consider the rate of living, and also the wages paid in the adjacent districts. Men will come from one neighbourhood to another and go to work at a lower rate of wage than that which prevails in the district perhaps, but that is only for a short time, for of course they obtain the higher rate of wage of the district as soon as possible, and these men go back to their native place and inform the men there of what is done in other districts, and the result is that an effort is made to raise the rate of wages. Witness believed that trades' unions had improved the moral tone of the men; a more honourable feeling had been promoted by them. There are no secret rules; everything is above board. There is no rule against working overtime, and no objection has ever been raised to the number of apprentices when they are legally bound to the employer. The society, however, objects to piecework, being of opinion that it makes men slovenly and careless in doing their work, but no action has been taken against piecework, and members do not refuse to work with a man who takes piecework. An efficient workman is admitted into the society, whatever length of time he may have worked at the trade, but the society objects to labourers being deliberately taken from the hod and placed at the trowel. There is no rule against a man using both hands to lay bricks, though witness said it was impossible for a man to lay bricks with both hands and make the work substantial and good. Both hands are only used for "inside filling in." The Bricklayers' Society has no

chasing" rule, as the stonemasons have. :onemasons object to bricklayers setting .eir stone after it has been worked.—Asked: 'hen would the mason raise objection?—upposing he had been working jambs of indows or doors he would raise an objection the bricklayers setting it, and that would ı just, because the bricklayers might do ore damage in setting one stone than the ason would do throughout the building.—sked: Do you think that you could not set stone of the kind you are referring to as well a stonemason?—Certainly not. Having ›en asked to state his opinion as to whether ı thought there was more reality and ›nesty in the old work than in the modern, r. Coulson replied that comparing the last ntury with the present, the work done in e last century was better than that of the esent century. It was not that the men e incapable of doing work superior to that of rmer times, but all kinds of rubbish are now ed to make mortar, and the men have often encouragement to do the work as well as it ght be done. Give the men time and materials, d the witness, and they can do anything. ıe bricks were better made now, because ıinly made by machinery, but the mortar ıs worse, and the work was not so honest. ı an instance of dishonesty in modern ıilding Mr. Coulson said he could men-›n some new houses on which he had ›rked, where, though there is some seven-›n to twenty rod of brickwork in them, ere are not 20,000 bricks in the whole ›use, instead of 73,000, independently of e bats which would naturally be amongst e bricks. All the bottom part of the house filled in with the old foundations of houses at have been pulled down and carted ither, lumps of brick and mortar together, d bricks here and there mixed with them. ıese houses are made merely to sell. The tness explained what is known in the trade picqueting. When an employer infringes e working rules of the society, or refuses to mply with the demands of the men for an vance of wages, the names of the men who › working on that job are reported to the ›iety, and a person is appointed to watch ere, and use all the influence he can to get e men away from the job. Supposing a man ›uld not leave the job, or otherwise violated › rules of the society, the members would t refuse to work with him, but he would be ıt to "Coventry." The society has no ıck list. Witness had heard that the total ımber of bricklayers in the kingdom was tween 20,000 and 30,000. Mr. George ›well, a member of the same society, and w secretary to the Reform League, gave uilar evidence. He stated that the hours labour had been shortened, and wages had en very much in consequence of the esta-›hment of the unions. Bricklayers have a cided objection to working with labourers ›t qualified as bricklayers. Witness ex-ained the system of "chasing." The man ıo does it is termed a bell-horse, and ob-ined 6d. or 1s. a day more for the purpose pulling on the other workmen in a job. ıe other workmen naturally felt that if ey were pulled on and did the same amount work as the man who was leading them, ey should have the same amount of money, t they do not get the extra money. The jection only applies where some artifice is opted by a manager of works or a foreman get work done in a quicker way than it ›uld otherwise be. The society does not a uniform rate of wages, but a minimum. itness regretted to say that in point of fact ere is no encouragement for men of ability d skill to work more, and that this is pre-dicial not only to the particular trade, but society. If they paid more to the abler ›rkman they were obliged to disguise it, but e fault was that of the masters, who tried to ıg the men down to the minimum, and make the maximum. They generally refused to ›ognise the minimum as the minimum, and to give something more as a maximum for skilled labour. The minimum is the lowest sum that the society thought a competent man ought to take. Mr. Howell stated it as his opinion that drunkenness had greatly diminished among workmen within the last few years, and he attributed this improvement to a large extent to the influence of the unions. The discipline of the lodge itself has a tendency to decrease drunkenness. "Neither drunkenness nor swearing is allowed in the lodge room, and there is a moral self-restraint necessary to be exercised in the room, and the exercise of that has a most beneficial effect on the members."

In commenting upon the evidence of Mr. Thomas Connolly before the Commission (which we gave last week), the *Times* remarked that the witness appeared to think it a commendable proceeding if a workman could succeed without detection in putting a faulty stone in a building. Mr. Connolly replies to this by explaining the relation of owner, contractor, and workman. "Let me take, for example," he says, "one of those stone buildings now erecting in the city. The proprietor employs an architect to design it and draw up a specification; the architect, on behalf of the owner, enters into a contract with a builder to provide all materials and execute all workmanship necessary for the due completion of the works. When the works are commenced the architect employs a clerk of works to see that his designs are fairly carried out, and that all materials are equal to the description in the specification. The stone is generally sent worked from the builder's yard, and masons are sent to fix it or build it in. If a stone is set and the clerk of works objects to it he orders the mason to take it out of the wall; the workman calls his foreman, and if he says it must be taken out the workman does so at once; the workman is there to do as his employer or foreman orders, therefore he must not be held in the slightest degree responsible for the quality of the material or workmanship. If he interfered in the matter, he would have to get other employment. Suppose the *Times* appears tomorrow printed with bad type and on inferior paper—can the compositors or pressmen interfere? Must not they work with the materials supplied to them, and where is the difference between them and the masons who are employed in a similar manner? I, therefore, repeat now what I have stated in my evidence, that the honesty or dishonesty of a workman is not connected with the question. If works are badly executed, and with inferior materials, the only persons to blame are the contractor, who agreed to supply better, and the clerk of works for allowing it to go in."

RETAINING WALLS.

UNQUESTIONABLY the most ancient form in which a mass of brickwork or masonry was constructed is that of a wall; and, excluding its application to habitable dwellings, that of a retaining wall, which in the widest signification may be considered as a wall built to resist the pressure of any substance or material, whether solid or fluid, upon one or both of its surfaces. It is, therefore, only natural that the subject should have received that attention which is due to its important bearing upon engineering and architecture; and has from time to time formed the object of investigation and analysis by various and numerous authors. Many of these have treated the question in a strictly mathematical manner—Dr. Hutton, for instance, whose scientific tracts contain a most elaborate research into the conditions of their stability, but practically speaking they are of little or no value. Latterly, however, the subject has been investigated by able writers in a manner so as to enable the results to be applicable to the designing, or rather as a guide to the designing, of these examples of construction. Although we have given a wide definition to the term retaining walls, it would be as well to separate it from those specimens which have comparatively but a small height, and are usually termed dwarf walls. The best illustration of this latter description of walls is to be found in railway work, and is represented in fig. 1. It frequently happens

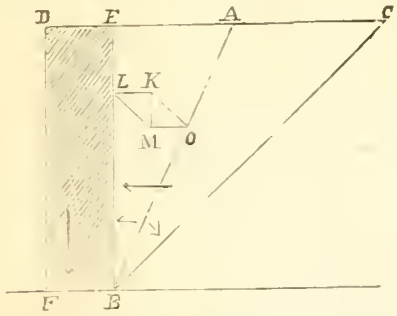


that, in order to lay an additional line of rails it becomes necessary to cut off a small piece of the toe of the slope of a cutting, and to build a small retaining wall about 3ft. or 4ft. in height to hold up the slope. These are called dwarf walls; and their relation to retaining walls proper may be regarded as something analogous to that of a short inflexible pillar to a long one which would yield by flexure instead of by crushing. In the figure is shown the slope of the cutting originally extending from A to B, and it is evident that by building the wall the piece between the toe A and the wall is removed, and an additional amount of land gained for the purposes of traffic. Owing to the enormous rise in the price of land in and about London, there is not one of the main lines, such as the Great Western, London and North-Western and others, that have not been completed to adopt these means of increasing the width of their permanent ways; and in many instances the necessity for more accommodation has been so urgent that, instead of the removal of a small slice of the bottom of the slope sufficing, it has been indispensable to remove nearly half of it, and build large retaining walls in the place of merely dwarf walls.

Notwithstanding that numerous rules have been laid down by various authors for arriving at a correct value of the thrust which a mass of earth exerts against a retaining wall, and for calculating the proper thickness of walls requisite to withstand the pressure, yet, owing to the want of precise data respecting the direct action of the earth upon the wall, they cannot be regarded as anything more than guides for arriving at the general principle upon which is based the stability of these structures. The main points to be attended to in designing retaining walls are the pressure of the bank of earth to be supported, and the actual resistance exercised by the wall in opposition to the moment of the disturbing force. Experience has amply demonstrated that there is a certain direction called the "line of fracture," along which the earth that is supported by a retaining wall has the tendency to slide. The slope down which the earth would slide if it were altogether unsupported is known as the natural slope, and it has been experimentally determined that the line of fracture, when the pressure is a maximum, practically bisects the angle formed by the natural slope and the back of the wall. In all walls there is a certain point about which the different pressures may be considered to be equally balanced, and this point is termed the centre of pressure. On the supposition that the wall is one solid mass and making H equal to its height, the position of the centre of pressure will be at a distance from the top of the wall of $\frac{2 \times H}{3}$. The majority of banks of earth supported by retaining walls have their upper surface horizontal at least for some distance behind them; and although the pressures vary throughout the whole height of the wall, yet it is manifest that the maximum pressure is the one to be determined, since, if the wall be strong enough to bear this, it will certainly not yield to

an inferior force. The following method, although not new, will be found both simple and accurate for effecting the calculation.* In fig. 2 let B C be the natural slope of the earth,

FIG. 2.



or that down which it would slide were the wall removed, and supposing the line of fracture A B to bisect the angle C B E, which will be the case when the pressure is a maximum, the prism A B E will be the whole weight that the wall will have to sustain. Taking this prism for a single unit of length and thickness the superficial area will represent the cubic contents. Putting H for the height of the wall and θ for the angle C B E, we have the area of the triangle equal to $\frac{H^2 \times \tan 2\frac{1}{2}\theta}{2}$

It is only necessary to multiply the above equation by W, the weight of one cubic foot of the bank, to find the total weight of the prism, which is supported partly by the wall along the line E B, and partly by the bank along A B, and may be considered as a solid mass of immovable material. The line K M represents the direction of the force of gravity, and the lines K L and K O the pressures exercised against the wall, and the force of the bank respectively. These pressures produce a certain amount of friction against the wall of the bank, but as the friction against the wall does not materially affect the question, the friction of the bank alone is considered and taken into account in arriving at the following formula, which applies to the case of a vertical wall supporting a bank with a horizontal topped bank. Putting P to represent the pressure, we have

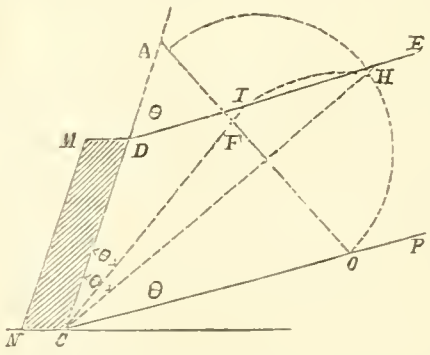
$$P = \frac{W \times H^2}{2} \times \tan\ 2\tfrac{1}{2}\theta.$$

To determine the moment of this pressure to upset the wall, we have simply to multiply it by the distance of the centre of pressure from the bottom of the wall, which we have already shown to be equal to $\frac{H}{3}$. Returning to Mr. Jacob's little work, we have the conditions of equilibrium, or of stability as he terms it, represented by the equation $\frac{W^1 \times H \times x^2}{2} = \frac{P \times H}{3}$ in which W^1 equals the weight of a cubic foot of the wall, and x the required thickness. Substituting for P the value found above for it, reducing and equalling, we find that $x = \sqrt{\frac{W \times H^2 \tan^2 \frac{1}{2}\theta}{3\ W^1}}$. Making $W = W^1$, which may be safely done in practice, we have finally $x = \sqrt{\frac{H^2 \times \tan^2 2\frac{1}{2}\theta}{3}}$

a very simple and neat expression for calculating the thickness of the wall.

In our articles upon docks, we have already given illustrations of different forms of retaining walls, so that it would be superfluous recapitulation to introduce them again; and we therefore prefer to give a general formula applicable to determining the pressure upon a wall by a bank whatever may be the inclination of its upper surface, which has been supposed in fig. 2 to be horizontal. It is clear that this is not always the case; for a glance at fig. 1 will point out that were a retaining wall in the position there assigned to a dwarf wall there would be a considerable surcharge, as it is called, owing to the inclination at which the upper part of the bank is situated. The general case of the stability of retaining walls has been well investigated some years ago by Mr. John Neville, and his construction, which is shown in fig. 3, is based upon the theory of

FIG. 3.



Prony, already mentioned, which establishes the fact that when the face of a bank is vertical and the top horizontal, the pressure is a maximum when the line of fracture bisects the angle formed between the natural slope of the ground and the bank of the wall. The following construction includes this special case as well as all the others:—Let M N C D represent the wall, D E the top of the bank sloping away in any direction, and C H the line of the natural slope of the earth. Produce the line of the back of the wall C D to A and draw from that point a line perpendicular to C H and meeting a line C P, which is drawn parallel to the top surface of the bank D E at the point O. Upon the line A O describe a semicircle, and, taking O as a centre and O H for a radius, describe an arc cutting A O in F and join F C. The wedge-shape portion D I C will require the maximum horizontal pressure to support it. Put δ to represent the angle H C P; then since D E is parallel to C P, the angle $\delta = (\theta - \theta^1)$. Let H = C D, and we have the following equation:—

$$\tan(\theta^1 - \phi) = \sqrt{(\tan^2 \delta + \tan\ \theta^1 \times \tan\ \delta)} - \tan\ \delta.$$

If we make R to equal the maximum horizontal resistance, and W, as before, the weight of a cubic foot of the bank, we shall find

$$R = \frac{W \times H^2}{2} \times \frac{\tan\theta \times \tan^2(\theta^1 - \phi)}{\tan\ \theta - \tan\ \theta^1}.$$

To work out this formula, the value found for $(\theta^1\ \phi)$ in the former equation must be substituted, and this forms then the general formula for the pressure against retaining walls, no matter at what angle the top of the bank may be inclined. When it is horizontal, as shown in fig. 2, the angle C D E becomes a right angle, and the value for R is precisely similar to that already found for P in another part of our article.

Most of the French writers on this subject have adhered to the theory of Belidor; and Rondelet, in his well-known treatise "*l'art de batir*," has followed the same line of reasoning. It is nevertheless indisputable that the result of his theory is to give a much greater thickness to revêtement walls than is required in practice, and were his rules strictly followed in modern examples, the loss of material and consequent expenditure would be something very serious, more so than public companies would put up with at the present day in spite of the opinion of their engineers or of anyone else. We have discussed the subjects of counterforts in our articles upon docks, and would only remark that the plan of building the retaining walls along the Metropolitan Railway is worth a visit from anyone who desires to witness the most recent mode of erecting these structures.

* Extracted from an able little pamphlet, "Practical Designing of Retaining Walls." By Arthur Jacob, A.B., Assoc. Inst. C.E., late executive engineer H.M. Bombay Service. Dublin: Printed by Charles Cooper, 3, Lincoln-place. 1867.

CONCERNING DOORWAYS.*

THE French language contains a most expressive word for the elevation of a building. I refer to the term façade, which is doubtless originally derived from the word "face," or face. And who has not been frequently struck with the resemblance of the front of a building to a face? This idea has been humorously set forth by the late Thomas Hood in one of the illustrations to "Hood's Own," where the windows of the house form the eyes, the pigeon-box above the door the nose, and the doorway the mouth of the countenance. But, fancy apart, there is, I believe, much truth in the analogy between the eyes and mouth of the face and the windows and doors of the façade. The doorway is literally and truly the mouth of the structure, by which access is gained to the interior, and through which the dwellers within make their exit. It may be considered, indeed, as the most important feature of every building, being that which presents itself more immediately to the eye than any other, and therefore entitled to the greatest care and attention at the hands of the architect. To show the honour in which the door was held among the ancients we may mention the fact that they had deities who took charge of the lintel, hinges, and other parts respectively of the door. When the pontifex dedicated a temple he grasped the door-post with his hand. The cills seem to have been a particular object of reverence, and were frequently kissed on entering or departing. Among the Greeks it was not unusual to have a sentence inscribed upon the jambs of the door, or on the lintel, describing the nature of the building. The Romans warned away intruders from their dwellings by the figure of a dog worked into the mosaic pavement, with the words "*Cave canem*" just beyond the threshold of the door, which gave rise to the proverb, "Ware the dog." In the same situation, or on the cill itself, words of welcome were also placed, the greeting "*Salve*" having been found in many of the houses at Pompeii.

How much of historical interest centres around the doorways of our ancient buildings! What tides of human thought and feeling have surged through them generation after generation! The doors which one day have been thrown open in welcome to the proud monarch who came in brilliant array to assume the crown and sceptre of the kingdom, another day usher in a train of muffled mourners bearing his remains to the grave appointed for all living, while the solemn dirge floats through the long drawn aisles—

> For all that beauty, all that wealth e'er gave,
> Await alike the inevitable hour;
> The paths of glory lead but to the grave.

* * * * *

I. *As to the position of the doorway.*—This is a matter which depends so obviously on the class and kind of building, and on exigencies of plan, that little need be said about it. All great buildings, as temples, palaces, halls, galleries, museums, courts of justice, and the like, demanding general symmetry of arrangement, must have their doorways in the centre of their façades. In the Egyptian, Greek, and Roman temples, in the cathedral and abbey churches of the middle ages, and in the great churches of modern Christendom—as St. Peter's at Rome, and St. Paul's, London—in our great municipal, commercial, and other halls—as St. George's Hall, Liverpool, the Fitzwilliam Museum at Cambridge, the Town Halls of Liverpool, Leeds, and other places—where else but in the respective fronts could the doors have been placed without wantonly detracting from their grandeur, a quality to which symmetry or uniformity is essential!

In minor works, where the purpose of the building or limitations of site break in upon general uniformity, the door may be placed elsewhere, and be no less pleasing and expressive than in the centre. Placed at the end of a front, for instance, the door assumes the position of head of the line of ground storey windows, like an officer at the head of a column, or the capital letter to a sentence. There seems to the mind a natural fitness in this place. Indeed, many conjunctures of circumstances may be conceived under which any other arrangement would be not only injudicious but absurd; and the practice, now happily not very common, of forming a sham doorcase at the other end of the elevation to balance the true doorway, is one which is too ridiculous for grave

* Abridged from a paper read before the Liverpool Architectural Society. By W. H. Picton, Esq., A.R.I.B.A., March 20, 1867.

ndemnation. In a word, I should say that the or ought to be always in the centre of the façade, cept where a good reason, arising out of the ture, purpose, or internal distribution of the ilding, can be given why it is not.

II. *As to construction.*—In early classical door-ys the jambs are very simple, of square sec-n, forming pilasters, which carried the cornice ove. The pilaster arrangement, though after-rds much modified and varied, never wholly ook the classic style in after times. The first age, as we have noticed before in the course of is paper, was the introduction of the architrave thin the pilasters, which in some buildings were spensed with altogether. At a later period, wever, we again meet with the pilasters, placed w within the architrave, and entirely subordi-te to it, supporting the lintel of the fanlight. find them also in an attenuated condition in lian and other buildings of the revival, in which m they are still largely employed. I have col-ted together upon one sheet a number of archi-ve moulds, taken from buildings of the antique iod and also from those of the revived style. e general form does not vary much. The Flo-tine architects, profiting most probably by the mple set by their Gothic predecessors, added a ld splay to their doorway jambs, as may be n in the doors of the Strozzi and Riccardi ces. The early Christian builders began to struct their doors in a similar way to the ancient an workman, only they surmounted the pilas with a round arch. Such a door as the in the cathedral of Pisa and several of Lombard doors are of this class. As the dle age architecture progressed, the pilasters ecting from the face of the wall were adoned, and the jambs, which at first had of square section, became wide and deep ys richly moulded, and faced with ranks of ll shafts. The splayed jamb was undoubtedly ost excellent element introduced by the Gothic itects; for, by means of it, the striking effect deep reveal was obtained, with the additional ntage of having only a short neck to the open-The same end has been reached in the sical styles by the employment of a large cove w excellent effect. With regard to the shape he doorway head, I think that in the case of openings the semicircular arch is by far the gnest and most effective covering. In small s the pointed arch is certainly the most eful and elegant, while the straight lintel is rally the most convenient. The custom-se door at Rouen, the doorway in the flank of ence cathedral, and the doorway at Rome of h I showed you a sketch, will bear testimony ese opinions.

I. *As to decoration.*—The amount of decoration h should be bestowed upon the doorway must nd, of course, very much upon the nature of building of which it forms a part. Some con-ncy should, however, be observed in its treat-t in this respect. In a richly ornamented ling you naturally expect to find the richest cien of the decoration in the doorway, as the important feature. In a building of plain simple character a highly wrought door would anifestly quite out of character; but still here due preminence should, I think, be given , as far as the means at disposal will permit. the former class, the richly decorated, we have markably fine example in the doorway the Acropolis at Athens. Although ex-ngly elaborate, the ornament is not over-, and sufficient room is left for contrast, one e greatest elements of beauty. On careful ination it will be found that everywhere ghout the whole doorcase, the enriched dings are contrasted with plain surfaces. ning with the cornice, we find, first, the plain of the cyma; then the enriched cyma itself, the honeysuckle ornament in low relief, in not to affect the contour of the moulding; th another fillet, and then again an enriched ; then follows the broad surface of the a resting upon a bold egg and dart ornament e bedmould. The same judicious treatment ried out in the architrave. First is an en-d bead, then a narrow fillet, followed by a broad ding with a beautiful leaf enrichment, then a narrow fillet, just sufficient to form a strongly ed line, followed by another ornamental bead; come two plain members and a narrow fillet, then another ornamental bead, like a distant of the former one. You will observe also he ornamental bead under the bedmould is ned and carried down the outer edge of the ers. To unite the decoration of the cornice with that of the architrave, and the inner enriched bead to the outer, rosettes are introduced at intervals, which give the last finish to one of the most beautiful works of antiquity. In the doorway at Bologna, by Peruzzi, the same well-balanced adjustment of the ornament is observed. The enriched mouldings of the architrave here mark out its lines in the most effective manner. The consoles are also well worth study for their beauty of decoration. The thoughtful observance of the law of contrast by the early mediæval builders renders their doorways the effective features which they are. The door of Lincoln Cathedral is one example. The arch mouldings are alternately enriched and plain. There is also a gradation observed here in the character of the ornaments, those on the outer edge of the arch and furthest from the eye being bold and simple, while those on the inner edge are more delicate and elaborate. The telling band of ornament carried round the outer edge, resembling considerably a Greek fret, is a fine contrast in its rigid lines to the rounded sweep of the arch. Unfortunately, the architect of the upper portion of the building (not having apparently much reverence for the work of his progenitors) has ruthlessly cut away a part of this striking feature. I have spoken in a former part of my paper of the gorgeous adornment of later Gothic doorways. The most effective and striking of these will, on examination, be found to be those in which the ornament is carefully distributed, and where the play of contrast is kept up throughout.

IV. *As to expression.*—This is the first and great est of the architectural graces. What though we build the strongest and most commodious structures, though we form their walls of costly marble and enrich them with the most elaborate carving, though we fill their pediments with sculpture and crown their façades with groups of statuary, giving them every imaginable adornment, if they possess not the element of expression they have no life in them. Like the countenance of many a handsome woman, in which there may be great regularity of profile, much beauty of complexion and features of exquisite contour, but which lacks the winning smile and the quick expressive glance of the eyes, they will be but

Faultily faultless, icily regular, splendidly null.

We all know how much the beauty of the face depends on the mouth, which is, indeed, to some extent, an index also to the character. In scarcely a less degree does the expression of a building depend upon its doorway. Like the mouth, it should be a true guide to the character of the edifice. In the Florentine palaces the doorways have nothing princely about them, nothing to lead the traveller to think that he is about to enter a palace; in short, they do not express the purpose of the building. On the other hand, in the Cancellaria, the work of Bramante at Rome, and in the Farnese Palace, the doors are noble and dignified openings, flanked by stately pilasters, with complete entablature, the only features of the kind in the whole length of the façade, on that stage. The Gothic church doors are generally appropriate, in dignity and grandeur, to their sacred purpose. The early Renaissance builders took example by their Gothic predecessors, their doors being made prominent and of becoming character. It is much to be deplored that the later and more modern architects of the revival should have strayed so sadly from the path of true expression. We find them using even Pagan symbols in their church entrances, such as the skulls of oxen and sacrificial implements, thus putting a lie into the mouth of their temple of truth. In all our buildings, though we may not attain to much beauty, we may at least have what is true; for rest assured, without it, we shall attain to no *real* success. Let our civic buildings, then, have noble doorways, wide and ample, through which the surging throng of business men may freely pass, impressed with the fitness and appropriateness of their details, while their eyes are feasted with the graceful forms of their sculptured ornament. In our "church of the future," let there be an awe-inspiring portal, whose deep and grateful shadow shall whisper peace to our wearied spirits, and make us feel that "this is none other but the house of God, and this is the gate of heaven." In our dwellings let us have at least an air of respectability about our entrances, a cheering welcome aspect, as though we were not "unmindful to entertain strangers." Let there be nothing about them which, as we approach the well-loved threshold, shall mar the warm feeling of the heart that

Be it ever so humble, there's no place like home.

THE OLD LANDMARKS.

A LARGE number of workmen have been set to work for the removal of portions of the extensive and complicated network of lanes, courts, and alleys, covering the area immediately to the east of Clement's Inn, for the purposes of the New Palace of Justice; and in a few days Old and New Boswell-courts, Clement's-lane, and the adjoining places, will all be gone. In Old Boswell-court the *Post-Office Directory* has hitherto been published. In Clement's-lane, which was attacked on Wednesday morning, stand some old houses, one of which is remarkable as the scene of one of those royal intrigues and misdeeds which figure in the *Memoirs pour Servir* of Charles II. and his Court. As soon as this portion of the site of the new law courts is cleared, the buildings lying to the west of Bell yard will be attacked, and in a few weeks there will be a vast open space, bounded by Temple-bar on the east, Clement's Inn on the west, Lincoln's Inn on the north, and the Strand on the south. When the works for the new buildings to be erected upon it will be commenced, is, of course, another question.—The buildings heretofore occupied as the Admiralty and Ecclesiastical Courts and the Wills and Probate Offices are fast disappearing from Doctor's Commons, St. Paul's Churchyard. Nothing now remains of them except portions of the outer walls, which will soon be levelled with the ground for the extension of New Earl street, the section of which nearest Cannon-street has been completed some time. This new street, as we have previously stated, is intended to run in a north-easterly direction from the railway bridge of the London, Chatham, and Dover line which crosses Earl-street, Blackfriars, passing on the south side of St. Ann's Church into Doctor's Commons, thence crossing several narrow streets, will form a junction with the finished portion of New Earl-street, near Cannon-street and Bow-lane. It is the intention of the Corporation to complete this very desirable and important communication between Blackfriars-bridge and the Mansion-house with as little delay as possible.

BATTERSEA PARK.

THAT the art of landscape gardening and the pictorial treatment of grounds has derived an impetus from the recent institution of several public parks for the wholesome recreation and enjoyment of the people, is a fact that few who are acquainted with the subject will be inclined to dispute. The park now under consideration is a most successful example. It has within perhaps a dozen years been converted from a low, morass-like tract, over whose surface the river anciently flowed, into a scene of varied and enchanting beauty, not so much known or resorted to by people of reputed taste as its intrinsic merits would warrant, though often thronged by the classes for whose advantage it was more directly intended. Yet the equestrian will find long lines of soft roads appropriated to his morning canter, while others, of the most compact macadam, are open for vehicles; so that whether in the saddle or the carriage most agreeable routes are at command. The day will come, no doubt, when these delightful ways will be more constantly traversed than at present—when they will share and vary the attention now so exclusively directed to Hyde Park; but let the countenance of fashion come when it may, the favour of the people seems to have been extensively secured. The pedestrian finds new but agreeable avenues margined by rich belts of ornamental shrubs, that rise as sheltering backgrounds to more fragile herbacious subjects of the floral kingdom. There are the plantation, the pleasure ground, and the parterre, by turns; but the grand botanical treat to summer visitors is the sub-tropical garden, where many interesting varieties of choice exotics are brought under general observation. Not only has the surface of the park been raised but it has been moulded into a most agreeable diversity of level; and that in a strictly natural and art concealing way, hiding or revealing distant objects according to the discretion of the eye or the canons of taste. At one moment the visitor passes the base of a wooded eminence, at another he perceives the denuded strata of a craggy peak, or he follows the not flat but sinuous borders of no mean, although uncertain, expanse of water, denizened by an eclectic ornithology and enlivened by the swift movements of skiffs and wherries. From such a scene he turns upon the grass sward overspread with innumerable

cricketers; elsewhere he admires the supple feats of gymnastic amateurs, or the precise evolutions of volunteer exercise. In all this the observer finds much to rejoice at, and nothing of which any reasonable being could complain. But while thus satisfied with what has been done it may be allowable to offer a suggestion upon a feature now in course of treatment, and that feature is no less important than the bank of the river Thames. Those accustomed to the locality will know that during several years the formation of a river wall with blocks of concrete was pursued. The present state of the implements or plant used in those operations would seem to proclaim an abrupt cessation, but from whatever cause this may have arisen the result of the work is a nearly perfect barrier to the tide up to high-water level or somewhat above, but the casing has never been crowned with any marked top or capping. From the upper line of this casing the ground slopes at an angle of about 45 deg. till the park level is reached, and this would not perhaps be an altogether undesirable form for the permanent work, but at the top of the slope there should be a breast wall or parapet about 3ft. high; though the shape of the embankment is immaterial, the object thought desirable is this. The embankment extends along the whole northern boundary of the park, from Chelsea Suspension Bridge, at the east, to the Albert Tavern, at the west, and will be perfectly level. The opportunity for an esplanade, say 30ft. wide, and possibly a mile long, could not be better. The handsome appearance of the river at this part, the consequence of the bridges above and below, the grounds of the Hospital, and the "Physic Gardens" opposite, together with the projected embankment there, will give much dignity to the Middlesex shore. Between the esplanade and the ride there might be a plantation of the kind now being formed; but with a definite line of trees at the prescribed distance from the parapet. A decided rigid line would accord with the masonry and impart a grandeur to the terrace walk which seems so natural, so desirable, and for which there are such unexampled facilities.

THE BIRMINGHAM BUILDING TRADE.

It is well known that disputes have agitated the building trades of Birmingham to a considerable extent, and that much loss and irritation have been the result. For some months past earnest efforts have been made both on the part of masters and men to establish a more satisfactory basis of action in future. The following code of rules which have recently been agreed upon in arbitration between the employers and the carpenters and joiners exhibit a spirit of mutual concession, and are, therefore, likely to endure, for some time at all events; as the rules are the result of much anxious thought, we trust that no small matter from either side will be allowed to disturb them. If matters can be so mutually arranged at Birmingham, we see no reason why masters and men cannot effect a similar agreement elsewhere:—

1. Hours of Work.—The ordinary hours of work shall be from 6 a.m. to 5.30 p.m. on each of the first five working days in the week, with one hour and a half per day allowed for meals; and on Saturdays from 6 a.m. to 1 p.m., with half an hour allowed for breakfast. But during six weeks before and six weeks after Christmas Day, where artificial light is not furnished, the ordinary hours of work shall be from 7 a.m. to 5 p.m. on each of the first five working days of the week, with one hour per day allowed for meals; and from 7 a.m. to 1 p.m. on Saturdays, with half an hour allowed for breakfast; and outdoor workmen to be paid the same as if working in the shop.

2. Rate of Wages.—The ordinary rate of wages for skilled operatives of the various branches to be 6½d. per hour. Superior and inferior workmen to be rated by the foreman.

3. Overtime.—All overtime made at the request of the employer, between 7 p.m. and 6 a.m., on the first five working days, and after 1 p.m. on Saturdays, to be paid time and a half. Sundays—double time.

4. Paytime.—All employers shall commence paying wages either on the works or at the office, not later than ten minutes past one o'clock on Saturday in every week.

5. Distance.—If the distance of the work be not more than two miles from Stephenson-place, the men shall walk in their own time. If more than two miles, then walking time shall be allowed at the rate of three miles per hour beyond the first mile and a half. But the men shall walk back in their own time, except on Saturdays, when the wages are not paid on the place of work. Lodgings and railway fares for all men sent from the town to a country job to be paid by the employer and subject to special arrangement between employer and workmen, and for all works more than four miles from Stephenson-place. This rule shall not apply to men set on at the job, and who may reside within two miles of such job.

6. Notice.—Two and a half hours' notice shall be given by the employer or workman of any intention to put an end to the service, and in default thereof, either party shall forfeit and pay to the other two and a half hours' wages. Such notice shall be given so as to expire at the termination of the day's work in all cases.

7. Authority of Employers.—Each employer shall have power to conduct his own business in any way he may think advantageous in the matter of letting piece work, in taking apprentices, in using machinery and implements, and in all details of management not infringing the individual liberty of the workman.

8. Alteration of Rules.—No alteration is to be made by either employers or workmen in any of the foregoing rules, or in the existing rate of wages, without giving to the other a notice in writing. Such notice shall be given on or before the 16th day of December in the year, and state the full particulars of the proposed alterations, and the party receiving such notice shall reply to it, either by giving a counter notice or otherwise, on or before the 1st day of January ensuing, after which, if necessary, a council (composed of six employers and six workmen of that branch of the trade requiring the alteration; or if a general alteration affecting the whole of the trade, of one member from each branch, or otherwise, so as to have an equal number of employers and workmen) shall be arranged and shall meet on or before the 1st of March ensuing, to consider such proposed alteration, which, if agreed to, shall come into operation on the 1st of May following.

9. Court of Arbitration.—If the members forming the council cannot agree upon any of the proposed alterations or matters referred to them, they shall appoint an umpire to arbitrate between them, whose decision shall be final and binding on all parties; such court of arbitration shall be held, and conclude its sittings, so that any alteration decided on shall come into force on the 1st day of May following.

10. Publication of Rules.—These rules shall be printed and posted up in some conspicuous place in each of the employers' workshops in Birmingham and its neighbourhood, and a printed copy of these rules shall be taken as evidence of the contract and submission to conference or arbitration between any employer and any workman in any proceeding to enforce any award made under these rules.

Thomas Lloyd, Chairman.

Masters.	Workmen.
E. W. Barnsley.	James Lewis.
C. Jones.	William Davis.
John Caesswell.	George Edge.
W. and T. Webb.	James Thorneloe.
Joseph Hardwick.	John Michael.
Joseph Jeffaey.	John Price.

ARCHITECTURAL SOCIETIES.

The fortnightly meeting of the Liverpool Architectural and Archæological Society was held last week, Mr. T. J. Kilpin, president, in the chair. The Secretary read a report by the council upon a communication from the Master Builders' Association, embodying their views on the form of contract suggested by Mr. Plevins, of Birmingham. On the motion of Mr. Boult, seconded by Mr. J. A. Picton, the consideration of the report was postponed, and it was referred to the council to appoint four gentlemen to confer with four gentlemen to be appointed by the Master Builders' Association, on the subject of their communication.—The Secretary announced that the council had received four designs for the fourth students' competition, and had awarded three marks to the one signed "Vale," and one mark to that distinguished by an anchor within a circle. It appeared that in the four competitions, Mr. Deacon had obtained seven marks, Mr. Metcalf four, Mr. Haworth three, and Mr Evans two. Mr. Deacon therefore had gained the first prize, and Mr. Metcalf the second.—Mr. J. A. Picton offered a prize of two guineas for the best collection of sketches made during the recess.—Mr. Gale stated that, in digging the foundations for new buildings about to be erected on the north side of Lord-street, the excavators had rather unexpectedly come upon an immense oak tree, which, he said, had either fallen or been blown down where it lay, or had floated there. It was at a depth of 10ft. from the pavement. It was from 3ft. to 4ft. in diameter and was very hard. It had not been bared its entire length. Near the portion which had been bared were the roots apparently of another tree. In one corner of the excavations the remains of a bog, probably formed by the decaying foliage of the trees, had been found. The deposit was covered with a blackish clay. Not far from it were some sand and a good deal of water, and below it—some 16ft. below the pavement—was a gravel and shingle beach. Mr. Gale exhibited a specimen of the oak, and a portion of the boggy deposit.—Mr. Audsley then read the paper for the evening, entitled "Notes on French Architecture, with illustrations."

WORKMEN'S DWELLINGS.

DESIGN TO CONTAIN 120 TENEMENTS.

There can be no question that our artisans are badly lodged compared with the amount they pay in rent, and it requires no further proof that if a man is to spend his leisure hours with his family he must have not only space for mere existence, but well-built walls to keep out the heat of summer and the cold of winter, good light, and careful ventilation and drainage. Show him that he can obtain this without paying more than he now does for the miserable suburban cottages or reeking town barracks, and his good common sense will soon cause him to take the opportunities that may offer to enable himself and family to live in something like comfort. The author of this design does not claim for it that it is perfect in any way (indeed, several valuable suggestions have been made to him since it has been in print which might improve it much); but he merely offers it as a suggestion that by grouping together three or four classes of accommodation, from one to five rooms in each class, various wants of different-sized families might be accommodated; and as in these days of professional philanthropy it is usual to prove that good deeds pay in this world as well as the next, a statement showing the estimated outlay and income is appended, by which it appears that at least 6¼ per cent. per annum may be returned without counting any profits upon the baths and washhouses. The profits of the co-operative store would, of course, be divided among such of the tenants as chose to join the scheme.

ESTIMATE.

Accommodation, &c.

8 1st class,	8s. per week,	£20 16s. per annum	=	£166	8s.
32 2nd ,,	6s. ,,	£15 12s. ,,	=	£499	4s.
44 3rd ,,	5s. ,,	£13 0s. ,,	=	£572	0s.
36 4th ,,	3s. ,,	£7 16s. ,,	=	£280	16s.
		Total income from rent		£1,518	8s.

Total rent		£1,518	8s.
Deduct 25 per cent. for expenses ...	£379 0s.		
Ground rent	£80 0s.		
		£459	0s.
	Nett income	£1,059	0s.
Total cost of erection		£17,244	0s.

Return in average income, £1,059, being about 6¼ per cent. on outlay; add 1½ per cent. for profit on baths and washhouses, when nett profit will be 7¾ per cent. on outlay.

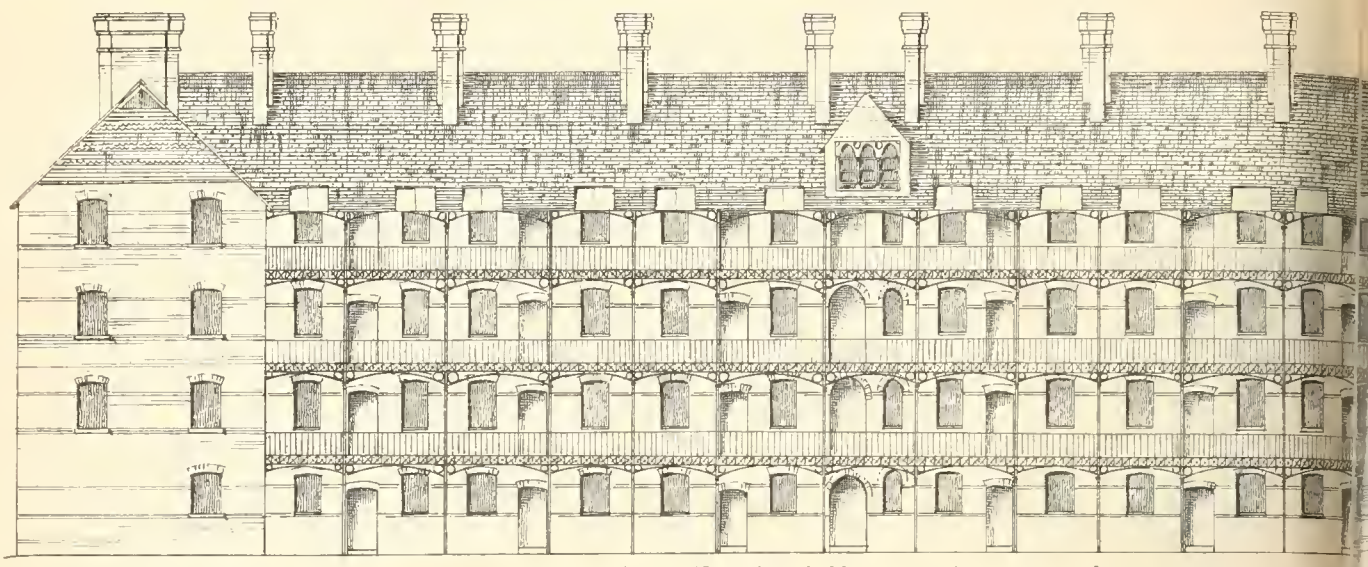
T. R.

ASPHALTED PLATFORMS.

On the western side of the new Railway Station at Broad-street some very extensive and important works are now in progress. A monster goods station is slowly developing itself from a vast chaos of bricks, stone, iron, and timber. Everything is on so gigantic a scale that the visitor might almost fancy himself suddenly dropped into some strange region inhabited by industrious Cyclops. Huge columns of iron stand like giant sentinels in stately rows, and ponderous girders lie prostrate on the ground, and seem to defy all the efforts of mechanical science to raise them. Several of these enormous girders, however, are already lodged on their lofty resting-places. A long series of splendid arches, each one of which would make a large railway station, presents to the eye a marvellous effect of perspective, and affords a multitude of platforms for the rapid loading and unloading of merchandise. These platforms are now nearly finished, and, like everything around them, they are wondrous both in their magnitude and in their construction. Their surfaces are as smooth as marble and as hard as granite, being covered with Pyrimont Seyssell Asphalte, laid on a bed of carefully levelled concrete. They are in every way similar to, and for the same duty as, those that have been in constant use for many years at the Great Northern and North-Western depôts for goods at King's Cross and Camden Town. The adoption of asphalte at all these places arose from its use at Messrs. Pickford and Co.'s depôt, Wood-street, at the time it was erected in 1843. The whole of these works have been confided for execution to Mr. Jay, railway contractor.

The hotel companies which promised such large dividends to their proprietors are generally turning out a bad speculation. At the last sale by auction of the London Stock and Share Company, at the Baltic Sale-rooms, Threadneedle-street, the following were some of the prices realised:—Shares in the Alexandra Hotel Company, in which £10 each had been paid, sold for £4 4s. per share; shares in the Freemasons' Tavern Company, on which £5 each had been paid, sold for 8s. per share; shares in the Grosvenor Hotel Company, on which £10 each had been paid, sold for £2 10s. per share; shares in the International Hotel Company, on which £5 each had been paid, sold for 10s. 6d. per share; shares in the Langham Hotel Company, on which £10 each had been paid, sold for £3 5s. per share; and shares in the Star and Garter Hotel Company, on which £10 each had been paid, sold for £2 10s. per share.

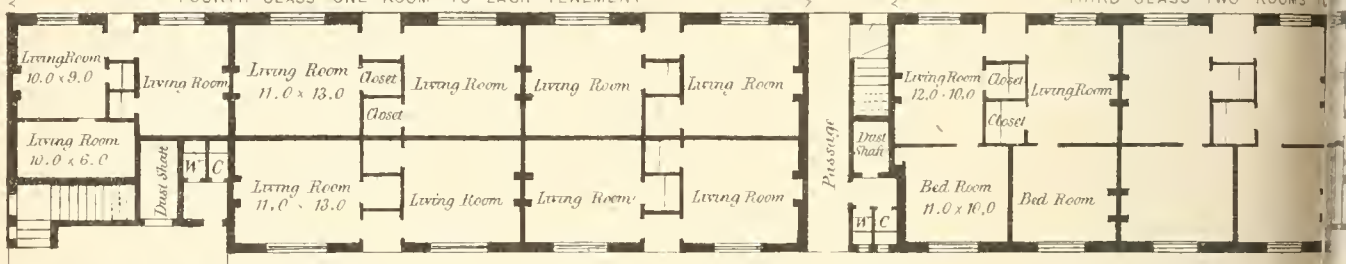
DESIGN FOR A BLOCK OF DWEL



ELEVATION OF SECOND CLASS TENEMENTS

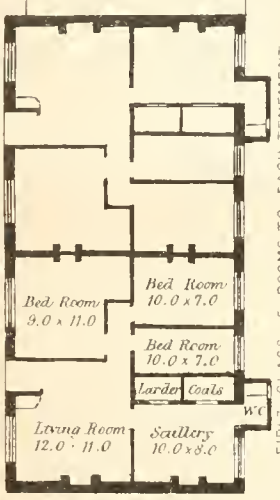
FOURTH CLASS ONE ROOM TO EACH TENEMENT

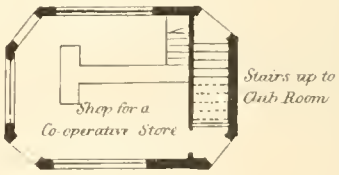
THIRD CLASS TWO ROOMS TO



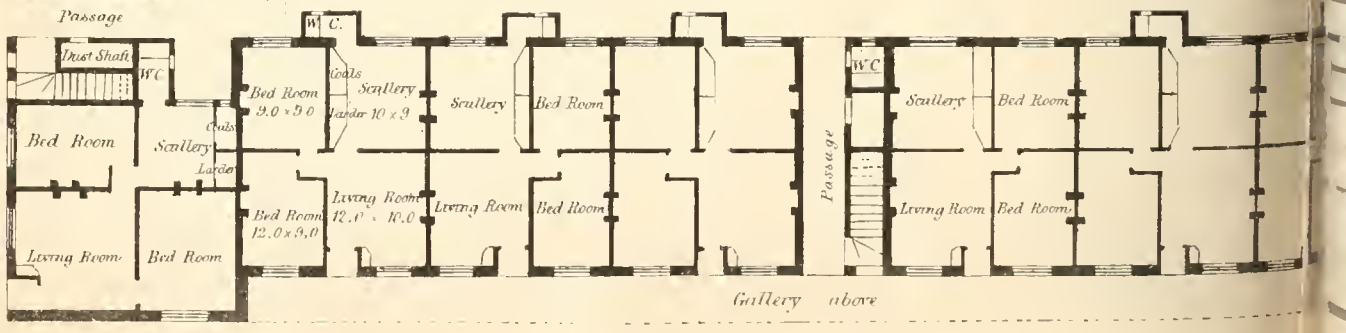
Gallery above

FIRST CLASS 5 ROOMS TO EACH TENEMENT





Passage



Gallery above

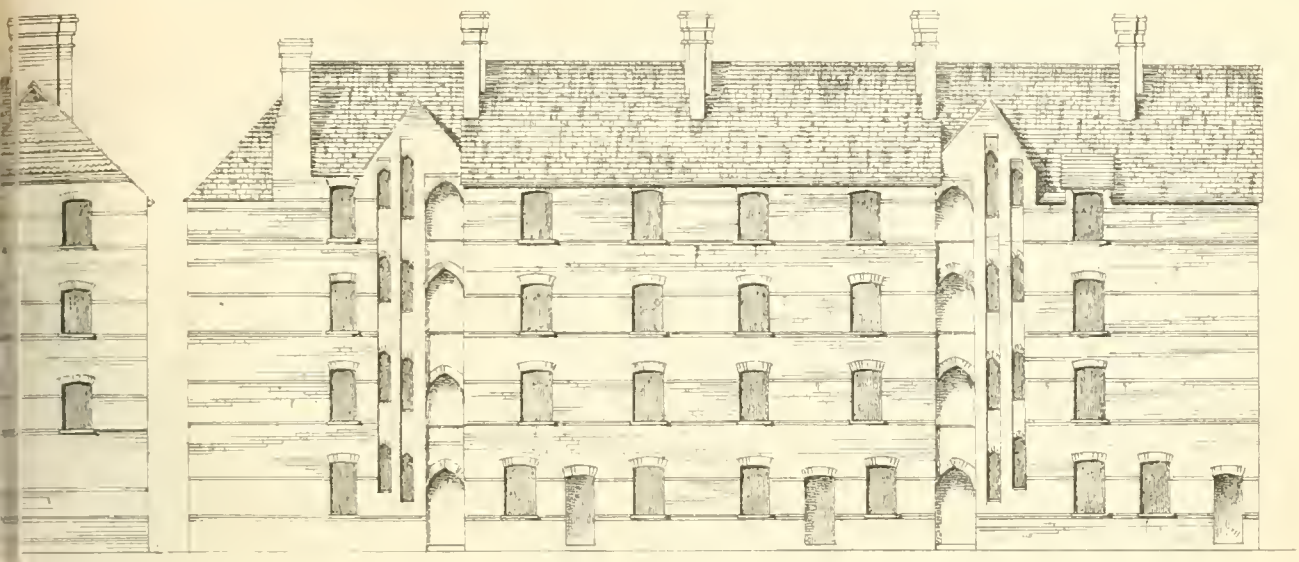
SECOND CLASS FOUR ROOMS TO EACH TENEMENT

SCALE

Feet 140 130 120 110 100 90 80 70 60 50 40 30 20

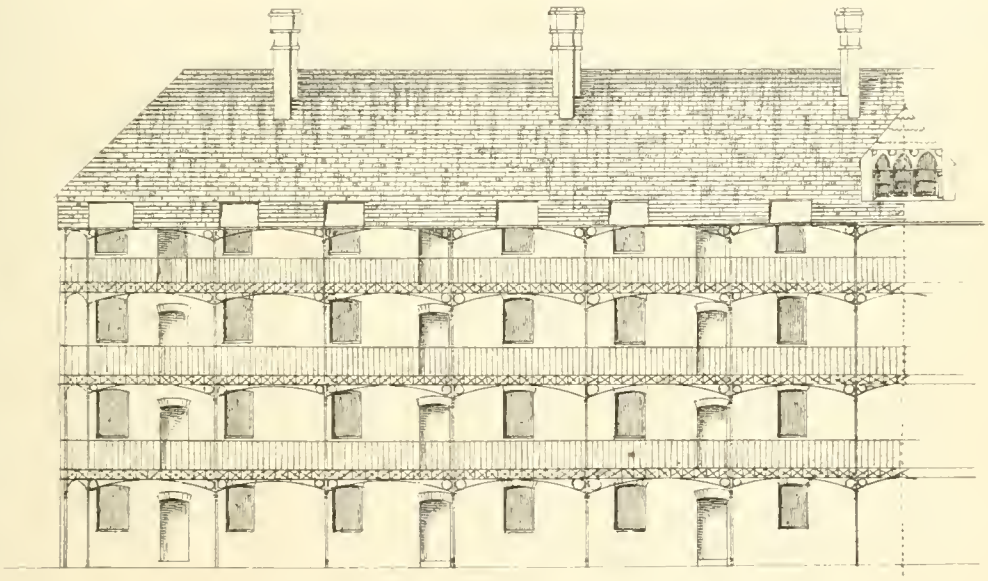
Printed by Whiteman & Bas

CONTAIN 120 TENEMENTS.

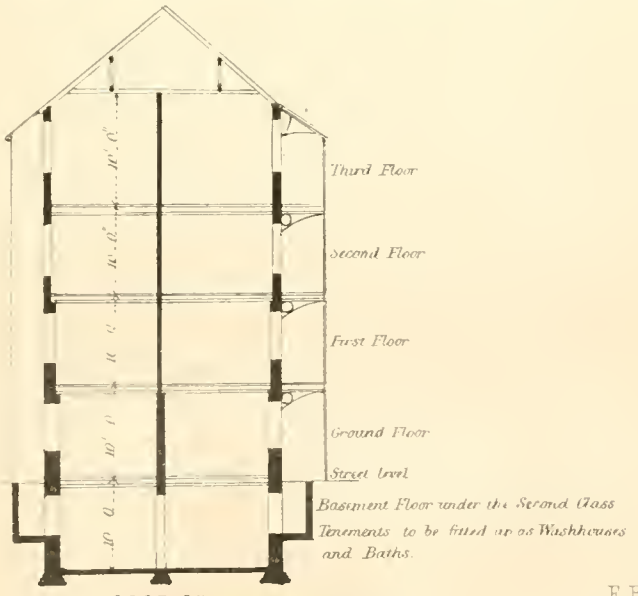


ELEVATION OF FIRST CLASS TENEMENTS

THIRD CLASS TWO ROOMS TO EACH TENEMENT.



ELEVATION OF THIRD AND FOURTH CLASS TENEMENTS



SECTION

F. Rogers Architect.
9, Buckingham St Adelphi

The Building News Apr. 26th 1867

SLATES.

THE number of slates annually quarried in the British empire is rapidly on the increase. The slate trade is well known to be a profitable one; and hence, whenever a new quarry is found, or an old one re-worked, companies will be organised and fair promises made of a large percentage of profits. Like all undertakings of this description, they are subject to failure and disappointment. In some cases the slates do not turn out so well as was anticipated; in others, the demand does not prove to be so great as was asserted, and hence shareholders have had to submit to loss. It must be confessed, however, that as a rule, speculation in a good slate quarry is attended with but little risk, since the demand for slates continues to increase, and our export trade is flourishing. But good slates are the exception, not the rule; and, unless the transport be easy, are not likely to be quarried with profit. "Generally," observed Professor Ansted, in one of his Cantor Lectures at the Society of Arts, "good slates are obtained only from certain veins or limited bands of rock. These are of comparatively small dimensions, and occur in the midst of a considerable mass of schistose rock and of other slates, too much broken or too badly cleaved to be of use." It is not believed to be absolutely necessary that slates should be quarried from rocks of ancient geological date, for they have been found in secondary rocks.

Roofing slates are of three kinds—the Welsh, or dark-coloured slate, which is largely used, and for which there has been of late years a very extensive trade; the Cumberland and Westmoreland slate, some of which are very beautiful but rather costly, of a light blue colour; and the sandstone slate, which is generally of a greyish colour. This latter slate, from its heaviness, is found to be of the greatest use for farm-houses and out-offices. The most magnificent slate quarries and the best slates are to be found in Bangor, North Wales, and Kendal, Westmoreland. These latter slates are thick and heavy, but do not generally run so large as the Welsh rag. Some of the slate is procured from the mines of Delabole, in St. Teath, Cornwall, about twelve miles from Bodmin. These mines are very extensive, and have been worked for many years. Tons of slate are annually sent from here to France and other countries from the ports in the neighbourhood. In 1842, about seven hundred persons were employed in the three quarries in this place, one-tenth of whom, day-the-bye, were women, who earned 6s. a-week, while their husbands earned on an average 18s. From a description of these works, written in the same year, we learn that "the women wear over their other dress a common waggoner's frock, to protect it from the dust of the slate." "Nearly the whole of the employment is piecework, called *tut*. There are about twenty departments, the principle of division of labour being fully acted upon. The people are paid once a month only, the time required for measuring piecework not permitting, it is said, more frequent payments." Now, however, we find, so greatly is the demand increased, that one thousand men are employed in quarrying; and that thousands of tons of Delabole slate are annually sold. The export trade is remarkably good, it being carried on chiefly with Plymouth, Wales, London, and France; and the goods are shipped at Port Isaac and Port Quivern, in Endellion. The stones raised are believed to be the largest ever known, and they are of a beautiful dark blue colour.

Penrhyn slates are well known. The great quarry at Penrhyn, which is worked in twelve galleries, one over another, has been opened nearly a century. The works are very extensive. The galleries or terraces are in the shape of a horseshoe; the highest is 500ft. above the lowest, while each is 40ft. above the one below. The poorest slates are obtained from the terraces nearest the top. Excellent slates are found in some parts of Scotland. The Ballahulish are especially good, and the operations are carried on there on a very extensive scale. We do not know what is the annual produce of slates from the Ballahulish quarries, but some years ago it amounted to six or seven millions, weighing ten thousand tons, —a large quantity, which it is said involved the removal of at least sixty thousand tons of rubbish that resulted from the workings. Successfully-worked slate quarries are to be found in Luss, Camstradden, and Roseneath in Dumbarton, and Birnam, in Perthshire.

The activity of the Welsh slate trade during the past few years has been extraordinary. Three years ago there was so great a demand for these slates that orders had to remain on hand for six months, and double the number of men had to be employed. Since then numbers of companies, formed on the limited liability principle, have been organised for opening new ground or extending old quarries; and the consequence is that the Welsh trade is at the present time in a marvellously flourishing condition. In Wales, the slate quarries are mostly among the mountains. Welsh slate is more readily obtained in the south of England, and is better liked for roofing purposes than the blue or Cumberland description; besides being finer in grain it is somewhat stronger than blue slates. Over three thousand persons are employed in the slate quarries of Festiniog, in Merionethshire, which were partly owned by the late Lord Palmerston. The slate procured from Cooris, in the same county, is of a deep blue colour, and is much appreciated for roofing purposes and the manufacture of enamelled articles.

Irish slates have been in great request of late years, and great difficulty has been experienced in obtaining them, in consequence of the existing quarries being inadequate to meet the demand. Slates from the Valentia quarries, in Kerry, have been used for the Charing Cross, Blackfriars, and Waterloo Stations, and also for other railway stations in various parts of England. These quarries are being largely worked. They are situated upon the side of a mountain, and are 420ft. above the sea level. It appears that the amount of waste occasioned by blasting is avoided by severing the slates by means of wedging, the waste being used up for roofing slates in the locality.

The bluish grey coloured slates, which break before the zax, or large knife, like well-burnt pottery, and that give a uniform ring on being struck, are undoubtedly the best. Blackish or dark blue slate, though cutting freely, absorbs moisture and decays rapidly, while whitish or light grey slate is generally stony. Professor Ansted says that in the better qualities of slates there is little or no pyrites, and the veins and joints are so arranged as to assist in the working. They are generally obtained from some depth within the quarry, and more from valleys than from hills. "The exposed and weathered slates are more brittle and harder, and seem in some cases to have lost much of their fissile properties." When placed horizontally, slate does not exhibit much injury from weathering, but if it be exposed to incessant foot-wear it becomes worked up again into its original mud.

Slates are known by certain names, to distinguish their sizes. "Ladies" measure 15in. by 8in.; "countesses," 20in. by 10in.; "duchesses," 24in. by 12in.; and "queens," 36in. by 24in. There is a slate known as Welsh rag that equals the "queen" in surface, but is much thicker than the ordinary descriptions. A so-called "double" slate is smaller than the "lady," and is cut from the refuse of large scantlings; it is about 12in. by 6in. "It is not easy," remarks the well-known geologist whose name we have before mentioned, "to judge with certainty of the condition of a vein of slate from its appearance at the surface after exposure to weather, and much knowledge of rocks is needed to justify the expression of an opinion." There are varieties both of the purple and green kinds, all of which exhibit different modes of weathering. Great hardness, a perfect facility of splitting, and a fine grain are required to make a good slate, and the larger the size of the slabs or slates that can be cut the greater is the value of the property.

The late Mr. Wyatt introduced into this country a very effective and light principle of slating—one which he had evidently copied from the roofs of the ancient temples of Greece. The principle, which was never patented, is that of laying wide slates side by side, and covering their joints with narrow slips bedded in putty, the overlap at the ends being no more than the bond is with the method usually carried out. By the adoption of this plan the roof does not require being boarded over, as the slates bear from rafter to rafter, to which, indeed, the slates are screwed, the covering slips being also screwed and bedded in putty. This mode has its disadvantage, as the heat will cause expansion and contraction, so that the joints may be destroyed, and leaks therefore will occur. It has been stated that slating of this kind may be laid at no greater elevation than 10 deg., but for slating in the ordinary way the angle should never be less than 25 deg., although large slates with 3½in. bond carefully laid and pointed may be allowed at a rise of 20 deg. We may add here that slater's work is measured by the square of a hundred superficial feet.

The work of slate roofing was for many years done by a number of men belonging for the most part to slate quarries who were known as slaters. It is somewhat curious to find that these men, who worked hard all over the country during the spring and summer months, returned to Westmoreland, Cumberland, and Wales for the winter, during which time they lived on their summer's gains. It is strange that such a custom should have continued as long as it did, since it must have crippled the building trade. The slating business is, as everyone knows, not now confined to a few slate dealers, with their privileged set of men, but for years past the monopoly has been broken down.

NEW METHOD OF VENTILATION.

A method of ventilation has been tried in a large public establishment, the Almshouse, at Philadelphia, which deserves consideration, as it appears to have effectually accomplished the end proposed—the complete removal of foul air. In describing the method *Chambers' Journal* says:—An opening is made at the level of the floor in the wall of a room or ward in the position usually occupied by the fireplace, at which heated air is made to flow in. Near this, also at the level of the floor, two other openings are made connected with a flue, to serve as outlets. The warm air on its entrance naturally rises, but finding no escape at the ceiling, it accumulates at the upper part of the room, and forces downwards the air which, having been longest in the room, is comparatively cool. This at length is compelled to escape by the two outlets above mentioned, and thus there is a complete circulation and displacement of the whole mass of air in the room. Even in the most crowded wards, the air was so thoroughly freshened by this method, that not the slightest offensive odour could be detected; and an effectual check was given to the fever and cholera which had broken out in some parts of the building. The merit of this method appears to consist in a reversal of the usual practice, which is to place the outlets at the ceiling: if so much good can be effected by placing them at the floor, we should be glad to hear of a trial made in some large establishment in this country.

A German chemist prescribes 6 parts of Portland cement, 1 part nicely-powdered lime, burnt, but not slaked, 2 parts of sand, and 1 part of slaked lime mixed with the necessary quantity of water, used as a filling between stone and iron, both being previously damped. After forty-eight hours the cement will be nearly as hard and as durable as stone.

Archæology.

The British Archæological Association will meet on Monday, July 29, at Ludlow, under the presidency of Sir Charles H. Rouse Boughton, Bart. The members and visitors will dine together, the association will be received by the mayor and corporation, and the president will deliver his inaugural address on the first day of Congress. The association will be entertained at Downton Hall by Sir Charles Boughton, at Burford Park by Lord Northwick, at Downton Castle by Andrew Boughton Knight, Esq., and at Oakley Park by Lady Mary Clive. Among the papers to be read are three by Thomas Wright, Esq., M.A., F.S.A., one of the founders of the association, and a native of Ludlow, whose reputation stands high in the district; another by J. R. Planché, Esq.; a third by F. R. Dillon Croker, Esq; and others by well-known archæologists; altogether presenting an attractive programme.

Mr. Harford Mellor, an antiquarian, asserts that he has discovered the remains of King Alfred, which have now been buried 966 years. Mr. Mellor feels confident that the royal remains are now lying in the gilt mortuary over the chancel of Hyde parish church, and the two leaden plates found, with the King's name upon them, are now in the hands of the vicar, Mr. Williams.

In anticipation of the intended visit of the members of the Archæological Society to Selby Abbey Church on the occasion of their annual meeting at Hull in July next, and also with a view to the ultimate restoration of the south wall of the nave and the south transept, the churchwardens have had workmen engaged levelling the earth surrounding the foundation of the south transept. During the progress of the work on Saturday last, a stone bearing traces of some inscription became exposed; and on a more careful examination the word "Alexander" was distinctly deciphered, though in somewhat imperfect characters. The stone is about 6ft. long by 15½in. broad at the base. The name of the abbot is surrounded by the carving peculiar to the twelfth and thirteenth centuries. The tomb, in all probability, contains the remains of Abbot Alexander, the twelfth abbot of Selby (A.D. 1214—1221.)

At the last meeting of the British Archæological Association, Mr. Godwin, vice-president, in the chair, Mr. Syer Cuming exhibited a new batch of forgeries in zinc. They are all of fresh forms, and more calculated to deceive than the leaden forms. They consist of arms, gauntlets, legs, ampullæ, helmets, bottles, &c. It appears that thousands of these forged articles are being exported to Germany.

According to the Scotch papers some interesting geological discoveries have recently been made in the course of the construction of a large common sewer in Glasgow Green. In the course of the operations, the workmen have discovered some curious fossil and other remains, to which it may not be out of place briefly to refer. It may be stated that the cutting is about 20ft. in depth in some places. During the past three days the *employes* have been busily engaged digging out a huge oak tree found in forming the sewer. It was embedded nearly 20ft. beneath the surface from time immemorial, and was found to be nearly as hard as flint. It had to be cut in three parts before it could be raised to the embankment; and after being placed on the green sward, it became an object of considerable attraction to many of the citizens, and the observations in reference to its age and the place where it grew have been somewhat curious. Where this old "monarch of the wood" grew no one can tell. There are few oaks in the vicinity of Glasgow nowadays, and it is not improbable that it may have flourished in the ancient oak forest at Cadzow, near Hamilton, in days of yore, and that when "decay had waved its raven wing," it had been swept down the Clyde by some great "spate," and got embedded in Glasgow Green. There are many evidences to show that the Clyde has changed its channel. Besides this hardy old veteran of the forest, other trees have been discovered, portions of which were found to be fossilised. Hazel nuts have also been found at the depth of from 12ft. to 15ft. from the surface.

The remains of the ancient Monastery of Llanfaes, near Beaumaris, having been entirely removed in the course of recent building operations, some fragments of flat tombstones were discovered, not in their original position, but built into walls of very respectable antiquity themselves. One bore part of the title of an "archidiaconus Anglesieæ," and on two other pieces,—evidently the two upper corners of a flat stone slab which once had a brass in the centre, and a legend round the edge,—appear these letters: on one, "R. HOWE . . ."; on the other, "AP. TVDVR." The form of the letters is very antique; the interest in them is enhanced by the fact that in the "Myfyrian Archaiology of Wales" is preserved a species of elegy, written in very archaic Welsh by one Goronwy Gyrriog (a bard whose "era" is not well ascertained but whose language is of a very early character), in memory of Gwenhwyfar, daughter of Madoc, wife of *Howel ap Tudur*, in which it is said, "She lies captive under a veil of stone at Llanfaes—Llanfaes above the sea-cliffs conceals Gwenhwyfar; that sacred home, the sanctuary of the brotherhood." The letters on these fragments look very like "uxor howelis ap Tudur." Trecastell, one of the ancient residences of the Tudors, is near Llanfaes.

MR. BURGES'S DESIGNS FOR THE NEW LAW COURTS.

A CONTROVERSY on the merits and demerits of the design for the new Law Courts is now being carried on in the columns of the *Standard*. A writer in the *Westminster Gazette* having, to his own satisfaction (judging from his trenchant style and pitiless denunciations), proved all the designs to be worthless, "Philocalus" steps into the arena to do battle for Mr. Burges. "The writer of the articles in the *Westminster Gazette*," ever ready and eager to defend his position, speaks in this wise of Mr. Burges's design in the *Standard* of yesterday:—

"I said that I could not compliment Mr. Burges on his practical knowledge, The plate contained in this week's BUILDING NEWS explains what I mean. It has but the merit of scene painting, and lacks nerve, purpose, and principle, which seem to have received but little consideration from the compiler. To take a more minute glance at the drawing, what do we find?—1. The whole building wants connection. No one part grows out of or follows another. It is neither sufficiently irregular to be picturesque, nor sufficiently regular to convey the idea of strength. The whole façade is suggestive of its having been designed on four slides. It has no autonomy; and for any benefit, either of effect or strength, which one stage derives from another, these slides might be pushed forward at pleasure from 1in. to 3in., and the effect would be equally good or equally bad. These horizontal bands appear, like Manchester prints, to be made by the yard, and tacked together at will.—2. There is not a single vertical line leading from the base to the cornice. —3. The main gable appears to be perfectly unconnected either with the lower building or anything above the parapet. The lateral shaft, some 20ft. high, which is placed on either side, is apparently supported by one of the shafts of the upper arcading, which is not more than one-fourth its size. This arrangement, however, again fails to carry a central line, as the inner face of the upper shaft just manages to miss the soffit of the lower one, thus producing a lamentable appearance of weakness. But what can be worse or more out of proportion than this main gable, in which nothing appears to possess a natural growth or to contain an objective purpose? Its central finial is 6ft. 6in. high; the attendant lateral human figures being but 6ft. What will this be in execution, where the head or finial of the man will not be more than as many inches as the finial of the gable is feet in height? The contrasts will certainly be striking, but the relative proportions questionable. Its central wheel, which by the way is a piece of constructive ornament and not a window, and has no purpose, is 12ft. in diameter, whereas those in the first story are but 4ft. Judging from the elevation the voussoirs of the gable windows appear utterly to crush the supporting shaftlets; but what would be the effect of gable when seen from below, with the parapet hiding from view at least two-thirds of the now insufficient jambs? In short, all above the cornice would seem to be the rechauffée of a much bolder work, but one very foreign to the lower stages of the composition. Not being acquainted with any of Mr. Burges's executed designs I am compelled to judge from drawings rather than from buildings. It is true that Mr. Burges, who has been judged sufficiently capable of taking part in the greatest composition of our time, has delineated a section through sills, cornices, plinths, arches, &c. But this is no proof of his practical knowledge; for there is not a line nor a section which is not infinitely better shown in almost every page of Viollet le Duc. Indeed, this very drawing fully confirms my worst apprehensions. Had Mr. Burges any idea of what the effect of his building would be when built, he would never have adopted flat sills 2ft. 6in. deep, which from below would cause the whole of the bases to be lost sight of, and his openings to appear all arch and no jamb. For a confirmation of my remark allow me to refer him to Viollet le Duc, vol. vi., p. 18; where he will find, not only a view showing what the effect of his work would be, but also the prototype of his own shaftlets. But putting appearance out of the question, if he were a practical man he would never leave this length of flat sill to receive the continued downpour to which it would be subjected. Why, the whole wall would be soaked through in a week."

HOW TO SELECT INDIAN INK.

INDIAN ink, or Chinese ink as it is sometimes called, when wanted for the purpose of mechanical and other drawings, is best tested in the following manner:—Rub in a porcelain paint dish as usual to the required consistency. Then with it rule a number of lines on a piece of drawing paper, making the lines of various thicknesses corresponding with the fine and shade lines of a drawing. When the lines have dried, brush over them with water freely. Good ink will stand the washing and the lines will keep sharp and clear; poor ink will run or spread sideways as soon as the paper is wetted. The best ink comes from Japan. It is rather hard to rub, but to overcome this difficulty use a piece of slate, say 1½in. wide and 4in. long, resting one end in the paint dish in which some water has been poured, about four or five drops. Then rubbing the ink on the slate, close to the water, and washing it down into the water, it will soon obtain the required blackness.

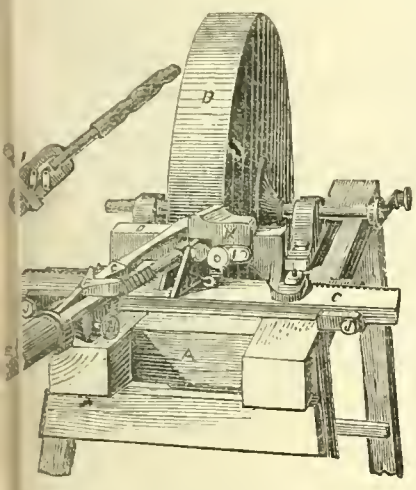
DEATH OF SIR ROBERT SMIRKE, R.A.

IN the death of Sir Robert Smirke the country has lost one of its most eminent architects. The melancholy event took place at his residence, 20, Suffolk square, Cheltenham, on the evening of the 18th inst. The late Sir Robert Smirke was born in 1780, and was consequently in the 87th year of his age. His father, Robert Smirke, enjoyed considerable reputation in his day as an historical painter; and his two sons, Robert and Sidney, inheriting his love of art, achieved for themselves yet higher distinction as architects. Robert, the subject of the present notice, studied for some time in the office of Sir John Soane, and subsequently spent several years in Italy, Sicily, and Greece, visiting, at intervals, the principal cities in Europe. He obtained the gold medal of the Royal Academy in 1799, and was elected associate in 1808. Steadily advancing in his profession he was elected a Royal Academician in 1811, and in 1823 was entrusted with the building of the British Museum, and in 1829 with the New Post office, St. Martin's le-Grand. Both buildings are examples of the revived Grecian style in fashion during the early part of the century. The Courts of Justice at Gloucester, Hereford, and Perth, the College of Physicians, King's College, and Millbank Penitentiary are all from his designs. These and the restoration of York Minster after its destruction by fire in 1829, and again in 1839, are the best known of Sir Robert's public works. Lowther, Eastnor, and Kinfauns Castles may be pointed to as examples of his ability in the construction of private mansions. Having been for many years architect to the Old Board of Works he was knighted in recognition of his valuable services, when, in 1831, that board was reconstituted. For a long time he held the office of treasurer to the Royal Academy, but relinquished this appointment on going to reside in Cheltenham in 1850, and a few years ago, finding his declining health materially interfering with the efficient discharge of the duties of a Royal Academician, he resigned its honours that they might be conferred upon a younger and more active man. Sir Robert Smirke, in 1819, married a daughter of the Rev. A. Freston, rector of Edgeworth, in Gloucestershire, who died in 1861. He leaves behind him an only daughter, married to Captain Lambert. In private life few men have been so highly esteemed as the late Sir Robert Smirke, while, in discharging the duties of the various responsible offices which he at different periods was called upon to undertake, no one ever surpassed him. In the profession of

ich he was so distinguished a member, it was good fortune through life to enjoy a "high utation for integrity, practical capacity, and a rough mastery of the constructive principles his art, and no buildings of his, it is said, ever wed a flaw or failing." Mr. Sidney Smirke, A., the distinguished architect, is the only ther of the late Sir Robert Smirke.

DRILL REST FOR GRINDING.

LL of our readers who are interested in such matters will be well aware of the difficul which attend the grinding of a drill in such anner as to make both of its cutting edges etly alike in angle and position, and of the essity which exists for such equality. Such ding, difficult as it is with ordinary drills, mes yet more so with twist drills which are obtaining so large a popularity. It is, therefore, with great pleasure that we record the invention of the ingenious tool named above, by h all difficulty is avoided, an absolutely correct shape is secured, and the whole operation is ced to the simplest form, so that no skill perience is required for its successful execu-



tool, as applied to the grindstone with the in its place, is shown in the accompanying t. To the frame of the grindstone B is at- the bed-plate C, by means of the jaws J This bed-plate carries a rest D, with guide- K to which is attached a pivoted screw E, e of vertical adjustment by means of a tion on its pivoted end, which is held in osition desired by a pin. This pivoted e carries a sliding thrust-block F, which is up by the nut shown at E. The drill to und is supported on the rest D against ide-block K, with its heel in the thrust- F, and is gradually pressed forward by the until sufficiently ground on one edge; a r H is then set at this point, the nut and block are run back, the drill is turned, s other edge ground as before, until the block is arrested by the stopper, when the on is complete. For grinding twist-drills vice is used (shown at I), whose centre corresponds with that of its jaws. The es of the above arrangement is Mr. Wm han, of Philadelphia, and the apparatus is ed in the *Journal of the Franklin Institute*.

IMPROVEMENT OF RIVERS.

RE the rivers of our own country and those of Europe in general to overflow anks at stated periods in the proper and x manner in which the Nile, the Gambia, er, the Indus, and the Ganges effect at al intervals their fertilising inundations, sequent inconvenience, danger, and loss not be so frequent or so serious as those loods as they actually take place. How uch we might regret the inundations, and loudly we might complain of the fertili- f the land being accomplished at so great a should at any rate be prepared for it and aken unawares. The result of one week's ous rain is more than sufficient to flood ntain streams; and it is no uncommon event for acres of standing corn to be completely destroyed, fields of hay to be swept along by the irresistible force of the current, trees to be uprooted, bridges undermined, and human dwellings and human beings to become the victims of the fury of the torrent. One or more of these catastrophes happen annually; and it is incredible that rivers and streams should so long have been permitted to be masters where they ought to be servants.

It has been asserted by an ingenious theorist, that with the exception of a few rivers formed at the creation of the world they have been all excavated artificially; that they took their rise from springs which would otherwise have spread over the whole land and flooded it, and therefore the inhabitants were compelled to cut channels for them in their own defence. The same theory accounts for the fact that there are no salt rivers, although there are plenty of salt springs in every part of the world, since people, having no use in early times for salt water, never cut any channels to lead away the water from the salt springs. The weak point in this argument appears to be—Why, then, did not the salt springs overflow the land similarly to their fresh-water brethren? History, however, proves that a large number of the channels have been artificially formed, although it is equally probable that they were not the original channels in which the rivers flowed, but new ones cut for the sake of necessity, improvement, or convenience. A river being simply a water road or water way, analogous to a common road or railway, its course should be as straight as possible, that is, the direction of its current should coincide with that of its course. When this is not the case, as generally occurs, the river endeavours to make it so by eating away its banks with a force which is proportional to the angle made by them with the direction of its current. This act of demolition would invariably proceed slowly or quickly, according to the nature of the ground, until this angle was reduced to zero, and the banks were made parallel to the course of the stream, were it not for disturbing causes, such as obstructions which deflect the stream right or left against the banks.

The more tortuous or winding a river is the greater facilities it offers for overflowing its banks during a flood. Suppose a stream to have received suddenly a large volume of water either from the melting of the snow or the accumulation of rain upon the mountain's side, so long as the channel is tolerably straight it produces no evil effect, but directly its onward current is impeded by an abrupt bend—and there are rivers which have bends forming a complete right angle—it overflows at that point. It, in fact, from the high velocity it has acquired, has not time to adapt itself to the sudden sinuosity, and leaps over the obstacle, inundating the adjoining lands. Its action may be compared to that of a billiard ball, which, when driven very forcibly against the cushion, does not give the latter time to exert its repulsive elastic effect, but carried on by the impetus it has received from the cue, mounts the cushion and leaves the table. In both these instances a small velocity, and consequently a slight momentum, given to the advancing body would not produce the same consequences. The straightening the course of a river is therefore one of the first considerations involved in any proposed improvement, whereby the obstructions are diminished, the banks are rendered less liable to be worn away, and the danger of inundation considerably lessened. Instead of removing a bend or elbow by a new cut in the direction of the chord of the arc, a very common practice is to endeavour to protect the bank which suffers from the full action of the stream against it by masonry or brickwork. This is not only a far more troublesome and expensive proceeding, but also a very inefficient attempt to remedy the evil. It can only endure for a time, whereas when the diversion has been once made it is not only lasting, but permanently improves the condition of the river. Manifestly there is very little use in simply making one or two cuts, or only improving a small portion of a stream; the whole stream should be carefully surveyed, so that the mean direction of its current may be ascertained, and an average uniformity imparted to its course. When we consider that there are abundant instances where mountain torrents, rushing down from their elevated source, have devastated hundreds of acres in a single night, the importance of tracking them up to their origin, and there commencing to apply the remedy is obvious, but at the same time the difficulty and expense of so dealing with them cannot be overlooked. To confine and direct the force and volume of these descriptions of streams so as not only to prevent them doing damage to property and life, but also to utilise them and turn them to our own advantage is an engineering problem which has not yet received a solution. In diverting the channel of a river into a new cut the dimensions of the latter need scarcely ever be more than half that of the former, provided the river be not very deep. Whenever a new course is opened for a river it requires a good deal of attention and watching until its banks appear thoroughly consolidated, and not likely to have breaches made in them by the stream. The ravages made by small serpentine streams and rivulets in the time of floods are a disgrace to the proprietor and occupier of the lands in the vicinity.

No river could be said to be truly under control unless it were embanked from its source to its mouth. In reality any embankment of a mere portion of it, such as is at present being constructed with respect to the Thames, although it may be very beneficial to that particular length of its course, is detrimental to the portion below it, inasmuch as the velocity is increased, and the stream, after being temporarily pent up between its prison walls, bursts with greater force upon the natural barriers alone opposed to its action, after quitting its granite-bound channel. The ordinary earthen embankments, similar to those bounding the Thames in its course from London to Gravesend, answer perfectly well under certain conditions of soil for preventing the devastation of the adjoining lands by floods; but they also fail in numberless instances to render the land so protected anything better than a swamp, and they also are excessively liable to be trodden down and breached. Experience has proved that where rivers run through very rich vegetable mouldy soils, if through any disturbing cause, such as a violent storm, the current becomes violently forced against the bank, it will utterly sweep it away and carry along with it the valuable agricultural portions of the land it inundates. The only cure for this description of accident lies in constructing a solid permanent embankment wall to protect the softer and more easily attacked material. A long gently-sloping bank will, in some instances, answer the same purpose, but the land is generally of too valuable a character to allow of so much of it being thus appropriated, even to preserve the rest. Of all the branches of the profession, that relating to hydraulic engineering is the least understood, both theoretically and practically. The various problems connected with the determination of the flow, velocity, volume, and other properties of fluids, have defied all attempts at simplification, and remain to the present day invested with all the horrors, to a practical man, of intricate and abstruse formulæ.

The most elaborate tables have been constructed with the view of compensating for this want of simplicity, and without such valuable adjuncts the labour of hydraulic calculations is tedious and complicated to the last degree. The proper protection and careful management of our river banks is a subject of great interest and importance, whether considered with respect to the rivers themselves, the injury that may accrue from a neglect of them, or the advantages that may arise from bestowing a due attention upon them. The losses occurring from the state of utter abandonment into which our rivers have been permitted to fall are too well known to require any particular description. It was but yesterday that both Windsor and Oxford were completely under water; a portion of the county Wicklow was deluged by a torrent from the hills, and we find a transatlantic parallel in the havoc recently committed in the Western States of America. On referring to the admirable inaugural address of M. Eugene Flachat, the president of the French Institution of Civil Engineers, we perceive that he takes the same view of the subject as ourselves. The overflowing of the Loire, in 1846, caused a loss to landowners and other private parties of seven millions, and destroyed at the same time works of construction to the value of nearly two millions more, making in all nearly nine millions as the price of the ravages committed by the single inundation of one river. Since that period the Government took up the matter vigorously, and spent a million and a quarter in improvements and alterations connected with the river, which it will be perceived was money wisely and judiciously laid out, as the statistics of the last flood fully testify. In 1866 the overflow was not quite so violent nor so large in volume, and the damage caused under the first-men-

tioned head was only one and three-quarter millions, instead of seven; and under the second half a million, instead of nearly two. Our rivers, it is true, bear no comparison in point of the volume of water they contain to those of France, yet it is quite as much our duty to bring them all within proper restraint—to confine their waters to their own channel, beyond the limits of which they ought never to be allowed to stray.—*Engineer.*

THE HOLBORN VALLEY IMPROVEMENT.

An inspection was recently made by the Improvement Committee of the Corporation of the works now in progress at Holborn-valley, which are being rapidly proceeded with and far advanced. These, as some of our readers are aware, embrace the construction of a "raised way," for the purpose of a high level street, or road, commencing at Holborn-hill, at or near Ely-court, Ely-place, Holborn, and terminating in Skinner street, in the City, at or near the Old Bailey; a new street commencing at or near the junction of Hatton-garden with Holborn-hill, and terminating in the Farringdon-road, at a place in that road nearly opposite to the spot where the intended new line of street from the Metropolitan Meat Market will join Farringdon-road, near the late junction of West-street with the said road; also, a new street, commencing at or near St. Sepulchre's Church, and on the northern side of Skinner-street, across Snow-hill, and terminating in Farringdon road about 50 yards to the north of Snow-hill. From the report of the contractors, just furnished, it appears that 36,000 cubic yards of earth have been excavated and carted away. The foundations of the massive piers, each about 18ft. wide at the base, upon the solid blue clay, have been put in, and built up to the ground level; also the subways and vaults. One of the most difficult and unpleasant portions of the whole work, namely, the removal of the bodies from a portion of the churchyard of St. Andrew's, on Holborn-hill, has been satisfactorily accomplished. The completed works have swallowed up already 10,000 cubic yards of carefully mixed (Tatham's blue lias lime) concrete, and the number of bricks laid is set down as 4,500,000. Upwards of two years remain of the Parliamentary limit to the period for the completion of the entire work. There is not the slightest doubt but that the opening of the new thoroughfare and its approaches will take place within the period fixed by the legislature. The laying of the foundation stone of the viaduct proper of this important undertaking, at the south east angle of the viaduct, will take place before the termination of the spring quarter. His Royal Highness the Prince of Wales will be solicited by [illegible]rporation to perform the ceremony; and in [illegible] Royal Highness's absence, the duty will [illegible] reckon by the Right Hon. the Lord Mayor.

THE [illegible]DOS AND ALTAR AT [illegible]NSTER ABBEY.

The [illegible] under [illegible] which have been executed Scott, R.A., a[illegible]erintendence of Mr. G. G. view, may be th[illegible] are now opened out to table, the restore[illegible]merated:—The new altar sedilia, and the n[illegible] which have been executed rounding the altar. [illegible] work of extreme rich[illegible] are now opened out to It was mutilated in the [illegible]merated:—The new altar make way for a marble a[illegible]dos or altar screen, the tended for Whitehall Ch[illegible]sselated pavement sur- presented by that Queen t[illegible]old altar screen was a altar-piece was removed in 182[illegible] and appears to have screen was found to have be[illegible] of King Edward IV. pieces, though enough could be [illegible]e of Queen Anne to that its design was in many r[illegible]-piece originally in- with that of the eastern side of [illegible]el, but which was which faces the chapel of King E[illegible] the Abbey. This fessor. Mr. Matthew Wyatt, who[illegible], when the ancient architect to the Dean and Chapt[illegible]en almost cut to Bernasconi, the celebrated Italian [illegible]traced out to prove restore the screen in his artificial st[illegible]espects the same which he certainly executed with grea[illegible] the same screen ever unworthy the material might have[illegible]lward the Con- Chapter at the same time had a *quasi-*[illegible] was then the erected, the front and ends of which [illegible]her, employed in ornamental plaster work by Bernas[illegible] a plasterer, to slab forming its top being of black[illegible] fr[illegible]one, a work Strangely enough, they also had a m[illegible]t skill, how- e[illegible]ected on the site of the old sedilia, in co[illegible]ever been. The [illegible]ure[illegible] stone altar [illegible]ati[illegible]ere made [illegible]ove[illegible]coni, the [illegible]to [illegible] marble. [illegible]s. [illegible]onument of very respe[illegible] bore part of the title of an [illegible]diaconu[illegible] memo ration of King Sebert, the traditional founder of the Abbey. This was also executed in cement. The Chapter, feeling strongly the meanness of the material in which these works were executed, determined to renew the altar table and reredos in materials more worthy of their object. With this view, every means has been taken to ascertain precisely the state in which the ancient reredos was found in 1824, in which great help has been received from Mr. Brown, who directed the work at that time for Bernasconi. Some fragments also of the original work have been found. The aim has been that the work reproduced in 1824 in artificial stone shall now be retranslated into alabaster and marble. In doing this, the greatest care has been taken to follow implicitly the evidences of the original design. Bernasconi had in one respect departed from this by placing over the altar five beautiful canopies as on the eastern side of the screen. These were found not to have existed in the original, the central space having been occupied by a plain recess, no doubt for the reception of a rich retabulum or movable reredos. Before discovering this, a fine mosaic picture of the "Last Supper" had been prepared for this position by Signor Salviati, of Venice, from a cartoon by Mr. Clayton (Clayton and Bell). This will eventually be enclosed by a retabulum, but, that not having been as yet made, a temporary cartoon suggestive of its design will for the time occupy its place. The cemented altar is replaced by a new one of very rich design, chiefly wrought in cedar, though its slab is of rich marble, the old black marble slab being worked up into it. The front and ends of the altar table are enriched with appropriate Scripture subjects in relief. This work has been executed by Messrs. Farmer and Brindley, the well-known architectural carvers. The so-called monument of King Sebert (which was of brick, cement, and tar-cord) has been removed, and the seat of the sedilia found enclosed within it. This is now restored. The pavement in front of and around the altar was of modern character, and had extended so far forward as to bury a portion of the ancient mosaic pavement of the sanctuary. This is replaced with a rich tesselated pavement of coloured marbles and enamel mosaic, and is brought back to its original dimensions, so as to admit of the restoration of the portion of the ancient floor which it had injured and concealed. The screen, pavement, &c., have been beautifully executed by Messrs. Poole, the Abbey masons, the former being probably the most elaborate piece of workmanship of our day; every detail has been carried out in the strictest conformity with the ancient work. The cornice was found when opened out in 1824 to have contained a series of sculptured subjects similarly arranged to those on the eastern side of the same screen. They had, however, been so defaced as to be unintelligible. These have been replaced by a series of scenes from the life of our Lord beautifully sculptured by Mr. H. H. Armstead. The cost of these works, which will amount to at least £6,000, is defrayed from a fund appropriated to decorative purposes, under the special direction of the Rev. Lord John Thynne, the sub-dean, who was, in fact, the originator of the work.

During the progress of the works several curious antiquarian objects have come to light; the chief among which are the bases of two of the piers of Edward the Confessor's work, bu[illegible] nea[illegible] floor and still in their places, and the fact of the marble pillars against which the screen had been erected having been previously to its erection covered over with paper, on which coats of arms had been painted. These are pronounced to have been the arms of King Edward II. and his Queen Isabella.

Building Intelligence.

CHURCHES AND CHAPELS.

An elegant building has been erected in the style of a college chapel, for the convenience of English residents and visitors of Wiesbaden. The church cost upwards of £3,000, and stands in the best part of the city, overlooking the pleasure grounds.

The foundation stone of a new Unitarian chapel at Accrington was laid on Friday last. The building will be in the Gothic style, and will be 69½ft. in length and 31ft. broad. The building is to accommodate about 500 persons. Mr. Waddington, of Padiham, is the architect.

The church of St. Thomas à Becket, at Pylle, near Shepton Mallet, is about to be pulled down, with the exception of the tower, and rebuilt at the expense of Lord Portman.

The Duke of Buccleuch, one of the principal landowners of the neighbourhood of Kettering, has undertaken to defray the cost of restoring Oakley Church, which has been for several years in a dilapidated condition.

The erection of a new Wesleyan chapel has been begun at Longsight, near Manchester. In place of the usual ceremony at the laying of the foundation or the corner stone, it was arranged that four lady members of the congregation should severally lay a memorial stone at the four corners of the edifice. The new chapel will have a spire 112ft. high. Accommodation will be provided for 1,200 persons, and the total cost of the building including the site is estimated at £8,000.

Bow, London.—A new Congregational Church, the foundation stone of which was laid last autumn, was opened on Tuesday last. The new church, which has been erected from the designs of Mr. Rowland Plumbe, is in the Early Gothic style, and is divided into nave and side aisles by means of three large spanned arches springing from iron columns and carrying a clerestory. The principal Italian effect is obtained by means of different coloured bricks, which have been employed as a facing above a height of 11ft. from the ground, the walls being plastered below that level. There is accommodation for about 550 persons on the ground floor, there being no galleries at present. The total cost, including land, is about £3,000.

Chapel Royal, Savoy.—This ancient and historically-interesting chapel was re-opened on Sunday upon the completion of the decoration which the Earl of Devon advised her Majesty to command. The panelled roof has been much improved by the substitution of a colouring of azure blue in place of the dark tint adopted in the last restoration. The walls of the chapel have been diapered throughout, special richness and elaboration being reserved for the sacrarium. A series of canopied angels, bearing shields charged with emblems of the Passion, fill the upper sides of the chancel. The armorial bearings of the sovereigns of England and dukes of Lancaster occupy the spaces in the nave. The reredos has been gilded, the central panel being filled with a cross of gold relieved on a cruciform field of red. The silver window has been inserted by the Queen, in memory of the late Prince Consort. The memorials to Hilton and De Wiot, the water-colour painters, have been replaced by a rich carved stone font and oak canopy. The monument to Richard Lander, the discoverer of the course of the Niger, and first gold medallist of the Royal Geographical Society, is about to be restored. The restitution of other memorials, for which the old chapel was famous, is in contemplation. Candles have been in part substituted for gas in the lighting of the chapel. The beautiful garden surrounding it has been skilfully arranged by Mr. Broome, F.L.S., the gardener of the Inner Temple. The work of restoration has been entrusted to Messrs. Clayton and Bell, under the superintendence of Mr. Sidney Smirke. The chapel may be seen every day between the hours of eleven and one o'clock.

Freiston.—A new Wesleyan chapel was opened on Good Friday at Freiston, near Boston. It is a Gothic structure, built in the late decorated style. The walls are of red bricks with stone dressings. Externally it is divided into four bays, each of which contains a stone window of two lights trefoiled with traceried heads. At the south end are two porches between which is a large window of three lights, trefoiled with decorated tracery. The cornice, which is of moulded white bricks, is continued up the gables which are terminated by stone finials. The roof is covered with slate and ornamental Staffordshire ridging. The internal measurement of the building is 42½ft. in length, [illegible]ft. in width, and 30ft. in height to the apex of the roof. The roof, which is an open one, has three principals of Gothic design, which spring from moulded corbels. Upon these rest the pieces, purlins, and ridge, and over these the boarding laid transversely. There are upwards of 300 sittings, about 70 of which are free. The pulpit is sexagonal on plan, each side is divided into two-arched panels with trefoiled heads, at each angle there is a column on which rests a bold cornice. It stands upon a low base and is approached by three steps. The communion rail which surrounds the pulpit is supported by [illegible] mahogany pillars and ornamental iron balustrade

he pulpit and pew fronts are of pitch pine; the her portions of the pews and the roof are of red eal, stained and varnished. The windows are lazed with enamel glass, and coloured glass is troduced into the tracery. Immediately behind ie chapel is a spacious schoolroom and the quisite conveniences. The works have been ecuted by Messrs. Lee and Son, builders, of reiston Bridge, from a design by Mr. Lee, jun. he entire cost of the building, it is estimated, ill be about £700.

BUILDINGS.

On Friday last, the foundation stone of a New ndependent School was laid at Longridge, Preston ie school will be 51ft. long by 33ft. wide, and ill seat 400 scholars. It will cost about £650.

Bristol.—A quaint old gabled house which od formerly in St. Nicholas-street, and called e Elephant Tavern, has been recently removed the operation of the Local Government Act, d a substantial building erected in its stead. e new building which is from the designs of Henry Masters, architect, Park-street, is in the lian style, freely treated. The elevation is well ken up by stringcourses and combinations of ured materials, and is richly sculptured, a conuous feature of which is an elephant. The ngcourses, capitals, and cornices are richly ved, foliage and fruit symbolical of the good er sold within, appearing prominent. The le elevation is decidedly characteristic of a rn. The work has been carried out by Messrs. se and Son, and the sculpture is by Mr. ter.

Humewood.—A contract has been entered into Mr. Albert Kimberley, of Banbury, for the ding of a mansion at Humewood, Co. Wick. Ireland, for W. W. F. Dick, Esq., M.P. for county. The designs have been prepared by William White, F.S.A., of Wimpole street, don. The character of the building is to somewhat after the manner of the Scotch mial buildings, but with certain Irish pecuties of battlements, &c., and suited to modern irements. It is also to be capable of defence. fty tower, more than 100ft. high, surmounts entrance hall, which is a loftily-vaulted apart t. The whole cost is not to exceed £15,000.

Improved Dwellings for the Poor.—Upon a of waste land where the Archway-road is ed by Jackson's lane, the Highgate Dwell Improvement Company have just completed rge and airy edifice, to be called Coleridge lings. They are to be opened next month, will add nearly 100 rooms to the present ling accommodation of the artisans and la ers of Highgate. The directors are already to receive applications from those desirous of ning tenants, giving the preference to inants of Highgate. The buildings, standing healthy position, are four storied, substan built, not quite plain, yet without archi ral pretentions. They contain 96 rooms, le of being grouped into tenements of two hree. The rooms are large and light, and air ds throughout. There is a full supply of ; and each floor is provided with washhouses, coal places, coppers, dust-shoots, &c. The range from 2s to 2s. 6d. a week for single from 3s. 9d. to 4s. 3d. for two rooms, and 5s. 6d. to 6s. for three rooms; prices below is charged for much inferior accommodation ighgate. The directors have expressed their in n of giving preference to those whose it homes afford evidence of cleanliness and being convinced that such persons will turn od tenants in other respects. They also an e their intention of securing from this un ing a minimum dividend of five per cent. mum to the shareholders. There is reason eve that the present shareholders and other ists will be willing to advance further or other new buildings. Even before their g, good is resulting to the labouring classes ighgate; for the tenants of York-buildings een informed that their rents are to be d at the rate of 1s. per week for front, and week for back tenements.

Liverpool.—New Exchange Buildings.—The ing of this building has been opened. It is Renaissance style, from designs by Mr. Wyatt. The news room opens from the e, and is about 160ft. in length, including ding and conversation recesses, by a clear of more than 90ft., without any inter s supports. It is surmounted in the centre tome of 50ft. in diameter, glazed with tinted glass, relieved by a fret pattern. The total height is 80ft., whilst from floor of room to the square of ceiling is more than 50ft The walls and main cornice of the room are of Caen stone. Over the cornice, in semi-circular recesses, are allegorical groups of figures representing Justice and Prudence, Peace and Plenty, Science and Industry, Navigation and Commerce, all modelled by Mr. Mabey, of Westminster. The columns and pilasters supporting the cornice and subdividing the room are of Irish marble of a rich red tone. A dado or panelled base, shoulder high, of dove-coloured Bardilla marble, surrounds the room. The galleries of the east and west sides of the room have balustrades of marble and alabaster, and the panels of the cornice are inlaid with richly-coloured alabaster. The colouring and gilding of the large news room has been executed by J. G. Crace, of Wigmore-street. The general contractors are Messrs. Holme and Nicol, of Liverpool, and the whole of the works have been executed under Mr. Parsons, the resident superintendent of works. When completed the new Exchange will have a frontage to the street of 1,500ft. It will occupy six years in building, and cost £200,000.

London.—In consequence of the Holborn improvements, the West London Union have commenced the erection of new offices further back, adjoining the old site in Thavies Inn. The ground plan takes in no fewer than nine ordinary tenements, the cost of which has been about £6,000. The configuration of the ground is irregular, some levels being 3ft. 10in. and 7ft. above others. The old house in Thavies Inn will be reserved for the Guardians and the transaction of all the official business of the Union. The architect of the new buildings is Mr. Lewis H. Isaacs, of Verulam Buildings, Gray's-Inn, and the contractor is Mr. John Phillips.

Newcastle.—The foundation stone of the Exchange New Buildings West, was laid last week, the ceremony being performed by Mr. Matthew Thompson, the architect, assisted by the contractor, Mr. Walter Scott. The buildings are intended to be after the Italian style of architecture. They will be composed of shops, warehouses, and offices —the whole when finished occupying a frontage of 160ft. This is the first of a series of town improvement schemes about to be carried out in Newcastle.

New Operating Theatre at Guy's Hospital.—The very large number of students attending this hospital having rendered it necessary to provide increased accommodation for them, it was resolved some time ago to remove the old and inconvenient operating theatre designed by the original architect, and to erect a more suitable building in its stead. Accordingly Messrs. Newman and Billing, the architects, were directed by the treasurer to draw out a plan for the new structure, which was submitted to the staff for their approval. The old theatre was taken down, and as much of the surrounding parts of the hospital added to the old site as to render the superficial area of the new theatre about twice the size of the old one. The new structure is probably the most convenient and best lighted, as it is certainly the most elegant of the theatres in London. A commodious and admirable photographic studio has also been constructed in the neighbourhood of the theatre.

South Shields.—On Monday last, the foundation stone of new marine schools was laid. The building will be of two stories in height, and is designed in the Elizabethan style. It will be built of brick, relieved by the free use of stone facings. There will be fifteen rooms, including a large lecture room, and it is intended to have a tower, which will serve as an observatory. The total cost of the school will be about £4,500. Mr. T. M. Clemence is the architect, and Mr. J. Todd the builder.

TO CORRESPONDENTS.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the Editor, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty four Words.

Received.—H. S.—F. E.—J. N.—H. G.—E. W. P.—J. D. B.—J. B. R. L.—F. E.—E. W. G.—C. L. E.—A. R.—W. W.—C. B.—R. W. E.—L. W. and U.—G. H. G.—J. L.—J. N.—G. P.—A. R.—J. D.—J. M. T.—J. L.—T. T.—R. D. W.—J. N.—W. D.

"An Inconstant Subscriber" must be a constant fool.

Freehold Land.—Your question is one for a solicitor.

Houdan (Cork).—Write to the Editor of *Land and Water*, Fleet-street.

Correspondence.

MANCHESTER TOWNHALL COMPETITION.

To the Editor of the Building News.

Sir,—As you have opened your columns for the discussion of the plans adopted by the council in procuring designs in this important competition, we should be glad to make a few remarks, and to offer them in the form of suggestions which we believe, if carried out, would both add to the fairness of the competition and give increased confidence to the competing architects; and we hope they may fall under the notice of the council, who, we think, have been too severely criticised by some of your correspondents, both as to their acts and intentions. It can hardly be thought that the Manchester authorities have asked too much in the preliminary drawings required—only sufficient to draw a line between the architect and mere draughtsman; while in selecting from six to twelve of the best preliminary competitors for the final competition, they have given encouragement to architects to compete, particularly to the younger men, who have not that solid and highly respectable basis of gold and interest to repose upon which some correspondents seem to think the only necessary requirements and acquirements for the carrying out of important works. But we think that there are, at any rate, two grave defects in an otherwise excellent scheme, which might be obviated as we would suggest, the weak points being, firstly, that there is no distinct understanding as to whether any public exhibition of the preliminary sets of drawings should take place or not, affording, therefore, no guarantee to architects of immunity from plagiarism of the best parts of their design by some competitors who might be selected for the second competition, which adaptations, slightly altered, might be sent in as original work. Secondly, no distinct pledge is given that unbiassed professional judgments shall be obtained in both adjudications. We think the following arrangements would be better in every way:—

Firstly, that no public exhibition of the preliminary drawings should take place, the exhibition to be strictly confined to the judges and such of the corporate authorities who might have a direct interest in the requirements of the council; the drawings selected for the second competition to be returned at once to their authors, and all others retained until the final sets of drawings are out, when a public exhibition of the whole should take place; this would give the public and competitors confidence, and show that the selections had been fairly and rightly made.

Secondly, that unbiassed professional aid should be procured in both adjudications, for however much the council may be cognisant of its own wants as to accommodation and general arrangements, the intrinsic merits and the art portions of the designs would be better and more fairly estimated by men who, by special training, are more qualified to judge of those qualities; and we would suggest that either the three professors of architecture at the Royal Academy, King's, or University Colleges, or the three architect Royal Academicians be called in; and in case any of those gentlemen be obliged to refuse through being interested parties, or from other causes, then to call in one leading Gothic and one leading Classic architect to assist the council.—We are, &c.,

Two Intending Competitors.

THE "PUGIN" ROOF.

Sir,—The date as given by Mr. Pugin of the erection of the church in Eldon-street, Liverpool, which till now I had not heard of, of course proves that I had no claim to the priority of design, and I at once withdraw it. I had designed roofs on the same principle, that is, the combination of the open roof displaying its construction, and the plastered ceiling with interstice for ventilation, some years previously, one of which, very similar to my Cork roof, was executed for the Church of St. Alphonsus, Limerick; but for this, or for my practice of coupling in depth two principal rafters to gain stiffness, I never put in a claim even for "original power." It was only when I saw a roof at the church at Peckham of similar design, and I recollected reading in the *Tablet** a description in flattering terms of this "specimen of Mr. Pugin's double-back or quatrefoiled principals," that I was led to question its originality, more especially as I saw that the main advantage of the ceiling in

* October 13, 1866, opening of Franciscan Church.

the upper part had been lost sight of by its designer; although the friendly scribe of the *Tablet* would make us believe that a partial under-ceiling or panelling would equalise the temperature notwithstanding that this roof is open to the very ridge. Mr. Pugin mentions his drawings for the Church of S.S. Peter and Paul, at Cork, exhibited in Cork and London. I should like to ask him if the drawings exhibited in London were the same drawings as were submitted in competition. In conclusion, I am ready to submit any question of originality or priority of invention to the decision of our Institute.—I am, &c.,

S. J. Nicholl.

126, Marylebone-road, April 24.

TRADES' UNIONS AND THE MANUFACTURE OF BRICKS.

Sir,—In your issue of the 18th inst., you ask this question, "Why should there not be different sized bricks that could be worked in with ordinary stocks?" One reason is, that in this and other brickmaking districts the trades' unions do their best, and with much success, to prevent any but the ordinary 9in. by 4½in. by 3in. bricks from being made, that is, they will not allow those who are disposed to do so to make them but at a prohibitive price; and if any improvement should be suggested, every possible obstacle is thrown in the way. For some time past, bricks thinner and longer than the common shaped bricks, but containing the same number of cubic inches, have been wanted, but though there would be no more trouble, they cannot be had except at double prices, merely because, it is said, there would be an infringement of some absurd club rule. Last autumn, in a town not far from Manchester, all buildings in which a certain brickmaker's bricks had been used were stopped for several weeks, merely because this brickmaker had, quite unknowingly, offended the union, who had forbidden any bricklayer to lay his bricks for the future. If the Trades' Unions' Commission wishes really to know the extent to which the tyranny and injustice of trades' unions can run, let them inquire carefully in the Lancashire district.—I am, &c.,

Manchester, April 20. Free Trade.

Intercommunication.

QUESTIONS.

[361.]—QUALIFIED SURVEYOR.—What, in the eye of the law, constitutes a qualified surveyor? I will give my own case:—£100 was paid as premium with me to a well-known architect in a southern county; but, owing to ignorance of their value on my father's part and my own, no articles were drawn up, and all I have to prove my having been a pupil is a testimonial given me at the expiry of the term. I have since this been in both architects' and surveyors' offices, and have now started on my own account. My little practice seems to tend in the direction of measuring work and valuing it in cases likely to be brought into court, and I have several times been asked whether I was a regularly qualified surveyor, and have, of course, answered yes. Now, though both architecture and surveying have been my study and my profession, I wish to know whether I should be considered, in a court of law, to be a regular surveyor. Until lately, I had not the slightest idea of anything more than the necessary abilities and practice being required to be a surveyor in disputed cases; but since I have heard of builders taking out a certificate to enable them to practice as surveyors, I wish to know whether I, who have for some time practised as architect and surveyor, need anything of the kind, and if so, where and how to obtain it. Veremos.

[362.]—STAINED OAK.—Can any of your readers inform me by what process I can remove black stains from new oak, caused by the rusting of ironwork? Dick Turpin.

[363.]—SHELLAC.—I shall be glad to be informed, through your "Intercommunication," whether shellac is a mineral or a vegetable substance; and also the best means of using it for sticking fractured stones together.

B. C. T.

[Lac is an animal production which has been long known in India, and is used for dyeing silk and other purposes. It is deposited on different kinds of trees by a species of insect of the cochineal kind. Lac, in its natural state, is called sticklac, and when this is freed from its impurities by melting it over a gentle fire, and formed into cakes, it is called shellac. United with ivory black, or vermilion, it forms black or red sealing-wax. "B. C. T." may therefore use the shellac for the purpose he mentions as he would use sealing-wax.]

[364.]—INTERCOMMUNICATION.—To the Editor.—Sir,—Like many others, I have derived considerable advantage from "Intercommunication," but I think this department of your paper may be considerably improved. In the first place, I think many of your questions are much too simple, and ought not to be asked. Why should you be put to trouble, and your valuable space occupied, in putting and answering questions which the questioners might easily get answered by taking a little trouble, or asking some friend? Why, for instance, should anyone ask what days of the week the designs for the new Law Courts are to be seen by the public? Why could not the questioner put himself to a little trouble and go to the building and inquire for himself? Besides, why cannot you give the answer without putting the question, and so save space, like many other journals? By a little weeding, and more economy of space, I think you may improve this department of your paper. Mutual Aid.

[In answer to "Mutual Aid," we beg to say that what may be a "too simple" question to him may not be to many others, and, very possibly, what he would consider more important questions would by others be considered "too simple." Take, for instance, the very question to which he more particularly refers. He thinks the person who inquired about the designs for the new Law Courts might have gone and made the inquiry for himself. If so, he would have had to come from the country. Perhaps it has never struck "Mutual Aid," who lives in London, that a majority of those questions are asked by persons living in the country, and who, consequently, do not possess so many opportunities of obtaining information as himself. We think, however, that the question as to the new Law Courts was a legitimate one to be put by a correspondent living in London. The other matter raised by "Mutual Aid" affects the very essence of "Intercommunication." The question is sent by, and inserted for, our correspondent, to be answered by another correspondent for the benefit of all correspondents and readers. Instead of wasting space, this is the very best way to economise it. An answer given without the question is only intelligible and useful to the questioner, whereas, if both question and answer are inserted, all will have the benefit of them. We are, therefore, careful to select those questions which are most likely to be practically useful to the greatest number of readers. We question the policy too frequently adopted in periodicals of occupying space which belongs alike to all the readers for the sole benefit of a single questioner, and we therefore think that the plan we have adopted is the best to promote mutual improvement.

[365.]—ARCHITECTS' CHARGES.—Could any of your readers give me the general charge made by architects for plans, specification, and procuring builders' tenders for the carrying out of alterations and additions in old property. If such work is done, is it usual to charge 7½ per cent. upon the cost, and an estimated value of the old materials used, and of any portions of the old buildings left standing, and forming part of the new and altered property. If plans were made, and tenders procured, and the work then abandoned, would the architect be entitled to 3¾ per cent. upon the amount of the tender, which would most likely have been accepted, and an estimated value of the old material used? A. B.

[366.]—HEATING PRIVATE BATH.—Will any of your readers kindly inform me of the best manner of heating a bath in a private house. There is an objection to the customary way of heating by circulating pipes, with close boiler in the kitchen fireplace and the cistern near the roof, on account of the liability to freeze in winter, or deficiency of water, in which case an explosion is likely to follow: or what can be done to obviate this difficulty?

Inquirer.

REPLIES.

[314.]—SALINE SCUM ON TILES.—"Mosaic" will find an occasional washing with soft soap and water give increased brilliancy to the colours, and will remove the saline scum he complains of, which arises from the cement for the first few weeks after the tiles are laid, and when thoroughly cleansed in the above way, wash with skim milk and wipe dry with a clean dry cloth.

W. Wingham.

[345.]—BATH STONE.—In reply to "J. P. G.," the decay referred to might result either through the stone used being from different quarries, or through the neglect or ignorance of the parties using it. The Box Ground stone, the bottom beds of the Farleigh, viz., red bed Farleigh, and some of the Combe Down stone, are excellent weather stones, and very durable—the hardest frosts does not injure them; but the Corsham, white Farleigh, and one or two quarries of the Combe Down stone, are not good or first-class weather stone, and if exposed, are liable to rapid decay. As there is such a difference in the qualities of the stone produced by the various quarries, that for important jobs should be selected at the quarries. A great deal of the abuse heaped on Bath stone should be laid on the head of the mason who works it, as from ignorance or neglect it is cut up and worked without any regard to the bed of the stone, the description, or place it has to occupy. E.

[349.]—ARCHITECTURE AND GEOMETRY.—A letter addressed to K. K., 70, Camberwell New-road, S., will procure the requisite information.

[358.]—PAVING ROADS.—There are several methods whereby the noise over paved roads may be mitigated. One is, to pave the setts 1in. apart, filling up the joints with clean hard stone chippings, also putting a layer of these chippings 1½in. thick over the paving; then pour just sufficient boiling asphalte to bind the whole together in one solid mass. Boulder pavements can also be done in this manner, they being better adapted to this plan than setts, as the joints are large and more irregular, thereby giving a greater binding principle. In streets where heavy narrow wheeled traffic is great the layer of chippings would occasionally get worn through to the pavement and require repairing, thereby causing some little inconvenience to public traffic. Another plan is to place veneers of any kind of wood between each row of setts, these veneers to be 1½in. thick, 10in. long, and as deep as the setts, set the graining way up. They should also be dipped into boiling gas tar before being used; this will prevent the timber from rotting.

J. Duthie, 4, Peel-terrace, Preston.

STAINED GLASS.

Langtoft.—There has just been inserted in the east end of the fine old chancel of Langtoft Church, near Driffield, a stained glass window by Messrs. Clayton and Bell. It represents the Crucifixion and the Adoration of the Magi, treated triplet wise, in the two lower tiers; while in the upper tier, the central division is occupied by the subject of the Resurrection, with the angels and Maries at the sepulchre in the two side divisions. In the tracery our Lord in majesty is introduced, with demi-figures of the twelve apostles beneath.

COMPETITION.

The first premium in the competitive designs for the Grantham new Townhall, prison, &c., has been awarded to Mr. Watkins, architect, Lincoln; and the second premium to Mr. Robert W. Edis, architect, of Osnaburg-terrace, Regent's Park.

STATUES, MEMORIALS, &c.

A movement has been set on foot in Australia for the erection of a monument to the memory of the late Angus M'Millan, the discoverer of the Gipps Land, and for providing a home for his children.

The Cobden Statue at Manchester.—The ceremony of inaugurating this statue, erected in St. Ann's-square, Manchester, took place on Monday, amid demonstrations of public rejoicing. Mr. George Wilson, in the absence of Mr. Gladstone, unveiled the statue. The figure is an exceedingly fine, clear, massive bronze casting of a very superior quality of metal and represents Mr. Cobden in the attitude of addressing the House of Commons. The likeness is pronounced to be exceedingly good. The figure is 10ft. high, and stands upon a lofty square pedestal, in each face of which are large slabs of polished granite. The face of the figure looks towards the front of the Royal Exchange. The total subscription amounted to £4,460 12s. 3d. The committee selected Mr. Marshall Wood as the sculptor, who prepared the statue at a cost of £2,500, and £1,250 had been given out of the surplus fund to endow a chair of political economy in the Owen's College, Manchester, leaving £76 to expend in prizes for teachers and pupil teachers.

The eminent United States sculptor, Dr. Ward has received a commission for a statue of Shakspeare for the Central Park, New York.

Mr. Peabody.—We are glad to see that a movement is on foot to erect in some conspicuous place within the City a statue of Mr. Peabody, "a testimony of the deep feeling of gratitude entertained by the citizens of London and the public at large" to that good man and great benefactor. The first list of subscriptions has been published and amounts to over £1,000. The Prince of Wales heads the list with twenty-five guineas. We may here state that Mr. Peabody has gone to Washington to receive the picture of the Queen from the hands of the British Minister. The gift of her Majesty will ultimately be placed in a fireproof room in the Peabody Institute at South Danvers, Massachusetts. Mr. Peabody has also received from the Empress Eugénie an autograph letter complimenting him for the munificent liberality he has displayed on both sides of the Atlantic, and characterising him as "the great benefactor of humanity."

WAGES MOVEMENT.

The strike of the Manchester plasterers' labourers may now be said to be at an end, and to have been utterly defeated, the places of the society men being adequately supplied, and all the shops being now in full work.

The strike of enginedrivers on the North-Eastern Railway, which at first appeared so formidable, has now virtually terminated, as the company are running all the usual trains, both passenger and goods, over almost the whole length of their lines.

Since strikes are the order of the day, it seems only natural that undertakers should have their grievances. We read that the undertakers' men at Bapaume, in France, are on strike. They complain of the mode in which they are paid. If the funeral they attend is that of a rich person, they receive a considerable sum, but their payment decreases with the position of the deceased when alive, till it dwindles down to 75 cents. As the lower class interments are much more numerous than the higher, they find themselves underpaid.

Lincoln.—The bricklayers are still out, the employers refusing to accept their terms, though offering to pay the hour work. The men have, however, given up the Saturday afternoon holiday. Their wages were 24s. to 24s. a week, some builders giving the lower and some the higher rate, but the men now demand a uniform wage of 28s. a week.

Barnsley.—The strike in the building trade as to the quarrymen still continues, both masters and men apparently being equally determined to hold out. Several of the masons have been thrown idle for want of stone, and this inconvenience will be felt to a still greater extent in a few days, should no arrangement be come to. Nothing has yet transpired regarding the course the masters will take as to the demands of the masons, who ask for an increase of advance of 2s. per week, a reduction in the hours of labour, and a restriction as to the number of apprentices which the masters shall employ.

LEGAL INTELLIGENCE.

Fining a Mine Surveyor.—At the Wolverhampton Police-court last week, Mr. J. Cope was fined £20 and costs for an offence against the Mines Inspection Act. The defendant was consulting engineer to Mr. W. H. Dawes, ironmaster and colliery proprietor, in one of whose pits, on July 12 last, three boys were suffocated by wandering too an unfenced portion of the pit. The proceedings were brought by the Government Inspector of Mines for the district, who maintained that the defendant was the responsible person. For the

defendant it was argued, on the contrary, that the person who conducted the workings underground was responsible; and it was asserted that if the contrary should be ruled it would be impossible for the responsibility to be maintained, inasmuch as persons in Mr. Cope's position were, like himself, consulting agents for perhaps twenty other colliery proprietors. The stipendiary, however, in giving judgment, ruled as a fact that the defendant knew that the part of the pit in question was in a dangerous condition; and then said—"Considering, therefore, the necessity that the rules prescribed by the Act of Parliament for the safety of the workmen in the mines should be rigidly observed, I think it my duty to impose upon the defendant a penalty of £20 and costs," which was altogether £31 13s. 9d. Against this decision the stipendiary magistrate said there could be no appeal to a higher court.

DISPUTE FOR POSSESSION OF THE FOOTPATH.—The Lancashire and Yorkshire Railway Company appeared by counsel recently before the Wigan borough magistrates on the charge of wilfully obstructing a public footpath or highway within the jurisdiction of the Local Board of Health. This proceeding on the part of the Corporation arose out of the action of the Lancashire and Yorkshire Company blocking up a passage to the London and North-Western Company's station, and diverting an ancient footpath to render the stoppage more effectual. The Lancashire and Yorkshire Company were served with notice to remove the obstruction, and were then summoned; and as soon as these steps were notified the obstruction was removed, and the footpath restored to its original line; but the blockade to the London and North-Western station was kept up. Mr. J. L. Hunter, the borough surveyor, was examined at length, and proved that the road was a public one, and had for years been repaired out of the rates; and Mr. Councillor Thomas Smith deposed to the existence of a pathway, of which the disputed road was a divergence, across the fields in dispute for over fifty years. The bench inflicted the full fine of 40s. on Mark Yates, the Company's joiner, who had put up the obstruction. Notice of appeal was given.

General Items.

A New York paper speaks of a bronze statue which has passed, first, for Christopher Columbus, next, as Benjamin Franklin, and is now the contemplated object of purchase by the city government as George Washington. A useful statue this!

The following alterations in the names of public thoroughfares have been ordered to be made by the Metropolitan Board of Works:—John-street, on the west side of Tottenham-court-road, is to be called Whitfield street; Chapel-street, in the same locality, is to be called Tottenham-street; Ranelagh street, Pimlico, is to be incorporated with Bury-street; York-street, Shoreditch, is to be called Hows-street; Warren street and Stanhope-street, Camden Town, are to be called Delancy-street; Grenville-street, Somers-town, to be called Aldenham-street; Gloucester-place, Regent's Park, to be incorporated with Wellington-street; Seymour-crescent, Melton-place, Crescent street, and Melton crescent, near Euston-square, are to be called Euston-street; Brandon-row, William-street, and St. Andrew's-road, Newington, to be called Rockingham-street; John-street, Newington, to be called Heiron street; Kensington Park-terrace, Kensington, to be called Chepstow-villas; New Bridge-street, Lambeth, to be incorporated with Upper Kennington-lane; King-street and Tracey-street, Mile End Old Town, to be called Jamaica-street; Queen-street and Holmes-street, Mile End Old Town, to be called Dempsey-street.

The aerial railway over New York is to be supported upon wrought-iron columns, 1ft. in diameter and 14ft. high, secured in blocks of iron. Streets are to be spanned with ornamental bridges. The motive force is to be supplied by engines of 30-horse power, placed in vaults beneath the streets at intervals of half a mile. These are to work an endless chain of wire rope revolving over large drums, extending about a quarter of a mile each way from the engines, and turning by an iron tube placed beneath the pavement. The carriages are to be of a peculiar construction, capable of being stopped at any moment by the conductor with the application of power. The stations are placed at equal distances from each other, and waiting rooms are to be on a second floor of buildings adjoining. The railway passengers ascend and deseend by staircases. It is said that the Mayor of New York has some doubts as to the legality and powers of the company, and has not sanctioned the works.

Two more frescoes by Mr. C. W. Cope, R.A., are now being placed in the Peers' Corridor at the New Palace of Westminster. The subjects are:—"The Setting-out of Train-bands from London to Raise the Siege of Gloucester," and "Speaker Lenthal asserting the Privileges of the Commons against Charles I., when the attempt was made to seize the Five Members." These two complete the series of frescoes for the Peers' Corridor.

The Architectural Exhibition will be opened at 9, Conduit-street on May 1 next, and will remain open daily till July 13 next. Unusual efforts have been made on this occasion to make the exhibition an improvement on its predecessors. The Councils of the Architectural Exhibition Society and of the Architectural Museum have made arrangements to amalgamate their annual course of lectures, for the ensuing session only. So, instead of two courses of lectures, we shall this season have only one. Cards have been issued for a *conversazione* at Conduit-street for the evening of the 30th inst.

Notwithstanding the loud outcry against it, and the strong desire shown in certain quarters to put it down, ritualism would seem to be gradually gaining ground. At all events several of our contemporaries think it necessary to record as something noticeable that floral decorations in celebration of Easter were used in a greater number of metropolitan churches on Sunday last than formerly. It is added that the incumbents of many of the churches so decorated are not remarkable as ritualists. Be this as it may, the fact is significant, and may show which way the religious wind blows.

TETTENHALL (WOLERHAMPTON).—Last week a new Nonconformist school was opened here. The style of the buildings is Gothic, of the fourteenth century, and is built of brick, with stone dressings, and the school is in the form of the letter T. The total cost, including the grounds attached to the school, was about £16,000. Mr. Bidlake was the architect, and Messrs. Barnsley and Sons, of Birmingham, the builders.

A South London paper mentions an instance of overcrowding in that district which ought to shock everybody. In John-street, Newington, a man, his wife, three children, their grandfather, and three other adults, sleep in a chamber containing only 810 cubic feet of air. Another room is occupied by a man, his wife, their children, and fifteen dogs!

MEETINGS FOR THE WEEK.

MON.—Royal United Service Institution.—"Lessons for Lissa," by Commander P. H. Colomb, 8.30.

TUESDAY.—Royal Institution.—"Plato," by Professor Blackie, 3.

Institution of Civil Engineers.—Papers to be read:—Discussion upon Colonel Sir W. Denison's paper on "The Suez Canal," and, if time permits, "On Optical Apparatus used in Lighthouses," by Mr. J. T. Chance, 8.

WED.—Royal Institution.—Annual Meeting, 2.

Geological Society, 8.

Royal United Service Institution.—"The Turret *v.* the Broadside System," by Captain Cowper P. Coles, 8.30.

THURS.—Chemical Society, 8.

Royal Institution.—"Ethnology," by Professor Huxley, 3.

FRI.—Royal Institution.—"Music of Speech in Greek and Latin," 8.

SAT.—Royal Institution.—"Ethnology," by Professor Huxley, 3.

Trade News.

TENDERS.

CRANFORD.—For construction of sewerage works, Cranford, Middlesex. Mr. Charles James, architect:—Lodge, £1,100; Adamson and Sons, £894; Mann, £820; Thirst and Co., £802; Crockett, £800.

CITY.—For sundry alterations at No. 4, Mincing-lane, for Messrs. Thos Daniel and Co. Messrs. M'Murdie and Rust, architects. Quantities supplied:—Hart, £3,400; Adamson and Sons, £3,335; Henshaw, £3,107; Nixon, £3,098; Newman and Mann (accepted), £2,856.

CITY.—For alterations at 89, Bishopsgate-street, for Messrs. Jackson and Townson. Mr. F. G. Widdows, architect:—Asford and Whitters, £563; Ashby and Sons, £494; Ennor, £480; Child and Son, £425.

CITY-ROAD.—For works at 81 and 83, City-road. Mr. Thomas J. Hill, architect:—Auley, £487; Perry, £480.

ENFIELD.—For works at Baker-street, Enfield, for Alderman Challis. Mr. Thomas J. Hill, architect:—Patman Bros., £510; Cushing, £490; Fairhead, £445.

ENFIELD.—For erecting a house in the London-road, Enfield, for Mr. Easter. Mr. F. G. Widdows, architect:—Bayes, £1,150; Fairhead, £1,115; Patman Bros., £1,067; Field and Sons, £900.

FINSBURY.—For building lodges, gateways, entrances, and enclosing Finsbury and Southwark Parks. Quantities supplied by Rake and Ranwell, in conjunction with Curtis and Son:—C. N. Foster, (accepted for both): Southwark, £3,950; Finsbury, £3,100. Total, £7,050.

GREAT YARMOUTH.—For the construction of fish market at Great Yarmouth. Mr. H. H. Baker, architect. Quantities supplied by Mr. J. T. Bottle:—J. Plews, London, £14,208; Perry and Co., Stratford, £10,670; J. J. Bennett, £10,336; J. J. Fast, Melton Mowbray, £9,310; J. T. Chappel, Steyning, £8,885; W. Hood, Norwich, £8,678; Connold, Ipswich, £9,827; W. Spilling, Yarmouth, £8,556; H. J. Norfor, Yarmouth, £8,521. Separate tenders were also sent in and were accepted, as follows:—Norfor, bricklayer, £533; Barham, mason, £1,780; Chappel, paviour, £1,866; Dawler, slater, £530; Norfor, carpenter, £1,820; Barnes, smith, £710; Wright, plumber, £660. Total, £7,899. Architect's estimate, £8,218.

LONDON.—For warehouse for Mr. Jaques, Cow Cross-street. Mr. S. C. Capes, architect. Quantities by J. Chester Lansdown:—Ashby and Son, £3,431; Patman and Fotheringham, £3,298; Newman and Man, £3,255; Wagstaff, £3,259; Piper and Wheeler, £3,230; Webb and Son, £3,177; Foster, £2,986; Scrivener and White, £2,913.

LEYTON.—For four semi-detached villas. Mr. W. A. Longmore, architect:—Winter, £1,676; Hedges, £1,581; Gibling, £1,250; Elms (accepted), £1,240.

LONDON.—For additions and alterations to 64, Harley-street. Mr. C. Eales, architect:—Stevenson and Watson, £1,775; Brown, £1,650; Clemence, £1,548; Clarke and Mannooch, £1,507; Phillips, £1,498; Saunders, £1,462; Scrivener and White, £1,428.

MAIDENHEAD.—For new brewery for Mr. W. Nicholson. Mr. C. Cooper, architect:—Vickery, £2,669 15s.; Woodbridge, £2,627 10s.; Silver and Son (accepted), £2,589.

RHAYADER (RADNORSHIRE).—For new national schools. Mr. E. H. Lingen Barker, architect:—Mason, £529. Woolley, £419; Edwards, £409; Evans, £357.

READING.—For the erection of a block of model dwellings for the working classes, on the Blagrave Estate, Reading. Messrs. Wm. and J. T. Brown, architects:—Lovett, £3,329; Sheppard, £3,139; Kendell, £3,097; Carter, £2,900; Simonds, £2,879; Barnicoat (accepted), £2,700.

STOTTESDEN.—For the restoration of Stottesdon Church, Salop. Mr. Blashill, architect:—Owen, Bridgnorth, £2,200 (without allowing for old materials); Smith, Cleobury, £1,720 5s. 1d.; Nevett, Ironbridge (accepted), £1,677.

SOUTHWARK.—For alterations and additions to St. Peter's Schools. Messrs. Strudwick and Mennie, architect:—Brass (accepted), £1,083.

TOTTENHAM.—For works at Tottenham for Mr. W. Robinson. Mr. Thomas J. Hill, architect:—Auley, £1,028; Sabey, £985; Bayes, £900; Chapman, £895; Patman Bros., £848.

WEST HAM.—For building new retort-house for the West Ham Gas Company. Mr. E. H. Thorman, engineer:—Ashby and Sons, £3,523; Munday, £3,511; Rivett, £3,493; Perry and Co., £3,237; Hedges, £3,060; Hill and Keddell, £3,124; Ennor, £3,168. Allowed for old material:—Ashby and Sons, £90; Munday, £167; Rivett, £160; Perry and Co., £110; Hill and Keddell, £30; Ennor, £200.

PROPERTY SALES.

APRIL 24.

AT THE MART.—By Messrs. Edwin Fox and Bousfield.—Freehold ground rents, amounting to £58 1s. per annum, arising out of 16 houses, situate in Rosetta-street and Wilcox-road, South Lambeth—sold for £1,235.

The ground lease, for 55 years unexpired, at £110 per annum, of the premises No. 122, Regent-street, let for the whole term at £352 5s. per annum—£3,700.

By Messrs. Dann and Son.—Freehold residence, known as Stanley House, Bexley Heath, Kent, let at £40 per annum—£650.

By Messrs. Vigers.—Freehold residence, with garden, situate at Wimbledon, Surrey—£1,000.

Freehold plot of building land, fronting the main road, Wimbledon—£400.

By Messrs. Candy and Luckin.—Leasehold two houses with shops, Nos. 9 and 10, Cropley-street, Wenlock-street, New North-road, Hoxton, producing £78 per annum, term 61 years from 1845, at £7 5s. per annum—£700.

Freehold residence, No. 47, Florence-street, Upper-street, Islington, of the value of £45 per annum—£630.

Leasehold residence, No. 15, Raglan-terrace, Hamilton-place, Highbury Park, of the value of 60 per annum, term 80½ years unexpired, at £7 10s. per annum—£550.

Leasehold five houses, Nos. 7 to 10, and 14, Park-street, East-road, City-road, producing £110 10s. per annum, term 28¾ years from 1857, at £3 10s. each house—£515.

AT THE GUILDHALL COFFEE-HOUSE.—By Messrs. C. D. Field and Son.—Freehold ten houses, with shed and premises, Nos. 11 to 17, George-street, and 19 to 21, Lant-place, George-street, Suffolk-street, Southwark, let at, and of the value of, £278 8s. per annum—£2,410.

Freehold six houses, Nos. 1 to 6, Eastbourne Cottages, Cowley-road, Wellesley-road, Snaresbrook, producing £124 16s. per annum—£1,390.

By Mr. Henry Rice.—The advowson and right of patronage and presentation to the vicarage of Pirton, Hertford—£750.

By Messrs. Green.—Freehold residence, No. 51, Kensington Gardens-square, let at £105 per annum—£1,900.

Leasehold five houses and shops, Nos. 30 to 34, Archer-street, Westbourne-Park, producing £335 per annum, term 83½ years unexpired, at £8 per annum each house—£2,580.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Thomas Banbery, Battersea, journeyman carpenter, May 13, at 1—John Dillick Bennell, Bow, plumber, May 2, at 1—Joseph Dally, Little Pulteney-street, Golden-square, dealer in building materials, May 13, at 11—Samuel Gyer, Gordon-street, City-road, plumber, May 2, at 12—Charles Jones, Holderness-terrace, South Lambeth, carpenter, May 2, at 1.

TO SURRENDER IN THE COUNTRY.

Thomas Morgan Carter, Bristol, carpenter, May 3, at 12—Peter Crimes, Halton, Cheshire, wheelwright, May 17, at 11—John Fallows, Hulme, painter, May 2, at 11—John Harris, jun., Buckfastleigh, timber merchant, May 5, at 11—Stephen Pounds, Holtwood, near Wimborne Minster, timber dealer, May 3, at 11. William Dixon, Codicote, Herts, carpenter, May 23, at 1—John Hardcastle, Spittlegate, Lincolnshire, engine-fitter, April 26, at 11—George Middlewood, Hull, joiner, May 8, at 12—John Pedley, Darlaston, bolt and screw turner, May 6, at 12—John Priestley, Westwoodside, Lincolnshire, joiner, May 7, at 10—John Turner, Runcorn, carpenter, May 17, at 10.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9	0	£10	10	Archangel, yellow ..	£12	0	£13	0
Quebec, red pine	2	0	4	10	St. Petersburg, yel...	10	10	11	0
,, yellow pine..	2	15	3	10	Finland	8	0	9	0
St. John N.B. yellow	0	0	0	0	Memel.....	0	0	0	0
Quebec Oak, white ..	5	5	6	0	Gothenburg, yellow	9	0	10	10
,, birch.....	3	10	4	10	,, white	8	0	8	10
,, elm	3	10	5	0	Oefle, yellow.....	9	0	11	0
Dantzic oak	3	10	5	0	Soderhamn	9	0	10	10
,, fir	2	0	3	10	Christiania, per C., 12 ft. by 3 by 9 in. yellow	18	0	22	
Memel fir	3	0	3	10	Deck Plank, Dantzic, per 40 ft. 3 in.	0	14	1	4
Riga.....	3	0	3	5	Pumice Stone pr ton	5	0	8	0
Swedish	1	17	2	3	Oils, &c.				
Masts, Quebec red pine	6	0	8	0	Seal, pale....per tun	44	10	0	0
,, yellow pine..	5	0	6	0	Sperm body .....tun	138	0	0	0
Lath wood, Dantzic, fin	4	10	5	10	Cod	41	0	0	"
,, St. Petersburg	8	10	7	10	Whale, Sth. Sea, pale	44	0	0	0
Deals, pr C., 12 ft. by 3 by 3 in., duty 2s per load, drawback 2s.					Olive, Gallipoli.....	63	0	0	4
Quebec, white spruce	14	10	22	10	Cocoanut, Cochin, ton	58	0	0	0
St. John, white spruce	13	0	15	10	Palm, fine	40	10	0	6
Yellow pine, per reduced C.					Linseed	36	0	36	5
Canada, 1st quality.	17	0	19	10	Rapeseed, Eng. pale..	38	0	0	0
2nd do.....	12	0	13	10	Cottonseed	27	0	34	10

METALS.

IRON:—							
Welsh Bars in London .. ..per ton	6	15	0	0	0	0	3
Nail Rod .....—	7	10	0	8	0	0	2
Hoops ..... do	8	15	0	9	0	0	
Sheets, Single ..... do	9	15	0	10	0	0	
Staffordshire Bars ..... do	7	15	0	8	10	0	
Bars, in Wales ..... do	5	15	0	6	0	0	3
Rails ..... do	6	0	0	6	5	0	net
Foundry Pigs, at Glasg. No 1 .. do	2	13	6	3	7	0	
Swedish Bars ..... do	10	10	0	12	10	0	
STEEL:—							
Swedish Keg, hammered .....per ton	16	0	0	0	0	0	
Swedish Faggot ..... do	10	10	0	12	10	0	
COPPER:—							
Sheet & Sheathing, & Bolts ....per ton	85	0	0	89	0	0	
Hammered Bottoms ..... do	96	0	0	98	0	0	
Flat Bottoms, not Hammered .. do	91	0	0	93	0	0	
Cake and Tough Ingot ..... do	74	0	0	0	0	0	
Best Selected ..... do	81	0	0	83	0	0	
Fine Foreign ..... do	86	0	0	88	0	0	
Yel. Metal Sheathing & Rods ....per lb	0	0	7½	0	0	8½	
TIN:—							
English Block .....per ton	89	0	0	0	0	0	2½
do Bar ..... do	90		0	0	0	0	
do Refined ..... do	92	0	0	0	0		
Banca ..... do	92	0	0	0	0	0	nett
Strait ..... do	87	0	0	0	0	0	
LEAD:—							
Pig, English .....per ton	22	0	0	0	0	0	2½
,, Spanish Soft ..... do	19	15	0	0	0		
Shot, Patent ..... do	23	0	0	0	0		
Sheet ..... do	21	15	0	0	0	0	
White ..... do	30	0	0	31	10	0	
SPELTER:—							
On the Spot .....per ton	22	5	0	22	15	0	net
ZINC:—							
English Sheet .....per ton	28	0	0	0	0	0	
Devaux's V. M. Roofing Zinc .... do	28	0	0	0	0	0	*

* And 5 per cent. discount if laid upon the new system.

QUICKSILVER .....per btl	6	15	0	7	0	0
REGULUS OF ANTIMONY.						
French .....per ton	34	0	0	0	0	0

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From Interest and Dividends	£14,185
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THE BUILDING NEWS.

LONDON, FRIDAY, MAY 3, 1867.

ARCHITECTURAL EXHIBITION SOCIETY.

AT this season of the year, when Suffolk-street, Pall Mall, and the Royal Academy open their doors to the general public, the architectural profession has long been in the habit of exhibiting an interesting collection of drawings at 9, Conduit-street. From causes which will readily suggest themselves these exhibitions vary in merit and interest, but they never fail to contain a large number of admirable drawings which otherwise would never be seen by any but the immediate friends of their authors. The present exhibition is fully up to the average as regards quality and above it in quantity, upwards of a hundred drawings having been rejected from want of space. It is also enriched by many photographs of the designs for the New Law Courts, and by a beautiful collection of sketches by various well-known members of the profession.

Commencing with the Great Gallery, which contains the exhibition proper, the visitor will notice No. 1, a corridor niche, with subjects from the "Idylls of the King." We must protest against the growing practice of using very short columns, sometimes little more than one diameter in height. A cylinder of such proportions is the shape of several excellent varieties of cheese, but it is a simple impertinence to adorn a piece of marble of such squat proportions with a handsome capital and base. A column is, doubtless, a good thing in the proper place, but it would seem from many works of the present day that any place which will hold a column is the proper place to put it. If an almshouse, gamekeeper's lodge, or village cage possesses a window which can by any possibility be divided into two lights the inevitable column goes in, and ingenuity will find means of dividing it into two courses by inserting a sort of cushion resembling a soup plate inverted on another. At Richmond a very notable drinking fountain may be seen near the Baths, glorying in a pair of columns of Sienna marble, which will roughly measure nearly 5in. in height, and must weigh upwards of 5lb. avoirdupois. The eternal fitness of things demands that a column should be justified by a purpose plainly indicated, without which it must be gratuitous and consequently disagreeable. No. 2 is by Mr. R. W. Edis, and represents some offices in one of the arches of the South-Eastern Railway. The problem of utilising the immense number of railway arches in and around the metropolis is exercising the ingenuity of a great many. Mr. Edis's design is pleasing. No. 8, by E. W. Pugin, is a pencil drawing of a church at Kensington. The manner in which the tower is connected with the spire is original, and cannot fail to be effective. Pencil drawings and pen and ink drawings, though effective enough, are very deceptive, and the rougher they are the more deceptive. They invariably give the idea of a richer building with more marked projections and deeper shadows than the actual work would possess. The uninitiated are apt to think that if a sketch looks so pretty, what may they not hope from a finished drawing, and what indeed from the actual building? No. 14 is a very bad representation of a very good building—a convent at Carisbrooke, Isle of Wight, by Mr. Gilbert H. Blount. About a month ago we were much gratified by an inspection of this building, but found much difficulty in recognising it in the drawing, with which by no possibility can Mr. Blount have had anything to do. Mr. Rowland Plumbe sends a picturesque design for a chapel at Tottenham, but gargoyles and rain water-pipes should not be in juxtaposition; and Mr. Edis exhibits some new warehouses in Southwark-street now in course of erection. Southwark-street, by the way, is getting to be a sort of "happy valley" for architects. Mr. E. B. Lamb's contributions are always welcome, though this year he sends nothing particularly new. His designs are distinguished by their breadth of treatment. Mr. Lamb has few equals as an architectural colourist. We cannot, however, help thinking that in many of his works an absence of scale is conspicuous, the drawings containing scarcely a hint as to the actual size of the objects they represent. Even in his church in Kentish Town we detect the want of scale, and have no doubt but that Mr. Lamb himself thought the building would look larger than it does. Nos. 26 and 32 are designs by Mr. Edis for a townhall at Grantham. The Gothic alternative design is the best, but the spire is more original than graceful, and it seems pretentious to erect a tower to carry nothing but woodwork. No. 28, "Lodge at Danemore Park," by Mr. F. Waller, is excellent in colouring. No. 33 is one of Mr. Lamb's admirable sepia drawings. Mr. Quilter sends a "Gardener's Lodge," No. 32. The design is good, not being overdone, and the colouring is above the average. Nos. 38 and 39, "Designs for Townhall, Wolverhampton, and College at Taunton," by Messrs. Godwin and Crisp, are carefully drawn and would be effective in execution. No. 42, by Mr. G. E. Street, sketch of Church of St. Mary Magdalene, Paddington, is a very commonplace affair indeed, and the octagon tower does not assist the composition by any means. No. 45, "Boarding Houses, Cheltenham College," by Messrs. Godwin and Crisp, is excessively continental in style, having apparently neither gutter nor cornice. No. 41, "Design for a Volunteer Club House," by Lloyd, Williams, and Underwood, contains a quantity of work, but the design is too Belgian in feeling to be pleasing. We cannot see the advantages of going to foreign countries for our Gothic architecture without special reason, such as Mr. Burges gave for his adoption of French Gothic in his design for the New Law Courts. Mr. P. C. Hardwick sends some beautifully coloured sketches, Nos. 51, 52, and 57. The latter, a sketch of a wayside cross, &c., at Adan, Ireland, is of very delicate tone, a merit that the true artist will always appreciate. The vulgar invariably exclaim, "What pretty colours!" the judge remarks, "What good tone!" No. 56 represents some farm buildings and cottages, by Mr. T. H. Lewis. They are overdone, and if there is an abomination more offensive than an overdone farm building it is a cottage *ornée*. No. 61, "New Cemetery and Chapel, Overton, Flintshire," by Mr. W. M. Teulon. Here was a good chance thrown away. The site, which is admirably adapted for picturesque treatment, is spoilt by the treatment of the retaining wall. Mr. Teulon has seen enough landscape gardening to know how to adapt his buildings to their sites, but in this instance he has certainly not profited by it. Mr. G. Truefitt exhibits his design for St. George's Church, Tufnell Park, No. 66. This church has the peculiarity of being round. If the perspective were correct an opinion might be formed on the merits of the building. Exhibitors should recollect that perspective, to be of any value, should be accurate. In "Gwilt's Encyclopædia of Architecture," the new edition of which we can confidently recommend to our readers, a perspective delineation is represented to be "a delineation which, being properly coloured and shadowed, will convey a lively idea of the real object, and at the same time indicate its position and distance from the eye of the observer." It strikes us, however, that some of the drawings in the exhibition are more lively than lifelike. No. 67 is "A Brick Church Designed for the Provinces," by Mr. S. S. Teulon. Opinions vary much as to the merits of this architect, but it is certain that he is very unequal. In the present case it is hard to conceive what offence the provinces can have committed, that they should have this "brick church" thrust upon them. Mr. Teulon also sends a view of Elvetham Hall, but it is gimcracky in design and badly coloured. Mr. T. M. Lockwood exhibits a view of a "Residence at Chester," No. 74. It has all the appearance of an ordinary house, and it is not particularly well drawn or coloured. Men in Mr. Lockwood's position and reputation owe it to themselves to send in works at least well executed, or else refrain from exhibiting. Every excuse must be made for a young and struggling man who makes his own view, and colours it as best he can; but when architectural draughtsmen and colourists are to be obtained in abundance, and unfortunately at miserable remuneration, it is neither dignified nor generous in eminent men to exhibit any drawings that are not good of their kind. Nos. 82, 83, and 84 are by Mr. Buckeridge, respectively a church, a savings' bank, and a church. These drawings are neatly done in pen and ink, and have merits beyond neat execution. Nos. 85 and 86, by Mr. Purdue, "Design for a Church at Sharrow, Sheffield," are not well drawn. The old fashion of neat careful drawing has to a great extent disappeared, but there is a point where freedom verges close upon roughness, and force may be given without resorting to the use of excessively thick lines. Mr. Purdue sends another design for a church, No. 93, which is well coloured; which is more than can be said of Nos. 96, "New Vicarage, Great Ilford," by Mr. A. Ashpitel, and 97, "New Station at Leatherhead," by Mr. C. H. Driver. No. 99, "Design for a New Residence"—residence again!—for a gentleman in Cornwall, by David Brandon, is well coloured, as all Mr. Brandon's drawings are. They all, however, have great faults where the gardening joins the architecture. In the drawings he exhibits, the slopes are always wrong against the terrace walls; we say in the drawings advisedly, for the landscape gardener who laid out the Cornish gentleman's grounds is too much of a master of his craft to make such a mistake. Mr. Bassett Keeling's little church, No. 102, is pretty in design and well coloured. No. 107 is a competition design for "New Church," Dumfries, by Mr. James Barbour. The catalogue states that it was "not accepted;" and when we look at the junction of the spire with the octagon tower we do not wonder at it. It is more than questionable whether it would stand. No. 108 is another memorial! to whom may be readily divined. Nothing but great excellence in design can reconcile us to a single additional memorial, and Mr. James Lawson Stewart's design does not come up to the point of excellence. No. 114, an interior of a church in brick, by D. Wallin. This is another case of perspective. For aught we know, this interior may look very well or very much the reverse, but the drawing is not a representation from which to judge.

The admirers of Grecian art will examine Nos. 112 and 113, and also the photographs of the executed works. They will here see the heaven-pointing thumb of classicality as opposed to the heaven-pointing finger of Gothicism. We fear that it is not by efforts such as these that a giddy public will be won back to the pure forms of Athens and Magna Græcia. No. 115, "A Drinking Fountain," by Mr. J. J. Moye, does not present the cup that neither cheers nor inebriates in an inviting form, which, considering the great advantages to be derived from temperance, is to be regretted. Mr. F. Marrable exhibits an interior chancel of the New Church of St. Peter, Deptford. It is in brick, as is much the fashion, though for our own part we think it is not a material good enough for an interior. This, however, is a matter of opinion.

In this portion of the exhibition will be found some of Salviati's beautiful mosaics. Nos. 120 and 139 are copies of work executed at Windsor Castle—subjects Edward IV. and Henry VIII. The design is by Messrs. Clay-

ton and Bell. No. 123, by Mr. J. S. Quilter, conservatory and terrace, is another proof how little architects know about terraces and gardens. The conservatory is a handsome stone building, well designed and expensively constructed, but the grounds do not accord with the masonry, and never can be made to do so. The steps, instead of raking away into the country, should have been turned sideways against the terrace wall. The ground could then have been easily adapted. We last year reviewed in these pages a book on the very subject, the connection between architecture and landscape gardening; and this instance is a most notable one of the necessity of perfect accord between the professors of the respective arts. No. 135, also by Mr. Quilter, is a design for Headingley Theological Institution, Leeds. It displays considerable talent, and though unsuccessful in the competition, was rejected only by the casting vote of the chairman. The execution of this drawing for a competition, where it is unwise to throw away much time or money, is very good. We have ever deprecated the practice of aspirants in competitions wasting a lot of time and money in getting up very elaborate and elegant drawings. A well considered plan, a practicable section, and a perspective view with the projections honestly shown, not tricked up with shadows too deep to be true, is all that is required, and the whole to be as slight as is consistent with distinctness. Because it complies with these requirements we take Mr. Burges's drawing "Detail of part of Strand front," which appeared in the Building News of April 18, to be the best architectural drawing that has ever been exhibited. It is not so elaborate as many of Sir Charles Barry's; but it is like Mercutio's wound, "enough," and he must be captious indeed who wants more. Here we come upon several designs which were sent to Manchester on the occasion of the ill-managed competition for an Exchange. The details of that humiliating exhibition of human nature appeared at full length in these pages last autumn, and to keep green the memory of the wrongs the majority of the competitors suffered they send some of the rejected designs. Having already said enough about them we leave the visitors to the exhibition to consider them at their leisure. Mr. Horace Jones, the City architect, sends a design for a new telegraph station in Threadneedle-street. Messrs. Picton, Chambers, and Bradley send a design for the Railway Hotel, Lime-street, Liverpool. This is at all events a sensible design, differing in that respect from certain great works of similar nature in the metropolis. Mr. Darbishire favours the exhibition with a design for the Midland Railway Station and Hotel, Nos. 145 and 146, which is not equal to his performances in Swain's-lane, Highgate, but nothing is more difficult than sustained effort. Mr. Horace Jones sends a view of his meat and poultry market, which, we believe, represents the building pretty much as it will really appear. No. 155, "Central portion of the New St. Thomas's Hospital," is not by any means good. The pavilions are especially poor, as are the arches on second and third floors, having no impost, and an arch without impost at springing is the meanest thing in classical architecture. As this building directly fronts the Houses of Parliament, all classicists will regret that it should be so unworthy a representative of its type. No. 156, by Mr. H. Jones, is worthy of study, and here the classicists will rejoice. The spirit of the design is shown in every part, solidity and sturdiness characterise it. No. 162 is another of Mr. David Brandon's designs. A porch which has pilasters in front must have a portion of one on the return side next the wall, and a child in art knows it. The roof of the tower is attenuated, as is only too commonly the case. The porch is absurdly overdone, and is, in fact, the most ornate piece of the structure. No. 165, competitive design for Manchester Exchange, by Mr. R. H. Burden, is not well drawn. It may be a good design, but the drawing gives it no chance. No. 173, by Mr. T. Roger Smith, is well designed and drawn. No. 179, by Mr. H. M. Burton, is much to our mind. It looks like a mansion, and no one would think of calling it a residence. It is not overdone; houses are not usually overdone; it is only the residence and the cottage *ornée* that comes in for the overdoing. No. 144 is a view of Mr. F. Leighton's house, an illustration of which we gave last November.

In the west gallery may be seen a large number of interesting sketches. Messrs. J. L. Petitt, Phené Spiers, P'Anson, E. B. Lamb, T. H. Lewis, H. Watson, A. B. Donaldson, A. Moore, and others, contribute. Messrs. Bell, Redfern, and Almond send a photograph of a "Majesty" for the west front of Salisbury Cathedral. As regards the National Gallery designs here exhibited, we hoped the public had seen the last of them. No word we originally said of them do we retract, and after the verdict which public opinion has recorded, it is inconceivable that they should be found on the walls of any Exhibition room, least of all in one where the younger members expect to find subject for emulation.

A PHILOSOPHICAL VIEW OF ART.

No. 6.—The Scientific Co-ordination.

FROM our historical survey we have traced the operation of a great intellectual and social law. A gradual evolution of human ideas and conceptions, beginning in the birthland of our race, undergoing various transitions, and influenced more or less by adverse circumstances, is clearly apparent throughout; and this evolution has been shown to have followed a general law, not unlike that to which the individual mind in its different gradations of perception and reason is subject. When we speak of the stages of civilisation, we really mean the practical result of this grand operating principle which has not only successively modified ideas but moulded the popular realisations that have sprung from them. Briefly recapitulating these we have:—

First, a period of imagination, during which reason is undeveloped and subordinate, and material embodiment or personification of nature are common.

Second, a period more advanced, in which reason assumes a place; conceptions alternating between the material and the immaterial, and a period moreover characterised by an attempt to define and separate them, noticeable in the metaphysical epochs of Greece and the middle ages, and generally realised in art by anthropomorphic conceptions.

Third, a period marked by the ascendancy of experimental science and industrial enterprise, the rapid decline of the dogmatic spirit, and the two opposite and distinct movements of the secular and spiritual impulses. Now, it is necessary to bear in mind that these historical gradations of thought had not separate and exclusive existences. A principle of continuity runs throughout. These transitional phases pass from one into the other by insensible degrees, just as in the material world the solid body undergoes the liquid and gaseous states in passing from one extreme to the other. Each phase is chiefly noticed for its predominating element—the first, or mythotheological, becoming in the second more metaphysical, as a connecting link to the scientific or positive state; while it must not be forgotten that all these three elements—initial and intermediate—coexist more or less in each stage. Thus, the faculty for abstraction was never wanting in any stage, and yet we find its power considerably modified in quality as we approach an age of multifarious but definitive knowledge. In general, the process of abstract thought has been to refine and etherealise; from speculating on corporealities, the mind gradually transferred its powers to "essences," "origins," and other ontological niceties. Our perceptions of the visible world have only served to distinguish more clearly between the corporeal and the spiritual, and to upset the arbitrary origins of an early philosophy which continually confounded ideas and words with things. When men discarded objects of sense in the metaphysical periods, it was only to attach a sort of disguised personification to their conceptions, and not to discriminate, as we now do, by the aid of experiment and analysis these two distinct faculties.

The effect of this process on art is obvious on reflection. The close association entertained in the earliest stage of thought of the material and sensual with the idea was manifestly favourable to art and design generally; whereas the progressive tendency to separate the subject from the object has temporarily, at least, made the translation of ideas into the material more difficult. Men, like children in a primeval mood of mind, watched the fleeting clouds, the waving forests, and listened to the howling winds, and assimilated them to some idea of sense; the idea and object were always linked together, and an instinctive power of expression was created. Some nations, more than others, are gifted with the facility for comparison and assimilation. Even the structure of some languages illustrates this faculty. With some nations the personal pronouns are applied to inanimate objects; among ourselves, the Irish are more personifying than we are; while most southern and tropical climates attest a more imaginative and objective faith than the northern races. Viewing our subject under the influences of climate and race alone, which have necessarily modified the complexion of art of different nations, the law of a decreasing personification is perhaps less apparent; and it is an absurd and narrow notion among many, even educated people to suppose that a general law and its observance can be imposed alike upon all races in regard to creed and ritual. Can it be ever imagined that the nervo-fibrous races of western Europe or the tropics are ever to be brought under the influence of a form of religion, for instance, like that suited to our neighbours north of the Tweed? The notion is as narrow as that entertained by many conscientious members of the Church of England, who would lay down a law for the regulation of the individual consciences of all men, and exclude ritualism and its participants on no better ground than that they ought to be as strong-minded as themselves and need no external helps.

But we are digressing. The law of gradation, both as regards the ideas of successive epochs and the development of humanity—whatever the modifications of climate or race—remains inoperative, and may be applied to the progression of the sciences, their relation and dependence, and the order they will eventually assume in the grand economy of systematised knowledge. Such a classification of the sciences on a rational basis has been nobly and simply laid down by Comte in his "Cours de Philosophie Positive." From the great law of evolution, which shows that the phenomena of nature were first explained by analogies drawn from consciousness or the known; secondly, were explained by reason without proofs; and thirdly, were explained by invariable laws deduced inductively from experiments—he proceeds to divide and classify those dependent sciences which are based upon corresponding phenomena or a necessary and invariable subordination. These sciences are arranged, beginning with those relating to simple and general phenomena, and most removed from social or moral life, and proceeding to those most concrete and complex, having for their object the explanation of the laws of humanity. Astronomy, physics, chemistry, physiology, and sociology are the fundamental sciences based upon the above order of dependence—an order it may be observed conformable to the successive development of these sciences, as well as confirmatory of the great law of progress we have sketched. We have shown that it is a principle of this law to begin with simple and ab-

stract conceptions; and hence we find the earliest sciences to be those based upon *à priori* reasoning, and the most precise of all. It was this early power for simple abstractions which arbitrarily determined the laws of beauty in architecture before they were properly organised in a more complete and philosophical system. It was this early power also which led men to arbitrarily assign origins to the phenomena of nature, attaching them to the wills of beneficent beings, oreads, and demons. In all cases they proceeded from the known to the unknown; this was, in fact the principle of their childlike philosophy. Uninfluenced by spiritual discernment, the adoration of nature and its productive power took the place of the adoration of a Supreme Being; and such a phase of theological belief became prolific of a copious mythological and heroic poetry.

After simple and abstract ideas came those more complex; the laws of the inorganic world are followed by those of the organic world; and the latter comprehend the former, just as the abstract entity became the impersonal substitute for the simple phenomenon. The increasing complexity of the organic sciences render their elaboration necessarily more difficult than the mathematical sciences; the relations of the phenomena they explain and their laws or methods of action require a far longer time to establish; and hence the principles of physiology and the arts related to it, as medicine, are even now in a very unsatisfactory state, and are far from that positive or definitive state yet to be reached. Though many of the principles of art are determinable, the professors of medicine and architecture are at present much in the same stage of uncertainty, relying more on experimental knowledge than on well ascertained principles.

Coming to the Fine Arts, a different class of phenomena has to be considered, though one holding a place somewhere between simple abstract science and the higher categories of social and moral science, and consequently to be investigated on a similar method. The faculties of perception and conception are chiefly employed in the cultivation of the Fine Arts, and it was, therefore, not necessary for man when he had discovered some forms and proportions that were beautiful, or sounds that were harmonious, to inquire into the reasons that made them such, so long as he could fix them upon his memory or arrive at some empirical rules for their reproduction. The consequence of this hypothesis is the early development of the fine arts compared with physical science, which a new discovery often retarded, by contradicting or upsetting the arbitrary and unscientific principles given it. Such a process of retardation, paradoxical as it may appear, the art of architecture, so long taking the lead, is really now undergoing, or at least has been undergoing for the last two or three hundred years; and it may be observed that the arrival of such a period would have been prolonged if mankind had not modified their doctrines of theology, and the consequent divorcement between it and art which ensued. The critical elaboration which art, particularly architecture, underwent when the two secular impulses—industrial and scientific—began the great provisional estrangement between material and spiritual ideas and the sciences, though necessary to that scientific organisation still in the future, was for a time a decided check to the progress of art, while even now we are still reproducing, though less servilely than a century ago, the systems of bygone civilisations.

Previously linked to religion, art had always been the inseparable exponent of an arbitrary conception; whereas now, the progress of the sciences and their relation to each other demand the independent cultivation of the fine arts upon a more rational basis than our forefathers required, and in accordance with the definitive stage of modern thought. The peculiarity of the present anomalous position of architecture is really, I think, the reversal of the conditions under which it so long progressed. The scientific element was completely subordinated to the religious conception in all the great art periods. Now, on the contrary, the utilitarian element precedes the æsthetic in the majority of the architectural productions of the day; and it is the multiplicity of requirements our complex civilisation demands that makes their fulfilment so different and difficult a task. We have, in short, to superadd the experience of three centuries of eventful discoveries to an unprepared and unorganised art; we have to study these new elements in relation to and in harmony with the conceptive and receptive capacities of man; and it is the combination of the analytical and synthetical methods, the deductive with the inductive mode of investigation, that is now necessary to elaborate a system of definitive principles for the future organisation of art.

It will now remain for us to practically apply the theory we have sketched as briefly as possible; and we select architecture because it is more illustrative of the changes undergone by reason of its more complex character. Thus, historically, the phases of the Renaissance reflected in architecture just that divergence between the religious and secular ideas which effected a temporary combination; while their opposition and separation became more marked in the pure styles of the Greek, Roman, and Gothic revivals. Already their re-incorporation is shown in our modern eclectic system—in all our large recent works of Italian and Gothic character into which the modern spirit of thought is infused.

FINE ARTS.

SOCIETY OF BRITISH ARTISTS.

THE Society of British Artists, notwithstanding the abuse which it is the fashion to heap upon them, pursue the even tenour of their way, rewarded by profit if not renown. Their gallery in Suffolk-street has been enlarged this season by the opening of an additional room, and the works exhibited show a proportional increase in number, exceeding now a thousand. Of course, a very large proportion of them are of that class which can only be described as "rubbish," just as there is a preponderance of similar "rubbish" in the Trafalgar-square and other exhibitions of the season; but scattered through these is a considerable number of performances which rise to the level of mediocrity, and some few which present even higher claims. Of good honest "furniture pictures," that is canvases applicable to decorative purposes in the homes of the millions, the Suffolk-street display has, perhaps, the advantage over the average of its aristocratic neighbour. One gratifying characteristic in this exhibition is that it does not include portraits, with the exception of a rare specimen here and there, which has only to be seen to be execrated.

Not wishing to indulge in the cowardly sport of breaking flies upon a wheel, we shall in our few remaining remarks on this exhibition confine our observations chiefly to those productions which, if not of a merit to call for the highest flights of critical encomium, are yet deserving of some attention from the visitor. Mr. W. Bromley gives earnest of being an improving man in his representation of the scene between Queen Catherine and the Cardinal, "King Henry VIII.," Act 3, scene 1 (No. 9). The composition is respectable, and there is a good deal of truth in the expression of the faces. Another Shakspearian effort by the same artist, illustrative of the passage in "King John" where Hubert describes the consternation occasioned by the news of Prince Arthur's death (No. 328), is even more vigorous in the treatment than the preceding. Mr. C. Rossiter has a clever picture (No. 39) representing "The Arrest" of a cavalier in his ancestral halls by some soldiers of the Republican army. Mr. T. Heaphy exhibits a very fair performance on the subject of "General Fairfax and his Daughter Pursued by Royalist Troopers" (No. 238). The incident is where the poor child (only six years of age), worn out with fatigue, has swooned away in a barn where the party have taken hasty refuge, her father splashing her face with water. Mr. Salter, in addition to a portrait, of which the writer is happy to consider that he is not the original, presents us only with a small study (No. 531) of his picture, successfully exhibited a couple of years ago, of Good Queen Bess "Reproving Dean Noel in the Vestry of St. Paul's," for placing a new service book, decorated with pictures, upon her cushion. To close our account with historical subjects we must accord a word of especial recognition to Mr. P. Priolo for his water-colour painting of "St. Paul Preaching to the Early Christians at Syracuse" (No. 685). The locality of the occurrence is one extremely well adapted to pictorial effect—the persecuted hearers of the captive preacher having hastily assembled in the caves that had been made by quarrying stones for the building of the city. The artist has taken advantage of the broken lines thus produced to give great variety to his grouping, the whole being carefully and elaborately treated, and impressive in character.

In figure subjects of a less pretensive character we find the usual miscellaneous assortment of common-place materials. Mr. T. Roberts executes a variation upon Millais' two "sermon" performances, under the title of "A Tedious Sermon" (No. 33), and shows us a young minx in open rebellion against the infliction, in spite of the admonitions of her pretty but insipid-looking mamma, shows us, moreover, in the mid-distance the impassive features of the reverend preacher, all unconscious of the soporific effects of his dullness. Mr. E. J. Cobbett having tried high life subjects unsuccessfully, returns to his early loves, —and there they are, those sun-burnt country lasses, carrying home heather and enjoying a "Gossip by the Way" (No. 93), and not a day older, nor a whit changed, from what we knew of them twenty years ago. Mr. J. J. Hill presents us with rustic beauties a *tant soit peu* more refined in character than Mr. Cobbett, and always with a delicate perfection of bloom which Nature would strive in vain to imitate. Of these his "Fishing Girl" (No. 170), may be taken as a favourable example. Mr. Hurlstone, the president of the society, although unquestionably endowed with considerable learning in his art, and a certain feeling for its nobler aims, begins to fail lamentably in his handicraft. His "Peasant Girl of Alcala de Guadaira, Andalucia" (No. 186), though a pleasing study after nature, has been so hardly dealt with by art—we refer chiefly to the laying on of the colours—as to present almost the appearance of a caricature. Mr. J. Burr displays to advantage a certain trick of art in his "Reading of the Bible" (No. 487), the figure of the old woman listening and the general chiaroscuro being in humble imitation of the style of Rembrandt. Another performance of his, "The Rehearsal" (No. 106), representing an old man scraping on a fiddle, whilst avoiding affectation, falls into the no less deadly offence of tameness. Tam O'Shanter's maddrunk ride gives Mr. G. M'Culloch an opportunity for displaying a considerable degree of wild fancy in the composition (No. 116), combined with a woful deficiency of colouring. Sentimentalism runs mad in Mr. W. M. Hay's "The Ballad Singer" (No. 155), which we are told is an "incident in the lives of two sisters"—one in rags singing "Home, sweet home" on a snowy winter's night at one side of a pillar, while the other, comfortably dressed, listens with a mixture of feeling which we do not pretend quite to analyse, from the opposite side. Doubtless Mr. Hay will have his reward from a certain class of art-patrons.

This society has long prescriptively held a high position in landscape painting—Roberts and Stanfield being amongst those who achieved their earliest triumphs on the Suffolk-street walls. The tradition still endures,

but the spirit is gone. There are always a large number of landscape performances in the Suffolk-street Exhibition, evincing a certain amount of technic skill, combined with a decent regard to the arcana of nature, but the soul of nature which should breathe over the canvas and should bespeak the mind of the artist through his work is discovered no longer; at any rate not to the extent which is necessary to elevate landscape above mere view painting. One of the ablest landscape painters of the society is Mr. A. Clint, who is always earnest in purpose, but who, however well directed he may be in his purpose, never arrives at the point of creating his subject. In his carefully painted picture of a sunset in a lake and hill district (No. 28), there is a great deal of talent; but a talent which makes its workings obvious, instead of concealing them, which is the true test of real art. Mr. J. Tennant, who has become venerable in the outdoor pursuit of nature, paints, always in tea-tray decoration fashion, scenes which he considers agreeable and picturesque, but the spirit, character, and tone of which he is utterly unable to realise upon canvas. When he twits us cockneys in that aspiring effort, "Away from Smoky London" (No. 100), how little is he aware that the veriest drudge of City life, who now and again gets his day out with a return ticket, cannot but laugh at him for his halting and crude representation of a scene which should be full of invigorating freshness. His cattle, too, are sadly poor and out of drawing. Mr. G. Cole, who formerly chiefly devoted himself to cattle subjects, has recently taken up a new line in landscape, following upon the steps of his son, Mr. Vicat Cole, of which he has produced some very striking examples. But he this year shows how by aiming at specialities of effect an artist of undoubted merit may lose himself by misdirected efforts. In his "Spring Time" (No. 171), illustrated by the quotation:—

> The spring is come again—the joyful spring!
> Again the banks with clustering flowers are spread—

he shows us no joyful clustering flowers, but only a felled tree, and men at work peeling off its bark. The arcana of this particular group are depicted, no doubt, in very accurate detail, but the detail is hard—hard as the hatchet which is stuck in one of the truncated branches, and which sticks there as if it knew it was waiting to have its portrait taken. Mr. J. Syers is as honest and truthful as usual in his sea and mountain stream subjects, of which "On the Lledr" (No. 163), is an effective specimen. Mr. E. A. Pettitt also displays considerable power in his mountain passes—more particularly in "An Avalanche" (No. 417), which for "boldness and cold sublimity" is as fine a thing of the kind as we should expect to see produced by any pencil of the day.

PLATE GIRDERS.

THE usual thickness of the vertical web for plate girders is seldom made of a less gauge than ⅜in. in thickness, and for all girders of 2ft. 9in. to 3ft. in depth will be found ample. The centre plate might be put in ¼in. or 5-16in. if any convenience to the designer; but very often what little weight would be saved by so doing would be lost by having to use an extra covering wrapper or joint strip. In girders of larger dimensions the web plates would have to be increased in thickness towards the ends, where the vertical strain is greatest and is equal to half the weight of the fully loaded girder. When working out the sectional areas of the flanges of girders, a table of the areas of equal-sided angle and tee irons is very useful. The following has been worked out at a great amount of labour, and will be found to assist materially in all computations of this kind. In a girder the writer had lately to examine, owing to the ⅜in. holes in the flange plates not coming direct over each other, they had to be rimered out, and a full inch diameter of rivet to be used to fill up the enlarged holes; therefore make due allowance for such a contingency, which advice cannot too often be borne in mind, as each case of this kind reduces the sectional area of the flanges, and consequently reduces their strength.

TABLE OF THE WEIGHTS PER FOOT RUN, AND SECTIONAL AREAS OF EQUAL-SIDED ANGLE AND TEE IRONS.

THE L AND T IRONS ARE TAKEN AS UNIFORMLY THICK IN EACH PART.

Thickness of section in inches and parts.	Thickness in parts of an inch.																	
	¼		5-16		⅜		7-16		½		9-16		⅝		11-16		¾	
	lb.	sec. area.	lb.	sec. area.	lb.	sec. area.	lb.	sec. area.	lb.	sec. area.	lb.	sec. area.	lb.	sec. area.	lb.	sec. area.	lb.	sec. area.
1¼	2·31	·69	2·82	·84	3·31	·99	3·77	1·12	4·20	1·26								
1⅜	2·52	·75	3·08	·92	3·62	1·08	4·14	1·20	4·62	1·38								
1½	2·73	·81	3·35	1·00	3·94	1·18	4·51	1·35	5·04	1·51								
1⅝	2·94	·88	3·61	1·08	4·25	1·27	4·88	1·46	5·46	1·63								
2	3·15	·94	3·88	1·16	4·57	1·37	5·24	1·57	5·88	1·76	6·50	1·94	7·09	2·12	7·65	2·29	8·19	2·45
2¼	3·57	1·06	4·40	1·32	5·20	1·50	5·98	1·70	6·72	2·01	7·44	2·23	8·14	2·44	8·81	2·64	9·45	2·82
2½	3·99	1·19	4·92	1·47	5·83	1·74	6·71	2·00	7·56	2·26	8·39	2·52	9·19	2·75	9·96	2·93	10·71	3·15
2¾	4·41	1·32	5·45	1·63	6·46	1·93	7·45	2·23	8·40	2·51	9·33	2·79	10·24	3·07	11·12	3·33	11·97	3·58
3	4·83	1·44	5·97	1·78	7·09	2·12	8·18	2·44	9·24	2·77	10·28	3·08	11·29	3·38	12·27	3·67	13·23	3·96
3¼	5·25	1·57	6·50	1·94	7·72	2·31	8·92	2·67	10·08	3·02	11·22	3·36	12·34	3·69	13·43	4·02	14·49	4·34
3½	5·67	1·69	7·02	2·10	8·35	2·50	9·65	2·88	10·92	3·28	12·17	3·65	13·39	4·01	14·58	4·36	15·75	4·72
3¾	6·09	1·82	7·55	2·26	8·98	2·69	10·39	3·11	11·76	3·52	13·11	3·92	14·44	4·32	15·74	4·72	17·02	5·11
4	6·51	1·95	8·07	2·41	9·61	2·86	11·12	3·32	12·60	3·77	14·06	4·22	15·49	4·64	16·89	5·06	18·27	5·47
4¼	6·93	2·07	8·60	2·57	10·24	3·07	11·86	3·55	13·44	4·02	15·00	4·49	16·54	4·95	18·05	5·40	19·53	5·82
4½	7·35	2·20	9·12	2·73	10·97	3·25	12·59	3·77	14·28	4·28	15·95	4·78	17·59	5·27	19·20	5·75	20·79	6·22
4¾	7·77	2·33	9·65	2·89	11·50	3·44	13·32	3·98	15·12	4·53	16·89	5·06	18·64	5·58	20·36	6·09	22·05	6·60
5	8·19	2·45	10·17	3·04	12·13	3·63	14·06	4·20	15·96	4·77	17·84	5·34	19·69	5·89	21·51	6·44	23·31	6·98
5¼	8·61	2·58	10·69	3·20	12·76	3·82	14·80	4·43	16·80	5·03	18·78	5·62	20·74	6·21	22·67	6·78	24·57	7·35
5½	9·03	2·70	11·22	3·35	13·39	4·00	15·53	4·65	17·64	5·28	19·73	5·91	21·79	6·52	23·82	7·13	25·83	7·73
5¾	9·45	2·82	11·75	3·52	14·02	4·20	16·27	4·86	18·48	5·53	20·67	6·19	22·84	6·84	24·88	7·48	27·09	8·11
6	9·87	2·92	12·27	3·66	14·65	4·38	17·00	5·09	19·32	5·78	21·62	6·47	23·89	7·15	26·13	7·82	28·36	8·48

The weights are given in pounds and decimal parts; the sectional areas are given in inches and decimal parts.

TRADES' UNIONS' COMMISSION.

WE continue our report of the evidence before the Royal Commission. Mr. Charles Williams, General Secretary of the Plasterers' Society, was examined, and stated that the society was a national institution, the principal station being at Liverpool. The society was established in 1859, and has about 128 lodges or branches throughout the country, including Scotland. Its objects, as stated by witness, are "the protection of trade, the burying of our dead, and relief in case of accident." There were about 8,000 members in the society at the date of August last, and the annual income averages about £1,200. They have a general fund of £2,000, besides £1,100 in Barned's Bank as depositors. In the course of last year the number of members was nearly doubled. The subscriptions vary from 3d. to 6d. per week. For example, in London members pay only 3d. and 4d. per week, while in Liverpool they pay 6d. The funds are not equalised in the different branches. There is 2d. per week contributions clear to be sent down to the executive council to form a general fund; and all other moneys are for working expenses, including any incidental expenses that may accrue in the different localities. Being pressed pretty strongly as to what he meant by "protection of trade," Mr. Williams replied: "Our object is to improve the position of our trade, both in the shortening of hours, in the raising of wages, and in the elevating of our class." The average rate of wages at the date of the society's formation was 26s. throughout the country, or nearly so, and it is now about 30s. After a statement of the circumstances of the recent strike of the plasterers at Bradford, Mr. Williams said: "In our rules we do not allow either a man or any number of men to cease work unless we have investigated the affair thoroughly. We do not allow any advantage to be taken by any employer or by any number of men. If we found that our men were taking advantage of employers we should supplant those men, by sending other men to serve those employers in the event they still persisted." Mr. Roebuck said he wished to know upon what ground the society "ventured to interfere with a man doing what he likes?" To which witness replied, "We do not interfere with him; all we say is, that if we feel indisposed to take our commodity to that particular place for sale we have a right to restrict it. In my own town of Liverpool, which is a town of some importance, there is not a respectable employer but what we have a proper understanding with—that is, to give six months' notice on either side for any alteration in the trade custom." The following, among other questions, were then put to witness by different members of the Commission:—Does your society take steps for finding out where is a demand for work, and endeavour to supply that demand?—Yes, we do.—But you have no allowance provided for sending about men; you do not pay their expenses, do you?—A great many of the local lodges have private funds, it must be remembered.—You seem to have a great many benefits, and almost no subscriptions?—In the lodge I belong to, I pay 1s. 3d. a week on an average; but our benefits are large. Each member's wife at his death will receive £28 on an average, and 16s. per week accident pay.—Are there, in addition to the 2d. per week, different subscriptions varying in the different districts?—Yes.—Is there much difference between one plasterer and another in point of ability?—Some difference.—So that one plasterer would be very much more advantageous for an employer than another?—Yes, more particularly in the class of work, like this ceiling, for instance. If you were to bring some of our lowest men and some of our first-class men on a job similar to this ceiling, it would run 50 per cent. difference.—Do you allow the first-class man to take advantage of that ability of his?—The lowest class seldom do anything like this; they nearly always classify the men, and they are set apart to do different kinds of work.—So that a man of high-class work gets a higher rate of wages?—Yes, as a rule.—There is no rule in your society that keeps him down?—No.—Do you consider it a privilige to be allowed to work overtime?—Only in some instances. We discountenance overtime as much as we can. Mr. George Housley, Secretary of the Friendly Society of Operative Bricklayers, was next examined. The society was established in 1844. It has 96 branches in England, the Sheffield lodge being the executive. The members, according to the last report, numbered 5,254. The yearly income for 1866 was £5,964 5s. 2½d., and the reserve fund £3,649 15s. 8d. The society was established partly for trade purposes, and partly for accidents and deaths. The last annual account showed that the society had paid £1,362 9s. 6d. in the case of deaths, £1,448 18s. 2d. for accidents, and the yearly expenditure altogether is about £4,500. The benefits of the society do not extend to sickness. An allowance is made to tramps or members seeking work, and the strike pay for last year amounted to £45 17s.; but the average sum spent on strikes has been about £200 a year. The trade purposes of the society are also the raising of wages and the shortening of the hours of labour. The society, however, does not fix a minimum of wages, that is to say, a rate of wages below which members are not considered to be allowed to work. As a rule, it does not limit the number of apprentices, nor was witness aware that in some of the lodges of the society union men refuse to work with non-union men. Speaking from his own experience as a practical workman, witness never knew any objection made on the score that a man was laying bricks with one hand rather than another. On this point he said:—"If a man chooses to use and can use the trowel with his left hand, we are always extremely

happy to work with him, even though we are right-handed men; we make as good work with right-handed men as with left-handed men and *vice versa*." Witness further stated that there was no custom in the society or the lodges directed against the practice called "chasing." He had never known any objection taken by his fellow workmen or by the society to a man making the best of such skill as he possessed. The Sheffield lodge, it was asserted, does not discourage either working overtime or piecework, though it was remarked, as regards the former practice, that the society did not believe that it is essential to the well-being of the men that they should work overtime. Bricklayers' labourers are not allowed to belong to the society—they have distinct societies of their own; nor are they allowed to do bricklayers' work. Were a labourer set to lay bricks by an employer, the bricklayers would strike. There is nothing, witness stated, however, to prevent a labourer becoming a bricklayer and a member of the society, provided he qualifies himself by learning the trade. Asked: A man cannot become a bricklayer simply by looking at the work, I presume? Perhaps you can state how long it takes for a man to become a thoroughly skilled bricklayer—how long must he practise the trade?—It will depend on circumstances; if he is an intelligent man he will learn it in four or five years, while another man would be eight or ten, or even twelve years at it, and not be as well up in it then as the other man at the end of four or five years. In answer to another question Mr. Housley said:—Before he became a member of the society, he did not find that the union men prevented him from making the most of his skill. He joined the union because he believed it would be a benefit to him if he had an accident for his wife to receive 12s. a week, because it would be better than their going to the parish.—Asked: You joined it then as a benefit society?—Yes.—Not because it was a union?—Certainly not; and I believe that two-thirds of the men do not join it as a union; that is to say, they do not join it to strike.—In most cases, we are informed, the local rules of the union are signed by the masters, and witness gave it as his experience that a code of rules so signed, on behalf of both employers and employed, tends to prevent trade disputes, and tends to the general peace and well-being of the trade. The next witness was Mr. William Macdonald, who stated that he was honorary secretary of the Manchester Operative House Painters' Alliance. The society was established in 1852, and numbers 3,980 members, and has 53 branches all over the kingdom. Within the last twelvemonths there has been an increase of 14 societies, and 1,209 members. The objects of the society are the general objects of a trade society, combined with those of an accident and burial society. It was stated that this particular trade is more liable to accident than to sickness, and the society has never been able to afford either an out-of-work fund or a sick fund. Members pay 3d. per week for nine months in the year, and a penny per week for the other three months. A candidate is admitted into the Alliance who can either produce an indenture or establish the fact that he has served five years' apprenticeship. Witness declared that the society had never originated any strike, but had stopped and prevented a good number. It has no absolute rule as to the number of apprentices a master may employ.—Asked: What do you painters do about piecework?—I am a piecework.—In what sense?—I do graining. I grain by the piece.—Is it very general in your trade?—There are not very many who do it.—Is most of your work paid by measurement?—Between the employer and the customer it is measured, but not between the master and the workman.—Then in your trade there is no objection to men working by the piece?—In this particular branch of graining and marbling the work is done by piece, there is no objection to it there. Witness believed that the effect of the union was to keep up a fair rate of wages. By the rules a man who is worth (say) 6d. an hour is not allowed to work for 5d., the tendency of that being to reduce those who are getting 6d. to the 5d. They do upon the principle that the man who refuses the high wages which he might have and takes the low is injuring himself and everybody else. The union does not fix a maximum beyond which a workman shall receive no higher wages. It simply says that if a man is a good workman he shall not receive less than a certain rate of wages. A high class artisan may earn a shilling an hour, which is double the standard rate. It was the opinion of witness that in consequence of trades' unions wages are higher, profits not lower, and the work better in the end.—Asked: Have you any rule in your society as to working time?—Yes, it is simply this; that between six and nine o'clock wages are charged at the rate of time and a quarter, and during the night at time and a half. Overtime is discouraged, and that is the reason why an extra tax is put upon it. The trade being unhealthy, nine hours' work a day the union considers quite enough, without continuing it into midnight. (It would appear that the disease known as painter's colic is more prevalent in London than elsewhere, owing to more turpentine colour being used here.) The demand for an advance of wages rests upon the society's estimate of the actual state of the market. As an instance, it was mentioned that at Nottingham this year a demand was made for an advance per hour, but on account of the dulness of the trade, the claim was suspended until the times should mend. Mr. Robert Last, Secretary of the Operative House Carpenters and Joiners' Society, was next examined. He said his society was a trade and benefit society, with 150 branches throughout the kingdom, and has been established for forty years. It numbers about 10,000 members; the income for the last year, assuming all the contributions to have been paid, was something like £15,000, the reserve fund being £500. The new members added to the roll during last year numbered 2,504. The entrance fee is 7s. 6d; the heaviest fine inflicted on members is for taking piecework, which amounts to £1. If a man violates the rules and will not pay the fine, he is expelled the society. In the case of men out of work on strike every lodge retains its own funds, after paying its proportionate share of the expenses of the whole society. If a strike is sanctioned by the union every member has an opportunity to vote before the strike is entered on. There is no rule in respect to apprentices, nor is there any rule that prevents a member of the union from working with a non-unionist. The society has had about twenty-two "real strikes" within four years, and the strike pay expended in support of these and minor strikes has been £5,446 11s. 7d. For those out of employment the society has paid £2,040 17s. 11d.; in sick benefit, £3,628 19s. 3d.; in funerals and accidents, £1,970 16s.; and for burnt tools, £838 3s. 6d. This last item it was explained was payment for carpenters' tools used in the builder's shop when it happens to be burnt down. For tools that have been purloined, that is to say, stolen from the shop, the society has paid £127 8s. 3d. Carpenters are paid by the hour in some places, and in some places by the day. Being asked upon what basis the union decide that a demand for a rise of wages is a proper demand, witness answered: "The vote of the whole union is taken upon it, and if the majority are in favour of the men being allowed to solicit their employers for an advance it is done." The cause of strikes has generally been that men wanted more wages or a shorter time of labour. Being referred to the dispute between the carpenters and joiners of Birmingham and their employers, recently settled by arbitration, Mr. Last stated that the employers had agreed to give the men a farthing advance, and allow them to leave off work at one o'clock instead of three o'clock on Saturday. He acknowledged that the advantages of the arbitration were on the side of the men, but he believed that the employers wanted to bring all the trades on a level, as far as leaving off work on Saturday at one o'clock went, and they gave these advantages to bring them on an equality. Witness was then asked as to the introduction into England of foreign joiners' work ready made. He said he had never seen any of the materials supplied from foreign countries, although he had heard a deal of conversation about it, and had seen paragraphs in the newspapers on the subject.—Asked: Then you cannot trace that it has had the smallest effect upon your trade?—No more than the introduction of French eggs would stop our English hens from laying.—To the best of your belief no foreign work has come into the country?—I believe that if those things were put on board ship at the foreign wharves they are on board ship now.—You doubt the fact of the goods having coming at all, and if they have come you think they are of very inferior quality?—They are of an inferior quality you may be sure, because if they were of a good quality they would be generally used by the builders. Machine mouldings you see used, but go where you will, although these doors are said to have come into the country in great numbers, you hear of them nowhere.—Why do you assume that foreign work is so bad as you consider it?—On account of the price and also on account of the description I have had of it from Mr. Applegarth. Mr. Applegarth here said that Mr. Last had misunderstood him if he thought that he said the work was bad. He had no reason to believe the work was very bad; he had seen a great quantity of it, and the contrary was the fact. Being asked what was his opinion of the work, Mr. Applegarth answered, it is about as good as the general run of that kind of work is, but if you manufacture joiners' work and put it on ship board, and expose it to the action of salt water or sea air, the chances are that when you come to dry it in this country, however much you may dry it, it will shrink. The employers generally think so, and that is their objection to buying it. He thought this was pretty well sustained by the fact that it has taken two years to bring three shiploads over, and there are two shiploads still remaining out of the three.—Is the price cheaper?—About 10 per cent., but when I mention that, I must add that there is something to be said about the wages paid for the work and the manner in which the people live who produce it.—You have not heard whether any of that work has been put into a hot room to test it, and has stood the test?—I have not, but I have my own impression as to what would be the result.

FRESCO PAINTING.

ON Thursday evening, April 25, Mr. Cave Thomas gave a lecture on fresco painting at the Gallery of the Architectural Union, Conduit-street, Regent-street. The chair was occupied by Mr. Edmeston. This would be an interesting subject at any time, but is especially so now that mural decoration is a growing necessity. Mr. Thomas was fortunately at Munich when the great works of Cornelius, Heinrich Hess, Schnorr, and Kaulbach were in progress, and had the advantage of the experience of the first two professors' names, as well as abundant opportunity of practising the art in the Basilica of St. Bonifacius, so that when the Royal Commission of Fine Arts was formed he was enabled to furnish practical information on the subject, and to be twice successful in the competitions which the Commission instituted. It is consoling to learn that the first attempts in fresco at Munich, as elsewhere, were not entirely successful. Mr. Thomas prefaced his lecture by observing that fresco had been a concomitant of the great architectural epochs, and that therefore the prevalence or disuse of fresco indicated the vigour or decadence of architectural magnificence; that this mode of painting had been preferred by painters and architects in the best days of art, as that best adapted for mural or monumental decoration; that the question of durability even was not so all-important as that of its fitness for architectonic purposes, but that its durability had been fully tested by many of the fine Italian works.

At the beginning of the seventeenth century oil painting was introduced on walls, particularly in France, and the artists looked upon this mode of painting as an opportunity for displaying the effects of foreshortening, perspective, and colour, differing only from the decorations of the theatre by better studied forms and a more finished execution. Oil paintings upon walls into the composition of which lime has entered have always a tendency to become black, notwithstanding all the efforts of a celebrated French chemist to obviate this defect, and although fresco has a tendency to become lighter it is the lesser evil of the two. The resources of oil painting are too abundant for mural works, and require to be subdued and simplified, so as not to transgress a well-understood style of decoration. The Italian masters were always fully impressed with the necessity of adapting their works to the effect of their architecture, so as to make one harmonious whole.

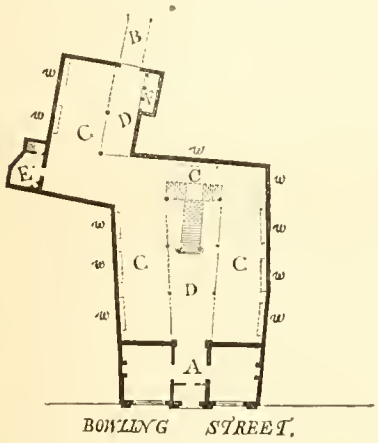
Mr. Thomas then described all the minutiæ of practice, the preparation of the wall and the lime, the implements and method of procedure, concluding by stating that he is aware that fresco has never been in much repute with our painters, but believes this to be but a temporary prejudice which would have been redeemed long ere this had the life of the late Mr. Dyce been prolonged. Mr. Thomas feels convinced that English painters only require more continuous practice and a larger experience in the use of the materials to permanently adopt fresco for mural decoration. It is a method, perhaps, which requires too extensive preparation to be either economical or convenient

for occasional works, but if the contemplated decorations of a building be of sufficient magnitude to engage the artist through several years, no method is better adapted than fresco to architectural embellishment. It is important, too, that English architects should learn that both the Italian and Munich decorations were not afterthoughts, but intended in the first conceptions of the architects, and that the painters in some cases commenced their designs and cartoons before the foundations of the buildings were laid, or at all events simultaneously proceeded with them.

THE ARCHITECTURAL MUSEUM.

THE removal of the collection of the Architectural Museum from Kensington to a place more accessible to students and art workmen, for whose benefit and instruction it was formed, has for a long time been contemplated by the Council; but the great difficulty in finding suitable premises or a convenient site has hitherto proved an impediment to the carrying out of their project. After patiently contending for a long time with these and other difficulties, the Council at last see their way to the realisation of their object. They have been fortunate enough to secure an excellent building site near Westminster Abbey; and by erecting a building in this neighbourhood, not far from the original site of the Museum—Cannon-row, where it is admitted on all hands that it did more good and was more practically useful than it has been since its removal to Kensington—the Council feel sure that their object will be best obtained.

Our illustration shows the plan and street elevation of the proposed new building, the drawings for which are in course of preparation by Mr. Joseph Clarke, F.S.A., who, with Mr. Ewan Christian, are the architects appointed. The site is irregular in form, and has a frontage towards Bowling-street; it is hoped that an entrance will ultimately be obtained from Great Smith-street in addition to that in this frontage. The building will mainly consist of ground floor and two tiers of galleries all round, the stairs leading to which face the entrance; the floors of these galleries will consist of T-iron joists and 2½-inch battens, carried by wrought-iron girders on the front edges of the galleries, and will be supported on cast-iron columns. The building will be lighted mainly by glass roofs, the iron trusses for which have been kindly promised by Messrs. Lucas. The width of the main part of the site is about 50ft.

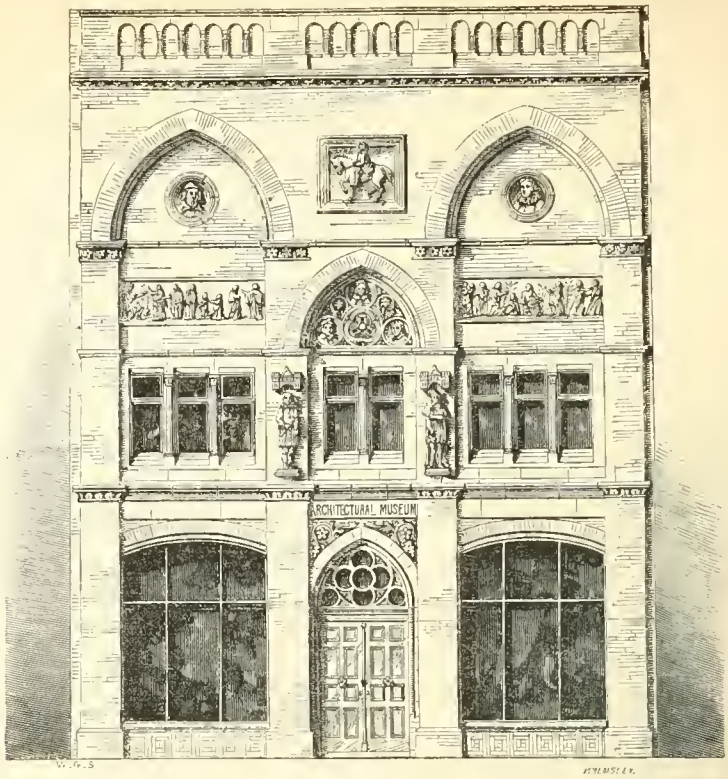


On the plan, A is the entrance from Bowling-street; B, entrance from Great Smith-street; C C C, galleries; D, open spaces; E, curator; F, porter; *w*, wells for light.

The total area of floor-space afforded by the plan is estimated at upwards of 11,000 square feet; and the wall space, augmented by screens, is nearly 14,000 square feet; the old museum in Cannon-row contained about 4,050 square feet of floor-space; so that there will be in the new building ample room for extending the valuable collection of the museum, to which object, after the whole of the Building Fund has been subscribed, the Council intend to devote themselves. The front will be of brick and stone; and it is confidently hoped that the carving, and perhaps some of the other works, will be the gifts of those art-workmen who are most immediately interested in the Museum.

Surely on such an occasion as this all who take any interest in the cause of architectural art and the arts connected with it will come forward with help for the Building Fund, and an annual subscription too. Both will be gladly received by

THE ARCHITECTURAL MUSEUM.



the President, A. J. B. Beresford Hope, Esq., M.P., Arklow House, Connaught-place, W.; the Treasurer, G. G. Scott, Esq., R.A., 31, Spring-gardens, S.W.; or the Honorary Secretary Joseph Clarke, Esq., F.S.A., 13, Stratford-place, W. The subscription of members is £1 1s. and upwards per annum (giving additional privileges); of students, 10s. per annum; and of art-workmen, 5s. per annum.

There is every reason to hope, then, that the Architectural Museum will shortly be able to supply, in a much more perfect manner than it has hitherto had the means of doing, that great and increasing want now so much felt by the public, architects, artists, art-workmen, and others—the means of study and reference to the architectural and other fine arts of former ages. For the furtherance of this object, donations or loans of specimens, casts, engravings, photographs, books, models, &c., of various objects of art, and rubbings of brasses, impressions of seals, ivory-carving, &c., &c., will be gladly received; the Council also solicit assistance in the shape of lectures on various subjects in connection with the objects of the Museum. The annual lectures and prizes will still continue to be given.

COURTS OF JUSTICE.

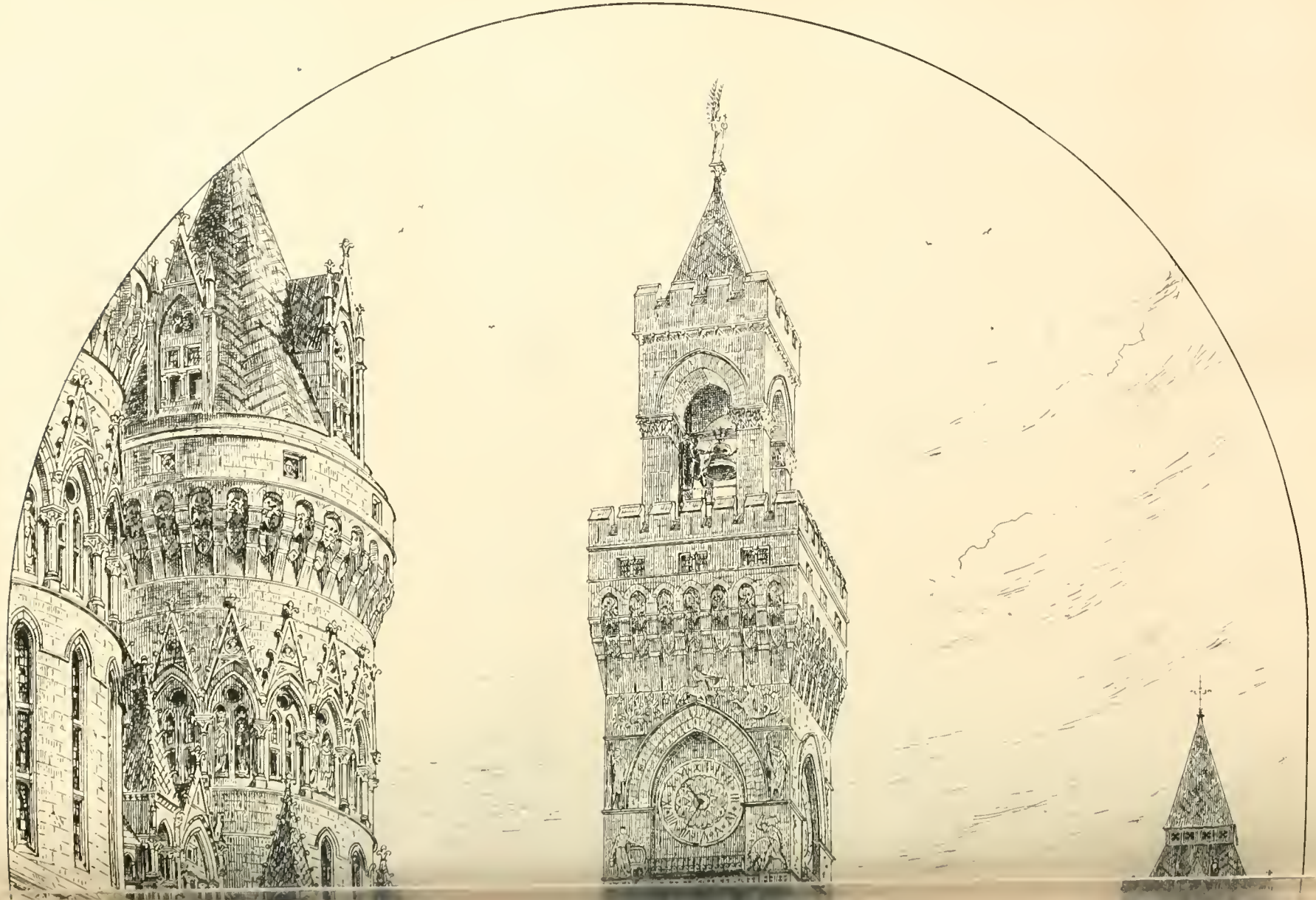
WE give this week a view of Mr. Burges's design, taken from the Strand, showing the front from the Central Entrance Gateway to the new Temple Bar. This last-mentioned feature, flanked by the clock tower on the north and by the Barristers' staircase tower on the south, is one of the noblest pieces of architectural composition in the collection of designs at Lincoln's Inn. As we have already said, the weakest points about the Strand façade are, 1st, the way in which the round superstructure of the towers which flank the grand entrance are united to their square bases; and 2nd, the over strong development of the machicolated cornices, which contrast so very forcibly with the moderated cornices of the main structure.

NEW FOUNTAIN FOR EDINBURGH.

A MAGNIFICENT contribution to the embellishment of the city of Edinburgh has been made by Mr. Ross, of Rockville, who has given £2,000 towards the erection of a fountain in the East Princes-street. The fountain, which will be chiefly constructed of bronzed cast iron, will stand on the upper terrace of the garden, midway between the Scott Monument and the Wilson Statue, and will necessarily be a conspicuous object. The design is by Durenne, of Paris; and a small copy of it was shown in Kensington Gardens during the Exhibition of 1862. It is a splendid work of art—graceful in outline and elegant in detail; and we (*Scotsman*) believe that in size and beauty it is not inferior to any modern fountain in Europe. The entire cost is calculated to be not less than £3,500. The fountain consists of a circular basin, 60ft. in diameter, within which is a highly ornamental basin of smaller dimensions, rising 3ft. or 4ft. above the surface of the water in the lower basin. The inner basin is twelve-sided, and discharges its water through lions' heads placed at the angles. From this basin the superstructure rises in several stages, the first of which consists of a circular pedestal, divided longitudinally into four sections by richly carved buttresses. The base of the pedestal is plain, but in the upper part of each of its four compartments are two mermaids in high relief, who support vases, from which, as well as from lions' heads occupying the spaces between them, water flows into a huge scallop shell, and thence trickles into the basin below. Opposite each of the buttresses of the pedestal, a horse of the amphibious sort which the sea-god Neptune is represented as employing is placed in the attitude of prancing over the water, bearing on his back a nymph, who supports on her shoulder a basket of flowers, from which a jet of water ascends. Round the top of the pedestal runs an exceedingly rich cornice, on which a basin having four semicircular projections rests. The sides of this basin are enriched with female heads interspersed with bosses and foliage, and project so far that the water discharged through the heads falls clear of the lower part of the pedestal. From the centre of this upper basin a second pedestal takes its rise. It is square in form, and has buttresses at the angles; but is not so highly ornamented as the lower pedestal. Over the buttresses are seated figures representing the Arts and Sciences. From dolphins at the feet of these figures jets flow into the upper basin, while from four lions' heads clustered on a small pillar which rises from the midst of the figures issue jets which are intercepted by semi-circular basins projecting from the pedestal, and converted into beautiful fringes of water. The pillar that supports the lions' heads terminates in a Corinthian capital, on which stands the crowning piece of the structure—a beautifully modelled female figure supporting a cornucopia, from which the water gushes in a bell-shaped jet, flowing clear of the figure, but enclosing it in a temple of water drops. The total height is 60ft. Messrs. Peddie and Kinnear, architects, were entrusted with the selection of the design, and under their superintendence the work will be carried out. Plans for the lower basin, which will be in stone, are already in progress, and no time will be lost in commencing operations. From the nature of the site a strong concrete bed will require to be put in but when this is done, the work will advance rapidly, as the fountain will arrive from France quite ready for fitting up.

Printed by Whiteman & Ba[illegible] A H Hal[illegible] Lith

Proposed · New · Law · Courts, _Strand · View. ___ Mr WILLIAM BURGES, ARCHITECT.



THE ALBERT INSTITUTE, WINDSOR.

At Windsor, of all places, one would expect that a memorial to "the good Prince" would be an imposing structure; but the capabilities of associations as well as of individuals have their limits, and it would appear that the promoters of the Albert Institute at Windsor may not safely reckon upon having at their disposal more than somewhere about £3,000. To the extent of the means at their disposal they have wisely determined to provide, as a distinctly commemorative memorial of the departed Prince, a building that will be both ornamental and useful to the ancient and regal town of Windsor, in a Literary or Mechanic's Institute, with accommodation for lectures, concerts, and such other public purposes as might be desirable or profitable to the community. A general committee of the subscribers was elected to carry their objects into effect. The committee agreed to receive a limited number of competitive designs, and appointed a sub-committee to report upon the designs presented. The competition was limited to five persons and firms, four of them architects and one not an architect. The sub-committee have selected two of the five sets of drawings, and have recommended one in particular. The whole of the drawings are now on view in the Townhall, Windsor; and, having seen them, we offer a few words of comment upon their merits. *In limine*, we think it deplorable folly that the instructions to architects should be so vague as they often are, and as they have been in this case. A first point in the instructions should certainly have been that each competitor should have delivered plans, sections, and elevations upon one uniform scale; whereas there is no uniformity of scale in the competing drawings, the range being from 1-6in. to ¼in. to the foot, which is the scale of the recommended design. This design is in a severe Greek style, and the elevation, upon such a large scale as above named, is certainly a capital water-colour picture. It has a cleverly drawn seated statue of the late Prince, really the feature in this set of drawings, surmounting the principal centre bay, and it looks altogether, as drawn, a very handsome massive building. The Prince's portrait is very well drawn in the statue, which is picked out in white, and cleverly relieved in the background of the niche with a belt of dark blue studded with gold stars, and otherwise set off with particolours. The accommodation provided by this plan by Messrs. Bell and Bacon is inferior, we think, to the arrangements of some of the others. Mr. Sim's design is more intelligible throughout from the completeness of the drawings than that to which we have been referring as recommended. The ground upon which the Institute is to be built is an irregularly-shaped plot with a principal frontage to Sheet-street of 63ft.; it 117ft. on one side, and 93ft. on the other, giving an acute angle on the longest side, which is utilised in the two designs to which our attention was chiefly directed, those of Bell and Bacon, and Sim. The principal features in the instructions appears to have been the provision of a lecture-hall capable of seating 500 persons, a library and reading-room, museum, conversation and committee-rooms, and the necessary waiting rooms, with rooms in the basement for the housekeeper. The five competitors are Mr. Alfred Bedborough, of Southampton, "X. X. X.," Messrs. Robinson and Bradbury, Westminster; Mr. W. Sim, of Danes Inn and Windsor; and Messrs. Bell and Bacon, of Regent-street. The designs of the two last-named competitors have been selected by the sub-committee, the first being recommended. The general committee will in course of next week finally determine which of the two designs is to be adopted. One point specially worthy of their attention is the difference in scale in the two sets of drawings, the elevation of the one, that of Messrs. Bell and Bacon, being on the scale of half an inch to the foot, which of course conveys the idea of a stately building, and admits of the minute delineation of mouldings and ornaments, the drawings of Mr. Sim—plan, elevation, and sections—are on the uniform scale of one-sixth of an inch to the foot, on which minute details can be little more than indicated. No sections are given in Messrs. Bell and Bacon's drawing; in Mr. Sim's numerous sections are given, showing the internal construction and arrangements, that across the lecture-hall, showing its ceiling, &c., being especially important. As regards cost Mr. Sims states that the amount (£3,000) placed at the disposal of the architect leaves little room for ornament, but that the Institute, according to his plan, may be finished neatly though plainly for about the amount stipulated, which we venture to think an under statement. Messrs. Robinson and Bradbury, who send in very meritorious drawings, are nearer the mark, we believe, in putting the cost of their design at £3,750. Messrs. Bell and Bacon state, rather vaguely, on the matter of cost, "We have studied to design a building in a style as economical as possible, consistently with obtaining the requisite amount of accommodation, arranged in the most convenient manner, and a good substantial building. We think the cost of the statue may fairly be provided from separate funds; it should be a work of Art to be worthy of the building and its object, and therefore would be necessarily expensive." The lecture-hall in Messrs. Bell and Bacon's plan is 46ft. long by 30ft. wide, and 22ft. high, with a raised orchestra removable, 20ft. wide by 8ft. deep. The hall will seat 400 persons. A gallery is also provided to seat 120. Adjacent to the hall is a ladies' cloak room, and to the front, on the ground floor, are a reading room, and conversation-room, each 24ft. by 18ft.; and behind the reading-room a library, 13ft. square. Behind the lecture-room are two artists' rooms. On the first floor there are museum and class rooms, each 24ft. by 18ft., and a committee room between them 18ft. by 16ft., the division being by movable partitions for conversion of the three rooms into a ball or supper-room of the whole width of the building, 55ft. 6in. We do not notice any provision for the ventilation of the lecture-hall, but observe the novelty in Messrs. Bell and Bacon's plan that in case of an alarm of fire, means of egress would be provided by three of the windows. An octagonal Italian tower on stone pillars surmounting the centre bay is an essential feature in the elevation, but we cannot discover from the plan how this tower is to be supported on the inner side otherwise than upon the roof—a serious constructive defect. The front elevation of Messrs. Bell and Bacon's plan shows a projecting bay with a winged principal entrance, and three windows corresponding upon the first floor, surmounted by a niche for the statue. Two windows for the ground and second floor are shown on each side of the central bay. Turning to Mr. Sim's design, which is in the Italian Classic style, it also has a projecting central bay for the principal entrance and three windows on each side. The vestibule and hall, though of ample width (10ft.), are considerably narrower than those on Messrs. Bell and Bacon's plan (18ft.), which seems a waste, the space thus economised being thrown into the rooms to the right and left, which are—to the front on the right-hand side a committee-room 22ft. 8in. by 16ft., and behind it a conversation room 22ft. 8in. by 10ft. 6in.; and on the left, library and reading-room 22ft. 8in. by 27ft., and behind it an ante-room 16ft. 3in. by 10ft. The lecture-hall at the back of the premises, where it is placed in all the designs, is in Mr. Sim's plan, 45ft. 6in. by 34ft. 6in. It is provided with six ventilating shafts which discharge upon the roof. We notice also that the convenience of a lift is provided from the basement to the first floor. The lecture-hall will provide seats on the ground floor for 416, with a gallery to seat 116—in all 532. Ladies' and gentlemen's waiting-rooms and other conveniencies are also provided. Mr. Sim's first floor provides a billiard-room 27ft. by 22ft. 8in.; museum room, 31ft. 2in. by 13ft.; and a class room, 22ft. 2in. by 11ft. 3in. The ceiling of the lecture-hall, we notice from the section, will be coved and crowned by an ellipse, the height being 21ft. to the top of the first cove, and 29ft. to the apex. We notice the contrast that in Messrs. Bell and Bacon's plan the lecture-hall is lit on only one side, in Mr. Sim's on both sides. The waiting-room, lavatory, and closet accommodation on both floors in Mr. Sim's plan is very ample for the sexes, but some of these provisions are almost left out of consideration in the other plans; his economisation of space and generally convenient arrangements, his provisions for lighting and ventilation, and the adaptation of his design to the miscellaneous educational, social, and festive purposes to which the building is likely to be devoted, are ingenious and judicious, and we cannot but think that the committee may go further and fare worse than by adopting the plans of their townsman.

SEFTON PARK COMPETITION.

The premium of three hundred guineas, which was offered by the Corporation of Liverpool for the best plan for laying out the Sefton Park, has been awarded to Messrs. André and Hornblower. The latter gentleman is a well-known architect of many years' standing in Liverpool. The estimated cost of carrying out their plan is £85,000. The second premium of one hundred and fifty guineas, has been awarded to Mr. Edward Milner, of Sydenham, whose plan is estimated to cost £122,560. In last week's number of the Building News, we spoke in very favourable terms of both these designs.

PARIS EXHIBITION.

The following minute has been recently passed by the Lords of the Committee of Council on Education with reference to the visits of teachers to the Exhibition:—I. In accordance with the practice of the Science and Art Department at the International Exhibitions at Paris in 1855 and in London in 1862, they consider it desirable to offer encouragement to the masters teaching in schools of science and art to visit the present International Exhibition at Paris, with the view of studying those objects which may be likely to benefit the instruction given in such schools. II. Their Lordships therefore announce to the certificated masters now engaged in giving instruction in schools of science and art connected with the Department, that they will pay to each such master or mistress visiting the Paris Exhibition, the sum of £5 in aid of their expenses, and to each an additional sum of £2 for any report or any useful suggestions which any such teacher may make (in respect to his or her duties or teaching) derived from the study of the Exhibition, such report having first been published in any journal, local or otherwise, and afterwards approved by their Lordships. III. And further, to each of the three best of such reports referring to instruction in science and to each of the three best reports referring to art, they will give respectively the following prizes in addition to the sum above named, namely:—For science, for the best report, £20; for the second best report, £15; and for the third best report £10; and the same sums respectively to the three best reports for art.

The *Times* gives the following hints to visitors about to proceed to Paris:—"Englishmen who purpose to come to Paris in the ensuing holidays must remember to bring their photographs with them. This is the last new invention of the French to secure that season tickets shall not be transferred. There are three classes of season tickets. First of all, there are the tickets of exhibitors and their agents. Hitherto there has been no photograph attached to these, but there is an intimation in the *Moniteur* that the photographers of the Exhibition are now ready to give the finishing touch to them by affixing to them the likenesses of their possessors. Next, there are tickets for visitors, which admit to the Exhibition at all times, from the beginning to the end of it. These have a portrait of the owner, a little bigger than a postage stamp, gummed upon them.

Lastly, there are the weekly tickets, and it is in these that our English friends are chiefly interested. The price of admission to the Champ de Mars is a franc; and when it is announced that the price of a weekly ticket is six francs, most persons will be disposed to say that it is not worth while to compound for the difference. But they are wrong. There are certain reserved hours of the morning when the price of admission is a couple of francs; there are certain gates of entrance, also, where the price is more than a franc; and there are certain supplementary exhibitions in the park and elsewere, the proprietors of which have authority to levy tolls. The weekly tickets at six francs cover all expenses of admission to the Exhibition, at all its gates, at all times when it is open, for a week from the day of issue, and they admit to all the supplementary parts of the Exhibition. The visitor who wishes for such a ticket will present his *carte de visite* at the proper office. The ticket, a thin strip of printed paper, will be gummed across his portrait, leaving the head visible, and the official stamp of the Imperial Commission will then be) not printed, but) embossed upon it, so as to prevent the possibility of fraud. The whole process is the work of a minute, and does some credit to the ingenuity of the French commission."

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE following are the more interesting portions of the report of the council to the annual meeting which will be held on the 6th inst. The council are glad to be able again to present a favourable report of the condition of the Institute, and to record that a considerably larger increase in the number of its members has taken place during the last than in any previous year. Since the last annual meeting fifteen fellows (three of whom were previously associates), twenty-three associates, four honorary fellows two honorary and corresponding members, four students, two temporary students, and one contributing visitor have been admitted.

The Institute has to regret the loss by death of two fellows, Mr. S. Angell and Mr. G. O. Leicester; of an honorary fellow, Sir R. Smirke, R.A.; of two associates, Mr. E. Blatchley and Mr. W. Hodgkinson; and of two honorary and corresponding members, Monsieur Guy, of Caen, and Monsieur J. I. Hittorff, of Paris, a memoir of whom by Mr. Donaldson, has appeared in one of the "Occasional Papers" of this year.

One fellow, and one student have retired; and one fellow and one associate, not having paid their subscriptions, have in conformity with the bye-laws, ceased to beloug to the institute. The Institute now (May 1867) consists of 260 fellows, 235 associates, 15 honorary fellows, 10 honorary members, 72 honorary and corresponding members, 13 contributing visitors, 12 students, and 2 temporary students. In May, 1835, there were 61 fellows, and 21 associates; in January, 1851, 124 fellows, and 104 associates; and in May, 1867, 257 fellows, and 221 associates.

The council cannot suffer the period of the presidentship of their honorary fellow, A. J. B. Beresford Hope, Esq., M.P., to terminate without some expression of their lively gratitude for his valuable services and unremitting exertions in behalf of the interests of the Institute and of the profession, both in the House of Commons and elsewhere. To him they owe the acquisition, by the gracious sanction of her Majesty, of the title of the Royal Institute of British Architects; as also the large and important accession to the number of honorary fellows, which has been trebled through his influence.

The alterations in the regulations of the voluntary architectural examination, at the closing ordinary meeting of the last session of the Institute upon the recommendation of the revising examiners, involved the certainty of a biennial examination after this year, even if only one candidate should be approved by the council. Although this prudent foresight has been justified this year) as no adequate number of candidates have presented themselves, the council owe their thanks to those members who promised their services, if necessary, as examiners and moderators. As these examinations have been arranged with great care on the part of the Institute, it is to be hoped that they will be appreciated and used by the younger men in the profession, for whose advantage they have been established

At a special meeting (held March 25) it was agreed to recommend M. Charles Texier, of Paris, honorary and corresponding member, to her Majesty's most gracious consideration for the royal gold medal of 1866, a recommendation which her Majesty has since been subsequently graciously pleased to approve.

The council regret that but few drawings were sent in competition, and only one essay submitted for the medals and prizes offered by the Institute. The only award made at the meeting held on March 25, was the students' prize, to Mr. W. Howes, of 12, John-street, Adelphi.

No award was made this year of the Soane medallion, of the prize offered by Mr. Tite, M.P., or of the prize offered by the late Sir. Francis E. Scott, the designs submitted not having been deemed worthy of premiation.

It is hoped the list of subjects for which the prizes for the next session are offered, may attract a larger and more worthy competition. By the kindness of Mr. Tite, this list is supplemented by the prize offered by him, of the value of forty guineas; while that of the late Sir Francis E. Scott, Bart., has been increased to twenty guineas by the liberality of the president, A. J. B. Beresford Hope, Esq., M.P.

The Pugin travelling studentship has been bestowed this year, by the council, on Mr. Henry Walker; and the sum of £40, the proceeds of the fund for the previous year, has been paid to Mr. Hubert J. Austin, who was appointed travelling student, 1866 the council having approved the drawings and the description of his tour which he had submitted.

The board of examiners, appointed by the institute under the Metropolitan Building Act, 1855, have held four meetings, at which eighteen candidates were examined, six of whom having been recommended to the council by the board, have received certificates of their competency to discharge the duties of district surveyor.

The following valuable, and in many cases illustrated papers, have been read at the ordinary general meetings of the Institute, since the last report:—

"On Battle Abbey and its Conventual Remains, with Additional Illustrations of the Conventual Arrangement of Benedictine Abbeys," by Rev. Mackenzie E. C. Walcott, M.A., F.S.A. "On the Practice of Architects and the Law of the Land in Respect of Easements of Light and Air," by Professor Donaldson, Past-president. "Some Remarks on the Mediæval Antiquities of Durham," by J. Tavenor Perry, Associate. "On the Measurement of the Obstruction of Ancient Lights," (further investigation), by Mr. W. White, Fellow, F.S.A. "On the Problem of Providing Dwellings for the Poor," by R. Kerr, Fellow, with several discussions following. "On the Present Condition of Architecture in the United States," by W. Ware, Esq., member of the American Institute of Architects. "On the Photographs taken for the Architectural Photographic Society, in the year 1866," by E. W. Godwin, F.S.A., Fellow. "Notes on the Recent Excavations made at Cambuskenneth Abbey," by W. Mackison, F.S.A. Scot., Fellow. "On the Churchyard Cross," by Rev. E. L. Cutts. "Remarks upon Failures in Construction," by E. Nash, Fellow. "On Pedantry in Architecture," by J. Boult, Fellow.

The Committee for the "Conservation of Ancient Monuments and Remains" has considered such questions as were brought before it, bearing upon the threatened destruction or injurious "restoration" of ancient building, and are gratified ao state that in the cases of the interesting ancient gateway at Tenby, the screen in the Church at Christchurch, Hampshire, the tower of St. Giles's Church, at Taunton, and the Church of St. John, at Leeds, the remonstrances were listened to, and these relics of the past have been preserved.

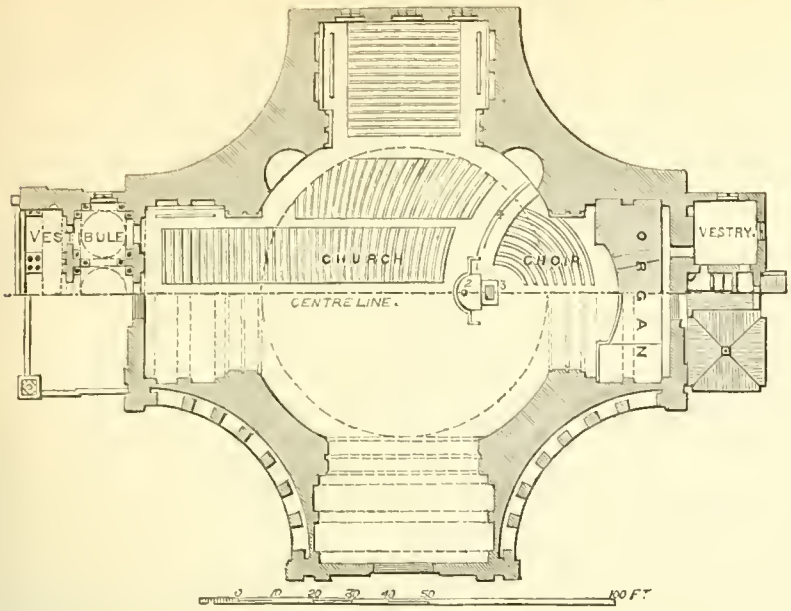
The Council is able to report a very marked improvement in the state of the finances of the institute, for, whereas in December, 1865, the balance was about £143, with liabilities of over £52, the balance in December, 1866, was over £242, free of all liabilities.

The important competitions for the proposed new National Gallery, and for the concentration of the Law Courts, have, on the whole, been conducted hitherto in a fairer spirit than has often been the case. The right principle of remunerating to some extent the labours of all the competitors, has been admitted, and some deference has been paid to the views of the competitors, and of the Institute in their behalf.

A SUGGESTION FOR A CHURCH OF THE NINETEENTH CENTURY.

AT a recent meeting of the Liverpool Architectural Society, Mr. Statham read a short suggestive paper on the above subject. He said he would attempt to sketch a form of church which should combine architectural effect with suitability to the requirements of modern worship and to the pervading artistic and religious feeling of the present age. Mr. Statham went on to say, it is assumed that the essentially congregational character of modern Christian worship demands, both in an æsthetic and a practical point of view, a wide central area, unencumbered by piers or pillars, rather than the long and narrow avenues, with intervening arcades, which characterise the essentially processional church of the middle ages; and the form of the Greek cross has been adopted, as furnishing a sufficient abutment for a large dome, without materially interfering with the unity of the plan. The reading desks (or reading desk and pulpit) are brought sufficiently far into the church to be visible in every part of it, and the font placed in a conspicuous position between them; the symbolism of placing the font near the entrance not appearing of sufficient importance to counterbalance the inconvenience of obliging the clergyman to traverse the whole length of the church, and the whole congregation to turn round, whenever the baptismal service is performed. The communion table occupies the place which it did in the earliest Christian churches, forming the centre of a semicircle of seats, which in ancient days were occupied by the inferior orders of the clergy, but are in this case appropriated to the choir, who are thus placed so that their voices may be audible both to the congregation and to each other; a space being left between the choir and the communion rail sufficiently wide for the passage of the clergyman in administering the sacrament. Behind the choir is placed the organ, which thus might be made a striking central object opposite the entrance of the church, and would be in a position where its sound would have room to expand and develope itself, instead of being smothered in the "organ chamber" which has lately come into vogue, and which is perfectly fatal to the effect of the instrument. The vestries (which might also be libraries) for the choir and clergy are reached by passages under the organ. The whole of what may be called the executive department of the church is thus brought into close contiguity, being planned in fact upon the same considerations of convenience and economy of space which are habitually acted upon in designing lecture rooms, concert halls, &c. The external form of the plan, with the four segments of circles abutting against the dome, and also the radiating buttresses round the base of the dome, were suggested by Wren's original design for St. Paul's Cathedral; a much finer design in some points than the one executed. The statues between the pilasters are intended to represent persons eminent in religious history, the panels beneath containing bas-reliefs representing some important event in which they took part. Internally the small panels in the wall would be occupied by designs in fresco or mosaic illustrative of the Creed and the Lord's Prayer; while the four large niches at the angles of the church, would furnish opportunity for the introduction of high class groups of sculpture, either allegorical or illustrative of events in New Testament history. The dome is intended to be constructed on the cellular principle—thin ribs of masonry springing from each of the buttresses at the base, connected together by the inner and outer dome; and at the weakest point a strong continuous timber bond is introduced. The eye at the top of the dome is covered with an ornamental iron finial. The whole of the building is shown to be roofed with stone; for whenever a lighter and more fragile material is used for the roof than has been employed for the walls, the monumental character, so suitable to a building of this class, is at once lost. Without claiming any artistic merit for the design (which, indeed, is little more than a sketch), it may be remarked that the attempt has been made to obtain something of that repose and stability of expression which characterise what is generally called Classic architecture, and which seem to arise mainly from the employment of two invaluable sources of architectural effect, a good deal neglected in the present day—viz., breadth of wall space and continuity of horizontal line. The ornamental details, however, would be executed with the Gothic boldness and depth of shadow necessary

A SUGGESTION FOR A CHURCH OF THE NINETEENTH CENTURY



in a northern climate; while it is hoped that the general expression of the building would be not inconsistent with the cheerful and practical character which belongs to modern Christianity. It is needless to observe that such a building, carried out according to the above propositions, would be an expensive one; but the general plan and arrangement, which form the basis of the whole, might be equally well realised on a smaller scale and with cheaper materials.

The President said the design certainly did away with a great objection to the present style of ecclesiastical architecture—the columns which separated the naves from the aisles, and which prevented the preacher being seen by many of the congregation, and interfered also with the sound of his voice.

Mr. Heffer said he believed the principles were right, but he should like to see Mr. Statham bring before them something more applicable to the wants of the present time, as far as money was concerned. He should like to see a design, based on the same principles, which could be carried out for £1,000.

Mr. Boult said the principles which Mr. Statham had suggested were quite as capable of being adapted to an expenditure of £1,000 as the principles of York Minster or those of the Pantheon at Rome; therefore, he did not exactly see the point of Mr. Heffer's observations. He was extremely glad to see an attempt made to design churches on independent principles. The Basilica string had been fiddled upon for nearly twelve centuries, and he thought it was pretty nearly time the professional Paganinis took up some other chord; and if Mr. Statham's suggestions should meet with favour and be adopted, he thought it would be a gain to the profession and to the public. The first principle in all Protestant places of worship, he took it, was that the service should be audible and accessible to everybody present. It was not a religion of display and parade, but it was one in which it was assumed that every member of the congregation was alike interested—the humblest and the remotest with those who occupied the high seats at the altar; and, therefore, the building should be designed so that everything that passed whether the monotone in the pulpit or the full choral service, should be alike heard and appreciated by every one present. In many respects he thought Mr. Statham's suggestions met that desideratum, and he thought the society was indebted to him for having embodied his idea in the form in which he had brought it before them.

ORGANS.

A new organ has just been provided for Providence Chapel, Hanley, at a cost of £180. Messrs. T. Halmshaw and Sons, of Birmingham, were the builders.

A new organ, by Mr. Wyatt, of Leamington, has been placed in the Catholic church at Warwick. The foundation of it is laid for twenty-two stops, but there are at present only sixteen provided; and among this number is a double diapason, 16ft. open, and a new stop of a true flute intonation, also another stop in the swell named the horn diapason. Mr. Wyatt has also built a new organ for the Wesleyan chapel in the same place.

Mr. Walker, of London, has built a new organ for the church of St. Giles's-in-the-Fields, at a cost of £420. The organ was opened on Easter Sunday.

Building Intelligence.

CHURCHES AND CHAPELS.

A new Congregational chapel has been erected in Whitechapel-road, at a cost of £5,200. The architect is Mr. T. C. Clarke, of Leadenhall-street.

St. Michael's Church, Monckton Combe, was last week consecrated by Bishop Anderson, of Clifton. The church will seat 300 persons, and has cost £1,533.

The corner stone of a Primitive Methodist chapel, in Petre-road, Sheffield, was laid last week. The building is of pressed brick and ashlar dressings, and is in the Italian Gothic style. It will accommodate over 1,000 persons, and will cost upwards of £3,000. Messrs. C. J. Innocent and Brown, of Sheffield, are the architects.

BOLTON.—On Saturday, the corner stone of the new parish church of Bolton was laid in the presence of the Lord Bishop of Manchester, and several thousand spectators, although the previous part of the day had been very unfavourable. The new structure, the cost of which (about £30,000) will be defrayed by the princely munificence of Mr. Peter Ormrod, will occupy the site of the old church, which had stood there upwards of 400 years, having been erected, it is supposed, about the middle of the fifteenth century. Mr. E. G. Paley, of Lancaster, has furnished the design of the new church. It is in the Decorated style, and embraces a nave with north and south aisles, north and south transepts, a chancel with an aisle on the south, and organ chapel on the north, and a tower and porch. The dimensions of the nave are 114ft. in length, 36ft. in breadth, and 73ft. 9in. from the floor line to the apex of the roof. The aisles are to be 88ft. long, by 17ft. wide. The chancel will measure 41ft. by 28ft., and will be 61ft. high. The transepts are to be 24ft. long by 22ft. wide, and 57ft. high. The principal entrance to the church will be through the tower, which is to be at the western end of the church, and rather more than 150ft. high. The porch will form the southern entrance to the church. The entire area of the new building will be 10,819 square feet, or nearly twice the area of the old one. There will be no galleries, but the ground floor will afford sittings for 1,300 persons. The stone used for the ground from the top of the base course, and also for the plain work of the tower, is from the Bradshaw Quarry; and for the body of the edifice, above the base course, and also for the ornamental work, Longridge stone will be used. Messrs. Cooper and Tullis, of Preston, are the contractors, and it is expected that the work will occupy about two years.

DEWSBURY.—The foundation stone of a new Roman catholic chapel, was laid the other day at Dewsbury. The edifice, which is from designs by Mr. E. Welby Pugin, will cost about £6,000. It is to consist of a nave, with an aisle on the south side, chancel, baptistery, priests' sacristy, boys' sacristy, and porch. It will be in the Gothic style of architecture. A campanile or bell tower is to be placed on one side of the chancel. The roof of the church, which will be of high pitch, is to be open timbered.

FOREST-HILL.—A new church was recently opened in the Stansted-road. The style adopted is a Byzantine manner of Gothic, and it is built entirely of stone and ceiled with wood. The church will accommodate 350 persons, and the total cost, including an organ, was about £4,000. Mr. Henry Fuller was the architect.

GOLCAR.—The memorial stone of a new Baptist chapel at Golcar, near Huddersfield, was laid last week. The chapel will accommodate 1,000 persons, in addition to 300 scholars. The cost is estimated at £4,000, and the contractors are—Mr. John Hallewell, Crimble, mason; Mr. Joseph Thornton, Golcar, joiner; Mr. Jonathan Shaw, Golcar, painter and plasterer; Mr. Fawcett, Westgate, Huddersfield, plumber.

HAGGERSTONE.—The Right Rev. Dr. Anderson ex-Bishop of Rupert's Land, acting under a commission from the Bishop of London, consecrated the church of St. Augustine, which is situated in a district in the north-east of London, formerly being a part of St. Leonard's, Shoreditch. The style of the church is decorated, and it is constructed to contain 936 persons. The interior consists of a nave and side aisles of four wide bays with a lofty clerestory and high-pitched roofs: a chancel of extensive dimensions with aisles. The chancel is at present in an unfinished state: but the work indicates that a reredos of unusual size and beauty will fill the space below the eastern window, which is not placed lower than the string-course of the clerestory, and is filled with handsome tracery of the Middle Pointed period. The organ is by Willis and Co., and when complete will have cost £600. The seats are all free, and there is to be daily service. The building, which cost about £10,000, was erected from designs furnished by Mr. William Woodyer, of Grafham, by Mr. Robert Futcher, of the Fisherton Works, Salisbury, under the superintendence of Mr. P. Bentlif. The stonework of the reredos and the carving in the church were executed by Nicholl, of Lambeth.

LOWER SLAUGHTER.—The venerable church here, which had reached the last stage of decay, has been rebuilt, and was opened on Easter Tuesday. The new church is from designs by Mr. Ferrey, of London. It consists of a chancel and nave (built on the old foundations), a tower (with spire), organ chamber, and vestry. The chancel is of the First Pointed, and the nave, tower, and north aisle of the Geometrical and Decorated periods. The details of the interior are of the Early English type. The arches, venerable relics of the old church, are of a transitional character—from Norman to Early English. The walls are built of local stone, lined with ashlar internally, the quoins, window and door dressings, &c., being of Farmington and Bath Corsham Down stone. The nave and aisle have open stained fir roofs, and the chancel has a polygonal panelled ceiling. The contractor is Mr. Oliver Estcourt, of Gloucester.

ROTHERHAM.—A new Congregational church was opened here last week. It is in the Gothic style, modified in the interior to suit the requirements of the Congregational form of worship. Accommodation will be afforded for nearly 1,000 worshippers, and the total cost of the new erection will be upwards of £4,100. The plan of the church is cruciform, with a nave and two transepts, there being vestries and other rooms abutting on the west end of the nave, where, also, there is a tower and spire 130ft. high.

BUILDINGS.

There are six lighthouses now in process of construction by the British Government—one situated on the Little Basses Rock at Ceylon, one on the Roman Rocks at the Cape of Good Hope, two in the Bahamas (on Castle Island and Imagua Island), one on Sombrero Island, and one on the Dellamara Point at Malta.

Blackburn.—The foundation stone of St. Thomas's Schools was laid by the Mayor on Easter Monday. The building will be from designs by Mr. James Bertwistle, Blackburn, and after the type of ecclesiastical structures of the Early English period. In the centre portion will be an infant school, 60ft. by 30ft., with class-room 30ft. by 20ft., the sides being the boys' and girls' schools, 65ft. by 20ft., with class-rooms 20ft. by 16ft. The building will be set back 40ft., having infants' playground and gardens in the front. There will be two separate porches, with archways, forming entrances to the whole of the schools. The boys' and girls' schools will also have separate side entrances, with lavatories, large open playgrounds, out-buildings, &c. The roof will be open-timbered, having curved principals, surmounted by a large ventilator, and each gable will finish at the apex with an ornamental cross. Messrs. Lewis and Gudgeon are the contractors for the masonry. The schools will be built of Haslingden Grane pierpoints, with freestone dressings, and quoins at the angles. The infant school will be first proceeded with, and the estimated cost is about £1,000.

St. Andrew's.—The foundation tone of a new College Hall for the accommodation of young men attending the University of St. Andrew's, was laid last week with full Masonic honours by Mr. James Whyte Melville, Grand Master Mason of Scotland. The architects are Messrs. Brown and Wardrop, Edinburgh. According to the plans, the general style of the building is Gothic. It is to be four stories in height. It is to contain accommodation for upwards of forty students, and there are thirty-six bedrooms and other necessary rooms. The building has 120ft. frontage, consisting of centre blocks with side wings. The plainness of the building is relieved by gables with ornamental finials, pointed window panels, with niches for figures. The principal entrance is by a porch in the centre block from the north side. Grounds are to be laid out for recreation purposes.

TO CORRESPONDENTS.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the Editor, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

Received.—H. G.—A. C.—J. L.—D. H. and J. N.—T. T.—M. T. S.—A. R.—D S.—H. O.—W. and W.—T. P. and Co.—S. F.—P. and Sons.—J. H.—H. W. B.—J. C.—V. and Co.—H. M. and Co.—W. H. B.—J. H.—G. H. G.—F. P. N.—J. G.—H. H. S. P.—J. A. H.

"A Constant Reader."—Go to school, or if that won't do, whistle.

Correspondence.

MODERN ARCHITECTURE.

To the Editor of the Building News.

Sir,—The criticism, if it deserve the name, of the *Westminster Gazette* reviewer upon Mr. Burges's Law Courts is remarkable for its strength of ill-feeling and weakness of argument. That so blind an advocate of Mr. Pugin should so far agree with him as to see nothing but faults to be avoided in all the Law Court designs is not to be wondered at. Belief in Mr. Pugin, absolute and unreserved—belief, too, in him to the exclusion of all others, characterises the criticisms in the *Westminster Gazette* and *Tablet*, for is he not the Catholic architect? Can any good thing come out of Galilee?

I don't pretend to understand all that he has written. I don't quite know how a building can lack principle. I know what an unprincipled man is, but cannot affix a definite meaning to an unprincipled clock tower. Again, I think when I was a boy I used to know that certain Greek cities were autonomous, and that autonomy meant self-government; but why a building is to be condemned because it hath no autonomy or self-government I confess that I am at a loss to make out. But there is plain English enough in certain parts of the letter, and upon it I will make, with your permission, a few remarks. The building is said to want connection—to possess no vertical lines. This objection arises from the critic's inability to comprehend a large building. No artist would have cut up the Strand façade as suggested. No doubt if Mr. Pugin had given us a design for so large a building we should have had lots of sandwiches, with compressed sharp-pointed arches squeezed in between slices of buttresses, or with the buttresses cutting off the sides of the archivolts, and other quaintnesses and tricks, useful to disguise art power, which are so prevalent in certain schools of architecture. Such cutting up would have caused the loss of all breadth of effect. There is a grasp of the subject as a whole in Mr. Burges's design which is no doubt quite unintelligible to the reviewer and his assistants, and so he finds fault with Mr. Burges multiplying the parts, as for so large an edifice any good architect would do, and depending for vertical effect upon the towers rising, as they do, from the ground. The main gable is said in one clause to be unconnected with anything, and two lines further on its lateral shaft is said to be apparently supported by a smaller shaft in the story below; both statements are equally absurd. The gable with its shaft of 20ft. is considerably recessed and rises from behind a parapet. It is much more practical to make the gutter in front, and the gable should be made useful and allow a free circulation of persons all round the building, than conducting the gutter through the cill of the gable window. Notwithstanding the writer's certainty of the walls being drenched, I have no doubt that it is within the capabilities of science to make both cills and gutters watertight. Upon mere matters of taste and proportion, as the comparative size of the top of a finial and of a man, or the proportion a rose at the top of a building should bear to circles containing half figures at the bottom, I will not enter into a controversy with the writer in the *Westminster Gazette*, nor will I more than notice his extraordinary mis-statement, that the stories in the Strand front could be moved as slides without injury to the design or strength!

All above the cornice is said to be a rechauffée of a much bolder work. This I deny altogether. It is somewhat stronger than the lower part, to compensate for its greater distance from the eye.

If this writer had been less sweeping in his attack upon all the designs sent in by architects, some at least with the highest reputation in the profession, and I may add if he had been a less interested critic, he would have had more chance of persuading his readers.—I am, &c.,

Your Correspondent.

FOLKESTONE COMPETITION.

Sir,—"Patience is a virtue," as everybody knows (particularly architects), but when I tell you that the competitors who sent in designs for a terrace of houses at Folkestone, advertised in your columns last October, have not yet received any reply, I think you will agree with me that a little impatience thereat can be no vice. The competitors in the Yarmouth competition were allowed the opportunity of seeing the designs sent in; the affair has been settled, and some of the drawings are now in the Architectural Exhibition. But in this case we are not allowed to see the designs, and we have every reason to suppose that our drawings are getting dirty and unfit for exhibition (which was the chief object in view in getting them up, of others besides myself), in the South-Eastern Railway Company's surveyor's office, because that gentleman will not trouble himself, or has not time to examine them.—I am, &c.,

A Competitor.

London, May 2.

Intercommunication.

QUESTIONS.

[367.]—CUBICAL QUANTITY.—Would you or some of your practical readers kindly inform me how best to obtain the cubical quantity of stone in Gothic or other arches, labels, &c., from ½ scale drawings, which seldom, if ever, show the joints; and also tell me what addition should be made to the length of lead gutters in estimating for laps and drips. Student.

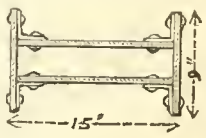
[368.]—LINE OF EQUILIBRIUM.—Can any of your readers inform me how to find the line of equilibrium or pressure in an arch. The books I have referred to are generally very vague. By inserting this in your "Intercommunication" you will greatly oblige. W.

[369.]—SQUARING DIMENSIONS.—I shall be very pleased to learn through your "Intercommunication" whether there is a shorter way of squaring dimensions other than by duodecimals or practice? W. Carter.

[370.]—CULVERT.—Will any of your readers kindly inform me of the minimum area required for a culvert with a fall of 1 in 10, to carry or convey the same quantity of water as a culvert with, an area of 60ft. and a fall of 1 in 400. Also, whether or not the smaller culvert would require the full amount of 60ft. area at the mouth or entrance, supposing an indefinite distance to intervene between culverts. T. C. T.

[371.]—PLASTER CEILING.—I should feel obliged if any of your readers would give me a little information through your valuable "Intercommunication" with reference to making a good firm plaster ceiling, I mean one that will stand without cracking and breaking, as so many do. It is very seldom one sees a really good ceiling twelve months after being finished; and as it is impossible to make one that is cracked look well, either with whitewash or paint, I look upon it as an inquiry of some importance how a good solid ceiling can be made. If any one practically acquainted with plaster work would have the goodness to give a few plain directions with regard to preparing the materials, and best manner of applying the same, he would confer a favour on A Lancashire Man.

[372.]—WEIGHT ON DOUBLE GIRDER BEAM.—As a subscriber to your valuable journal, the Building News, perhaps yourself or some of your engineering correspondents, would give me an answer to the following question:—What weight would be safe to place upon a wrought-iron double girder beam 16ft. 6in. bearing, 15in. deep, top and



bottom 9in. broad, of the best ½in. plates, put together with 3in. angle irons?

REPLIES.

[316.]—FIREPROOF BUILDINGS.—It may appear to be somewhat out of date to reply to a question which appeared in your columns some weeks since,* in respect of fireproof buildings, but as the subject is one of much importance, and no one has attempted to deal with it, perhaps I may be allowed to offer a few observations in answer to "Waterproof." My own impressions have long been favourable to a totally different mode of constructing large buildings—so far as their preservation from fire is concerned—to that usually employed. In my opinion, all the iron girders which support the various floors and the roof of an intended fireproof building should be made hollow, and connected upon an arterial system to a tank of water placed on the highest part of the edifice. An adequate supply pipe from the tank would convey the water in case of emergency to each floor. A series of sluice valves, fitted with spindles to make them accessible from the outside of the building, should also be placed on the supply pipe on the various floors. The bottom plate of each girder should be perforated with holes. Then, if a fire were to break out on any particular story, it is easy to see that, without breaking open doors, &c., to create draughts, the whole of that floor might be inundated, and that in the space of a few minutes. For sustaining the floors of warehouses, for example, sets of girders should be used of triangular form (see diagram) in section. These might be bolted together at the joints by means of faced flanges. We should thus get the whole arterial system contained in the floors overhead at very little more expense than that incurred in the ordinary way of fixing girders for carrying the brick arches. There is no good reason why, in some instances, the tank should not be a substitute for a roof. If this were so, one man might have at command the power to flood, if need were, the whole of the floors simultaneously. I have not gone into minute details of this plan for the reason above named, but perhaps enough has been said to set your readers thinking about it, and, as I hope, discussing its merits and practicability, or otherwise. Asbestos.

[347.]—DISINFECTANTS. — One pound of copperas, known as "sulphate of iron," dissolved in 4 gallons of water, will most completely destroy all offensive odours, whether in sinks, privies, or cellars. The warmer the weather, the oftener must the application be repeated. Sprinkling the copperas itself about is advantageous, and, if in cellars, is one of the best means of keeping rats away. X.

[347.]—Chlorine is a perfect one, with the advantage over all others that, being a gas, not a vapour, no trace of it will cling to anything, or remain a minute after the windows have been opened. But neither "J. Duthie" nor "W. Clark" gives the best way of procuring it, and the latter, a very bad way. If spirits of salt be used, and especially with heat, as he advises, much of it will fly off undecomposed, and, though as pungent and suffocating as chlorine, be not only void of its disinfecting power, but highly mischievous, rusting all metal objects within reach by depositing on them a dew of this corrosive acid. Chloride of lime, again, is a manufacture of perfectly vague value, and may contain hardly any chlorine when sold. The only good way, I find, is to get it direct from table salt, by mixing this with three-fourths of its weight of black oxide of manganese, dry, and pouring on it, when to be used, as much sulphuric acid as there is of oxide. No heat is needed, and if it were, the addition of 1 part of cold water would yield abundance. E. L. G.

[355.]—FURNACE CHIMNEYS.—If "Smoke" is going to build a chimney for cotton manufacturing purposes, 150ft. is low enough; if for chemical purposes, 200ft. is the lowest height that it ought to go if it is situated in a populous place, and in a hollow, it ought to be higher in proportion. Of course, the higher the stack the better draught it will have, and consequently need less coals, and the heat will be greater. William Booth.

[361.]—QUALIFIED SURVEYOR.—If "Veremos" will apply at the Inland Revenue Office, and obtain a appraiser's licence, which will cost him two sovereigns, he will be a regular surveyor in the eye of the law. A Subscriber.

* *Vide* Building News, March 22, 1867.

[364.]—INTERCOMMUNICATION. — When "Mutual Aid" wrote the letter which you published last week, he did not fully understand the purpose which "Intercommunication" is intended to serve. I hope your remarks have satisfied him of the importance, as a principle, of giving the questions as well as the replies, whereby you secure for the benefit of all your readers whatever information is obtained. This "mutual improvement" feature of the BUILDING NEWS is a marked success. For practical utility it is far before anything of the kind yet achieved, and if a yet higher standard is to be reached it must emanate from your correspondents. Let those who ask questions be careful to state them in language both clear and precise, so as to exclude the possibility of an intelligent reader being in doubt about the meaning. Let those who send replies bestow similar care on the construction of their sentences, and remember to avoid mere denials or assertions unsupported by facts or process of reasoning; in all cases let the why and the wherefore be given, together with such authorities as can be referred to, if necessary, to give weight to the argument. To show how necessary it is to be particular in these matters, I will take an example from the number issued 21st December, 1866, in which the question No. 167, signed "Excavator," appeared. This elicited four replies the following week, and another the week after that. They occupied not less than 59 lines of print; yet a satisfactory result was not obtained, for the answers all differed one from another, and this in consequence of "Excavator" having so written the question as to admit of several interpretations. Four of the five replies distinctly refer to this ambiguity on the part of the querist. On the 29th March last the following appeared in answer to "B. N.'s" question, 317:—"Impossible! The marvel is, where 'B. N.' got his dimensions from. The tangent of a true curve must be equal. I should advise 'B. N.' to study trigonometry." Signed "Zero." Of what use can this reply have been to "B. N." or to general readers? It conveyed no instruction. Perchance some may have interested themselves in trying to find out the meaning of "the tangent of a true curve must be equal." The marvel is, where "Zero" got the tangent notion from. "B. N." said nothing about it in the question; he simply gave two points on the curve, and their respective distances from a third point outside the curve. If the query was worthy of "Zero's" notice, it should have received from him a more careful consideration, and then, probably, his reply would have been less curt, and more calculated to enlighten the readers. In concluding, I would recommend all those who take an interest in "Intercommunication" to make an index, in which, under suitable headings, to figure the pages of the BUILDING NEWS on which are to be found the useful information which week after week is supplied; very little time is required to do this efficiently, and it will be well repaid in the surprising amount of practical knowledge, all easy of reference, that will have been collected. S. B.

[365.]—ARCHITECTS' CHARGES.—"A. B." will find, with regard to his second question, "would the architect be entitled to 3½ per cent., &c.," that Lord Denman ruled, in 1845, as Lord Kenyon had long before, that no surveyor is entitled to any percentage of the kind, "it being unreasonable to suppose that a surveyor could be entitled to a remuneration fixed upon the amount of bills which he himself was to regulate and settle." No percentage could be recovered unless it be proved that the defendant, at the time of making the original engagement, was informed, and understood, that such were the terms upon which compensation was to be made. In other words, before the architect can obtain it, he must first prove his employer a fool; and in the absence of such proof, the law assumes that architects are, like all professional labourers, capable of finding how to charge for their labour on some rational principle; and that the public, whatever mistakes it may make in hiring brains, can at any rate confine its choice to those evincing this not extravagant amount of sense.
LOOKER-ON.

[366.]—HEATING PRIVATE BATHS.—There is no better plan than by circulating pipes if they are a proper size, say not less than 1¼in. iron, and properly fixed. Iron pipes for the circulation are better than lead; with expansion and contraction lead pipes are liable to give way. To prevent the supply pipe from freezing, carry it to the supply cistern the same way the circulating pipes go. The supply cistern will do fixed 4ft. or 5ft. above the bath, and a light iron cistern for the hot box placed under supply cistern, with vent pipe carried about 1ft. above and bent over into supply cistern. If the bath-room requires warming, and there is room, place both cisterns there. For the scullery or kitchen sink take a branch from the ascending pipe, and if there should be a deficiency of water, the boiler still remains full, and the water will boil and give warning without any danger, and will work as safe as a boiler with open tap. I know apparatuses that have worked on that principle for upwards of twenty years, and are now in good working order. A CONSTANT READER.

WAGES MOVEMENT.

In Paisley, the masons have struck for 6½d. per hour.

The carpenters at Cardiff are still on strike, and there seems no likelihood of a settlement. The strike has now lasted a month.

A resolution was unanimously adopted by the operative painters of Edinburgh, last week, to the effect that intimation should be given to the masters that, on and after the 6th May, the wages be 6d. per hour for 51 hours per week. Overtime to be calculated as agreed upon at the meeting on the 25th February, namely, time and a quarter

BARNSLEY.—The masons and bricklayers of this district have struck. Three months ago they gave notice that they would strike if their employers refused to give 2s. per week in advance of the then rate of wages. Other demands were made, which the masters look upon as being of a very arbitrary character.

STOCKPORT.—Last year the masons here received an increase of wages, and shortened the hours of working. Until now, for an ordinary day's work, they receive 6s., and for a night near 12s. The price of labour has now arrived at such a pitch that cottage house building has all but ceased, for, though rents have increased to a large extent, they must be much higher before a prudent man can build; and this in the face of a reduction in the wages of the factory operatives of 10 per cent. The demand now is for shorter hours, to which the masters say "no;" and are asking the assistance of both operatives and employers, as they contend they are fighting the battle of all who reside in houses.

LEGAL INTELLIGENCE.

ACTION AGAINST A CONTRACTOR.—The Court of Queen's Bench decided the following case on Saturday. A Mr. Adams and his wife brought an action against Sir Morton Peto and others, contractors, to recover damages for an injury the female plaintiff has sustained by reason of the negligent conduct of the defendants in omitting to put a hoarding round an excavation. The defendants were the contractors for making a sewer in the neighbourhood of Blackheath. The defendants' men who were employed at the cutting left it perfectly unprotected when they went to dinner. Mrs. Adams, who was out shopping, was in the act of crossing the road when she fell over some of the works or into a cutting. Her leg was wounded and very much twisted and injured. She was rendered insensible, and was picked up and taken into a shop until she came to her senses. She was then assisted home—only three minutes' walk A surgeon was sent for, and she had to keep her bed for six or seven weeks, during which time she was attended by medical men, and was still suffering considerable pain, and was now an altered person. The excavation was about 12in. in depth, and the colour was the same as the surface. It was about 5ft. wide, and 24ft. long. There was no protection of any kind. The defendant's doctor and foreman came to see Mrs. Adams. Shortly afterwards Mr. Adams made a claim against the defendants, and was referred to their solicitors. The sight of one of Mrs. Adams's eyes was defective. The surgeon charged £10 for his attendances. The defence was, that Mr. Adams had contributed to the accident, and therefore could not recover. Two persons were left on the spot as watchers to prevent persons going across, and called to Mrs. Adams when she was crossing. The granite metal had only been removed a depth of four or five inches. She put her foot into the cutting, and then she fell down. The jury returned a verdict for the plaintiff for £50.

NON-LIABILITY OF CONTRACTOR.—A contractor under the Metropolitan Board of Works having completed a sewer beneath a public highway, and filled up the excavation in a reasonably proper manner, a subsidence of the road took place two or three months afterwards and caused a hole, into which the plaintiff's horse and cart ran in the night time, and suffered damage. It was held by the Court of Queen's Bench that the contractor was not liable.

THE METROPOLITAN BUILDING ACT.—An important case under this act was heard before Mr. Alderman Rose the other day. The summons had been issued at the instance of Mr. John Young, the district surveyor of the eastern division of the City of London, against Messrs. Plucknett and others, the present representatives of the firm of Cubitt and Company, the builders, of Gray's Inn-road; and the process stated that the defendants, being builders engaged in executing a certain work in Harrow-alley, Aldgate, did wilfully neglect to give to the district surveyor, appointed under the Metropolitan Building Act of 1853, notice of the particulars of the proposed works two days previous to the commencement of the said works, and which had been begun contrary to the provisions of the 38th section of the said Act. The circumstances of the case, as stated by Mr. Inderwick, the counsel for the complainant, were briefly as follows:—In September last, a fire broke out in the extensive premises of the London and North Western Railway Company, known as the Haydon-square depôt of that company, which destroyed an extensive range of the warehouses, some of which were underlet by the railway company to Messrs. Gooch and Cousens, the wholesale wool-staplers, and Messrs. Allsopp, the eminent Burton ale brewers, and other persons. To restore the premises the railway company entered into a contract with the defendants, Messrs. Cubitt, and the works proceeded with a view to accomplish that object. In the early part of the present year the operations of reconstruction commenced, and in February last the complainant, Mr. Young, the district surveyor, wrote to Messrs. Cubitt (the defendants), intimating that he had not received, as district surveyor, the usual notice required by the provisions of the Act of Parliament. The reply to the summons was made to the effect that the company was exempted from the necessity of giving the notice suggested, under the provision of the sixth section of the same statute. The real question was whether under exemption could prevail under the facts he was prepared to put in evidence. It was a question of very considerable importance, which Mr. Young, the complainant, had raised, and in which he was supported by the Metropolitan Board of Works. After the evidence of several witnesses, including Mr. Young, had been taken, Mr. Littler, on behalf of the defendants, said that the answer to the summons was framed under the 6th section (as already stated) of the Metropolis Building Act of 1853. That section provided that from the operation of the Act were exempted the royal palaces, the gaols and prisons, county lunatic asylums, the Mansion House, the Royal Exchange, the Bank of England, the British Museum, Greenwich Hospital, and Covent Garden Market; and then added that the special provision on which he relied was that any buildings belonging to any canal, dock, or railway company, and used for the purposes of such canal, dock, or railway company, under the provisions of any special Act of Parliament should be exempted from the necessity of giving notice, as suggested by the summons. The evidence showed that the constructions now in course of construction, with the tramways, lifts, and other appliances, showed that they were destined and intended to increase the traffic of the railway company, who possessed the power to terminate the tenancy of the lessees in twelve months' notice. On these grounds he (Mr. Littler) submitted that the summons must be dismissed.—Mr. Alderman Rose observed that during the progress of the case his mind had been much divided, but on looking at the concurrent circumstances which had been proved in evidence, he was of opinion that the evidence disclosed that the new construction was designed for the purposes of the railway company within the exemption provided by the Act of Parliament, and therefore he would dismiss the summons, but without costs.

General Items.

A handsome testimonial consisting of a silver cup has just been presented to Mr. H. H. Bridgeman, architect, Torquay, by the builders of that town. Mr. Bridgeman, we understand, is about to take up his abode in the metropolis.

Efforts are being made to restore the north aisle of the fine old Norman church of St. Margaret's-at-Cliff, Dover, which is in a very unsound condition.

A correspondent announces the death of William Sandilands (borne on the books of H.M.S. "Victory" as W. Saunders), the last survivor of those who carried the dying Nelson to the cockpit of that ship at the battle of Trafalgar.

A Paris paper says that Rosa Bonheur, the celebrated animal painter, has become insane, her madness consisting in fancying herself an animal, a goat being the creature into which the great artist believes herself transformed.

The annual dinner of the Artists' Benevolent Fund (established 1810) will take place in Freemasons' Hall on Saturday, the 11th inst. The chair will be occupied by Lord de Tabley.

A carved oak font cover, designed and executed by Charles Barnett, of Salford, was presented to the Church of Lymm, Warrington, at Easter, by one of the parishioners.

The estimate for expenses connected with both Houses of Parliament amounts to £55,137. Of this sum £12,198 are required for the completion of the clock tower and for works in New Palace-yard. The supply of gas and oil costs £5,200, and of fuel £1,704. The pay of the police attached to the building amounts to £1,700, and £115 are annually expended for winding and regulating the clock.

The death is announced of Mr. Alfred King, C.E. He was in the seventieth year of his age, and had acted as engineer-in-chief of the Liverpool Gaslight Company for upwards of forty years. During that period he has had to provide gas for a population which has increased from about 200,000 to 500,000 persons.

The streets of Memphis, in Tennessee, U.S., must be in a shocking condition. A paper there states that a valuable cow was recently drowned in the mud "at the corner of Poplar and Orleans-streets." The cow found it too thick to swim in, and not thick enough to skate on.

The Queen has signified her intention of laying the first stone of the Hall of Arts and Sciences on Monday, May 20. The contractors for the building, Messrs. Lucas Brothers, are busily engaged in making preparations for the ceremony. The ground is being excavated to some feet in depth, so as to mark out the amphitheatrical form of the building, and the excavation will be covered in with canvas to protect the spectators of the ceremony from every contingency of weather.

From the *Industrial Partnerships' Record* it appears that there are now between 2,000 and 3,000 shareholders in companies based upon the principle of uniting the interests of the capitalists with the interests of the workers, and there are at least 8,000 to 10,000 workpeople employed by these companies. These numbers are daily increasing. We may add to this constituency a large number of commercial men, friends of social progress, investors, and others, who, though not yet actual participators in the work, are watching the movement with great interest.

In a circular letter addressed to the members of the Royal Institute of British Architects, Mr. Charles Forster Hayward announces his retirement from the office of honorary secretary of the Institute, and declines to allow himself, in compliance with the invitation of the council, to be nominated again for the post. Mr. Hayward's reason is, that he finds the duties too onerous in conjunction with his own private practice as an architect. Mr. Hayward was elected in 1862, and has held the joint office of honorary secretary along with Mr. Seddon since that date. We are sure that Mr. Hayward's retirement will be regretted by every member of the Institute.

On Monday last, M. Charles Texier, of Paris, was formally presented with the Royal Gold Medal, which is annually awarded by the Royal Institute of British Architects to an eminent English or foreign architect, or, as in the present case, to some distinguished author in the field of architectural literature. There was a full attendance of members on the occasion, and Mr. Beresford Hope, M.P., President of the Institute, delivered an interesting address, to which M. Texier, who came from Paris expressly to receive the medal, responded.

The anniversary meeting of the Society of Antiquaries took place on Tuesday, when the office-bearers were elected for the ensuing year. Earl Stanhope, president; Mr. W. Tite, M.P., and Mr. C. W. Martin, M.P., vice-presidents; Mr. Octavius Morgan, M.P., vice-president and auditor; and Mr. Frederick Ouvry, treasurer. Mr. C. Knight Watson was re-elected secretary.

On Saturday evening last, about forty of the workmen employed in the erection of Christ Church, Gipsy-hill, Norwood, partook of an excellent supper provided for them at the joint expense of the church committee and the contractors, Messrs. Aviss and Sons, Putney. The repast, which was served by the landlord of the Paxton Hotel, Norwood, consisted of substantial joints, pastry, &c., with a plentiful supply of ale and punch. Mr. Aviss occupied the chair, and after supper the healths of the committee, the architect, Mr. J. Giles, of Craven-street, Charing-cross, and the contractors, were drunk in a hearty manner, and the men separated at a late hour much gratified with their treat.

A method of inverse filtration has been brought out in Philadelphia, which under some circumstances would be more useful than the direct way as at present practised. It may be thus described:—Cover the mouth of a funnel with a piece of calico or muslin, and plunge the funnel with the mouth downwards in the vessel of liquid to be filtered. To the stem or neck of the funnel, which is then uppermost, attach an india-rubber tube, whereby the whole is converted into a siphon, through which the liquid, after rising through the muslin, flows rapidly, leaving the impurities behind.

The paperhangers in the north-western district of the metropolis at a recent meeting, passed the following resolutions:—"Resolved: That in the opinion of this committee, the course taken by the London Trades' Council with regard to the Royal Commission for inquiring into trades' unions has done a very large amount of injury to the trade societies, and that the said council are deserving of the severest censure of every trade unionist in the kingdom." "Resolved: That no written answers be sent to the form of printed questions which has been sent by the Royal Commission on Trades' Unions."

Vigorous measures are to be adopted for the retention of Epping Forest as a place for public amusement and recreation. A crowded meeting of the inhabitants of East London, convened by the committee of the Commons Preservation Society, was held the other day. The meeting was presided over by Mr. Duffield, of Mile End, who explained the objects of the Association, and called upon the inhabitants of the district to take measures to prevent the enclosing of the Forest by the lord of the manor, as this was the only outlet for recreation of the crowded population of the eastern districts of London. Several gentlemen addressed the meeting, urging the necessity of supporting the society, who intended taking legal measures to prevent this encroachment on their ancient rights. Resolutions were passed, by which the meeting pledged itself to fight the matter out, and the proceedings were brought to an end.

The annual general meeting of the Art Union of London was held on Tuesday on the stage of the Adelphi Theatre. In the absence of Lord Houghton, Professor Westmacott, R.A., took the chair, and was supported by Sir Walter Stirling, Professor Donaldson, Mr. Assistant Judge Bodkin, and Messrs. George Godwin and Lewis Pocock, honorary secretaries. The proceedings opened with the reading of the annual report, stating that the amount subscribed for the past year was £11,345 5s. Among the works which will be distributed among the subscribers next year prominent attention is directed to an engraving of Maclise's famous picture in South Kensington of the play scene in "Hamlet." The reserved fund now amounted to £13,567, and it was decided that next season 792 prizes would be given in addition to the Parian busts to be distributed among those who had subscribed for ten years consecutively. The amount expended on prizes last year was £6,660. The chairman, in moving the adoption of the report, said it was deeply to be regretted that in our Universities and schools the last thing thought of was the study of æsthetics. The knowledge of art was not intuitive, and was only to be promoted by study and experience. The works which the society should offer to the public were those which possessed classic excellence, and at the same time attracted the sympathy of modern thought. He then pronounced an eulogium on art in general, and said that as Dryden had it, "The pencil speaks the tongue of every land." The adoption of the report was seconded by Mr. Assistant Judge Bodkin, and carried unanimously.

It appears from a letter just published from Lord Romily, Master of the Rolls, that in the autumn of last year Mr. Hepworth Dixon, in his tour through America, visited the public library of Philadelphia, and was shown four volumes of original State papers, bearing the royal sign manual of James I. and the signatures of the Lords of his Privy Council, addressed to the Lord Deputy of Ireland. Mr. Hepworth Dixon, being naturally surprised at finding documents of that valuable nature in so distant a part of the world, made further inquiry, and was informed by the librarian that these papers had been originally taken away by the Chancellor of James II., evidently for some political purpose, and at his death were sold to tha founder of the Philadelphia Library, by whom they were presented to the library in question. On inspecting the papers, Mr. Dixon at once saw their value, not only for the historical information they contained, but also as supplying a missing link in the State papers of Ireland. He therefore ventured to suggest to the Library Company of Philadelphia that it would be a graceful act on their part to restore to the British Government papers of such national importance. Mr. Dixon's suggestion was at once received, and he was informed that, if a proper application were made by the British Government, in all probability it would be acceded to. On his return to England Mr. Dixon communicated these facts to the Master of the Rolls, who immediately brought the matter before the notice of her Majesty's Government. The Lords of her Majesty's Treasury lost no time in taking the proper steps, and the Library Company have, in the most handsome manner, restored these valuable State muniments to Great Britain.

A statue to the memory of the late Field Marshal Lord Clyde is to be erected at last. It will be placed on the Parade in St. James's Park. The sculptor, we believe, is Baron Marochetti, who, it is to be hoped, will be more successful in this instance than he has been in his previous works.

MEETINGS FOR THE WEEK.

MON.—Royal Institution.—General Monthly Meeting, 2.
Society of Engineers. — "On Water Tube Boilers," by Mr. Vaughan Pendred, 7.30.
Royal United Service Institution.—"Explosive Shells Applied to Military Purposes," by Captain G. V. Fosbery; and, "On the Demagnetisation of Iron Vessels," the process will be shown by means of a model illustrating operations on H.M.S. "Northumberland," by Mr. E. Hopkins, 8.30.

TUES. — Royal Institution. — "Plato," by Professor Blackie, 3.
Institution of Civil Engineers.—"On Optical Apparatus used in Lighthouses," by Mr. James T. Chance, M.A., 8.

WED.—Geological Society, 8.

THURS.—Royal Institution.—"Ethnology," by Professor Huxley, 3.

FRI.—Royal Institution.—"Correlation of Force in its Bearing on Mind," by Professor Bain, 8.
Royal United Service Institution.—"Plan of Sustaining and Lowering Ships' Quarter Boats," by Captain C. H. Simpson, 3.
Architectural Association.—Special Business Meeting, 7.30.

SAT.—Royal Institution.—"Ethnology," by Professor Huxley, 3.

Trade News.

TENDERS.

BEXLEY HEATH.—For additions and alterations to two houses at Bexley Heath. Mr. W. B. Pinkey, architect:—Payne and Balding, £1,913; Osborn, £1,697; Nightingale, £1,513; Butler, £1,482; Soper, £1,456; Elins, £1,388; Manwaring, £1,341; Walker, £1,300; Wise, £1,299.

ENFIELD.—For building a residence in Baker-street, Enfield, for Mr. G. Riches. Mr. F. G. Widdows, architect:—Webb and Sons, £2,477; Carter and Sons, £2,330; Rivett, £2,273; Hill and Keddell, £2,265; Patman, £2,176.

FINCHLEY.—For sewers and other works in connection therewith, for the parish of Finchley. Mr. William Farmer, engineer:—Bell and Robertson, £2,008; Walton, £1,840; Cheffins, £1,780; Keeble, £1,544; Young and Fussell, £1,536; Sharman, £1,520; Pizzey, £1,499; Crockett, £1,491; Mann, £1,485; Purson, £1,482; Neblitt, £1,402; Wood, £1,382; Coulson, £1,347; Coker, £1,347; Thackrah, £1,341; Davenhill and Co., £1,331; Baker and Co., £1,302; Dickson and Oliver, £1,249; Falconer and Cowley, £1,173; M. Plowman, £1,155; Harvey, £1,142; Moxon and Mutton, £1,130; C. Plowman, £1,113; Heal and Weston, £1,062; Blomfield, £1,050; Burgess, £1,045; Davison and Prince, £982.—The last nine are reserved for further consideration and inquiry.

HOXTON.—For a five-story warehouse, 30ft. by 61ft., with additions, and four shops, at St. John's-road, Hoxton. Mr. Herbert Ford, architect. Quantities supplied by Mr. J. W. Dennison:—A. Rawlins, £7,398; Piper and Wheeler, £7,090; Pritchard, £6,739; Turner and Sons, £6,713; Brass, £6,678; Ashby and Sons, £6,531; Brown and Robinson, £6,439; Ashby and Homer, £6,321; Henshaw, £6,098; Webb and Sons, £5,984; Robert Mann (accepted), £5,887.

LEICESTER.—Accepted for Leicester Lunatic Asylum. Mr. E. L. Stephens, architect:—Osborne Bros., brickwork, slating, &c., £8,190; Osborne Bros., stonework, £2,819; Eagle, carpenter and joiners' work, £3,890; Norman and Underwood, plumber and glaziers' work, £1,130; Whitmore, painters' work, £306 13s.; Pegg, ironfounders' work, £1,430; Webbs, gasfitters' work, £326; Haden and Son, steam engine, washing machine, ventilating, &c., £944 18s.

LONDON.—For the erection of house and stables, 10, Grosvenor-street, for Dr. Weber. Mr. E. A. Greening, architect. Quantities supplied by Messrs. Parker and Elger:—Patrick and Son, £5,090; J. and C. I'Anson, £5,626; Rider and Son, £5,568; Cowland, £5,550; Ashby and Sons, £5,466; Piper and Wheeler, £5,440; Simpson, £5,417; Trollope, £5,342; Smith and Taylor, £5,189; Higgs (accepted), £4,948.

LONDON.—For additions to the Adelphi Theatre, for Mr. B. Webster. Mr. J. Lavender, architect:—Foxley, £1,857; Axford, £1,715; Green, £1,620; Patman and Co., £1,598; Webb and Sons, £1,549.

LONGTON (STAFFORDSHIRE.)—For a theatre, at Longton, Staffordshire, for Mr. Mathew Wardhough. The cast columns, gallery beams, and joists included. No other internal fittings. Mr. James Rigby, surveyor, Longton:—Barlow, Stoke-upon-Trent, £900; Hervey, Longton, £860; Collis and Hudson, Longton, £810; Spicer, Longton (accepted), £807; Inskip, Longton, £802.

MILE END.—For St. Luke's Infant Schools, Globe-road, Mile End. Messrs. Hammack and Lambert, architects:—Williams and Sons, £2,790; Webb and Son, £2,487; Ennor, £2,442; Gibson Bros., £2,387; Hedges, £2,339; Newman and Mann, £2,336.

NORFOLK.—For building a rectory house at Bodham, near Holt. Mr. J. S. Beulst, architect:—Harrold, £1,152 1s. 9d.; Youngs, £1,080; Corinat, £1,070 2s. 9d.; Chapman, £937; Nelson, £815.

PLAISTOW.—For new Church of St. Andrew, Plaistow. Mr. J. Brooks, architect:—Henshawe, £4,785; Foster, £4,620; Colls and Son, £3,680; Hill and Son, £3,620; Hill, Keddell, and Co., £3,587; Higgs, £3,314; Perry £3,257.

ROEHAMPTON.—For new stables, lodge, laundry, and new roof, and alterations to house, for J. F. Flemmish, Alton House, Roehampton Park. Mr. E. A. Greening, architect. Quantities supplied by Mr. Gritten:—Tracy, Southall, and Watson, £4,784; J. and C. I'Anson, £4,494; Trollope, £4,475; Myers and Son, £4,482; Mansfield, Price, and Co., £4,400; Brass, £4,380; Nicholson, £4,280; Higgs (accepted), £3,698.

WALTHAM CROSS.—For additions to Myddleton House, Waltham Cross, for Mr. H. C. B. Bowles. Mr. F. G. Widdows, architect:—Webb and Sons, £1,847; Carter and Sons, £1,770; Patman, £1,769; Hill and Keddell, £1,735; Rivett, £1,720.

THE BUILDING NEWS.

LONDON, FRIDAY, MAY 10, 1867.

TRADES' UNIONS' COMMISSION.

It is now nearly two months since the Royal Commission began to take evidence on the question of trades' associations, and during this period they have held about a dozen meetings, and have put upwards of two thousand five hundred questions to eleven witnesses. The evidence hitherto published has been entirely from the side of the men, and in defence of Trades' Unions; whether it has been in their favour we shall not at present inquire. The witnesses already examined have included the secretaries of the Amalgamated Society of Carpenters and Joiners, the Amalgamated Society of Engineers, the Friendly Society of Operative Masons, the Operative Bricklayers' Society, the Plasterers' Society, the Operative House Painters' Alliance, the Operative House Carpenters' and Joiners' Society, also the President of the London Working Men's Association, and the secretary of the Reform League. The testimony given by these witnesses, we need hardly say, was unanimous on one point, namely, that trades' combinations on the part of workmen were perfectly right and natural, and had done much not only to prevent strikes but to raise the rate of wages, shorten the hours of work, and altogether have tended to better the condition, socially and morally, of their members. The Commission are now turning their attention to the other side of the question, and are hearing the opinions of the masters. The Commission had a sitting on the 30th ult., when Mr. Thomas Piper was examined. He stated that he was secretary to the London Master Builders' Society. The society was formed in 1834 by fifteen builders, who met and resolved "That the parties now present do form themselves into an association to be called the Builders' Society, the object of which is to promote a friendly feeling and the interchange of useful information among those who are engaged in general building in and near London." There are now seventy-six members in the society. Each member pays an entrance fee of £3 3s., and an annual subscription of £2 2s., and the society has at present a fund amounting to £600. Being questioned as to the objects and rules of the society, witness gave a slight sketch of its history, and, referring to the various strikes among workmen, stated the nature of the action which the society had taken in each instance. It was stated that in September, 1834, the year of the society's formation, on the occasion of a strike among workmen, the members passed the following resolution:—"That in consequence of the principal part of the members of this society being at this time engaged in a strike with the workmen upon the subject of Trades' Unions, in which certain builders had not thought proper to join, it is inexpedient to proceed in the election of any such builder whose name may be proposed, as the result of the ballot might be to exclude from this society, upon a question of only temporary interest, gentlemen whom it would be desirable to enrol amongst its members," and for that reason it was resolved "that the ballot of Mr. James Bridger be postponed." Witness read this to show that the society itself was not, as a society, engaged in the strike at all. The society took no action, but the trade was summoned by public advertisement, and a committee was formed on that occasion, and workmen were asked to sign a declaration, but, added witness, they have never since been asked to sign one, though they have been asked to make a declaration. In the strike of 1859 and 1860 the men were asked to "make a declaration, but not to sign one." Asked: How could a man make a declaration without signing it: in what form was it done?—He would merely have to state it.—What was the declaration they were asked to make?—We declare that we are not members of any trades' unions. The witness seemed to imply that the reason why the men were asked merely to make instead of sign a declaration was owing to the difficulty of obtaining signatures in 1834: "the use of the pen to a man not accustomed to it is so difficult that it seemed to appal a great many of them." Passing to the question of overtime it was explained that the four o'clock movement originated in 1847 by the men asking to leave off work on Saturday at that hour. There was considerable difference of opinion among the masters on the subject, though personally witness was in favour of it, because he thought it was fair that the men should have their wages so paid that they might walk home in the master's time, which they would do by leaving off at four o'clock. Ultimately, the request was conceded, though no resolution was adopted or recorded, "it having never been the custom of the society to prescribe rules to its members in matters relating to the management of the concerns, or arrangements with workmen in their employ." It was admitted that when in May, 1853, the carpenters and joiners demanded 6d. a day extra a meeting of the trade took place, and a resolution was recorded in the books of the society to the effect that the demand for labour at that time did not warrant an advance of wages. The trade recorded a similar resolution in regard to a like demand on the part of the carpenters and bricklayers at the same date, declaring that it was not expedient either for workmen or employers to attempt to establish a standard rate of wages. While it was the opinion of the trade that the wages paid at the time was fair and ample, the resolution added "but there can be no objection to superior workmen being remunerated according to their respective merits; that other and better methods of determining such questions as the rate of wages and regulations of employment may well be found, or it is to be feared that the employers will be forced into a combination in self-defence, a course greatly to be deprecated." After mentioning other demands on the part of the men at different periods, which were granted by the masters, witness said he did not think that there would have been an increase of wages but for these applications to masters, and yet he did not think that the rise had taken place under the influence of the unions. There had been an enormous increase of building everywhere of late years, and contractors were willing to pay any price to get the work done in time. He believed that throughout these disputes the one main point with the men was to establish the principle of equality of wages, or something approaching to that—an object which he considered a bad one as far as the benefit of the public went. It would be better if men were paid more according to what they were worth—a principle which operates successfully in businesses of every kind. His wish was that the arrangement between masters and workmen should be on the same principle as that between the buyer and seller. In answer to a question as to whether he considered the members of trades' unions to be bad or good men in the trade generally, witness replied, "Well, they are of all sorts. I do not think that you can say either that they are bad or that they are good." He thought that in the first instance the unions originated among the superior workmen, but then it was by engrafting upon the benefit societies rules which were of such a character as to be found fault with. He did not remember any instances of employers wishing to give to certain men higher wages than the ordinary workmen were receiving, and opposition being offered by trade societies, but there have been cases where, when lower wages were offered, there has been objection raised, and that is one difficulty caused by unions.—Witness was asked if he was aware whether the members of his association had in any instance supported firms where the men had been on strike, and assisted them to resist the strike.—He replied: I do not know of any. It is the custom of the association to blackball a man if they think he has not the same degree of honourable feeling as the rest of the association. With reference to the practice of scamping building, witness stated that he did not think that any members of his society would do anything of the sort. He explained that there are genuine and honest "pockets"; as, for instance, if a flue over a fireplace is gathered in to the size of the flue, there is a space there which does not touch the substance of the wall itself, which, remarked witness, it would be absurd and rather injurious to fill in with solid brickwork—that is called a pocket. Again, it sometimes happens that where a brick wall is required which is to be supported on iron bearers, pockets are introduced to lighten the weight which these girders would otherwise have to bear. He had seen some of the foreign timber work, windows, sashes, doors, and so forth, which had been imported, and he thought it would be exceedingly well adapted for an inferior class of houses, but it cannot have been much used, as very little had come over.—Asked: Comparing the state of things when you were a young man with the state of things when you left off [about seven years ago], was there any real difference as to the amount of work done and the skill?—Yes.—In what way?—I do not think that the men were so industrious.—That they did not do so much work?—That is so.—But was it as well done as before?—There are as highly skilled men now as there ever were, and, in fact, a mason must be a well-skilled man, because his stroke his irrevocable. A carpenter can glue a bit on if he makes a mistake, but a mason cannot. This concluded Mr. Piper's examination.

ON SOME RECENT STATUES AT MANCHESTER.

We have been waiting the completion of the Cobden Memorial in St. Anne's-square, Manchester, to review both this work and the recently uncovered one of Prince Albert, in the so-called square of that name. Both these are important works, and the latter is decidedly an ambitious one. With the general form and outline of the Albert Memorial most of our readers are undoubtedly familiar. It is very advantageously situated in the centre of an open triangular place of considerable area, and is from the design of Mr. Worthington, whom popular report already indicates as the future architect for the new Townhall, which is to face it; the competition for which, by-the-bye, is now postponed from July till August the 1st. A flight of steps leads up to some iron railings, of which we shall hereafter speak; from the top of these stone steps rises a well-designed square panelled base, above which are four open archways, flanked by square buttress-piers, supporting an octagon spirelet. Such are the main features of the outline, and so far monumental. Had the detail partaken of the same spirit the work might have been one of art; but unfortunately the reverse is the case. The mouldings are thin and wiry in the extreme; the valuable line of the intrados of the arch is broken with "extremely pretty" cusping of microscopic minuteness, and its mouldings belaboured out of all shape by lilliputian foliage; frittering little crockets break its gable line, and its spirelet finds itself unequal to the restraint of running its little course in a straight line, but has blossomed and budded into dear little crockets as it approaches the summit of its purpose—a wrought-iron crown. The tympana of its gables are filled with perforated tracery, taking the highly appropriate symbolic form of interlacing triangles, and are surrounded by the everlasting foliage. Nor is all the pulverising into little bits sufficient; even the broad flat

surfaces of the buttress piers, which, from the apparent and real work they have to do ought to have been left in simple plainness, or at most banded by a horizontal line, have stuck on to each of their external faces a heater-shaped shield, surrounded by the garter and surmounted by the crown, like the impress on a soldier's button. Why could not these shields have repeated the correct form of those at the base if repetition of shields were necessary? but, above all, why repeat them here? Each of the four sides of the base are alike, and by varying these and using the tympana of the gables for this purpose, there would be ample room and verge enough for the whole College of Heralds to disport itself "rampant and proper." Of the carving itself, as handicraft, we must speak most favourably; the execution of it is admirable, but the design is anomalous in the extreme. The heraldric bearings at the base are as good as any German fifteenth century work, and full of the peculiar character of that school, whilst the major part of the rest is of a hybrid quality, produced by crossing the art of the early part of the thirteenth century of France with that of the middle of the nineteenth century of Manchester, and the offspring of this union is indeed a misbegotten monster. We have small doubt but that its sponsors have given it the name of Eclectic. Poor things have borne good names before now, but few good names have been borne by poorer misrepresentations than that of Eclectic. "Choosing at will" should imply selection, but the merely taking two incongruous elements and huddling them together by manual labour is not eclecticism in Art. Had the poor things the slightest spark of vitality they would crumble the stone asunder and rush apart; as they have not, they remain flat, stale, and unprofitable, to be cited, by-and-bye, as illustrations of the revived school of Batty Langleyism. Alas! we wish we could say they had the merit of forming an unique specimen. The canopies of the pinnacles which surmount the buttress piers are a conglomeration of pinnacles, gablets, crockets, and intercuspated cusps piled together with a lavish, but by no means cunning, hand, and contain beneath them statues mysteriously hidden by their own shrine—what they are is not revealed to the uninitiated. Beneath these are other diminutive statuettes of equal indefinitiveness which, like the small angels on the spire, are flattened on their background like magpies on a barn door—a warning to their species never to be caught by a ruthless hand. Altogether the Memorial presents the appearance of a very respectable gentleman [illegible] in his wife's cast-off millinery, and the that an [illegible] dignified. If the theory be true works we should [illegible] himself through his thington is a "nice young [illegible]y that Mr. Wortea party." But many as are [illegible] an for a small we discover in this monument the [illegible] mysteries all is the railing. It is a large close gr[illegible]atest of the well-known models of those at [illegible] after Croce, Viterbo, and Verona—the ordi[illegible]nta quatrefoil arrangement with the usual foliat[illegible]ry frieze, a grille to look through. Here it [illegible]d placed at the summit of some half dozen steps, up which you ascend for the sole purpose of descending again. If you do look through the grilles you simply see the plain mouldings of the surbase: all the ornamental work is high above it. We have tried to solve the mystery of this railing and these steps many times; it has murdered sleep, but still it rises as pertinent and insoluble as ever. Why have the steps, if but to go up to the railing to examine it? Why have the railing at the top of the steps? Why have both, or either? The monument would have been far more dignified on a massive solid base, strong enough of itself to need no protection, and we should be unhaunted by a thing which, as Lord Dundreary aptly remarks, "no fellah can understand." The ironwork is very poorly executed, and the escutcheons of arms which occupy the centre of each frieze panel are so badly enamelled that already many of them present the empty matrix only. The statue itself is a very "Noble" work of art. It is executed in marble, and the cast of the drapery is grand and massive; the modelling of the folds of the robe at the back is a very fine example of drapery treatment, and the rich yet soft texture of the fabric admirably expressed. The Prince is represented "full in the habit as he stood," in his peer's robes, and the accessories of the costume are admirably rendered without being made obtrusive. Unfortunately the attitude chosen is that in which it pleaseth sculptors mostly to enmarble the British subject—left hand on hip, right hand and leg thrown forward, head and left leg thrown back, in right hand something. This seems to be a formula religiously adhered to, and another example of this *pose* is already given to Manchester in the Peel statue opposite the infirmary. The attitude of the Prince is not faultless; the left leg is thrown too far back, so that the weight of the body falls too much in front of it, and in its most general view presents that in which "Ole John Brown" is by popular poetry immortalised. There may be another mystery in this—who can say what symbolism and allusiveness future archæologists may not deduce therefrom? Another query haunts our mind. What is the something the stock prescription has placed in the Prince's right hand? It most nearly resembles a French roll done up with *abandon* in a breakfast napkin. What is it? We pause for a reply! And meanwhile will go off to St. Anne's-square, and look at the Cobden Memorial. This aims, as befits its subject, at a lower mark, and yet we regret to say hardly reaches it. It is a simple unpretending bronze figure stuck upon the stock granite pedestal—made, we presume in allusion to Cobden's mercantile career, more like an office stool in this instance than is usual with these "bad eminences" on which our great are placed. The attitude of the figure is that of a man who finds something curious yet nasty on the forefinger of his right hand, and the sculptor has been singularly happy in catching the expression of mingled inquiry and disgust depicted on the human countenance under these trying circumstances. Cobden is without his hat, which is cruel, but he has a short macintosh, which is kind, and, moreover, expressive of the care he took in fostering the manufacture of the district. The portraiture of the great freetrader is said to be, by those who knew him, good. We are inclined to think that if this be the case Mr. Marshall Wood must have sought the aid of Mr. Home, who called his spirit from the vasty deep, and has accurately expressed what was in the great man's mind when he found, on revisiting this sphere, how great a mess his successors had made of that grand pie he once had his finger in. Yet with this probable solution before us we are still inclined to think the sculptor must be a rabid Tory, and thus revenges himself on the enemy of his tribe. It is really very painful to us to have to speak in this strain of endeavours so well-intentioned, but undeserved praise is keen satire in disguise, and, inclining as we do towards [illegible]uercy, we prefer open, generous, and honest [illegible]iticism, even though to do a future good we [illegible]st use a little present caustic.

FINE ARTS.

THE ROYAL ACADEMY EXHIBITION.

THE [illegible] Prince of Wales declared at the Royal [illegible]cademy banquet, on Saturday last, "With [illegible] reference to the present exhibition I think we [illegible] may say that for many years we have not [illegible] seen a finer exhibition." This is very com[illegible]plimentary, and as it comes on high authority [illegible] we must fain accept it. On the other han[illegible]d, a contemporary critic, whilst implying th[illegible]at the exhibition is "above the average," [illegible] a very loose form of expression, tells us that the Academic body have produced comparatively little of the meritorious portion of the collection, and that whenever an extremely bad picture forces itself into notice on the line, a reference to the catalogue will reveal its author's name with the initials R.A. or A.R.A. appended to it. Sir Francis Grant, the president, speaking on behalf of the Academy, whilst insisting that "he might point with pride to the pictures by members which this year adorned the walls," was fain "to recognise with infinite pleasure the many admirable works by artists not yet members of the Academy, but who doubtless will be"—if they live long enough he ought to have added, the competition for Academic honours being a life-long struggle, in the nature of a tontine investment, to which many come, but few are chosen. Our own opinion, after a first survey, wherein we have taken account only of the more prominent productions, is that the exhibition is "much of a muchness," neither very good nor very bad, with, however, quite the usual complement of daubs; and that of the works of mark contained in it, a larger proportion than usual are by "outsiders," who, as far as Academic influence goes, may never receive any return for their contributions to the general attraction.

To particularise a little. Prominently placed in the centre of the north wall of the great room is a Royal portrait group, by Sir Edwin Landseer, which naturally attracts a continuous crowd of loyal gazers. "Her Majesty at Osborne, in 1866" (No. 72), is represented still in deep mourning, seated upon a black horse, whose head is held by a gilley, whose sable attire and downcast look complete the solemn gloom of the scene. The plan of some buildings which her Majesty inspects and some other papers strewn upon the ground come in almost as a relief, being evidences of life and its every-day calls, whilst a little pet dog standing on its hind legs looking up at its Royal mistress is a pleasing touch of nature, which all must recognise. This picture, unpleasant as is the subject, must be remarked as one of the most conscientiously and solidly painted which the artist has produced for many years past. His other pictures (No. 124), "Deer at Chillingham Park, Northumberland," and (No. 144), "Wild Cattle of Chillingham," are cumbrous and commonplace affairs, which the hanging committee have judiciously placed a little out of the way above the line.

At a respectful distance on either side of the Royal portrait Mr. Millais exhibits two of his favourite child subjects, which will assuredly enhance his fame in this particular walk, however they may affect his status in art. "Sleeping" (No. 65) presents us with a charming little child taking its mid-day slumber, in a cot of fairest sheen, inimitable white sheets, and exquisitely-quilted white satin coverlet, a broad red sash flaunting saucily at the foot of the bed, whilst a blue silk drapery suggests coolness around the head. The companion picture, "Waking" (No. 74), in point of interest as well as of artistic execution, is much inferior, the up-turned gaze of the child reminding us a little of, though by no means an improvement upon, Sant's "Infant Samuel." In his more ambitious work, "Jephtha" (No. 289), Mr. Millais adds another proof of his utter inability to deal with an historical subject. As is often his practice he half hides the head of his principal personage, being unable to portray the agonized expression demanded in it; whilst the daughter sits on her father's knee, with her arm round his neck, with an expression utterly indefinable, if, indeed, it mean anything. The background is, as usual with Millais's, unpleasantly closed in, giving the appearance of crowding.

Mr. E. M. Ward is not successful in his Shakspearian attempt (No. 80), "Juliet in Friar Lawrence's Cell;" the faces are vulgar, and the composition crowded and awkward. Pass we on to Mr. Frith's large picture of "King Charles the Second's last Sunday" (No. 132), with all its indecent carouse as described by

Evelyn, and which we are happy to recognise as a work of first-rate merit, better worth than a cartload of "Derby Days" and "Railway Stations," to which, in obedience to trade commissions, his talent has lately been misapplied. The central group of the dissolute, but evidently time-worn king, "with his concubines, Portsmouth, Cleaveland, Mazarine, &c.," his hand listlessly twined in the fair locks of one of them, is admirably studied; the other incidents of gambling, music-making, flirting, &c., being well displayed over the canvas, to which we must add that the colour is richer and clearer than we have hitherto met with in this artist. The late John Phillip bequeaths to us three pictures, the latest efforts of his pencil, which prove that neither his hand nor his fancy had in any way fallen off up to the time when he was struck with mortal disease. In two of these (No. 152), "O Nannie wilt thou gang with me," and (No. 166), "A Highland Lassie Reading," the artist seems to have returned with yearning to the scenes of his native land which inspired the first efforts of his pencil. No. 191, "Antonia," is a female study, grand in character, and broadly treated, in the rich and sober tone of the best Spanish school.

Mr. J. C. Horsley has a carefully-painted picture (No. 143), of Roger Ascham contemplating with admiration the studious habits of Lady Jane Grey, intent on the "Phædon" of Plato, whilst all the rest of the family are engaged in the sports of the field; but we fancy we recollect something very similar on the same subject from his hand some years ago. As a specimen of minute detail-painting alone it is entitled to examination. Mr. J. R. Herbert does little credit to the Academic ranks to which he belongs by the cold, pale, formal effigy of (No. 158) "St. Edmund, King of East Anglia, on the morning of his last battle with the Danes, by whom he was captured and martyred near Bury, November 20, A.D. 870;" which must be looked upon as a last weak, very weak, effort of expiring pre-Raphaelitism.

Mr. Leighton, the new Associate, gives way to a vapid sensuous mannerism, both as to subject and treatment, which speaks as ill for his prospects in art as for his feeling for healthy nature. His most tolerable performance is (No. 405) "A Spanish Dancing Girl," though the atmosphere is anything but that which we have known of Cadiz; his most offensive (No. 589), "Venus Disrobing for the Bath"—disrobed should have been the word, as the figure is entirely nude, and attitudinising clumsily in a narrow cell between two marble pillars. Why Mr. Leighton should constantly affect these nudities we are at a loss to conceive, for neither in modelling nor in colour is he happy in his flesh. Anything harder, colder, more putty-like than that which he has manufactured on the present occasion we never saw in any representation of humanity. As an attempt at the warmth and ruddiness of human flesh, however coarsely produced, we might even refer Mr. Leighton to the "Bathers" (No. 627) of Mr. F. Walker, which hangs a little way off.

Amongst the works of "outsiders" we must speak with high commendation of Mr. D. W. Wynfield's "Oliver Cromwell the Night before his Death" (No. 494). It is full of thought, and all the more powerful for its congenial simplicity. The dying Protector lies on his death-bed, employing his last moments with holy reflection and prayer; the light of the waning day falls pleasantly upon the bed, at the foot of which, behind the curtain, kneel his daughters. In an adjoining room, leading backwards, is an impressive group of clergy in canonicals, also engaged in solemn devotion.

Another outsider, Mr. E. J. Poynter, who, we believe, is a young man, is permitted by the authorities to occupy a considerable space on the line in the West room with a scene illustrative of the "Slavery of the Israelites in Egypt" (No. 434), hundreds of them being employed in dragging a huge sphynx to its intended location, some of them dropping from sheer exhaustion under the whips of their task masters. As a bit of scene painting it is a clever performance, but the artist who produced it might employ his time, his talent, and his canvas upon something better if he chose. Here we close our first notice.

THE ALTERATIONS AT THE MANSION HOUSE.

THE alterations in the front of the Mansion House, consisting of the removal of the iron railings and the rebuilding of the steps, are now completed. The result is on the whole very satisfactory, as the public gain about 400 superficial feet, the railings formerly projecting on the average 4ft., while the appearance of the Mansion House is little, if at all, impaired. It has long been resolved to widen the Poultry and to make a new street from Blackfriars to the Mansion House. The increased throng which would thus converge to a point already almost blocked by foot passengers rendered it necessary that some steps should be taken for giving greater accommodation in front of the Mansion House. This was at first attempted in a very clumsy manner by rounding off the lower steps and cheating the balustrade and piers of their fair proportions, as shown by a temporary wooden model which for some weeks was "tried up." It may be remembered that at the time we protested against this mutilation, and we are glad to see that the removal of the railings has enabled Mr. Horace Jones to correct a deformity which he could never have sanctioned, and to produce as good a result as the difficulties of the circumstances permitted. The jointing of the balustrade, strings, and rail is constructionally correct, differing in this respect from the majority of modern works, among which it is with regret that we must include the raking parapet to the steps of the Thames Embankment at Westminster. It is of little moment that the staircase balustrade of Dorchester House in Park-lane, should be thoroughly wrong, as being inside the house few see it; and though at Baron Rothschild's new mansion at Hyde Park-corner, the handsome-columned porch is supplemented by a mean iron railing, it matters little to the public. The Thames Embankment, on the other hand, is public property, is seen by all, and no trouble should be spared to make the necessarily simple features as good as possible. Before it is too late it may be well to call attention to the very ugly proposed balusters, a few of which may be seen near the Temple Pier. Perhaps in no single architectural feature is there a greater difference than between baluster and baluster. Those of Sir Charles Barry were always appropriate to the character of the work. The best are perhaps those in Trafalgar-square, which being in granite might have afforded the Metropolitan Board of Works an idea of the proper method of treating balusters in that material. Independently of improper treatment as regards the material, those at the Temple Pier to which we refer are of as bad proportions and as badly spaced as misguided ingenuity unaided by technical knowledge could devise. It is not too late to effect some improvement in these balusters, so few having been made. The coping or rail of the parapet is not good in design, and the balusters have not even the rigid propriety of those of Waterloo Bridge in the same material. It is evident that in this particular no architectural or artistic knowledge has been brought to bear, which, considering the vast nature of the work, is as contemptuous to the public who supply the money as it is discreditable to the Board that should supervise its expenditure.

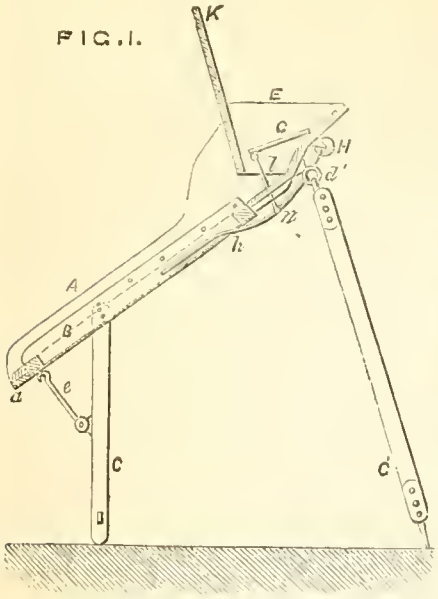
To drain, fence, and lay out the roads in Southwark Park has been undertaken for £7,281. Had the highest tender been accepted the cost would have been £19,015. This is another exemplification of the disparity of contractors' estimates.

SCREENING SAND.

A PROPER description of sand constitutes a more important ingredient in the composition of a good mortar than is usually admitted; and even when its value is fully recognised too little attention is often paid to its quality. There are certain localities in which good sand is always to be found, and again there are others which are entirely destitute of the least trace of it. Sometimes it can also be procured in a state fit for using immediately, but as a general rule it requires to be screened. In specifications it should be described as clean and sharp, free from all dirt, vegetable substances, and other impurities. The simplest method, and the one always practised by practical men to distinguish a clean sand, is to take up a handful, squeeze it well, and then observe whether it comes readily off the palm, which it will not do if there be any very perceptible amount of dirt or loam mixed with it. Whether it is that we use different proportions, different ingredients, or no longer possess the same quality of sand and lime comprising the mortars of early times, it is certain that there is no comparison between them and ours. It has been suggested that the inferiority of modern mortar is due to the presumption that the ancients had some peculiar plan of preparing their lime, the secret of which has been lost. Be this as it may, it is unquestionable that, considering the rapid manner in which buildings, railway viaducts, and other structures are now run up, there is more than ever a necessity for employing good mortar. The condition in which building sand is generally found is that of gravel, which on being screened yields sand suitable for making mortar, and ballast for mixing with lime to form concrete. The weight of the unscreened gravel has been found by actual experiment to be 25¾ cwt. per cube yard; that of the ballast when screened 25 cwt., and that of the screened sand 21½ cwt. per cube yard. When these weights were taken, the material was perfectly dry, and the box was filled loosely in the same manner that a cart would be, without any ramming or punning to make the substance pack tighter. A cube yard in the solid before excavation would weigh a good deal more than the above, and would in all probability come near to 30 cwt., especially if wet.

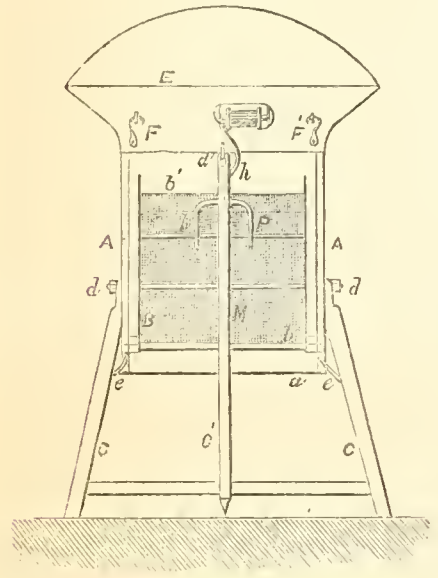
The size of the meshes, or rather the distance between them in the screens, will vary according, as fine mortar for face work and neat joints, or coarse for backing and rough work is required. For gravel to be well screened there should not be less than four meshes to the inch, and the great point is to get all the sand screened in fine weather and when dry, for the difference in a large quantity would be something considerable. In the accompanying cuts we give an elevation and section of an ingenious description of screen which contains some novel features. The principal portion of it consists of an inclined trough A, which is composed of a pair of sides united at their lower extremity by a cross piece *a*. Within the trough is placed a frame B carrying the wirework. The screen is supported at the back by two feet C C, and in front by a larger one C'. The two former are movable round the points *d d*, or the latter about *d*'. When it is required to set up the apparatus the leg C' is thrust into the ground, being furnished with an iron point for that purpose, and C C are maintained in the desired position by the fastening rods *e e*. Any required degree of inclination can be given to the screen by shifting the longer leg C, thus increasing or diminishing the rapidity of the operation. It is not intended that C' should perform the duty of rendering the apparatus perfectly steady; on the contrary, so long as it preserves it from falling a gentle oscillatory motion is favourable to its action. At the upper extremity of the trough A is attached the hopper E by the two hooks *f f*' (see fig. 2), and upon its exterior surface there is a cylinder H enclosing a spring working upon an axis. One end of this axis is connected with the forked branch *h* bent round to avoid the leg C', as is well represented in fig. 2. The hopper also contains a movable table G, which can be adjusted to any angle by the rod *l*, which carries at its lower extremity a fork *n* catching the crooked branch *h* (see fig. 1). This latter is furnished with a series of holes, and the angle of inclination of G is determined according as the pin passing through the eye of *n* is inserted in one or other of them. A glance at fig. 1 will point out that the workman stands in a position relative to the screen exactly the reverse of what usually occurs. In this instance he stands behind the apparatus and not in front of it. He throws the sand against the back *k* of the hopper and it

FIG. 1.



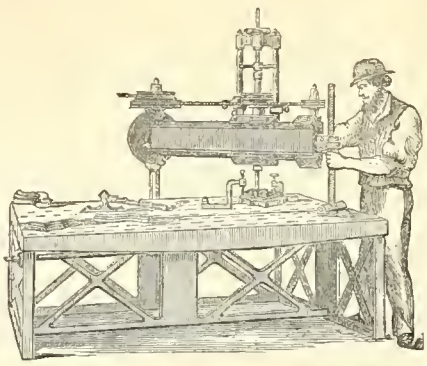
falls upon the movable table G. So soon as a certain weight is placed upon G, the spring in the cylinder H uncoils and the table drops, allowing the accumulated material to fall upon the meshes of the frame B, through which the smallest particles at once pass. Manifestly, however, the impetus acquired by the descent from the table G to the screen would not be sufficient to cause the greater portion of the sand to pass through. In the ordinary screen the labourer throws the sand

FIG. 2.



with some violence against the wires; in the majority of cases with a great deal too much violence, as the broken and enlarged meshes of many a screen can testify. Something, therefore, in addition to the mere fall of the sand upon B is required to accomplish the operation successfully, and in this consists the ingenuity of M. Fournier. Directly the table G is freed from the weight upon it, the spring raises it again smartly to its original position, and in so doing quickly raises the crooked branch *h*, which had been depressed by the action of the spring as already explained. The branch *h* in rising strikes against the rod P, which in its turn communicates a strong shaking motion to the screen, causing the remaining smaller particles to escape through the meshes to the ground, and the larger to roll down to the lower end of the apparatus, where they may be received into a suitable receptacle. One advantage of this arrangement is obviously that a second shifting of the coarser particles or ballast is saved, as it can be carried away in the mass, and the sand only remains to be shovelled up again. Unless the material to be screened is damp or sticky the table G and the spring may be dispensed with, and the operation conducted as in the ordinary manner, by simply throwing it into the hopper, although the position of the screener is still reversed.

THOMPSON'S UNIVERSAL JOINER.



THE above illustration represents Thompson's patent universal joiner. This machine has now been in use some time and has given great satisfaction to those who have used it; it is capable of doing a great variety of builder's and carpenter's work. The machine is compact, the size being 6ft. by 8ft., and consists of an iron table, which is planed and perforated with holes to allow of fixing the work; it is also divided to allow of its being used as a vice if necessary. At the back of the table is fixed an upright shaft to support a beam on which are fixed the slides to hold the cutting tools. This slide moves backwards and forwards on the beam at will; the beam also is capable of being changed from a vertical to a horizontal position, so that the person using the machine can move the tool in any position that may be required. The work the machine is capable of performing is curved and irregular mouldings, rabbets, grooving up to the rate of 10ft. per minute, plain mouldings, housings for stairs and ladders, cross and angular grooving, mortises and tenons, dovetails, planing and sawing, and any other work that may be required, and it is said to be equal to 25 men, so that the saving in time and labour is immense. One of the machines is at work in her Majesty's dock yard, Woolwich, and other building yards, and no doubt it requires only to be more fully known to be more generally adopted.

A GREAT FRENCH ARCHITECT.*

JACQUES IGNACE HITTORFF was born at Cologne, August 20th, 1792, and was early taught, after the old German manner, to prepare himself for his future career by handling the mason's tools. In 1810 he went to Paris and pursued his studies under the architect Belanger, a very able master and kind friend, who constructed the glass dome of the Halle au Blé, to cover the vacant area of the central court as originally left. He continued to attend the schools of the Ecole des Beaux Arts, where Percier recognised the abilities of the young architect, and ever after proved his constant friend. Upon the return of the Bourbons to France in 1814, M. Belanger was confirmed in his appointment of architect of the public fêtes and ceremonies which he had previously filled, and he appointed his young friend Hittorff as his assistant inspector, having for his colleague M. Lecointe. With his colleague, M. Lecointe, he designed and superintended the funeral pomps and burial of the Prince de Condé, of the Duc de Berri, and of Louis XVIII.; as also on festive occasions the marriage of the Duc de Berri, the baptism of the Duc de Bordeaux, and at Rheims the coronation of Charles X. They also reconstructed the interior of the Salle Favart; and in eight months rebuilt the graceful and commodious theatre of the Ambigu Comique. In 1820 to 1823 he visited England, a part of the North of Germany, the South of France, Italy, and Sicily. In 1826, M. Hittorff published with M. Zanth, the results of this journey in the "Architecture Moderne de la Sicile, fol. Paris, 1835," and in the "Architecture Antique de la Sicile, fol. Paris, 1837." I am happy to inform you that the concluding volume on the "Sicilian Antiquities" was just completed by M. Hittorff for publication. All the plates are ready, and I learn from his son that he was, at the decease of his father, engaged upon the revision of the last part of the text, so that we may soon expect its appearance. It will be a most interesting section, as it contains the total restoration of a Greek Doric temple in all the integrity of its minutest parts, and many of the vexed questions will be solved according to his views, with the reasons elaborately explained. In 1832, M. Hittorff published with M. Olivier, the celebrated architectural engraver, a French edition of the English work on the "Inedited Antiquities of Attica," in order to complete the series of translations of the English works which up to that period had appeared on Greek antiquities, as "Stuart's Athens," and the previous volumes of the Dilettanti Society upon the monuments in Asia Minor.

Hitherto I have briefly dwelt upon some of the studies of the scholar and the productions of a brilliant author, rather than upon his other more immediately practical labours as an architect. I think his earliest work in the Champs Elysées must have been the circular Panorama, built in 1838, equal in diameter to the Pantheon at Rome, and the roof of which he supported in a most original manner on the suspensive principle by a most ingenious arrangement of twelve iron cables, and which admitted the uninterrupted passage of the light upon the picture of the circumference. It was described in July, 1842, at one of the ordinary meetings of the Royal Institute of British Architects. From that time to this the Champs Elysées have been the arena on which he has exercised most happily his fertile imagination in the erection of fountains, restaurants, cafés chantants, and other constructions for the amusement of the people; the most important, however, of which is the Grand Cirque Olympique, now called of the Empress, built in 1839. This is well known to all who have visited Paris as a sixteen sided building, capable of holding 4,000 spectators, for equestrian exercises, above 134ft. in diameter, and covered by a roof without a tie beam, the stability of which depends upon the circular or polygonal curb against which the feet of the rafters rest; attached is stabling for the horses of the troupe. The decorations are conceived in the best taste, so that the vastness of the area without any central pillars and the elegance of the ornamentation place it in the same rank with the large and more costly productions of the like nature of the times of the ancients. In 1851 a larger and a more sumptuous circus was erected on the Boulevard des Filles du Calvaire in nine months, with increased reputation to the author, and enriched, as was also the other Circus, with the sculptures of the eminent Pradier and Duret, and the pictures of M. Berrias. M. Hittorff assisted in the erection of the obelisk of Luxor in the Place de la Concorde, and designed the pedestal. His inquiring mind was not satisfied with the rude condition of the rough and as it were fractured apex, and it occurred to him that it could not have been left so exposed by the ancient Egyptians, all of whose works are finished off with such precision, regardless of labour or expense. At length it occurred to him that there must have been some artificial finish to the summit of the monolith, and further research proved to him that it must have had a bronze gilt capping, or pyramidion, a conclusion which he fully justified in a pamphlet that he published at the time; but his suggestion was not carried out, and the apex still remains in its fragmental state. To M. Hittorff's graceful taste is due the design for the colossal fountains in the Place de la Concorde, combining sculptural and architectural forms in an admirable manner, and the jets casting forth volumes of water, more abundant than those even of St. Peter's at Rome, and in magnificent contrast with our squirts in Trafalgar-square. He also materially modified in other respects the original conception by Louis of what may be considered the most magnificent Place of all Europe, surrounded as it is by the gardens of the Tuileries and of the Champs Elysées, the Garde Meuble, the portico of the Old Chamber of Deputies, with the avenues commanding views of the Madeleine, the Arc de Triomphe de l'Etoile, and the Tuileries Palace.

Mons. Hittorff was associated in the erection of the Basilica Church of St. Vincent de Paul, near the station of the Chemin de Fer du Nord, with the estimable and accomplished M. Le Père,* father of Madame Hittorff. I know not to what extent the conception of this great church

* From a paper read before the Royal Institute of British Architects, April 8, 1867, by Thomas L. Donaldson, Past President.

* M. Le Père, born at Paris, 1751, deceased 1844, was member of the Scientific Expedition to Egypt, and prepared many important drawings for the large work on that country. He was joint architect with Gondouin for the bronze column of the Place Vendome, and subsequently contrived a most ingenious scaffolding, fixed on the capital, for raising and placing the statue on the monument.

was due, respectively to the genius of one or the other of its architects, but the death of M. Le Père occurring in the course of the work the completion was necessarily directed wholly by his son in-law. The Basilica of the Romans was a favourite theme of M. Hittorff, as we know by his published restoration of the Basilica of Fano from the text of Vitruvius. On the present occasion he sought to realise some of his early impressions, reconciling them with the special purposes of a Roman Catholic place of worship. The nave and side aisles, divided by a line of columns two stories high, with a gallery and flat roof, and hemicyle at the altar end, have a very grand effect, and Christianise, as it were, the heathen elements of such a disposition. The whole of the details and embellishments are symbolically treated, and the colouring and gilding are of the most refined Greek taste; and notably are to be admired the magnificent series of stained glass windows, and the decorations of the podium between the upper and lower ranges of columns, consisting of a procession of the saints, male and female, of the Roman Catholic Church, painted by the inimitable and lamented Flandrin, the first of ecclesiastical painters of the present period. The church lies on the sloping side of a hill, which required a magnificent flight of steps to reach the portico, and this is realised by a series of divisions of easy ascent and varied plan, flanked by balustrades forming a grandiose basis to the church itself. M. Hittorff had contemplated the decoration of the walls of the portico with paintings, as shown in one of the plates of his work on polychromy, illustrating subjects from the Old and New Testaments, to be executed in enamelled slate or stone, in the general adoption of which enduring process he took great interest, as being peculiarly adapted for mural decoration of public buildings. These paintings were partly executed, but did not seem to meet public favour, and have since been removed.

The notice of this church leads me to observe one of the peculiarities of Paris in regard to its religious edifices. The whole city is divided into arrondissements, with a like ecclesiastical distribution. In each municipal division there is (or is intended to be), a central basilica of gigantic proportions and cathedral-like arrangement, each one at a cost of one or two hundred thousand pounds, or even more, subordinate, however, to the Metropolitan Cathedral. Of this class on the north side of Paris are the Madeleine, Notre Dame de Lorette, St. Vincent de Paul, and the churches in the Boulevard Malesherbes, and in the quarter of the Chaussée d'Antin, now nearly completed, and forming so many ecclesiastical centres grouped around the Mother Church of Notre Dame. The municipality provides a like class of edifice for the local civil administration of each arrondissement, consisting of a Mairie, carried out in the like sumptuous way; for happily our neighbours are not satisfied with the erection of their buildings, intended for public purposes, in a humble and niggardly economical manner, as our police offices, but require that they should add to the dignity of the metropolis. These Mairies combine various functions for daily and occasional use, and they thus afford the opportunity of considerable architectural effect. Hittorff executed one on the Place du Panthéon, the staircase of which is a very striking feature, and he completed the suite of buildings opposite the eastern façade of the Louvre, and close to the Church of St. Germain l'Auxerrois, a communal school, distinguished for its arrangements, a presbytery and a Mairie for the quarter in the Renaissance style, repeating some of the leading features of the adjoining church. This, however, cannot be cited as one of his successful compositions. He engraved and completed near the Barrière du Trône for her Majesty the Empress, an institution for the reception and education of three hundred daughters of workmen, and he carried out a distribution of part of the Bois de Boulogne in conformity with an original sketch by the Emperor, which I once showed me as one of the curious treasures of his study. He designed the circular range of circular edifices surrounding the place of the Arc de l'Etoile, and from which radiate various Boulevards to different parts of Paris and the suburbs. Time would fail me to recite all the works which our late colleague either designed or executed during his long and active life of professional experience. In Paris alone, whether to the north or south, the east or west, or very centre, we find monuments of his skill and taste profusely scattered. I have not dwelt upon their distinctive merits, nor have I paused to analyse their disposition or arrangement, the styles he adopted for each, or the more or less success of each effort. I address myself to his professional brethren, who are fully capable of forming their own judgment, and who require no critic to lead them to a conclusion. It is enough, in such a rapid notice as this, to indicate the most notable that the history of our art cannot fail to record, and which are the best tests of his various powers, and which procured his reception in the Imperial Institute of France in 1853, the award of our Royal Gold Medal in 1856, the election in numerous foreign academies, and crosses and honorary distinctions from various continental sovereigns. The last great work of our friend, and which is in effect a colossal one, is the terminus at Paris of the Great Northern Railway of France. This propylon, as it were, of the Egyptian and Greek type,* consists of three circular-headed archways of the Ionic order and tetrastyle treatment, each crowned with a pediment and graduating in size, and with intervening Doric colonnades, the whole consisting of purely Greek detail, and enriched with sculptures of the highest class. I must own that, impressed as I was when I first saw it, I felt staggered by the audacity with which all the usual canons of art were disregarded in the general composition, and yet producing on the mind a most imposing, and, it may be said, solemn effect. I have stood at periods before it to study the elements of the design, and how the like impression could be produced by any other more severe treatment, but in vain; and I could not but render homage to the genius of the architect who, by a most capricious mastery of its subject, could successfully render himself independent of the ordinary conventionalisms of his art. This is a most striking instance of the different treatment with which such stations are handled in France and England; with them, it is to be a monumental object, to impress the stranger with the imperial greatness of the capital of France, and to develope its taste for all the resources of architecture and the sister arts; with us it too often results in a huge magazine or shed, or an enormous refuge of a colossal hotel to receive the wearied traveller. I have also mentioned his larger publications as an author; but his pen and fertile imagination were unceasingly at work, embodying in memoirs from time to time the practical results of his own observations upon the passing topics constantly arising in such an artistic circle as that of the French Metropolis, and among numerous biographies one of our distinguished colleague, the late Sir Charles Barry, in 1860. Another of his most recent essays read before the French Institute, drew attention to the analogy existing between the fresco decorations of the Roman baths and of Pompeii and the rock cut façades in the valley of Petra, showing a complete identity of the two, and that the wall paintings of the Romans were not merely capricious exercises of the painter's fancy, but actual and therefore valuable records of existing buildings. The decease of our late friend is the more to be deplored, as in him we lose the sole surviving earnest disciple and most able exponent of pure classic art.

* The total length of the front is 518ft., and the total height, to the top of the statue of the City of Paris, is 115ft. The lofty columns of the interior and other cast-iron work were executed at Glasgow.

MAKING TURPENTINE.

The great turpentine country commences about thirty miles south of Weldon, N.C., America, and thence extends to Wilmington, one hundred and thirty miles further south. It again extends from Wilmington, N.C., nearly to Florence, S.C., a distance of one hundred and six miles. In this entire region there are but few cultivated farms, and for miles there is hardly a garden, the turpentine business engrossing the whole attention of those employed in it, and preventing them from cultivating the soil. Early in the season, about March, the pine trees are boxed and chipped. Boxing is to cut a hole or box in the trunk of the tree, about a foot from the ground, large enough to hold a quart or two of the sap or turpentine, and above that the bark is chipped off 2ft. or 3ft. each season until the height of from 10ft. to 15ft. is reached. From time to time three or four boxes are made in each tree, which is correspondingly chipped. The turpentine is dipped from the tree into buckets, and from thence conveyed to barrels. The ladle is an iron "scoop," which is, however, rather flat in shape than otherwise: but as the turpentine is adhesive there is no difficulty in dipping it. From a pint to a quart is taken out at each dipping, and sometimes seven dippings are made in a season. A tree lives under this process about fifteen years.

The principal labour employed in the dipping (which is always during warm or hot weather) is black, under the direction of white labourers, who superintend the turpentine distilleries, by which the sap of the pine tree is converted into spirits of turpentine and rosin. Tar is made from the light wood or most pitchy part of the wood, melted by burning over a cauldron. The pine forests are owned in large tracts, and the principal part of the labour, free and slave, comes from sections of the state where the slave property is still owned, but hired out. It puts a great amount of money into circulation. From 175 dols. to 250 dols. per annum is paid for the slave labour, but the white labour is better compensated. At Wilmington, in the turpentine distilleries, in the coopering establishments, and in every branch of the turpentine labour, hardly a white man is to be seen. The proportion of white men through the pine forest region is somewhat greater. Between Florence and Charleston, in this State, the turpentine ambition has doomed many of the forests to be boxed and chipped, though there are some landowners who regard it as the part of prudence to hold back for lumber; and one of them declares that not a tree of his shall be boxed. South Carolina is running close upon the "Old North State" in the turpentine production, but cotton and rice are yet her great staples.

NOTICES OF PUBLICATIONS.

The Sewage of Towns. Edited by John Hitchman, M.R.C.S. Simpkin, Marshall, and Co. Price 3s. 6d.

We have here in a collected form the various papers read at the Congress on the Sewage of Towns held at Leamington Spa in October last, and of which we gave our readers a pretty lengthy report at the time. The discussion on the papers is also given, and we have likewise a lecture "On the Poisons of the Spreading Diseases," delivered before the members of the congress by Dr. B. W. Richardson. Of several of the papers read on the occasion named—including particularly those of Dr. Hawksley, Dr. Letheby ("The Power for Good or Evil of Organic Matter"), Dr. Carpenter, Mr. Baldwin Latham ("On the Utilisation of Sewage at Croydon"), and Mr. C. E. Austin ("On the Sewage of Worthing")—it may be truly said that they are among the most important contributions to sanitary science that have lately appeared. The paper by Mr. Hitchman "On the Removal of the Refuse of Towns and Appropriating the Same to its Natural Purpose" is an able plea for the earth closet system, and is not the least valuable of the papers in the collection. We regret to add that Mr. Hitchman, who was well up in all sanitary matters, was suddenly cut off before he had finished his useful report, which is the last of the many labours he has performed in the good cause he had so much at heart. We are glad to see that a movement is now on foot to erect a fitting memorial to Mr. Hitchman at Leamington, as a tribute to the valuable public services he rendered to that town and community.

The Paris Universal Exhibition, 1867.—Her Britannic Majesty's Commissioners have issued an extensive and laboriously got up catalogue of the British section of the Paris Exhibition, containing a list of the exhibitors of the United Kingdom and its colonies, and of the objects which they exhibit; of some of the more important of these a brief description is given. The work is printed in four languages—English, French, German, and Italian, and has a plan of the British section appended. The bulky dimensions of the volume preclude it from answering the purpose of a portable or pocket guide to the Exhibition, for which we presume it is not intended, but nevertheless as a work of reference it will be found useful. The catalogue is printed for the Commissioners, and sold by Messrs. Spottiswoode and Co., of New-street-square.

In accordance with its custom the *Art Journal* is treating its readers to an ably written and beautifully illustrated catalogue of the principal objects of art in the Paris Exhibition. The number for the present month contains part II. To those who remember the *Art Journal's* similar catalogues of our own exhibitions it is not necessary to commend this valuable work. Nothing superior of the kind we believe has ever appeared. The same number contains the ordinary amount

of reading matter, with two full-page steel engravings, "Christiana at the House of Gaius" (Pilgrim's Progress), from the picture of John Gilbert, and "Scottish Lassie," from the picture by the late John Phillip, R.A.

THE NEW ROYAL ACADEMY.

THE annual banquet of the Royal Academy took place on Saturday, and passed off very successfully. The Prince of Wales and several other royal personages were present, and the speeches differed little from those of previous years. In the course of his remarks the president, Sir Francis Grant, made the following allusion to the New Royal Academy:—"When giving the health of her Majesty's Ministers, I expressed the gratitude of the Royal Academy for the site granted to us on the Burlington estate; but I must be permitted to observe, although our lease is signed, and we are busy laying the foundations of the galleries to be erected in the rear of Burlington House, we do not get possession of Burlington House proper till the Government have provided accommodation for the Royal Society, now occupying that building. When that is effected, Burlington House—on which it is proposed to erect an additional story—will be the entrance to the new Royal Academy. The upper story will contain the collection of diploma pictures and other works of art belonging to the Royal Academy, whilst in one wing Gibson's sculpture will be placed, and in the other the library of the Royal Academy. These apartments will be always accessible to the public, and will, I hope, be considered an interesting addition to the galleries available for instruction and recreation. There can be no doubt that it is most desirable that the Academy should vacate its present abode as soon as possible, to afford space for the constantly increasing national collection of ancient pictures. The Academy also long to occupy their new galleries, and thus escape the sorrow and disappointment annually created by the rejection of a vast number of highly meritorious accepted works which are returned solely from want of space, whilst others are of necessity placed in situations quite inadequate to their merits. We also desire no longer to be obliged to close our schools for the three most important months of the year. It is impossible to over-estimate the importance of this to our students. It is evident, therefore, that for the speedy realisation of these important national purposes we shall be greatly dependent on the friendly co-operation of the Chancellor of the Exchequer. If with his friendly assistance and the sanction of Parliament this can be speedily arranged, a year will be saved in the carrying out of these important purposes."

ARCHITECTURAL SOCIETIES.

AT the general meeting of the Royal Institute of British Architects, held on Monday evening, Mr. Beresford Hope, M.P., President, in the chair, the hon. gentleman resigned his office, having occupied it for two years. He then proposed Mr. Tite, M.P., as his successor, this being his second nomination to this honourable office. The motion was seconded by Professor Donaldson, and carried by acclamation. The statement that Earl Grosvenor was a candidate in opposition to Mr. Tite was without foundation. The report of the council to the annual meeting given in our last was read and agreed to. The following is a correct list of new office-bearers and Members of Council of the Institute:—President: W. Tite, M.P. Vice presidents: David Brandon, Charles Barry, Joseph Clarke. Honorary Secretaries: J. P. Seddon (home duties), T. L. Donaldson, Past President (foreign correspondent). Ordinary Members of Council: F. P. Cockerell, Charles F. Hayward, Edward B. Lamb, Joseph Peacock, Alfred Waterhouse, Ewan Christian,* James Edmeston,* James Fergusson, F.R.S.,* Frederick Marrable,* Charles C. Nelson, F.S.A.,* John Pearson, F.S.A.,* F. C. Penrose, M.A.,* T. Roger Smith.* Country Members: Matthew E. Hadfield (Sheffield), M. R. Phipson (Norwich). Treasurer: Sir W. R. Farquhar, Bart. Honorary Solicitor: F. Ouvry. Auditors: G. B. Williams (Fellow), F. T. Dollman (Associate). The names marked thus (*) are new names.

The closing meeting of the session of the Liverpool Architectural Society took place last week, Mr. T. J. Kilpin, president, in the chair. The president having handed to Mr. Deacon and Mr. Metcalf the prizes awarded to them by the council for their success in the students' competitions during the session, Mr. Boult laid before the meeting a copy of the catalogue of the architectural exhibition opened that day in London, expressing his regret that there were only two exhibitors. Mr. Bradley, the treasurer, read the statement of accounts, which showed a balance in hand of £10 7s. 4d. Mr. Statham, the secretary, then read the report, in which the council congratulated the members on the prosperous condition of the society. Twenty-one new members had been elected during the session, and the number at present on the society's books was 160. The council suggested that the annual excursion during the recess should be to Hooton Hall and East Ham. In conclusion, whilst commenting on the fact that the society continued to be highly thought of and respected by other architectural societies in England, they urged upon all the members, and more especially the professional members, the importance of doing their utmost to increase the prestige of the society, and its value as an agent in promoting the progress of the art of architecture, and giving mutual information and assistance on subjects of professional interest. The report and financial statement having been adopted, Mr. T. J. Kilpin was unanimously elected president for the next session, Messrs. F. Horner and W. H. Hay were elected vice presidents, and Messrs W. H. Picton Grayson, J. H. Ridsdale, C. Hermann and Vale were elected members of the council. Mr. J. P. Bradley and Mr. H. H. Statham were respectively re-elected honorary treasurer and secretary, and Mr. Black was appointed honorary librarian.

PARLIAMENTARY NOTES.

IN the House of Commons, on Friday, Mr. Lanyon, in rising to move for the addition of professional architects to the committee for selecting a design for the New Courts of Justice, said that he did not entertain any feeling but that of the highest respect to the members of the Commission. The names were a guarantee for everything that was honourable and fair. He then read a letter from one of the competing architects, who said in the letter that they had the fullest confidence in the judges, but that they did not believe that gentlemen could decide such an intricate question without professional knowledge. If the Solicitor-General had a great question with reference to the procedure of Chancery, would he bring it before a committee of architects? or if a question of trade was to be decided on, would the bench of bishops be the proper tribunal? Two architects of high standing had already been named with whom the commission were to consult, and it would be most desirable that those two gentlemen, who met with the unanimous confidence of the competing architects, should be added to the commission and should have a vote on the decision of the matter. The task of selecting a suitable one from the many plans on exhibition was a most difficult one, and with all his professional knowledge he would find very great difficulty in saying which plan he would vote for. He trusted, in justice to the architects and the public, that his motion would not be refused. He moved that in the opinion of the House it was expedient that two professional architects should be added to the committee appointed for the purpose of selecting a design for the new Courts of Justice. Mr. Hunt said the competing architects were unanimously of opinion that the two gentlemen who were appointed as professional assessors to the judges of the design should themselves be appointed judges. If those gentlemen thought they could derive assistance from the advice of those professional gentlemen, the Government would have no objection to their appointment as judges of the design. But at the present moment that could not be done. The Commission must be first consulted. Mr. Cowper thought that after what had been said by the Secretary to the Treasury, there was no necessity for pressing the motion to a division. Mr. Lanyon withdrew his motion.

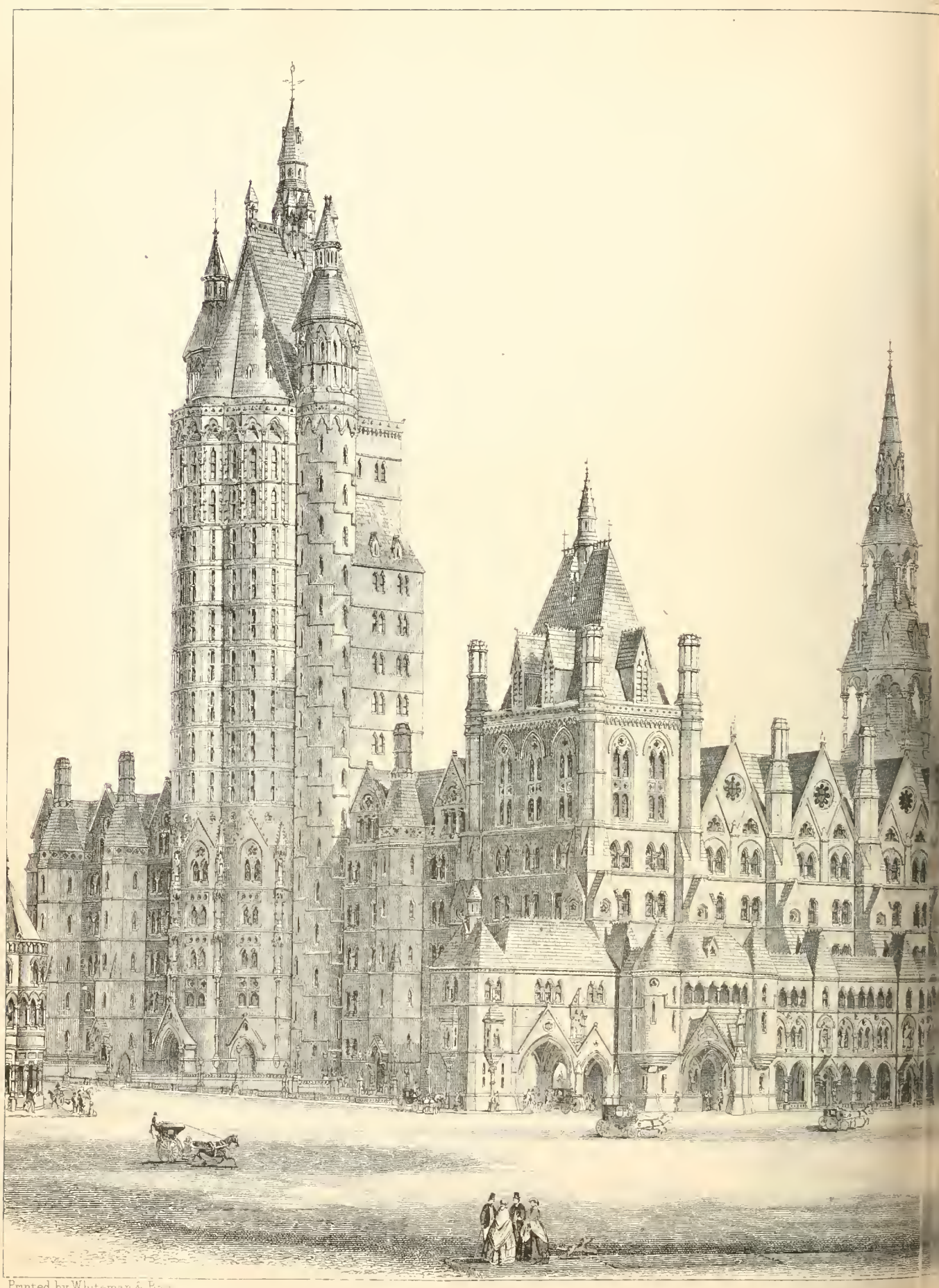
MALACHITE.

IF copper was as inoxidisable when exposed to the atmosphere as gold or silver, it would be esteemed one of the most beautiful as it is one of the most useful metals. When polished, it is of a deep reddish colour but it soon becomes dull owing to a portion of its surface combining chemically with the oxygen of the moist atmosphere, and forming a thin greenish coating. This green oxide is copper rust. Some of the ores of copper are exceedingly beautiful, especially the green and blue carbonates, the former called malachite. It usually accompanies the ores of copper, but it has been found in the largest masses and greatest abundance in certain mines in Siberia; and Russia is the only country which has attained distinction for the manufacture of articles from it. Sir Roderick Murchison, who has examined the Russian mines, supposes that this carbonate of copper was once in a liquid state, and that it gradually solidified by slow dropping. Every mass of it seems to have been grouped around a centre in nearly concentric layers, and according to the varying richness of the solution at different periods during dropping, the concentric layers vary in dark and light tints of beautiful green. The masses of malachite found in the Siberian mines are generally of a rounded form. This mineral is softer than marble, but it is much heavier, quite brilliant and its green tints have a silky appearance. It has been held to be a gem by some writers, and it almost deserves to be classed among the precious stones of the jeweller. It is fragile and very difficult to work. Although seldom found in lumps weighing more than 20lb., masses have been found in the Ural Mountains, in the mines of MM. Demidoff, of St. Petersburg, in masses of several tons weight. It receives a very high polish, and is chiefly used in the production of rich inlaid cabinet work, such as tables, mantelpieces, workboxes, snuff boxes, vases. In several of the palaces of the Emperor of Russia, there are rooms in which the furniture is mostly veneered with malachite. At the celebrated malachite works of M. M. Demidoff, the largest pieces of malachite are first reduced to blocks, then they are cut into thin veneers, with circular saws. A block of malachite being secured upon its carriage, it is fed towards a revolving circular disc, and fine sand and water are fed into the cut until the veneer is severed in the same manner that marble slabs are cut out. In every piece of malachite, there are light and dark streaks of green, and their curves are as graceful as some of those in veneers cut from mahogany crotches. These veneers of malachite are cut to the proper form, so as to combine the varying tints in the most artistic and agreeable manner. Every piece has its edges cut with a revolving copper disc, then the edges are ground to fit them accurately for the positions they are to occupy. In a table the framework of which is iron, the malachite veneers are set in their proper situations, with a cement made of malachite dust. When all the pieces are laid according to the prepared design, they are then ground down with sand, and finally polished with rouge. No seams can be detected in the work, and the play of the light green tints is really beautiful. Some of the churches of St. Petersburg have columns of veneered malachites. It requires great patience to work in this material, as it is so liable to break. The greatest artistic work in malachite ever executed was by M. M. Demidoff, in the form of a set of folding doors for a grand saloon. They were 7ft. wide, and 14ft. high, the veneering was about ¼in. thick, and thirty men were employed a whole year in their construction.

DESIGN FOR THE NEW LAW COURTS.

WE give this week a double-page lithographic illustration of the Strand view of Mr. Seddon's design for the new Law Courts. Having given on March 1 last an exhaustive article on the design, and on February 22 a block plan of the same, there is no necessity for us to describe it more fully on the present occasion.

There is now on view at the Albert Dock offices, Liverpool, a large and elaborate model of the scheme which has been developed by Mr. Lyster, the engineer to the Mersey Dock estate, of new approaches to the landing stages, alterations of the adjoining docks, quays, &c. It is to a scale of 40ft. to the inch; longitudinally it extends from the Albert Dock southward to the Waterloo Dock at the north—a distance of nearly a mile; while it stretches back sufficiently far to include a portion of Lord-street and Dale-street, thereby embracing the Townhall, the New Exchange, St. George's Church, and the Custom House, &c. The design shows very great merit and is a beautiful and interesting work of art. It is the production of Mr. C. N. Thwaite, of London, a gentleman already favourably known to the architectural profession for his truthful and artistic execution of many similar works.



Printed by Whiteman & Bass

Design for the New Law Co

H. Abbott Lith

Strand-View. J. P. SEDDON, ARCHT

MR. BERESFORD HOPE AND THE INSTITUTE.

MR. BERESFORD HOPE has just descended from the presidential chair of the Institute to make way for Mr. Tite. We stoutly opposed Mr. Hope's election, not because we thought that he would not discharge in an able manner the duties of chairmanship, but because we considered then, as we consider now, that the President of an Institute of Architects should himself be an architect. Everyone must admit that such a presidency is a post of distinction, and as such it should, in our opinion, be occupied by some man who may have fairly earned, by his works and character, the good opinion of his professional brethren. We know no more worthy object of ambition to set before the young architects of the country than the presidency of the Institute; and if the honour is to be won by industry, and by devotion to the advancement of architecture, then will it act as an incentive to correct conduct. But if, on the other hand, that honour is to be conferred on privilege, or on some man who by his riches or his title may occupy some particular social status, then the office of President of the Institute will tend rather to discourage than to encourage enterprise and genius. The mildew of patronage has already eaten too deeply into Art. Fortunately architecture is awaking from the lethargy of ages, not because it is smiled upon by the favoured few, but because of a gradual art revival which is taking place simultaneously with unparalleled industrial progress and political activity. And if architecture is to occupy its rightful place in the future, it must, like engineering, or eloquence, or poetry, or painting, depend on its own inherent strength. In art, in science, and in literature, the best man wins the foremost place; and it must be the same with architecture if it is to be vital, strong, and enduring. But, if the highest post of the chief architectural society of the country be conferred on the possessor of riches or titles, or any other accidental circumstance, then a slight is cast on an honourable profession, and an inducement to activity will be taken away. We hope, therefore, that the mistake of electing an amateur for the President of the Institute will not be repeated. If, however, that mistake should be repeated, we only wish that such a man as Mr. Beresford Hope will be chosen; for he has fulfilled the duties of the presidency with courtesy and with wisdom. Having said so much of the late president we will venture a word on the present president. No one could possibly object to Mr. Tite if he were now elected for the first time; but, having filled the office once, we think the council of the Institute would have acted more wisely by conferring the honour now on some one else. Certainly the architectural profession is not so destitute of eminent men that the council must either elect amateurs or re-elect ex-presidents. Would it not have been more just to the profession, and exhibited more generosity, to have elected such a man as Mr. Gilbert Scott, a man who by his abilities has justly earned an eminent name and an enviable social position? When Manchester refused to elect Mr. Bright as its representative in Parliament, Mr. Cobden attributed it to "fireside jealousy." We very much fear that a similar charge may be brought against some of the members of the council of the Institute in this instance. But, in humouring this jealousy, they are only perhaps putting a rod in pickle for themselves. They certainly do not raise themselves in the estimation of disinterested men; and should the time ever come when they may be eligible candidates for the presidency, it may be remembered that they were not actuated by the most honourable motives in electing Mr. Tite, after he had once filled the office, and disregarding the claims of such a man as Mr. Gilbert Scott; and possibly the very seeds of jealousy they are now sowing will germinate hereafter to their prejudice. We are sorry that, in the advocacy of the principle of putting worth before birth, and merit before means, and also of fairly distributing well-won honours, we are obliged to use names, but we have done so out of no disrespect to Mr. Hope, who has acted so judiciously, or to Mr. Tite, who has now for the *second* time so eminently deserved, and is so well calculated to fill, the post of president.

PARIS EXHIBITION.

In the middle of July there is to be a grand festival in Paris for the distribution of the medals and other honours of the Exhibition. It will be held in the Palace de l'Industrie, in the Champs Elysées; it will last for several days, and it is intended that it should be very magnificent, in order to make up for the meagreness of the ceremonial at the opening of the Palace in the Champ de Mars.

The *Moniteur* announces that the subscription to assist French workmen to visit and study the Paris Exhibition already exceeds £4,000. The Society of Arts have started a subscription with 100 guineas to assist British workmen in like manner, and desire to receive subscriptions.

After all, writes a correspondent, we have not expatiated for nothing on the horrible inconvenience of finding no means of getting home from the Exhibition. M. Hermann, a gentleman of immense intelligence, has organised the following system, for which service he deserves well of his country. He has established two telegraphic offices at the Porte Rapp, by which communication is opened with every cab-stand in Paris. Thus, granted that you want a cab, you go up to the wicket, pay 50 cents., and mention at what gate you want a vehicle to meet you. The message is sent. The reply gives the number. Porters see that the cab on its arrival awaits you and your party; thus, in five minutes, you are enabled to return in comfort to your hotel.

Mr. Hodgson Pratt has made arrangements with the English and French railways, with the Imperial Commissioners, and with certain provisioners, under which 200 workmen per week may go to Paris, live in a pleasant hall, spend a week in sightseeing, and come back again for 30s. All they will have to purchase for themselves is their food and an Exhibition ticket, and Mr. Pratt estimates the total cost at about £3 for the week.

An unprecedented fact has occurred at the Exhibition of Paintings which opened recently at the Palais d'Industrie. M. Jean de Waldeck, born at Vienna, 16th March, 1766, but naturalised French, and who therefore has completed his 101st year, exhibits two oil paintings, both of which he executed this winter. M. de Waldeck is the pupil of David and Prudhon.

Our contemporary the *Lancet*, we observe, is not very favourably impressed with the great "gasometer," so far as relates to sanatory arrangements. Regrets are expressed that a little more attention was not paid to details in the construction of the building, especially in reference to the ventilation. "In the plan originally proposed," says the *Lancet*, "special provision was made for the free admission, distribution, and exit of air in, throughout, and from the building; indeed, for the production of a free current of pure air. The courts, however, have been so constructed as to frustrate this desirable object, for they are, many of them, entirely shut off from communication with the apertures of ingress and egress of air, and, as they are of variable size, the temperature in different parts of the building will vary much, especially during the coming summer, when there will often be a crowd of some 25,000 persons present. The building will be probably very draughty in some quarters, whilst in others the air will be renewed but slowly, at the same time that it will be hot and impure; visitors may, therefore, possibly be subject to the evils of sudden changes of temperature, and the building itself become famous as a place to get cold and its many consequences."

England is not behind hand in sending specimens of her arms. In a shed standing to the right of the main entrance, there are specimens of almost every gun manufactured in England, and many sections of iron targets which some of these guns have smashed or pierced. A monster 600-pounder Woolwich-made gun, weighing 23 tons, stands in the centre, and on each side of it are some Armstrong 7 inch wrought-iron cannon. Panels are devoted to showing specimens of every tool of all the trades in the military service, and one case contains a specimen of the Enfield rifle in every stage of perfection and with all the latest improvements up to and including its adaptation to the breech loading system by Snider. A new invention by a sergeant-major of artillery is likely to draw the attention of military men. It is a gabion made of sheets of tin, which can be either laced together and stiffened with wooden transverse perpendiculars, or packed up straight or in a coil.

The American department contains many of these ingenious notions and inventions in which our cousins across the Atlantic excel. One of these is a small machine is called "The Matrix Compositor," invented by John Sweet, who is in attendance to explain it. It is a most ingenious contrivance, and for some sort of work is likely to supersede the present mode of printing. It is about half the size of a piano, and is furnished with keys. Upon the top is a revolving wheel with letters, which, upon the keys being touched, press upon a soft block of paper, on which they leave a deep impression. As this operation is continued, pages or columns are impressed, forming a mould from which stereotype plates can be cast, the labour of distributing the type, and the very numerous errors caused in proofs by the letters getting into the wrong boxes of the type case, being entirely avoided. A lad or girl could after a little practice work with this machine faster than the most experienced printer could set up type. It is, however, only admissible for some sorts of work, and this because mistakes cannot be corrected. For reprints it is admirable, but for the printing of original matter or newspaper work, where after corrections are needed, it could not be used.

Building Intelligence.

CHURCHES AND CHAPELS.

The Bishop of London has just erected a private chapel attached to Fulham Palace. The architect is Mr. Butterfield. The chapel was consecrated on Monday, with choral service.

On Wednesday week last Viscount Grey de Wilton laid the foundation stone of a new church at Battley, near Leeds. The building is from the designs of Mr. M. Sheard, architect, of Batley, and will be in the style known as the Early Geometric Decorated Gothic. It will consist of a nave, side aisles, chancel, organ chamber, vestry and tower, the latter rising to the height of 146ft. Accommodation will be provided for 500 worshippers, and the estimated cost will be about £4,700.

Calow.—The new Church of St. Peter's here has just been consecrated. The edifice consists of a nave 54ft. long and 24ft. 6in. wide, with apsidal chancel 28ft. long and 17ft. wide, and a tower on the south side, which serves the purpose of a porch. The nave is fitted with deal benches, the seats hollow and the backs reclining. The walls in this part are plastered. The ceilings are plastered and stencilled between the rafters. The church is designed after the style of the early part of the thirteenth century. The works have been creditably executed by Mr. Wright, from the designs and under the superintendence of Mr. S. Rollinson, architect, Chesterfield.

Christchurch (Hants).—On Good Friday a new Congregational chapel was dedicated at Christchurch, Hants. It is built in the Italian style, freely treated; the walls are built of white and yellow brick, with gauged arches to doors and windows and relieved with Bath stone dressings. At the south-west angle is a tower and spire 100ft. high. The interior of the chapel is 75ft. long by 40ft. wide, and accommodates, with the galleries, 700 persons. The interior of the roof is open, of framed timber, ceiled at the collar-beam, subdivided into panels by moulded ribs, slightly stained and varnished, the ceilings and walls being tinted. The panels are pierced for the purpose of ventilation. The architect is Mr. W. J. Stent, of Warminster, Wilts, and the contractor Mr. Walden, of Christchurch.

Easthampton, Berks.—The new church in this parish, which has taken the place of a very ancient and ruinous fabric, was consecrated by the Lord Bishop of Oxford last week. The church consists of a nave, with its south porch and baptistery; a north aisle and Downshire south tran-

sept, with the chancel and a south aisle set apart as a vestry and organ chamber. The entire length is 112ft., and the nave is 27ft. wide. The style of architecture adopted by the architect, Mr. Hugall, is an early type, embracing Byzantine and First Pointed details. All the woodwork is of red deal, varnished. The benches are all open. The chancel fittings are of oak.

GLASTHULE.—A new Roman Catholic church has recently been erected at Glasthule, near Kingstown. It contains nave, aisles, side chapels, organ gallery, sacristies, &c., and the dimensions are internally about 120ft. in length and 50ft. in width, of which 26ft. is appropriated to the width of the nave and 10ft. each to the aisles. The nave is divided from the aisles by an arcade of seven arches, resting on polished Aberdeen granite columns 12ft. apart from centre to centre. The chancel is 24ft. deep, and is divided into three bays by marble columns resting on stone corbels at the level of the string under chancel windows; these columns support the principals of the roof. The roof is constructed of curved and framed principals, one over the centre of each nave column, supported on corbels at the level of string-course under clerestory windows, with two rows of purlins at each side. As no intermediate principal is used corbels are introduced under the purlin and bolted to the principals. The roof is boarded to the back of rafters. The architects are Messrs. Pugin and Ashlin, of Dublin; the contractor, Mr. J. M'Cormick.

GLOUCESTER CATHEDRAL.—The Dean of Gloucester some months ago started a proposition for the raising of £50,000 for the restoration of this noble cathedral. Reparations have been going on at the expense of the Chapter for years, but this was to be a special and exhaustive effort. Mr. Gilbert Scott was made architect of the cathedral, and he has embodied the results of a careful survey he made in a detailed report he has just presented to the Dean and Chapter. He proposes reparation and restoration, the estimated cost of which is £45,000,—£17,000 for external, £22,000 for internal, works, and £6,000 for incidental expenses. The estimate includes £1,000 for gas-lighting. The whole spirit of his report centres in the one word "restore." "My main aim," he says, "is the limitation of the works of restoration in such a degree as to render them as conservative as possible of ancient work. I should earnestly desire not to renew a stone which is not so decayed as absolutely to demand it, and to decide all questions which occur with a leaning to conversion rather than to restoration or removal." Mr. Scott gives in detail the list of the restorations. The stonework of the choir must be cleansed; the screens and many monuments and chapels restored; all mutilated stonework repaired, and so on. The reredos, one of the most gorgeous specimens of decorative painting in the country, should be untouched. If anything is done with reference to stained glass, he strongly recommends that the work shall be given to Mr. Hardman, of Birmingham, some of whose windows in the north aisle of the nave are mentioned as the most successful restorations of fifteenth century glass he (Mr. Scott) has ever met with.

HALIFAX.—A new Congregational church is being erected here. The style adopted is Early Geometrical Gothic. The church will be built with Northowram pitch-faced wall stones and freestone dressings. The edifice will be 113ft. 6in. long by 53ft. wide, and 56ft. high externally. It will be divided into nave and side aisles by cast iron pillars supporting the galleries and roof, and five bays in length. At the north end of the building will be an octagonal recess for the organ, 22ft. wide and 6ft. 6in. in depth, divided from the nave by a deeply moulded and enriched arch, springing from granite columns with carved freestone capitals. Over the pillars dividing the bays will be moulded arches in brickwork and cement, between which and in the centre over each pillar will be granite columns with carved capitals and moulded bases, supported upon carved corbels, upon which the roof principals will rest. The internal woodwork, where exposed, will be of pitch pine. The pews will be 2ft. 10in. wide, and, allowing 20in. for each person, will accommodate 568 persons on the ground floor, and 364 in the galleries. Messrs. R. Ives and Son, are the architects; the masons' work is being executed by Messrs. M. Forth and Co., and the carpenter's and joiner's work by Messrs. J. Dyson and Son. Mr. Powell is clerk of the works. The cost of the erection is estimated at £8,500, exclusive of schools. The site was purchased from Sir F. Crossley, M.P., for £1,292. Sir Francis is a donor of £1,000; Mr. John Crossley, £750; Mr. Joseph Crossley, £500; and Mr. Edward Crossley, £500.

LEAMINGTON.—The memorial stone of the south transept of the parish church has been laid. The works consist of a south transept 30½ft. by 32ft., south porch 31ft. by 15ft., a west aisle to the south transept 10½ft. by 17ft., and double chancel aisles to the east of the south transept 30ft. by 21ft. The style and character of the new transept may be said to be generally of the Flowing Decorated or fourteenth century period, with some flamboyant features, bearing a strong resemblance to the florid ecclesiastical architecture of the continental cathedrals. The work is being executed by the contractor, Mr. James Marriott, of Coventry, under the supervision of Mr. T. D. Barry, C.E. Mr. Punshon is clerk of the works. The estimated cost of the work is £8,400, and the contract stipulates that the building shall be finished by November 9, 1868.

ROTHERHAM.—A new Congregational church has been erected in Rotherham from the designs of Mr. Shaw, architect. The style adopted is Early Decorated. The plan is cruciform, having nave 90ft. by 38ft., and north and south transepts each 20ft. by 18ft., with vestries and porches at west end. The principal entrances are at the east end, and consist of deeply-recessed doorways and large vestibule with gallery approaches. The tower and spire will be 170ft. high. The cost of the building is £4,500, and it will accommodate 900 persons.

SHREWSBURY.—The first stone of the new church at Mesle Brace, which will replace an edifice erected at the very commencement of this century, was laid on the 30th ult. It will consist of a nave, 68ft. 6in. long inside by 26ft., having north and south aisles; a chancel, the width of the nave, and 35ft. long, terminating in a three-sided apse; and north and south chancel aisles, one being provided for the organ. There will also be a south porch, and at the west end of the north aisle provision is being made for a massive tower, for which there are not at present sufficient funds. The accommodation will be for 500 persons. The style of the church is Early Decorated, and the cost is estimated at £3,360, exclusive of the tower. Red Hill stone is being used for the walling, Shelvoke for the dressings, and, for the shafts to arcade and chancel arch Besford Wood. The architect is Mr. E. Haycock, jun., the contractors being Messrs. Bowdler and Darlington, of Shrewsbury.

BUILDINGS.

A substantial and commodious court-house, with suite of buildings attached, was opened at Castle Eden on Monday. The cost of the buildings will be about £1,200.

The Midland Railway Company has purchased twenty acres of land at Wellingborough for the purpose of erecting shops for the manufacture and repair of engines and plant. It is stated that employment will be given in the shops to several hundred workmen.

The gasworks at Hogsthorpe are completed, and most of the townspeople have availed themselves of the opportunity of improving their shops. The cost of the works is something over £1,200. The contractors were Messrs. Holmes, of Huddersfield, and the builders Messrs. Hobson and Taylor, of Hogsthorpe. The price of the gas is generally considered too high, being charged 8s. 4d. per thousand feet.

The Duke of Northumberland has devoted a portion of his estate at Tynemouth for the erection of villas and pleasure grounds for the benefit of that popular watering place. Mr. John Green, architect, Newcastle, has been instructed to prepare plans for this purpose on a plot of between forty and fifty acres.

BIRMINGHAM.—The directors of the Birmingham and Midland Bank are about to erect a new banking room, from designs by Mr. Edward Holmes, architect. The style of the buildings will be strictly Classical, the front towards New-street being divided into three and that towards Stephenson-place into eight compartments, divided on the ground floor by boldly-rusticated pilasters, having Ionic pilaster caps on a plain substantial basement. The first floor will have three-quarter attached columns of the Corinthian order, with coupled pilasters at the angles. The upper cornice will be proportioned to the total height of the building, and will be crowned by an open balustrade, the angles being carried higher and treated as coupled pilasters, with separate caps and cornices. The public entrance will be in the centre of the New-street front, under a portico having four Ionic detached columns, the shafts and bases of which will be of polished granite, each in one piece. The banking room will be 92ft. long, 49ft. wide, and 30ft. high, lighted by nine circular headed windows, each 18ft. high, and by a lantern light in the centre of ceiling 37ft. by 18ft. 6in. It is proposed to erect the main fronts in Portland stone. The interior walls and decorations of the bank and principal rooms will be executed in Martin's cement. So soon as the old buildings on the site are pulled down the works will be commenced.

EDINBURGH.—A new building is in the course of being erected for the Edinburgh office of the Crown Life Assurance Company. The design, which is by Messrs. Peddie and Kinnear, architects, is Italian, and the building consists of four stories. The ground floor, which shows three arched openings, two windows and door, will be allotted to the public office of the company. The doorway and windows are separated by projecting piers, which are continued up to the frieze. The frieze is divided into three compartments, corresponding to the piers, each pier having over it a double truss supporting the cornice, while the spaces between are occupied by panels. The windows in the first floor are also circular-headed, and are surmounted by trusses, which support the balustraded balcony of the floor above, the balcony serving as a cornice to the first floor. The second floor windows are square-headed, with architraves and cornices, while the smaller windows of the top story rest on a bold stringcourse. The wall terminates in a cornice, supported by trusses about 2ft. apart, having rosette ornament between. The roof, which rises at a steep pitch, is finished with a platform enclosed by an iron rail, with corner pillars and finials. The building is simple in its ornamentation, but it will be a prominent feature in the line of street. The builders are Messrs. Watherston and Son.

NEW YORK NEW POST OFFICE.—The contract between the United States' Government and the corporation of New York for the purchase of the lower end of the City Hall Park for the site of a new Post Office, at half a million dollars, has been completed, and the building will be begun immediately. The building will have a front of 150ft.—50ft. less than the front of the Grand Hotel at Paris. It will probably be of marble, in as elaborate a style of architecture as the money appropriated by the Government will allow, and Postmaster Kelly says "we see no reason why the Yankees may not beat the world in post-offices." At the upper end or Broadway a gateway, 30ft. wide, will admit the mail waggons into a court 150ft. long by 40ft. wide. The hall will be lighted from the roof, some 150ft. from the ground.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the EDITOR, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty four Words.

RECEIVED.—L. H.—A. H. H.—Dr. D.—J. G.—J. S. D.—J. O.—B. Bros. J. H.—J. G.—E. C. L.—C. J. W.—J. C.—H. M.—W. J. S.—J. H.—A. W.—H. K.—C. J. F.—L. and N.—J. G.—C. W. J.—C. L. E.—O. G. N.

JOS. TALL.—Your letter on concrete buildings in our next.

"A Looker-on." "H. H. S. P.," &c.—We have received several long letters on Mr. Burges's design for the new Law Courts and the controversy which has grown out of it. It would be impossible for us to insert all the letters, and as some of them are too full of personalities, we are obliged to make a selection.

Correspondence.

CHURCH ARCHITECTURE.

To the Editor of the BUILDING NEWS.

SIR,—Having read in your valuable paper that at a meeting of the Liverpool Society of Architecture recently held, Mr. Statham threw out a suggestion for a church of the nineteenth century, which should combine architectural effect with suitability

to the requirements of modern worship and to the pervading artistic and religious feeling of the present age, allow me to say a few words on the subject. The Greek cross as pictured in the ground plan is by no means a new suggestion, as Mr. Statham says. Sir Christopher Wren wished to adopt that plan in St. Paul's Cathedral, and, finding he could not carry out his design, actually shed tears, which had he carried out would have rivalled in magnificence St. Peter's at Rome.

There is a small church at Addleston Park, Surrey, on very nearly the same principle as Mr. Statham suggests, being of the form of a Greek cross surmounted by a dome, and although not a public church, I believe was built expressly for the family of Lord Kilmorey and tenantry on the estate. Instead of the pulpit being placed a little in advance of the east end, as sketched in your plan, with space reserved behind for organ and choir, the one to which I refer is placed at the south east angle of the church, the same having been adopted in St. Paul's Cathedral, while the east recess is appropriated for the Communion Table. The north recess contains seats, I believe, appropriated to his lordship; the south were to be for choristers and harmonium, the west for tenantry, as also centre of dome. The church is glazed with very fine stained glass windows representing saints, and incidents of our Lord as figured in Scripture history; the interior of dome is lighted by four circular windows above the four piers which carry the dome; the floor is inlaid by Minton's encaustic tiles, as also the wall in the eastern recess. In the centre of the wall there is the cross inserted with beautifully polished tiles. Messrs. Cubitt and Co., of Gray's Inn-road, were the builders, and the works were superintended by Mr. Axford, of Sun-street, Bishopsgate, who also superintended the erection of the City terminus of the North London Railway; the dome is covered with lead surmounted by a gilt cross. Great credit is due to Lord Kilmorey in adopting such a plan; and the mausoleum in the grounds is very impressive, being Egyptian composed of red and grey granite, the interior being lighted from the top with amber-coloured glass pear-shaped.—I am, &c., J. W. Fennell.

24, Luard street, Caledonian-road,
Islington, May 6.

MODERN ARCHITECTURE AND THE LAW COURTS.

Sir,—There can be little doubt that in meeting "Your Correspondent" I am again face to face with my old friend "Philocalus" of the *Standard*, who, as I ventured to predict, is now deeper in the quagmire than he was when last we parted. I have generally an objection to aliases. His adoption of one in the present instance looks peculiarly significant. Although, however, he has changed his name his tactics remain unaltered, for he still continues, but with diminished force, to abuse. Up to the present time neither "Philocalus" nor Mr. Burges have been able to demonstrate anything beyond their utter incompetency to defend, any more than to design, such a building as the Law Courts. From the letter which appeared in the *Standard* of the 7th inst. it may be fairly presumed not only that "Philocalus" finds the case a bad one, but that, acting on my advice, Mr. Burges has politely requested to be excused from his friends. At all events it is obvious that "Philocalus" is prepared to sink himself in order to give the object of his admiration one more chance of life; though there was scarcely any necessity for his assurance that "he had no connection with the competing architects" after his recent attacks on two of their number.

"Philocalus" certainly deserves some credit for the staunch manner in which he has stood by his friend Mr. Burges, whose name he first dragged into notice, and whose design he, unhappily for his object, held up as being so immeasurably superior to all others. His arguments in its favour, however, have certainly not proved conclusive, nor his statements facts. Knowing this to be the case, he has endeavoured to raise a secondary feeling, and to seek shelter behind the smoke of doctrinal difference. Such an effort is wholly unworthy of the cause he seeks to defend, and will prove of as little avail as the petticoats of Mrs. Malaprop. The modesty of "Your Correspondent" is, however, worthy of admiration, for he confesses that he does not "pretend to understand all that has been written," or to "know how a building can lack principle." He "knows what an unprincipled man is," but he "cannot affix a definite meaning to an unprincipled clock tower." Does "Your Correspondent" require a lesson in elementary philosophy, and to be told that he has confounded the subjective with the objective, and the moral with the intellectual? Can he possibly imagine that I, or any sane man, would ever think of attributing to a clock tower a want of moral principle, and thus make it a responsible agent? A moral principle is one thing, and can only be attributed to a moral agent, except by metaphor, and such moral principle is practically only subjective. An architectural principle, on the other hand, may be both subjective and objective, that is to say, the principle or the idea (for in this case the terms are synonomous) is first conceived in the mind of the designer, and then may be expressed outwardly in the material building. Such a building may fairly be said to possess a principle, because based on a scientific idea; and a building not so based may justly be said to lack principle. With regard to the signification and use of the word "autonomy" I beg to refer "Your Correspondent" to my letter in the *Standard* of the 6th inst., wherein the meaning of the word and its propriety as applied to architecture is fully explained.

The most important statement contained in "Your Corresponden's" letter, is the astounding intelligence that Mr. Burges "has depended for vertical effect on his towers, rising, as they do, from the ground." It is on this point that I have been at issue with "Your Correspondent" from the very beginning. Although it is to be hoped, for the safety of the surrounding inhabitants, that the said towers are not like the now renowned "lateral shafts,"—shoved up nobody knows how—yet the assertion that they rise from the ground is ostensibly incorrect. The south-west tower is most assuredly without any visible base, for it rests, upon or vanishes into an intersection of roofs, a crowd of gables, and the continuous arcading. For any apparent injury which the homogeneousness of the design might suffer, there is no reason why Mr. Burges should not have added to the "breadth of effect" *ad infinitum*; for not only is the building raised in slices, but it also bears an unfortunate and unmistakable appearance of having been manufactured by the piece, from or to which any number of yards might be cut off or added. The whole composition is strongly suggestive of Wardour-street ware, in which the panels of a stall, the end of a seat, the crockets of a reredos, and the jerry work of a half bred joiner, are brought together, without reason or fitness. The rest of "Your Correspondent's" remarks, or at least, such of them as contain anything beyond abuse, have been answered at length in my letter already referred to. I need, therefore, only repeat my assertion that he has failed to make good a single statement he may have set forth. This is not to be wondered at, for the objections I have raised have all a positive existence, and hence are simply incontrovertible. No one knows this better than "Your Correspondent," who, in the beginning of this controversy, was probably as little acquainted with the faults which are now patent to all, as he perhaps still is of the existence of such a thing as the Lincoln Clerestory. I am, &c.,

The Writer of the Articles in the "Westminster Gazette."

London, May 8.

Intercommunication.

QUESTIONS.

[373.]—BLOCKS AND FALLS.—I have grown to regard your Intercommunication column with considerable interest. It seems to me to contain, as it were, the concentrated essence of practical information, and to convey more real instruction in a few terse and brief sentences than is sometimes gained from the perusal of whole pages of other so-called scientific journals. In venturing, as a young hand in the building trade, to put a question to you or your kind contributors, perhaps I may be out of order, and if so, please cancel my remarks; but if I find favour, allow me to ask how it is that so much power appears to be gained in lifting heavy weights by the use of blocks and falls? The laws which govern the action of the pulley are supposed to be made clear in school books, but my experience tells me that the results of the singular combinations of pulleys in double and treble sheaved blocks, &c., are mysterious to many who are in the habit of using them. Perhaps this is one of the very common things that are passed over without inquiry as to their causes, and taken as matters of course. At any rate I shall be pleased to learn more about block-tackling and its phenomena than I know at present.

Hydraulic Lift.

[374.]—PURIFYING WATER.—Is there any simple mode of detecting impurities in water to be used for drinking or cooking purposes? It seems to me that a little more practical information on this head would be useful. There appears to be no way, at present, of arriving at accurate results as to the quality of water without employing an analytical chemist at a large cost. I want to see domestic tests of a cheap kind which will determine whether the water we are going to drink is likely to do us good or harm. While we are free from cholera and cognate complaints—which it is now notorious arise very frequently from the use of bad water—we might calmly deal with the subject. Perhaps some philanthropic chemical friend will answer my question.

Hydropath.

[375.]—ROYAL ACADEMY.—Would any of your numerous readers inform me, through the medium of your "Intercommunication" how I can become a student of the Royal Academy; and whether one can compete for the R.A. Gold Medal and Travelling Studentship without such admission as student?

X. Y. Z.

[376.]—CASTS IN PLASTER OF PARIS.—I am desirous of taking some casts in plaster of Paris of some delicate work in relief; perhaps some of your numerous readers could tell me how to set about it, so as to ensure a perfect reverse of the object.

G. H.

[377.]—LAYING STONE.—It is always specified that stone should be laid on its natural bed; will any of your correspondents inform me how they know which is the natural bed of a stone?

G. J.

REPLIES.

[334.]—REPAIRS.—In your columns of the 12th ult., a correspondent "J." asks a question respecting the application of the Metropolitan Building Act. In the section relating to the raising of already existing buildings he will find the apparent ambiguity he complains of fully answered. It is there distinctly stated that the thickness of the walls of the raised building must be of the dimensions prescribed for that rate to which the building will belong when so raised. There is, however, a clause introduced which allows any existing building to be raised to the extent of 10ft. in height, provided the surveyor considers the walls to be sufficiently strong to bear the additional height. So far as the Act goes, and also obviously on other grounds, there would be no objection to putting a room in the roof, so long as the height of the walls remained unaltered, for the house would still belong to the same rate of building. What "J." appears to want to do is to transform a building of the fourth rate into one of the third, and still have the same thickness of wall. Anyone can see that this is in direct violation of the spirit and meaning of the Act.

C. C.

[341.]—SEA WALLS.—There would be no necessity in the particular instance mentioned by "J. T.," in going to the extra trouble of building the wall with a curved batter. I should give it a straight batter, and if stone were plentiful in the neighbourhood, I would put a flatter slope on the lower part. The back of the wall might be built plumb, with offsets at proper heights; the parapet, if there is any, should also be plumb. If there is no parapet, I should build the top three or four feet of the wall perpendicular, so as to throw back the spray in times of gales.

The Writer of "Docks."

[343.]—RIDGE TILING.—"Improver" will find Portland cement as good a material as any for bedding and pointing tiles, whether they are used as coping tiles, or in the situation he mentions.

Cement.

[352.]—ELECTRO ON STONE.—It has been proved by Mr. Murray that non-conducting bodies, such as sealing-wax and plaster of Paris, can be covered permanently with a thin metallic coating by the electro-plating process, by taking care to rub their surface previously with the thinnest possible film of plumbago. There is not the slightest doubt but that, as plaster of Paris can be coated in this manner, so can any description of stone. "Inquirer" would do well, however, to bear in mind that it is a much more difficult operation to coat a non-conductor of electricity than a metal which is one of the best conductors. A little more patience will be required.

Cyanite.

[356.]—STRENGTH OF WALLS.—Your correspondent "Muscle" does not state whether he requires his wall to take the thrust of the roof, which I suppose he does, since it has no tie-beam, or whether simply to support it. If the wall is to take the thrust of the roof, it will be a very uneconomical way of proceeding, as the thickness must be very great. He must first calculate the thrust brought upon the wall and tending to push it outwards, by the principals, which is as follows:—Let W be the total load on one principal, including its own weight; let L be the length of the rafter, and R the rise of the roof, then putting T for the thrust against the wall we half $T = \frac{W \times L}{2 \times R}$. Evidently the moment of this thrust to overturn the wall is directly as the height or leverage with which it acts, which is the height of the wall; multiplying, therefore, the above value of T by the height, we have the total moment tending to overturn the wall. To oppose this we have the resistance of the wall, which, putting W^1 for the weight of a cube foot of it, H for the height and t for the required thickness, is $\frac{W^1 \times H \times t^2}{2}$ and we finally obtain $t = \sqrt{\left(\frac{W \times L}{R \times W^1}\right)}$. "Muscle" will find it a much more economical plan to substitute a light iron trussed roof exerting no thrust upon the side walls, instead of the expensive plan he proposes.

An Engineer.

[360.]—FACTORY CHIMNEY SHAFTS.—An excellent practical rule for the batter to be given to chimneys of the kind alluded to by "Truro Street," is ¼in. to the foot. For a stack so high as 250ft., and, indeed, over 200ft., I should not make it more than 3-16th of an inch to the foot.

Clerk.

[366.]—HEATING PRIVATE BATHS.—In reply to an "Inquirer" as to the best manner of heating a bath in a private house in order to prevent an explosion in time of frost, is to have a boiler fixed in the back of the kitchen

fireplace, and in this boiler a coil or worm of lead or copper pipe, say between 40ft. or 50ft. in length, and from this boiler a steam pipe into the flue and on a level, and near to this boiler a small feeding cistern with ball and ball cock to supply the boiler; this may be attended to in time of frost by hand. Then by the cold cistern in the roof have a hot cistern, then have the flow and return pipes connected to the coil in the boiler and to cisterns in the roof. In adopting this plan there cannot possibly be any explosion. I had this plan fitted up in a gentleman's house with great success. CLERK OF WORKS.

[367.]—CUBICAL QUANTITY.—1. If joints are not shown in a drawing, they must be assumed to be in their most natural and economical position, or radial in an arch. The extrados, × radial depth, × breadth, will give the gross quantity of stone usable for any arch. 2. "Student" can surely examine a lead gutter. G.

[368.]—LINE OF EQUILIBRIUM.—How to find this line in an arch is fully explained in Mozeley's Mechanics, and sufficiently even in H. Law's Civil Engineering, in Weale's Shilling Series. G.

[370.]—CULVERT.—The answer must depend on the velocity of the stream above, which can only be known by measurement. One stream may be more where its fall is, but 1 in 1,000—than another where it falls 1 in 100; for the velocity depends on the whole configuration of the upper bed and valley, not on the mere gradient of one portion. G.

[371.]—PLASTER CEILING.—To make a good ceiling the joist should be thoroughly dry and well seasoned, sufficiently strong and well stayed. The strongest and straightest laths should be selected, free from knots and dents, and nailed on not too far apart—only sufficient for the mortar to work in freely, which forms a key to the work,—for when the timber is not thoroughly dry it is sure to shrink. If the laths are too slight and far apart, they always sag or bend downwards with the weight of the mortar suspended to them, which, with the shrinkage of the timber, is the cause of the cracked ceiling. The mortar should be well pricked up between the laths, not merely stuck up against them, as is often the case, to get over it when it is done by the yard, &c.; that is another cause of its cracking, and even dropping down, which is very unsightly. The pricking up should be well hardened before the second coat is applied, then it may be finished off in the usual manner. STEPHEN LEWIS.

[371.]—The reason so many plaster ceilings crack is the shrinking of the timber. If a ceiling does not crack when drying it will never do so unless the timber shrinks. The way this may be remedied is by nailing light spars crossways to the joists, and lathed and plastered to them instead of the joists; and great care must be taken to prepare the lime so that it will not crack when drying. All the lime must be boiled (not slaked and washed, as it generally is done in the north). The first coating must be properly dried before the next is applied; this, with about the regular proportion of good sharp sand, will not fail making a good sound ceiling. Another way is by plastering the ceiling with Keen's or Martin's cement, 1 part cement and 2 parts sand, the first and second coating may be mixed with hair, and the finishing, pure cement. This makes a sound hard ceiling, and may be painted twenty-four hours after finished. Though expensive, it may be depended upon for not cracking. F. G.

[372.]—DOUBLE GIRDER BEAM.—As wrought-iron, in such a form as the top and bottom plates of the described beam, would not resist half the amount of lengthway compression that it will of tension, the inquirer will see that his top plate ought to have been twice as thick as the bottom. Moreover, for the sides, I think a quarter the thickness of the top would be ample, if they were corrugated vertically. If all be equally thick, at least three-fourths the metal of the side and half that of the bottom and lower angles is thrown away, or 6 cwt. of the 15 cwt. that the beam described must weigh at the least. This is supposing the 15in. depth to be only at the centre, the top descending to each end like a bow. If it be straight, the weight will be at least 18 cwt., and fully half the material be useless load. In any case, then, the problem is to find what added weight will, together with the beam's own weight, produce a compression of the top plate and angle irons sufficient to begin crushing or squeezing out the 7 or 8 square inches of their middle section. If we suppose the greatest compression allowable on them to be 4 tons per square inch, that is (say) 30 tons, then, as a weight distributed equally along the beam acts with a leverage as a quarter of its length to its middle depth, or as 49½in. to 15in., about 9½ tons will produce the above pressure. But if collected at the centre, half that load will have the same effect. Deducting from each of these, then, the beam's own weight of 15 cwt., we find that it should bear 4 tons on its centre, or 8 tons 15 cwt. distributed equally. E. L. G.

STAINED GLASS.

A new stained glass window has just been put in Rotherham parish church by Messrs. Wailes, of Newcastle, under the direction of Mr. Shaw, architect. It is in the Perpendicular style, and embraces three large lights, in compartments separated by stone mullions, and numerous smaller openings, which have been filled with the richest painted glass. The principal subject is "Mary sitting at the feet of our Lord, hearing His Word." The Saviour is represented seated in the centre, Mary on His right, and her sister Martha on the left, and He is in the act of praising the former and mildly rebuking the latter, according to the narrative of the Evangelist. The figures are painted of a large size, and are free from the grotesque and conventional treatment so often adopted in painted glass.

GUILDHALL.—A fourth stained glass window has just been placed in the north-west corner of the Guildhall. The design is by Mr. Alexander Gibbs, of Bedford-square. It is divided into four compartments, the subjects being the presentation of the four principal charters of the City; the figures are richly coloured and jewelled on diapered backgrounds, and are surmounted by canopies on a rich ruby ground; the arms of the City and those of the donor are introduced in the tracery lights. The first subject is William the Conqueror holding in his hand the first charter granted to the City, which declared the citizens to be "law worthy, and their children to be heirs of their lands and goods, and that no one should be allowed to do them wrong." The second subject is Henry I. presenting the charter granting to the City to hold Middlesex with London, and the right of hunting in the forests. The third subject is Richard I. granting the charter to the City of the conservancy of the River Thames. The fourth and last subject is Edward VI. presenting the charter of the four Royal Hospitals. The City is indebted to the liberality of Mr. Cornelius Lea Wilson, a lieutenant of the City, and a warden of the Goldsmiths' Company, for this beautiful window, which is now open to public inspection, and will repay the trouble of a visit. It is best seen from the gallery, into which a door has been opened in the south-west corner.

STATUES, MEMORIALS, &c.

A proposition for the erection of a public monument over the grave of the late Lord Panmure was originated some time ago by the members of the Brechin Mechanics' Institution, and the sum of £50 has been subscribed towards the object.

A fund is being formed in order to place in his native city of Aberdeen, a memorial bust of the late John Phillip, R.A. The list of subscriptions is headed by the Earl of Dalhousie.

The proposed memorial bust to Stothard, the painter, which is to be placed in the National Gallery, has been undertaken by Mr. Weekes, and will be put in hand forthwith.

A very successful casting of a large bronze statue to the late Mr. Ostler, of Bradford, so well known for his active labours to improve the condition of the youth employed in factories, was made on Tuesday at Messrs. H. Prince and Co.'s foundry at Southwark. The statue is 10ft. in height, and will weigh upwards of two tons. It was designed by Mr. J. B. Phillips, and is destined for Bradford.

So long ago as the year 1850 a statue of Sir Robert Peel was subscribed for by the political friends of the eminent statesman, and long since executed by Baron Marochetti. It appears, however, that the important matter of a site for the statue has been overlooked or at all events a site has never been provided. The cause of this was explained by Lord John Manners in answer to a question by Lord E. Bruce in the House of Commons on Monday evening. The Chief Commissioner of Public Works said that the statue of Sir R. Peel could not be erected immediately. The only reason why it had not been erected was in consequence of the non-completion of works which were going on for the convenience of members of the House. So long as these were proceeding it was perfectly impossible to erect the statue to Sir R. Peel on the spot designed, but it would be placed there at the end of the session.

WAGES MOVEMENT.

In New York the "Eight Hours' Bill" has passed the legislature, and now only needs the Governor's signature to become law. Some of the carpenters now on strike in New York have started a co-operative carpenters' shop, and will work hereafter on their own account.

The strike of masons at Barnsley, which took place on Wednesday last, has partly terminated. Some of the small contractors have offered to give the 2s. advance per week, and the men have at once resumed work. The principal masters, who employ large numbers of hands, show no disposition whatever to give way.

BRADFORD.—The masons' labourers have not struck work as was threatened, but have consented to go on at the present wages without the advance. The plasterers have obtained some important concessions. They had given notice that they should require a reduction in the hours from 56 to 50½, and an advance in wage of 2s. per week. The wage at present is 26s. The time is given without demur, as it is the hours worked by the other trades generally. The advance of wages is given at present also, but it is not guaranteed as permanent.

HUDDERSFIELD.—The masters here arranged with the masons, who had given a six months' notice for an advance of 3s. per week, to commence on the 1st inst., to give the wages asked, namely, 30s. per week of 50½ hours in summer, and 27s. per week in winter. They conceded the other matters in dispute—thus their strike was averted.

MANCHESTER.—The plasterers' labourers' strike is now virtually at an end, and the whole of the shops of the members of this Association are now filled with non-union men—with the exception of Messrs. Mannion and Malloy, Jelly, Cook, and Son, J. Burns and Hindle, who are paying the advance of wages demanded by the men, viz., 24s. per week.

WATER SUPPLY AND SANITARY MATTERS.

The water of the Bradford Canal, which unites with the Leeds and Liverpool Canal in the valley of the Aire, has been run off, and the canal closed. An injunction from the Court of Queen's Bench, involving penalties of £10,000 against the existence of the canal in its polluted condition, has led to this result.

A HOT-BED OF EPIDEMICS.—The people of Newcastle—the city of the Tyne too—ought to feel no small alarm a the facts stated in the Registrar General's return for th last quarter with regard to the high rate of mortality i their midst, and the causes thereof. From the Registrar' return it would appear that the deaths in England in th three months ending in March amounted to 134,254; an the annual rate of mortality was nearly 26 per 1,000 for th winter, which is now in England the most fatal of th four seasons. The death rate was 27 in the town, and 2 in the country, districts. In the thirteen great towns o the United Kingdom the winter death rate was 29; Hu had the lowest rate, 25; Newcastle-on-Tyne the highes 37. The Registrar thinks it may be desirable to inquir into the singular insalubrity of Newcastle, for whic nature has done so much, and for which the municip authorities appear to be still incapable of procuring th conditions of a healthy existence. "If coals are dear, that scarcely a disadvantage to Newcastle, which supplies th country with that article, and obtains its artificial heat a much cheaper rates than London. The dwellings, th water supply, the drainage, the scavenging, the disinfe tion of the sick, the habits of the people, demand effectu measures of reform; and then Newcastle, now class among the great towns of the kingdom, will no longer b the worst hot-bed of epidemics amongst them."

HALIFAX.—On Wednesday week last the ceremony of cu ting the first sod of a new reservoir at Mixenden, near Ha fax, was performed by the Mayor of Halifax. It is in co nection with the system of waterworks by the Halifax Co poration, and the last in the series which the town has t power to construct under its present Parliamentary powe The reservoir is just behind the village of Mixenden, on t rising ground. The capacity of it will be about 100,000,0 gallons, and the cost of it about £20,000. It is supp mentary to the large reservoir at Ogden, the new one ha ing comparatively little collecting ground. The engine is Mr. Bateman, Manchester, and the contractors Mess Helm, Charnock, and Jennings, Halifax.

JEDBURGH.—The cutting of the first sod of the Jedbur New Waterworks took place the other day. The Bla burn springs, from which the water is drawn, are seven number, and yield altogether 42 gallons per minute, wh is equal to 60,480 gallons a day, affording 17 gallons a d to each person in the burgh—the population being ab 3,500. The water of these springs is to be collected int cistern near an old quarry, a little below the lowest spri It is brought from thence down the romantic vale of Bla burn to the distributing reservoir at the top of the tow The contractors are Messrs. Anderson and Scott, Lanton.

LEGAL INTELLIGENCE.

BREACH OF BUILDING REGULATIONS.—In t Court of Queen's Bench last week, was heard t case of Christopher Harring *v.* the Mayor a Corporation of Stockton. The appellant is builder at Stockton, and the respondents are t mayor, aldermen, and burgesses of that horou (which is regulated under the Stockton Impro ment and Extension Act of 1852), by th surveyor, Mr. George Edwards. In the early p of last year, the appellant submitted to the L Board of Health a plan of fifty-eight houses wh he proposed to erect in a street called Christopl street. The plan was objected to, on account the open space which it allowed. He prepa another, and it was approved; but the surve found, when the building was going on, that was deviating from the plan. The town cl thereupon summoned him, and the case heard by three justices, two of whom w borough magistrates. The appellant was c victed and fined £5; but being dissatisfied, asl for a case, which was allowed, and was now sta by the Bench for the consideration of this co —The court, after hearing the statement of fa on behalf of the respondents, and without cal on counsel for the appellant, confirmed the d sion of the justices.

WHAT IS A HOUSE?—The case, "The Queen Watson," which came before the Court of Queen Bench a few days ago, raised the question, W can be deemed to come within the meaning of e word "house" with reference to rating? 'e question arose as to a rate made under a local which provided that a party might be rated respect to the annual value of any house in occupation. Several parties had been rated respect, not only of their houses, but the mises appertaining thereto and occupied th with, including sheds, outhouses, gard orchards, and even fields. The first case, wh may be taken as a specimen of the others, the following:—The appellant was a tanner, the rate made upon him in respect of his h comprised, along with his dwelling-house garden and outhouses attached thereto, the fol ing premises:—Several buildings, tanpits cov with roofs, sheds, barns, stables, all occup 1 acre 20 perches, and a meadow used as a dr ground, containing 1 acre 20 perches, and ano meadow, "all held and occupied together u one lease, and used and occupied by the ten for the purpose of his residence and busine These latter words indicated the ground on wh the sessions had upheld the rate. There a similar case, in which the tenant had a timber yard adjacent to his dwelling-house,

e was rated for both as for "a house." In nother case there was a mill, which joined the ash-house, but the wash-house, though it adoined, was not joined to, the house. All the preises, however, were within a common fence or nclosure. The Lord Chief Justice said the ourt considered that all that could come within curtilage"—as the garden in which the house ood—might be included within the house, but ot premises which, though occupied with the ouse, were used for the purpose of the business, nd not of the residence. In other words, all hat was accessory to the house as a residence, or, the language of Lord Hale, *domus mansionalis*, ight be included; not anything beyond that, nd incident to the business. It was not within e intention of the act which imposed a rate on ouses that such buildings as timber yards and n-yards, and other premises used for the purses of business, should be rated. The rates ust therefore be amended according to the prinple thus laid down. Mr Justice Blackburn conrred. In the ordinary case of a flower garden was obvious that no one would take the house thout the garden, or the garden without the ouse. In London this was almost always the se; in the country the gardens were larger, and ses might be more doubtful. But whatever ght be the difficulty in applying the principle, at was the principle,—viz., that whatever was cessory to the house was part of the house, *i.e.*, hat was accessory to the dwelling-house. On s principle the mill might be included, which rned virtually joined to the house, but not the ildings in the other case separate from the ouse, and only occupied for the purposes of the siness, not the residence. Mr. Justice Lush ncurred. Judgment to amend the rates accordgly.

COMPENSATION.

n the Court of Compensation, on Monday, the publisher the *Mark Lane Express* and other publications claimed n the Law Courts' Commissioners a sum exceeding ,000 for business premises and loss on removal, at No. , Strand, near Temple Bar. Mr. Lloyd, Mr. Sargood, Mr. Horace Lloyd, instructed by Messrs. Rogerson and d, were for the claimant; Mr. Hawkins, Q.C., Mr. , and Mr. M'Mahon, were for the Royal Commissioners. onsiderable portion of the day was wasted over the jury. y ten answered, and others were challenged. Mr. kins thought they had better disperse as they could proceed. Some one said "Read the Riot Act," and Hawkins said his learned friend Mr. Sargood was ly to be sworn in as a "special." Further time was d away, and at past twelve o'clock the jury of ten were harged, and the case went off for want of a jury. The ense would be considerable on both sides.

General Items.

The Architectural Association at their special siness meeting to-night, will discuss the address the General Builders' Association.

The Town Council of Edinburgh have resolved invite the British Association to hold their eting in 1868 in the Scottish metropolis.

Mr. Gott, the surveyor of the Borough of Bradd, has had his salary raised from £400 to £700 annum.

The *New York Herald* states that within a years past, thirty-five churches have been ned down within ten miles of Boston, Massasetts.

t is understood that Mr. Hawkshaw, the gineer, after an extensive series of soundings, satisfied himself that the bottom of the glish Channel has too many and too deep ults" to permit of tunnelling.

Mr. Anthony Trollope will preside at the fiftyond annual dinner of the Artists' General nevolent Institution, which will take place in Freemasons' Hall on Saturday, the 18th inst.

The following gentlemen were elected members the last meeting of the Society of Engineers. jamin S. Fisher, Edward Buckham, Benjamin ke, Henry Shield, John B. Palmer. Fred. C. vers, Thos. Greenhill, and John Watson, S., Esqrs. Associates: Charles M. Barker. hard Gunning, William Sandison, Douglas H. bee, and F. Ireland Rumble, Esqrs.

Mr. G. M. Greig, the well-known Scottish water-our painter, died at his residence near Edinh on Friday. Interiors were Mr. Greig's ciality—picturesque bits of Old Edinburgh and er old towns in Scotland were favourite subs with him, and have brought into play all his qualities as a water-colour painter.

The *Western Morning News* says:—There is a great quarrel now going on among the civil engineers, involving principally Mr. Scott Russell. We do not presume to pass any judgment upon the merits of it, but the manner in which it is being conducted may be judged from a choice passage which occurs in a professional paper in this country, edited by Mr. Zerah Colburn. The editor talks of "laying the lash upon a gentleman so as to make his thick hide bleed at every pore." We should add, for the credit of British journalism, that though the paper in which this delightful piece of writing occurs is published in London, its editor is a countryman of Mr. James Gordon Bennett (of the *New York Herald*). We do not know if Mr. Colburn served his apprenticeship to that person.

The sewage works now in the course of construction in Holborn met with a considerable check on Wednesday afternoon. In Southampton-street there are a great number of vaults, of ancient date, belonging to the houses on each side of the street, and some of these giving way, the shoring, and with it from 1,000 to 1,500 tons of earth and stones fell in. Providentially there did not happen to be on the spot a single workman out of the hundreds employed, and thus the damage was confined to the works themselves.

A cement, which is said to have been used with great success in covering terraces, lining basins, soldering stones, &c., resisting the filtration of water, and so hard that it scratches iron, is formed of sixty-three parts of well-burned brick and seven parts litharge, pulverized and moistened with linseed oil. Moisten the surfaces to which it is to be applied.

The coal production of the following countries in the year 1865 was as follows:—Great Britain, 98,150,587 tons; Austria, 4,161,698 tons; Belgium, 11,840,703 tons; Bavaria, 260,600 tons; France, 11,061,948 tons; Prussia, 21,197,266 tons; Russia, 128,571 tons; Spain, 418,827 tons; United States, 22,906,939 tons; and the Zollverein, 22,350,000. Austria imported from Great Britain 97,226 tons; Belgium, 21,810 tons; France, 1,586,327 tons; Prussia, 577,183 tons; Russia, 477,033 tons; Spain, 409,497 tons; United States, 197,213 tons; and the Zollverein, 586,507 tons.

The approval of her Majesty's Government has up to the present time been given for the improvement of existing or the erection of new court houses in twenty-two cities and towns in Scotland, the total cost of which will amount to £136,458. One-half of this sum has been paid or will be payable from public funds. Edinburgh requiring £42,000; Dundee, £13,587; Dumfries, 10,148; Perth, 13,273; Wigtown, 9,145; and Jedburgh, 7,065, for the completion of their court-houses and offices. The estimate for this year under the above vote is £21,000, a sum of £30,000 having been expended last year.

The population of London in the middle of the present year is estimated by the Registrar-General at 3,082,372; of Edinburgh (city), 176,081; of Dublin (city and some suburbs), 319,210; of the borough of Liverpool, 492,439; of the city of Manchester, 362,823; and of the borough of Salford, 115,013; of the city of Glasgow, 440,979; of the borough of Birmingham, 343,948; of the borough of Leeds, 232,428; of the borough of Sheffield, 225,199; of the city of Bristol, 165,572; of the borough of Newcastle on-Tyne, 124,960; of the borough of Hull, 106,740.

The trumpery Chinese fishing temple, at Virginia Water, near Windsor, having become decayed, is about to be removed, and another edifice, designed like a Swiss chalêt will be erected in its stead. The new structure, which it is said will be a more spacious affair than the present, is expected to be completed by the autumn. The present pavilion consists of a central apartment of some size, and wings. There is or was, a variety of grotesque figures and ornaments on the roof, and the whole thing presents a very showy and gingerbread appearance. It was an idea of George IV.—who had also skill in cutting out coats, and an undeniable taste for cookery, and here, in the gallery connected with the pavilion, the grand monarch and suite were, to quote the language of a Windsor guide book, "accustomed to find accommodation when attempting to amuse themselves with the gentle art of angling."

Petroleum lamps have lately come into use, but many persons object to them because of the frequent breaking of the glass chimneys. In halls, passages, and other places exposed to draughts of cold air, the loss of chimneys constitutes a serious item of expense. Oil of petroleum radiates so powerful a heat as to occasion the fracture of the glass on a lowering of the temperature. A means of obviating this loss has been tried in Germany with success. It consists in a double chimney, the outer one being very slightly larger than the inner, and both resting on the same base. If the outer one receives a chill, the film of air between the two, thin though it be, prevents the transmission of the shock, and the inner one remains uninjured. In this way the brilliant stream of petroleum can be economically used; but it is worth mention that in sitting rooms, where the temperature is uniform, the breaking of chimneys but rarely occurs.

MEETINGS FOR THE WEEK.

Mon.—Royal United Service Institution.—"The Combined End-on and Broadside System," by Captain T. E. Symonds, 8.30.
Society of Engineers.—Discussion on "Water Tube Boilers," by Mr. V. Pendred, 7.30.
Royal Geographical Society.—Papers to be read: 1. "On Chinese Tartary," by Captain Sherard Osborn. 2. "On Dr. Livingstone's Last Journey and the Sources of the Nile," by Mr. A. F. Findlay, 8.30.
Tues.—Royal Institution.—"On Spectrum Analysis," by Professor Miller, 3.
Institution of Civil Engineers.—1. Discussion on Mr. Chance's Paper "On Optical Apparatus used in Lighthouses." 3. "Experiments on the Removal of Organic and Inorganic Substances in Water," by Mr. E. Byrne, 8.
Thurs.—Royal Institution.—"On Ethnology," by Professor Huxley, 3.
Chemical Society, 8.
Fri.—Royal Institution.—"On the Absorption of Gas by Metals," by Professor Odling, 8.
Royal Institution.—"On Military Law," by Captain G. F. Blake, 3.
Sat.—Royal Institution.—"On Ethnology," by Professor Huxley, 3.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

2353 F. G. A. HORSTMANN. A New or Improved Mode of Obtaining Motive Power. Dated September 10, 1866.

This invention consists in obtaining motive power from the expansion and contraction of mercury, spirits of wine, glycerine, and other expansive liquids. In carrying this invention into effect the patentee forms a hollow cylinder to contain any required quantity of mercury, spirits of wine, glycerine, or expansive liquid sensible of the variations in the temperature of the atmosphere, so that as the temperature varies, the mercury, spirit, or liquid expands or contracts, causing a piston and rod working in the said cylinder to rise and fall. *Patent completed.*

2412 C. H. CHADBURN. Improvements in Movable Door Screens. Dated September 20, 1866.

This invention has for its object certain arrangements whereby curtain screens fitted to doors are drawn, or partially drawn, on the opening of the door to which they are fitted, for the purpose of privacy, or to counteract, or partially counteract, draughts when the door is open; and several modifications of the apparatus may be so arranged that the curtain is spread out when the door is closed, and is folded to the back of the door when open. *Patent abandoned.*

2426 W. CLARK. Improvements in Securing Teeth in Saws. (A communication.) Dated September 21, 1866.

This invention relates to a new and improved mode of securing teeth in saws; and is more especially designed for securing teeth in circular saws, and the invention has for its object the securing of the teeth in the saw plate in such a manner that they cannot possibly become loose and detached when the saw is at work, nor the saw plate subjected to any undue strain, and the teeth at the same time rendered capable of being readily fitted to and detached from the same plate. The invention cannot be described without reference to the drawings. *Patent completed.*

2457 J. CHANDLER. Improvements in Apparatus for Drawing and Preventing Waste of Water from Service Pipes or Cisterns. Dated September 25, 1866

This invention relates to a peculiar construction and arrangement of apparatus for drawing and preventing waste of water from service pipes or cisterns, and consists of a self-closing valve enclosed in a metal case, which valve is opened by the pressure of the hand or thumb acting upon a pin from the outside of the said case, which pin presses on the one end of a bell-crank inside the said case, the other end of which bell-crank presses upon the spindle of the valve, and causes it to open and allow the water to flow into the metal case, the lower end of the said valve being connected to the service pipe or cistern. The metal case before mentioned is provided with an opening similar to a common pump nozzle, which allows the water to flow out into any vessel required, and upon the hand or thumb releasing the pin before mentioned, the valve closes by the pressure of the water acting on the back of it, and assisted by a spring attached to the top end of the valve spindle; hence the non-liability of the valve remaining open, and the prevention of waste of water. *Patent abandoned.*

2485 J. H. JOHNSON. Improvements in Taps or Cocks for Water and other Fluids. (A communication.) Dated September 26, 1866.

This invention relates to an improved and simplified construction of tap or cock suitable for regulating or controlling the flow of water and other fluids, and consists, essentially, in providing the body of the tap with an internal tube opening into a chamber, also formed on the body of the tap. This chamber has a screwed cap fitted

thereon, through the centre of which passes a screwed spindle provided with the usual handle, which spindle acts upon a cap or valve inside the chamber, and causes it to close down upon the mouth or end of the internal tube in the chamber. *Patent completed.*

2492. W. R. CORSON. IMPROVEMENTS IN AFFIXING KNOBS OR HANDLES TO THE SPINDLES OF DOOR FURNITURE. Dated September 27, 1866.

This invention has for its object a means of fixing knobs or handles to the spindles of door furniture, so that such furniture is readily applicable to any ordinary thickness of door, and this is effected in much simpler and cheaper manner than has hitherto been practised, and consists in the use of a square or any other suitable form of spindle, having a screw thread cut partially down its length from either end, and provided with two or more longitudinal rectangular slots, formed at right angles to each other at or near each end of such spindle. The knobs or handles are made to screw upon the threads formed on the spindles, so as to be adjustable to the greatest nicety to any ordinary thickness of door, and a hole or slot is constructed through the neck or narrow part of each of such knobs or handles. *Patent completed.*

Trade News.

TENDERS.

DEVIZES.—For the erection of quarters for five sergeants, and other works at the the Wilts County Militia Stores, at Devizes. Mr. Weaver, county surveyor, architect:—C. Long and Jones, Bradford, £1,018; Gane and Co., Trowbridge, £947; W. Long, Bradford, £917; Mullings (accepted), Devizes, £840. County surveyor's estimate, £850.

DEVIZES.—For abutment arches to tower, and other works to All-Cannings parish Church, near Devizes. Mr. Weaver, architect:—Marquiss and Munroe, Bristol, £208; Mullings (accepted), Devizes, £163.

FINCHLEY.—For sundry alterations, additions, &c., to a house at Fortis Green, Finchley. Mr. John Thomas Wimperis, architect:—Fish, £600; Carter and Sons, £597; Southcott and Widgery, £485; Watson (accepted), £475.

FINCHLEY.—For sundry alterations, additions, &c., to Lee House, Finchley Common. Mr. John Thomas Wimperis, architect:—Carter and Sons, £714; Watson, £680; Wheeler (accepted), £430. Also for new front, enclosure wall, and rehanging old gates:—Carter and Sons, £350; Watson, £335.

FINCHLEY.—For additions and alterations to a house at Fortis Green, Finchley, for J. A. Noble, Esq. Mr. John Thomas Wimperis, architect:—Fish, £1,750; Moultrie, £1,720; Carter and Sons, £1,670; Watson, £1,576; Wheeler, £1,522.

HANLEY.—For the erection of the new Hanley Hotel for the Hanley Company (limited). Messrs. Scrivener and Son, architects. Quantities supplied by the architects:—Contract No. 1, buildings:—Naden and Son, £10,000; Helton, £9,830; Collis and Hudson, £8,590; Barlow, £7,610; Steel, £8,220; Mathews, £8,208. Contract No. 2, plumber, glazier, &c.:—Helton, £1,420; Barlow, £1,296; Collis and Hudson, £1,285; Steel, £1,175; Mathews, £1,153; Scarratt, £1,148; Naden and Son, £1,100; Bickley Bros., £1,068; Mellard, £1,050 10s. 9d.

KILBURN.—For building the Holy Trinity Schools, and residence, at Kilburn. Messrs. Francis, architects. Quantities by Mr. Joseph Robson:—Myers and Sons, £2,120 (schools), £629 (residence); King and Sons, £2,088 (schools), £632 (residence); Howard, £2,087 (schools), £630 (residence); Calls and Son, £2,080 (schools), £600 (residence); Hill and Sons, £2,034 (schools), £600 (residence); Dove, £925 (schools), £575 (residence).

REGENT-STREET.—For building small picture gallery, sundry alterations, general repairs, &c., to No. 6, Glasshouse-street, Regent-street, W. Mr. John Thomas Wimperis, architect:—Killby, £398; Bywaters and Co., £367; Scrivener and White, £329.

WOOLWICH.—For maltings at North Woolwich. Messrs. Hunt, Stephenson, and Jones, architects:—Cubitt and Co., £31,434; Newman and Mann, £30,430; Holland and Hannen, £28,646; Piper and Wheeler, £27,250; Jackson and Shaw, £27,150; Myers and Son, £26,868; Henshaw, £26,546.

PROPERTY SALES.

MAY 7.

AT THE MART.—By Messrs. Debenham, Tewson, and Farmer.—Leasehold two houses and shops, Nos. 77 and 79, Holloway-road, producing £80 per annum, term 98 years from 1837, at £10 per annum—sold for £1,000.

Leasehold house, No. 39, Union-street, Nile-street, Hoxton New Town, let at £21 per annum, term 41 years unexpired, at £3 10s. per annum—£165.

Freehold four cottages, Nos. 4, 5, 7, and 8, Angler's-gardens, Frog-lane, Islington, producing £52 per annum—£410.

Leasehold two residences, situate in Park-street, Camberwell, producing £50 per annum, terms 33 years from 1851 and 61 years from 1822, at £8 8s. per annum—£195.

Freehold house and shop, No. 9, Brighton-terrace, Rhodeswell-road, Stepney—£360.

Leasehold three houses, Nos. 14 to 16, Taylor's-place, Bull-lane, Stepney, producing £41 12s. per annum, term 67¾ years from 1855, at £8 per annum—£200.

Leasehold house, No. 40, Middle Grove-street, Commercial-road, let at £20 16s. per annum, term 77 years from 1824, at £3 per annum—£90.

Leasehold five houses, Nos. 29, 31, 33, 35, and 37, James-street, Oreen-street, Bethnal green, producing £102 14s. per annum, term 60 years from 1845, at £18 18s. per annum—£420.

Leasehold three houses, Nos. 1 to 3, Lower Pelham-street, Brick-lane, Spitalfields, producing £83 17s. per annum, term 21 years from 1853, at £21 per annum—£10.

Freehold residence, known as Sherboro' House, Hanger-lane, Stamford-hill; also 9a. 1r. 21p. of building land, known as Soares Mead, producing £100 per annum—£7,500.

Freehold 2a. 2r. 20p. of building land, fronting Seven Sisters-road, Stamford-hill—£1,600.

Freehold two houses, Nos. 1 and 2, Williams-place, Kensal-green, producing £48 per annum—£790.

By Messrs. Farebrother, Clark, and Co.—Freehold 1r. and 37p. of building land, situate at Chislehurst, Kent—£450.

By Mr. J. Slater.—Freehold house and premises, No. 5, Clare-street, Clare market, let at £63 per annum—£1,400.

Freehold house and premises, No. 6, Clare-street, let at £30 per annum—£800.

Freehold ground rent of £19 per annum, secured upon the stabling, and known as Nos. 2 to 5, Sidmouth-mews, Gray's Inn-road—£500.

Leasehold ground rent of £19 per annum (for about 97 years), arising from three residences in Ashdown-street, Kentish New Town—£330.

By Messrs. Horne and Eversfield.—Freehold manufacturing premises and two houses, situate Nos. 39, Worship-street, and 25, Holywell-row, Shoreditch, let on lease at £210 per annum—£5,550.

Freehold house, No. 26, Holywell-row, Shoreditch, let on lease at £7 per annum—£230.

Freehold messuage and shops, No. 27, Holywell-row, let on lease at £20 per annum—£550.

By Mr. F. A. Mullett.—Leasehold residence, No. 18, Gloucester-gardens, Hyde Park, let on lease at £170 per annum, term 70 years unexpired at £25 per annum—£2,690.

Leasehold house and shop, No. 17, Park-lane, New-street, Dorset-square, annual value £35, term 80¾ years from 1820, at £4 4s. per annum—£250.

Leasehold house and premises, No. 35, Spring-street, Paddington, let at £46 per annum, term 98 years from 1823, at £5 per annum—£590.

Leasehold house, No. 25, St. George's-road, St. Mark's-road, Notting-hill, let at £36 per annum, term 99 years from 1862, at £5 per annum—£415.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham' Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Reuben Buckingham, Tavistock-terrace, Notting Hill, house decorator, May 28, at 2—Joseph Dark, Bath-place, Copenhagen-street, bricklayer, May 29, at 12—John Howe, Hillingdon Heath, Middlesex, builder, May 27, at 1—Walter Lurkins, Dod-street, Limehouse, carpenter, May 15, at 11—Jesse Mears, Merton-lane, Wandsworth, brickmaker, May 28, at 2—John Hurren, Acton-street, Gray's Inn-road, builder, May 29, at 1—Joseph Charles and Ebenezer Jones, Rathbone-place, engineers, May 27, at 12.

TO SURRENDER IN THE COUNTRY.

C. Aston, Wolverhampton, wheelwright, May 16—Amos Mawson, Bradford Moor, stone leader, May 17—Samuel Mellor, Oldham, ironfounder, May 17—Richard Middleton, Nottingham, builder, May 14—John Winders, Parr, Lancashire, bricklayer, May 15—James Heatley, Whitehaven, plumber, May 17, at 11 30—Alfred Rose, Hollington, builder, May 18, at 11—William Webb, Smethwick, brassfounder, May 22, at 12.

PARTNERSHIPS DISSOLVED.

F. Retslag and E. Powers, Red Lion-square, and Coventry, varnish manufacturers—Halstead and Fryer, Leeds, plumbers—Haworth and Harper, Oswaldtwistle, Lancashire, ironfounders—C. and J. Alcott, Rugby, stonemasons—Bowden and Croom, Manchester, joiners—G. Hamilton, and G. Binyon, York-road, Lambeth, lock manufacturers—E. Stappard and Co., Newcastle upon-Tyne, plumbers—Hildred and Mason, Leicester, carpenters—Davy and Fryer, Nelson in Marsden, gasfitters—Margetts and Eyles, Oxford, cabinetmakers—Lauder and Co., West Hartlepool, timber merchants.

DECLARATIONS OF DIVIDENDS.

R. D. Jones, Chalford, timber merchants (separate estate)—J. and R. D. Jones, Chalford, timber merchants, first dividend of 2½d.—J. Jones, Chalford, timber merchant (separate estate), first dividend of 6s.—W. Holmes, Swansea, plumber, first dividend of 2s. 9½d.—John Holmes, Liverpool, boilermaker, second dividend of 1s. 5d.

DIVIDEND.

A. Watts, Freemantle, Bassett, and Bedwell, builder, May 30—C. Champion, Wandsworth, builder, May 29—J. Palmer, Nottingham, builder, May 28—W. H. Wilcox, Teignmouth, builder, May 24.

SCOTCH SEQUESTRATIONS.

G. P. Macindoe and J. Grant, Kirkintolloch, ironfounders, May 10, at 12—James Learmonth and David Miree, Glasgow, brassfounders, May 14, at 12.

NOTICE OF SITTINGS FOR LAST EXAMINATION.

W. Sheppard, Pickering-place, Westbourne-grove, house painter, June 7—E. Coney, Littlehampton, Sussex, builder, June 11—H. H. Lovett, Licham, Norfolk, ironmonger, June 11—R. Lythe, Great Broughton, near Stokesley-in-Cleveland, Yorkshire, blacksmith, May 31—J. Hardcastle, Lincoln, engine fitter, June 3—R. H. Lowson, Romaldkirk, Yorkshire, blacksmith, June 10—J. Holden, Walsall, journeyman plumber, May 29—T. Harding, Newcastle-under-Lyme, journeyman painter, June 11—W. H. Price, Blackwater, Sutton, builder, June 14—F. Williams, New Kent-road, tool manufacturer, May 31—J. W. Woods, Union-street, Borough, wire worker, May 31—B. Froud, Battersea, builder, May 27—E. Rowland, Lant street, Southwark, builder's foreman, May 27—C. Paul, Tottenham, painter, May 29—F. J. Clarke, Clapham, timber merchant, May 29—J. Nye, Stockwell, engineer's journeyman, May 29—B. J. Gee, Balaclava-road, Bermondsey, builder, May 31—E. Morgan, Edgware-road, carriage builder, May 31—W. J. D. Coker, St. Paul's wharf, City, and R. J. W. Hill, St. Paul's wharf, City, contractors, May 31—F. Chadwick, Westminster Chambers, Victoria-street, architect, June 6—T. A. Hedley, Poultry, civil engineer, June 13—T. Burton, West Bromwich, nail maker, June 5—H. Crapper, Attercliffe, plumber, June 5—W. Oakley, Sheffield, anvil manufacturer, June 5—W. Goodwins, Scottow, Norfolk, carpenter, May 28—T. M. Carter, Bristol, carpenter, May 28—I. Davis, Kingswood, carpenter, May 27—W. Down, Merton, wheelwright, May 17.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9 0	£10 10	Archangel, yellow..	£11 10	£12 10
Quebec, red pine	3 0	4 10	St. Petersburg, yel..	10 10	11 0
" yellow pine..	2 15	4 0	Finland	8 0	9 0
St. John N.B. yellow	0 0	0 0	Memel.....	0 0	0 0
Quebec Oak, white..	5 5	6 0	Gothenburg, yellow	8 10	10 10
" birch.....	3 10	4 10	" white	8 0	8 10
" elm	3 10	5 0	Gefle, yellow.....	9 0	11 0
Dantzic Oak	3 10	6 0	Soderhamn	0 0	10 10
" fir	2 0	3 10	Christiania, per C., 12 ft. by 3 by 9 in. yellow	16 0	22 0
Memel fir	3 0	3 10	Deck Plank, Dantzic, per 40 ft. 3 in.	0 15	1
Riga	3 0	3 5	PUMICE STONE pr ton	5 0	6
Swedish	1 15	2 3	OILS, &c.		
Masts, Quebec red pine	6 0	7 0	Seal, pale....per tun	42 0	0
" yellow pine..	5 0	6 0	Sperm body	120 0	125
Lathwood, Dantzic, fm	4 10	5 10	Cod	40 0	0
" St. Petersburg	6 10	7 10	Whale, Sth. Sea, pale	43 0	0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.			Olive, Gallipoli.....	63 0	0
Quebec, white spruce	14 10	22 10	Cocoanut, Cochin, ton	37 0	53
St. John, white spruce	13 10	15 10	Palm, fine	40 15	41
Yellow pine, per reduced C.			Linseed	35 15	36
Canada, 1st quality.	17 0	19 10	Rapeseed, Eng. pale..	37 10	38
2nd do.....	12 0	13 10	Cottonseed.....	23 0	34

METALS.

IRON:—			
Welsh Bars in London .....per ton	6 15 0	0 0 0	
Nail Rod ..... "	7 10 0	8 0 0	
Hoops ..... do	8 15 0	9 0 0	
Sheets, Single ..... do	9 15 0	10 0 0	
Staffordshire Bars ..... do	7 15 0	8 10 0	
Bars, in Wales ..... do	5 15 0	8 0 0	
Rails ..... do	8 0 0	8 5 0	
Foundry Pigs, at Glasg. No 1 .. do	2 12 6	3 7 0	
Swedish Bars ..... do	10 10 0	12 10 0	
STEEL:—			
Swedish Keg, hammered .....per ton	16 0	0 0 0	
Swedish Faggot ..... do	10 10	12 10 0	
COPPER:—			
Sheet & Sheathing, & Bolts ....per ton	85 0 0	89 0 0	
Hammered Bottoms ..... do	98 0 0	93 0 0	
Flat Bottoms, not Hammered .. do	91 0 0	93 0 0	
Cake and Tough Ingot ..... do	74 0 0	0 0 0	
Best Selected ..... do	81 0 0	83 0 0	
Fine Foreign ..... do	86 0 0	88 0 0	
Yel. Metal Sheathing & Rods ....per lb	0 0 7½	0 0 8¼	
TIN:—			
English Block .....per ton	89 0 0	0 0 0	
do Bar ..... do	90 0	0 0 0	
do Refined ..... do	92 0 0	0 0	
Banca ..... do	82 0 0	0 0 0	
Strait ..... do	87 0 0	0 0 0	
LEAD:—			
Pig, English .....per ton	22 0 0	0 0 0	
" Spanish Soft ..... do	19 15 0	0 0	
Shot, Patent ..... do	23 0 0	0 0	
Sheet ..... do	21 15 0	0 0 0	
White ..... do	30 0 0	31 10 0	
SPELTER:—			
On the Spot .....per ton	22 5 0	22 15 0	
ZINC:—			
English Sheet .....per ton	28 0 0	0 0 0	
Devaux's V. M. Roofing Zinc .... do	28 0 0	0 0 0	*
* And 5 per cent. discount if laid upon the new system.			
QUICKSILVER .....per btl	6 18 0	7 0 0	
REGULUS OF ANTIMONY.			
French .....per ton	34 0 0	0 0 0	

ROYAL POLYTECHNIC. — "T Effigy of the Defunct" shown in "Blue Beard's Closet" new Illusion of Professor Pepper and Mr. Thomas Tobin; "Tower of London," by the permission of Messrs. Harrison Ainsw and Cruikshank, with startling effects, musically treated by Mr. Ge Buckland; 'A Temporary Star on Fire," in Professor Pepper's L ture on "Spectrum Analysis;" Alexandre's Original Ventrilo Entertainment, with "The Head of the Decapitated Speaking" Automatic Leotard," Dickens's "Carol," read by Mr. Cape; and Kings "Mechanical Paradoxes," are a few of the very attractive tertainments provided for the Easter Holidays at the Royal P technic.—Vide the Public Press.

THE INTERNATIONAL PRIZE MEDAL
AWARDED 1862,
ALSO THE DUBLIN MEDAL, 1865.
To BUILDERS, CARPENTERS, and BLINDMAKERS
JAS. AUSTIN & SON,
Manufacturers of the above Articles, particularly wish to dir the attention of the Trade to their
IMPERIAL PATENT FLAX SASH LINES
Of which they are now making four qualities, and they strongly re mend that in all cases they should be purchased in preference to PATENT LINES made from Jute, which Article has neither STRENGTH nor DURABILITY of FLAX, consequently cannot so much satisfaction to the Consumer. They also invite the partic attention of Upholsterers and Blind Makers to their Improved Pa Blind Lines, which are very much superior to anything yet off to the trade.
They can be obtained of all Ropemakers, Ironmongers, Merchs Factors, and Wholesale Houses in Town and Country.
ESTABLISHED 1774.

ACCIDENTS WILL HAPPE
Everyone should therefore provide against them
£1,000 IN CASE OF DEATH,
Or £6 per Week while Laid up by Injury, caused by
ACCIDENT OF ANY KIND,
May be secured by an Annual Payment
OF FROM £3 TO £6 5s. TO THE
RAILWAY PASSENGERS' ASSURANCE COMPANY,
The oldest established Company in the World insuring against
ACCIDENTS OF EVERY DESCRIPTION.
64, CORNHILL, and 10, REGENT STREET, LONDO
WILLIAM J. VIAN, Secretary.

THE BUILDING NEWS.

LONDON, FRIDAY, MAY 17, 1867.

THE ROYAL ACADEMY EXHIBITION, 1867.

Architecture.

WITH an imagery derived from Eastern sources, and that by a process which Dr. Darwin could reconcile with his "Theory of the Origin of Species," the Chancellor of the Exchequer has declared that he "looks upon the rooms of the Royal Academy as the Mecca of Society." His imagery is just; for to reach the Mecca alluded to the traveller has to cross a desert, and here the "Forty Thieves" exhibit the "spoils" of architecture. Year by year we have noted how that less and less has been the space allotted to our art; that in each successive change its quarters have grown not only narrower but worse; and that each year the *debris* of contributions that dare not be excluded, yet was disdained to be hung elsewhere, has intruded further into, and usurped the best positions of, that bad one accorded to an art certainly as important as portraiture, and perhaps even in the eyes of the Academicians themselves on those very rare occasions when they open both at once, of equal value in the history of national progress as dead birds and beasts and still life generally. This is the ninety-ninth exhibition held by the Royal Academy, and as next year will be one of those bugbears of the present day—a centenary—we have little doubt but that advantage will be taken to suppress architecture altogether. Nor will this be anything but a gain, for it would be far better to exhibit nothing than to exhibit weakness only; and such a display as the architectural exhibition of this year merits extinction. The knowledge that such scant justice as to hanging would be meted out to them deters architects from submitting or caring to prepare good drawings, and the few good men who have this year contributed have evidently only done so in a protesting, hesitating manner. We should hail so crowning an injustice as our wholesale murder and annihilation with joy, that might by its enormity rouse the supineness of the profession, and some exertion would be made to secure at least one exhibition in the year which would faithfully record that year's progress in architecture. Fifty-one drawings are this year exhibited under the name of architecture, but of these at least some ten or eleven are simply sketches of past art, and of the remainder some are engineering affairs, and one stained glass; so that there remains but about three dozen architectural drawings in a collection of nearly 1,200 works of art. Of these three dozen the greater part are bad, not only as compositions in architecture, but as drawings. The first that attracts our attention is the garden front of Shephalbury (873), near Stevenage, by Mr. T. R. Smith. It is an ordinary red brick house, very much afflicted with a breaking-out of bow windows; and from the colouring we should say it was to be built of rubies and set in emeralds. The materials are unusual; but in these days of 5 per cent. commission it is advisable, we suppose, to use expensive material if we can. Of Mr. Harvey's design for the Manchester Exchange (874), we think we said enough at the time, and are only sorry to say it does not improve on acquaintance. Taking an interest in all educational movements as we do, we sincerely hope that the instruction conveyed in the English College of the International Education Society (875), now building at Spring Grove, Isleworth, from the designs of Messrs. Horton and Massey, will be better than the building itself. It is both poor and plain, and though the latter quality may in both men and buildings be associated with great worth, yet poverty in each alike is condemnable—at least such obtrusive poverty as this. The interior of St. Peter's Church, St. George's-in-the-East, recently erected from the designs of Messrs. Pownall and Young (879), is much too fidgety in its style of drawing to clearly set forth what the building really is. Short, spasmodic scratching is not etching; we very much doubt the advisability of the single-light windows on each side of the reredos; we fear they will detract from that feature, and do but little for the general good of the church, which is simple and good, and is free from the vice of aiming at too much. Most commendable from the same cause is No. 881—view of Longmead, Bishopstoke, Hants, from the designs of Mr. Street. Here we have an honest, simple, red brick house, without any unnecessary fussiness or chopping; and, thank Heaven, no blue brick bands. It is manifestly what it purports itself to be, a "gentleman's" house; and we heartily congratulate Mr. Street and Mr. Barton alike; good as it is we should like to see it better, and should desire to see some of the bands with Latin inscriptions suppressed. To place them on the larger gables and the porch is very excellent, both in idea and effect, but to treat the little dormer gablets to similar phylacteries on their small foreheads is, we think, an affectation, and, pleased as Mr. Street may be with the idea, we think it possible to have too much of even so good a thing.

Mr. Pearson's church at Sutton Verry (883), and (886) Mr. Keeling's one at Camberwell, hang close to each other; the former is an ordinary church of no particular merit, and the latter is an extraordinary church with every fault of the worst style of that acme of architectural fooling, the Strand Music Hall. No. 885, Leighfield House, Staffordshire, is one of those fine old half-timbered houses which skirt the borders of Cheshire, and we must do Mr. Griffiths the compliment of saying that we fail to detect where his proposed addition and restorations begin and end.

Mr. Wallen gives us, in No. 887, the interior of St. Laurence's Church, Norwich, as proposed to be restored, but which we hope never may be in such a guise. The polychromatic decoration shown is very bad; we say nothing of the ritualistic affair at the end. We presume youth will always be very young, and the pastime is not an extremely dangerous one.

Quite refreshing is it to come to Mr. Haig's beautifully cool airy drawing, Dromore Castle, County Limerick (888), for the earl of that name, by Messrs. Godwin and Crisp, and which we illustrated in our journal a few weeks back. Should Fenianism rampantly revive in some future day it could hold out a fair defence until the constabulary, fired by the recollection of the large meed of praise and small measure of reward they have recently won, could get to the top of that very long hill. It is almost an Irish castle of the olden time, and the national style is well impressed on it, too much so, perhaps, we should fear for comfort, for those old places must have been fearfully trying to the hind legs; that, however, we have nothing to do with, but it is a very pleasant production, and one of the very few that we care to remember. Very good too, indeed, is Mr. Street's porch for the nave of Bristol Cathedral (889), plain and massive in its general treatment, the carving husbanded nicely, and expended in sculpture where it can tell a tale or preach a sermon. The nave buttresses rise boldly to their work, unbroken by little slopings, and are very good; but why do small flying buttresses spring from the top of them to the pinnacle of the parapet? Surely there can be no thrust there to be counteracted; all that is wanted is resistance below this point. Mr. Street may have some good reason, but it fails to be manifest from the drawing.

Mr. Barry gives us the interior of the new *salon* at Crewe Hall (890), which is a very pleasing drawing, and a good make-up from the old work, but the effect is quite spoiled by the stained glass roof. Surely, with all those beams and arches, some vertical means of lighting might have been found. Mr. Barry also exhibits his design for the new National Gallery (No. 897), in which he adheres faithfully to the traditions of the elders, and uses domes and columns in the most orthodox manner. As it is highly improbable anything like this design will be carried out, we must consider it merely as an Academy study; and of its kind it is good, immeasurably beyond either of the other attempts at this building shown in this year's exhibition. Mr. E. W. Pugin contributes three designs. The first (No. 891) is an exceedingly clever drawing of St. Cuthbert's Collegian Church, Ushaw, near Durham; it is a fine composition, having an apsidal end, each face of which is filled with traceried windows under gablets, and has a well-composed tower capped by a square pyramidal roof; the side walls have the spaces between the buttresses filled with blank arcading, forming, probably, recesses for small altars internally, and which produces a very pleasant effect. The second of Mr. Pugin's contributions (No. 900) is not by any means so satisfactory; it is styled the original design for Holy Cross Church, Liverpool, and from the qualificative adjective, we presume it is not the design carried out, and for this we think Mr. Pugin will some day be thankful. It is excessively exaggerated in its vertical lines, and its linked sweetness is far too long drawn out. Mr. Pugin seems to have gone mad on upright lines; even the very arches are all ultra extra centred to enhance this effect, and by the much more reprehensible means of dwarfing all his figures in the foreground the effect is still more exaggerated. Here this great vice is its own punishment. The presbytery which is attached to the church is of too German a character to assort well with the surrounding buildings. With (No. 904) the Church of Notre Dame, at Dadizule, we are familiar, but the more we see of it the more we like it, and in the north-east view the grouping of the small chapels which connect the transept with the choir is particularly happy. Altogether, it is a work of far greater merit than either of the other two, and ranks amongst the highest efforts exhibited.

Mr. Bazalgette exhibits (No. 892) his design for the Abbey Mills Pumping Station for the Metropolitan Main Drainage Works, which is of the most cosmopolitan character, and very bad even for an engineer. What Sir Daniel Cooper, Bart., can have done that he should be compelled to dwell under such a sky as Mr. Barton has given him we do not know. However bad it may have been, our pity for him transcends the horror of his crime. As for the house, it is like a young hotel reared on very limited liability principles; it and Mr. Drew's Leigh Park (No. 894) are bad alike. Mr. Brandon's Junior Carlton Club House is a very ordinary—nay, a very commonplace—Italian façade; arched windows without any pediments in the ground floor, square windows with arched pediments in the first floor, circular-headed windows with triangular pediments in the next, and square windows with no pediments at all in the top; the usual cantilever cornice with regulation balustrade of soda-water bottles between soup tureens on the top, a sort of design any boy of intelligence after a six months' course of "Chambers" and "Letarurilly," would produce. Don't do it Mr. Brandon; pray dont! think of the many better things you have dreamed of and done; and if you are sat upon by a committee, strike! Mr. T. H. Wyatt exhibits his design for the Chateau de —— no, we are wrong. On looking at the catalogue we find it is (No. 896) the Quadrangle of the Exchange at Liverpool. We really could never have supposed it was a commercial building in an English town, but believed it was some new old chateau for some new old noble over the water; but we perceive that Mr. Wyatt, instead of exporting his ideas

to France, like the play-wrights, imports them thence. Human nature is very ingenious, especially in wrong doing, but try as it may to devise anything more unlike a Commercial Exchange than this it must fail, and yield the palm, as we do, to Mr. Wyatt. The Water Tower at Canon's Ashby (No. 901), by Mr. Digby Wyatt, is a very picturesque design and a very pleasing drawing; the former spoilt by the huge monogram in the upper story, and the latter by the general chalkiness of the colouring of the stonework.

Next in order comes a huge drawing of a large circus, badly designed and weakly drawn, indeed so indefinite that we scarcely can read what is intended by much of it. Its principal feature is the second story, where windows are divided by double Ionic columns supporting cantilevers, and which in their turn carry a balcony, the purport of which is not very evident; but be its uses what they may, we maintain that of all the "so-called" orders the Ionic is the last which should be so applied. The cushioned form of its cap and its curvilinear lines unfit it for such a purpose, and the utmost it should ever receive above it, or ever did in thinking times receive, is some slight wreath or other flat ornament. But to treat it thus shows as much want of real art feeling as might even be expected from South Kensington. Not content with misapplying the order, the cantilevers are used over porches, and even under pediments where no balcony is possible. The basement and arrangement of steps, so far as we can make out, seems picturesque, and the frieze round the main cornice might be made very effective, but the tendency to run to boilers seems not yet eradicated in this quarter, for we find by the catalogue (No. 905) that this is the world-trumpeted "Hall of Arts and Science about to be erected on the estate of her Majesty's Commissioners for the Exhibition of 1851, based on ideas originated by the late Captain Fowke, and designed by (assisted by R. Townroe) H. J. D. Scott." Really all this talent ought to have produced something, but the reign of King Cole seems as fatal to architects now-a-days as it was in those of yore to millers, weavers, and tailors. It is really so bad that we should not be surprised if Mr. Cole were knighted next Monday. No. 906, Farringdon-street Bridge, by Mr. Haywood, is done up like a pantomime imp in green and gold, and almost as ugly. A very pleasing Belgian transept, with a gloss of Heidelberg, is Mr. T. R. Smith's Stancliffe, near Matlock, and if we could ensure sunshine in England it would be very charming; it is clever and chaste both in composition and drawing. For Mr. Penrose we are truly sorry: that the learned author of that elaborate disquisition on the Parthenon should be reduced to this shows to what a low estate a dean and chapter can bring a man. The design of the proposed new National Gallery is as bad as any town in Spanish America might be proud of, and vastly like what they would have done two hundred years ago. For mercy's sake, Mr. Penrose, use your influence to have the frame turned the other side outwards; mystery might enhance your reputation, publicity here must injure it. And you, too, Mr. Digby Wyatt, your little sketch (No. 960) shows us how much we have to be thankful for that you did not send a larger one.

Mr. Burges's St. Finn Barr's Cathedral, at Cork (No. 912), is a good ordinary French church, without the slightest attempt to impress an Irish character on anything except the cattle in the foreground, which are bulls of a true Hibernian breed. We submit that in all Mr. Burges's studies in France, and they have been many and earnest, he never met with a worse mode of uniting the main wall of a chevet and an aisle roof than he has here adopted. He, no doubt, is perfectly satisfied with it; but we are not. In the Grand Hotel, Scarborough, Mr. Brodrick treats us to the Palace of Aladdin in our youth, only considerably increased since then. That, if we recollect aright, had only one dome; now we have four roc's eggs and more, each capped by its own particular incubator. Oh! that they could hatch a dividend; great would be their use, and we might then forgive their want of beauty. The rest of the building is of ordinary hotel character, but counterchanged; heretofore they have generally been red with white facing. This puts on a sort of bandsman's uniform of white faced with red. Of Mr. Watson's design for the Manchester Exchange, we, in our review of that competition, spoke hopefully, and, having nothing to add except that with the opportunity of improving the colouring he has since had we are sorry he has not used it. Mr. Scott sends his Bangor Cathedral, which is almost as bad as Mr. Scott can do, and as ill drawn as Mr. Wyatt can make it. Of the other drawings, silence is the sincerest flattery; but we cannot part from this portion of the Exhibition without looking with pleasure on Mr. Spiers's beautiful and truthful sketches of the Parthenon and the great Khan at Damascus, and admiring Mr. George's slight but pretty ones of Seville and Calais. We hope some day to see drawings from them in a future "Dudley." To Mr. Dobbins's staircase, we are inclined to cry, "Gee-up, Dobbin!" But why attempt such a painting after Roberts's charming rendering of it? It seems almost a sacrilege to touch what he so wonderfully expressed. And now away, for after all there is some truth in what a charming voice behind us says:—"Come along, dear, surely there's nothing worth looking at there, or they wouldn't put it in so strong a draught!"—so we follow them and revel for a while in the glorious colour of Creswick, O'Neil, and Linnell, and in the architectonic grouping of the human form by Leighton and A. Moore; learn a lesson of faith and charity from Faed, and rejoice that if those ages of faith Mr. Donaldson has painted were like his representation, architecture had the good sense to do as he has indicated—turn its back upon them.

SANDSTONES.

OUR English sandstones are very numerous, although the superior descriptions are few in comparison with the inferior kinds. Sandstone, we need hardly remind the reader, is nothing but sand compacted with solid stone by cementing substances which are comparatively indestructible. The grains of sandstone consist of quartz of various colours—the green colours being derived from silicate of iron, and the red resulting from the covering of the grains with peroxide of iron, both colours being frequently intermingled in consequence of chemical changes. The grains vary in size. The coarser kinds may be of the size of a pea; but these are not adapted for fine external work. There are other kinds, the grains of which consist of the smallest possible particles. Sandstones may be consolidated by various means. If by the infiltration of mineral matters in solution they contain these substances. The felspathic sandstones, which are of a dull white colour, contain grains of felspar. In many sandstones flakes and spangles of mica are to be found in large quantities, and are consequently known as micaceous sandstones. Other kinds contain large quantities of lime, and are therefore distinguished as calcareous sandstone—a term which is not, however, confined to this description of stone. The lime is frequently to be found in the form of shells. Sand and clay are to be found together, and the workmen call the clay patches to be found on sandy shores "galls." The different varieties of sandstones are known by names which are mostly local denominations. In South Staffordshire there is a hard sandstone, largely used in that county, which is known by the quarrymen as "rock." "Rotch" or "roche" is the name of a softer kind of stone. Slightly compacted sandstone is known as rubble. The hard grit is known in the North of England as "hazel," and elsewhere the same sandstone is called "post." It appears that in South Staffordshire a hard, smooth, flinty grit is known as "peldon," and a northern term for a similar stone is "calliard" or "galliard." "Freestone" is a more popular term, and it is applied to any kind of stone that works freely in every direction, while "flagstone" is a term employed for those stones which split more freely in one direction than in any other. Sandstones are usually laminated, and this is especially the case when mica is one of the constituents. Stones, the plates of which are generally arranged in planes parallel to their beds, Sir John Burgoyne tells us, should be carefully placed in constructions, so that these planes of lamination may be horizontal, for if placed vertically the action of decomposition will occur in flakes, according to the thickness of the laminæ. "Indeed," continues Sir John, "the best way of using all descriptions of stone is in the same position which they had in the quarry; but this becomes a really imperative rule with those of laminated structure. Uniformity of colour is a tolerably correct criterion of uniformity of structure, and this constitutes, other circumstances being equal, one of the practical excellences of building stones." York stone is laminated, and is consequently used for paving purposes. The compact old sandstones will not resist the weather when used externally, as may be seen at Chester Cathedral. Such stones receive great injury by absorbing the water; and, in consequence of retaining moisture, they are liable to disruption by frost if exposed to atmospheric influences. Of course, there is no difficulty in ascertaining whether a sandstone is thus liable, since if immersed for a certain period in water its weight will soon greatly increase. Of late years it has been the practice to ascertain whether a stone is thus susceptible to the frost by dipping it in a saltish solution, repeating the process until the salt has crystallised on the surface of the stone. Should the stone be susceptible to the action of the solution its edges will be found deposited in the vessel beneath; but where this is not the case we may be warranted in employing the sandstone for external purposes.

In order to distinguish between crystalline limestones and those sandstones which resemble limestones in their fine grain and similarity in structure, it has been proposed to touch the stone with a drop of diluted acid, which will cause a copious effervescence with limestone. An engineering contemporary considers that a more simple method would be to distinguish the sandstone by its power of scratching glass.

The Commission appointed to examine the different stones that were proposed to be used for the New Houses of Parliament selected four specimens of sandstone taken from four quarries—viz., Craigleith, in Edinburghshire; Darley Dale, in Derbyshire; Heddon, in Northumberland; and Kenton, in the same county. They gave the following as their average constituents:—

Silica	95·725
Carbonate of lime . .	1·065
Iron alumina	2·150
Water and loss . . .	1·060
	100·000

142lb. 7oz. per cubic foot was found to be the average weight of these four kinds of stone.

The sandstone of the carboniferous age known as the *Craigleith* stone, and derived from Edinburgh, is considered to be the best sandstone used for building purposes. The colour of this stone is lightish grey; the grain is exceedingly fine; it is to some extent laminated, and it should therefore be laid on its natural bed. The composition of this stone is as follows:—Fine quartz grains with a siliceous cement, slightly calcareous, and occasional plates of mica. There is only about 1 per cent. of carbonate of lime, an

there is 98 per cent. silica, the remainder consisting of bituminous substances and mica. Professor Ansted has stated that the beds vary in thickness, the thickest being 10ft., and that the number of workable beds is very large. We understand that it is obtainable of any practicable length and breadth, and up to 10ft. thick; weight per cubic foot, 146lb. A cubic foot will absorb four pints of water. It has been found that good samples will resist crushing weights to the extent of 5,800lb. to the square inch. Specimens of this stone are exhibited by Mr. George Johnstone, of Craigleith, in the South Kensington Museum. There is a house in Queen Anne-street, Cavendish-square, which was erected of this stone in 1760. At the time when the house was painted, in 1840, no appearance of decay was presented. Indeed, it is believed that though the stone darkens by exposure to the atmosphere yet it is but little affected by smoke and frost. The repairs made in 1838 in Blackfriars Bridge were done with this stone. It has, too, been largely used in the city of Edinburgh, most of the public buildings and offices having been erected of it. It appears to have been extensively exported to Hamburg and other places on the Continent. Yet it is too expensive to be largely used in London, and being white it will soon be discoloured. The price at the quarry is not so high as it used to be. We believe it is now 1s. per foot ordinary block, and 2s. 3d. per yard 3in. tooled flags, rough.

In Edinburgh and other Scotch cities *Humbie* stone has been largely used, and it is found to be more easily worked than Craigleith stone. The Royal Exchange and Bank in Glasgow have been built of this stone. *Glammis* sandstone is a very excellent fine material, and several well-known castles in Scotland have been built of it. The Dundee and Arbroath old red sandstones are reputed to stand the weather admirably. These stones are dark-coloured and flaky, the *Dundee* stone being sometimes of a dark purplish brown colour, produced by the presence of a great deal of iron oxide. The *Arbroath* stone is more pleasing in appearance, and is greenish-grey; it is frequently used for flag pavements. *Darley Dale* sandstone (Derbyshire) is composed as follows:—Quartz grains of moderate size and decomposed felspar, with an argillo-siliceous cement; ferruginous spots and plates of mica; colour, light ferruginous brown. *Heddon* stone was found by the Parliament House Commissioners to consist of coarse quartz grains and decomposed felspar, with an argillo-siliceous cement; ferruginous spots; colour, light brown ochre.

Kenton stone is composed of fine quartz grains with an argillo-siliceous and ferruginous cement; mica in planes of beds; colour, light ferruginous brown. This stone is sold at the quarry at 1s. per foot ordinary block, or 5s. per yard 3-inch tooled flags, and is delivered in Newcastle. The *Yorkshire* sandstones of the millstone grit series are largely used for building purposes. Professor Ansted has described the composition of these sandstones as fine grained quartzose sand, with some felspar cemented with argillo-siliceous cement, and having plates of mica in the planes of stratification. Their colour varies from bluish-green to pale ferruginous brown, oxide or silicate of iron forming a part of their composition. These stones weigh about 145lb. to the cubic foot, and support a crushing weight, equal, it is said, to that of Craigleith. "But the Yorkshire flags," says Mr. Ansted, "absorb water readily and part with it freely; and thus, though as paving stones laid horizontally they are very durable, they are apt to peel when placed in walls. They are also unsafe when in contact with damp earth, or where water has only occasional access, and there is no thorough circulation of air." The *Park Springstone* (sold at 1s. 2d. per foot ordinary block) is obtained from quarries near Leeds, and from Halifax and Huddersfield. *Stenton* stone, obtained from the quarries near Durham, has worn well. The circular keep of Barnard Castle, built in the fourteenth century, is of this stone, and is in capital condition. So also is Ecclestone Abbey, erected in the thirteenth century, the minute ornaments and mouldings of which are in fine preservation. A light sandstone, obtained from *Whitby*, in Yorkshire, is largely imported. The Abbey at Whitby, which is of the thirteenth century, was built of this material, or of a similar kind, and with the exception of the west front, which is very much decomposed, it is generally in good condition. A coarse local sandstone was used for the west front, the transepts, and tower of *Ripon* Cathedral, and the stone remains in good preservation. Nottinghamshire sandstones, those from *Mansfield* especially, are well-known in London. They are of two kinds. The cube white calcareous sandstone is composed of silica, 51·40; carbonate of lime, 26·50; carbonate of magnesia, 17·98; iron alumina, 1·32; water and loss, 2·08. There is also the cube red calcareous sandstone, the chemical analysis of which is as follows:—Silica, 49·4; carbonate of lime, 26·5; carbonate of magnesia, 16·1; iron alumina, 3·2; water and loss, 4·8. Mr. Lindley's circular in the South Kensington Museum informs us that these two sandstones are the connecting link between the magnesian limestone and the new red sandstone formations, partaking of the characters of both. The quarries, from which the specimens exhibited by Mr. Lindley in the Museum are taken, have been in work for four hundred years. The price varies from 10d. to 1s. per foot, ordinary block. The sandstones obtained from the Wealden deposits near Tunbridge Wells are used in London, although they have been considered too irregular in their composition, and too easily acted on by the weather to justify an extended use for other than local purposes. The subcretaceous formations of the neighbourhood of Godstone, Maidstone, or Folkestone, are valuable. *Chilmark* stone is more of a siliceous limestone. It is remarkably heavy, weighing 153½lb. to the foot cube, and is non-absorbent, taking up less than a pint and a half of water in the foot cube. The *Reigate* firestone was largely used for the old buildings around London; it is the principal material of Windsor Castle and Hampton Court.

THE ARCHITECTURAL EXHIBITION, 1867.*

By Edward W. Godwin.

It was from this place just a fortnight since that Mr. Beresford Hope, in a very characteristic address, confessed to some difficulty in making himself understood because he had determined to avoid anything which might be regarded as personal. He could not, therefore, illustrate any of his observations, whether favourable or not, by any direct reference to modern architects or their works. Now, I may as well state, once for all, that I do not intend this difficulty to stand in our way to-night. For myself I cannot understand why architects should be treated more tenderly than the professors of other arts—why, for example, the sculptor of the Nelson lions should be severely rated, and the architect of the Foreign Office allowed to go scot free! If free criticisms of the works of poets, painters, sculptors, and musicians are right, much more is it right freely and fearlessly to criticise the works of architects. We may if we like exclude the works of all the former. We are not obliged to read Mr. Tupper's rhymes or Mr. Swinburne's poetry, and no one compels us to buy Mr. Cope's canvases or Mr. Burne Jones's pictures, but whether we like it or not we cannot help ourselves in the matter of architects. They shut out the sunshine on all sides of us, they turn pleasant pastures into dreary streets, they thrust their crudenesses into the sky, and brandish their ugly compass work at every corner, and then in the face of all this we are asked to be tender, to avoid being personal, and the rest of it. This word "personal" has lately found itself doing service in a variety of ways. There was a time not very long ago when it meant little more beyond that which Latin authors once attributed to it. Now, however, you cannot talk of an architect's early studies, his method of study, the good or bad influence of others upon him, the effects of having too much or too little to do, nor, indeed, can you be always sure of speaking of gross breaches of professional etiquette, without running the risk of being considered "personal" and unkind, so thin-skinned and so unaccustomed to outspoken free opinion is the modern English architect. I hold strongly to the belief that the value of these exhibitions is but of small account if our criticism is to end merely in comparing one work with another. If there is to be any real outcome—if the architects of the future (the pupils of to-day) are to gain any real good from these walls, it can only be by or through a system of strong personalities. It is not enough for students of art to be able to recognise the good and the bad; the fine art and the "masking stuff" are both the certain results which might fairly have been predicted when their authors started in the race. That to which students should direct their thoughts is not the greatness of Cæsar but the kind of meat upon which he hath fed; not so much the race as the system of training. Indeed, it is precisely about that sort of thing which some very tender people regard as essentially personal that we require not only knowledge but unsparing criticism. Believing, as we do, that there is no royal road to art, that genius is only a fanciful name for the supreme of common sense, earnest feeling, and hard work, we want to know something of the personal whenever we see the evidence of earnest feeling and hard work, and for the sake of helping others we should know something of the personal whenever we miss this evidence. Take the designs of an important competition. One is so full of graceful proportion and elegance of detail that it almost borders on the effeminate. Another is so over strong in its masses and so broad and grand in its detail that it secures for itself a certain feudal barbarity. A third is without grace or strength, has been conceived in vanity, and must end in vexation. A fourth has simply no character at all, neither bad, good, nor indifferent. Now it tends very little to the advancement of architecture or the improvement of architectural students merely to see these four designs placed side by side in an exhibition. The question is, How comes it that they are so different? and in this question is involved the whole life and all the important personalities of their authors. Some works are so earnestly wrought that we have little difficulty in seeing through them with tolerable clearness the general tone of the past life of the worker, nor have we any need of special supernatural aid to predict with fair expectance of accuracy his future career. The majority of architectural works are, however, so void and vapid that, judging the men by their works, their lives are too commonplace and their minds too empty to have the slightest interest for us one way or the other either praiseway or blameway. These are unfortunately what the public consider as "safe men;" they indulge in no eccentricities; there is nothing odd nor quaint about them, showing a more or less diseased mental organisation, for the simple reason that they have no minds to be diseased. With them architecture is not an art nor a profession, but a mere building agency. With your permission, then, I will pass by this class of so-called architects, leaving them to trade with the public and to impose upon their employers until that happy day arrives when the public shall have found out that architecture is as much a fine art as painting

* Paper read at the Architectural Exhibition Society on May 14, Mr. Lamb, presiding.

or poetry. Omitting this class, then every degree of art thought from zero to summer heat, and an almost endless variety of circumstances which have contributed to determine these degrees—the prestige of a name, early marriages, a life spent in seclusion, or what is almost as bad, passed within the boundaries of a narrow clique; flattering, and therefore false friends, the love of money superior to the love of art, an anxiety to rise rather than to learn; all luxuries, especially those which come to us through any other channel than your own hard work—these are some of the things which are manifestly at the root of much of the zero of the bad art around us. On the other hand, we may see the evidence of the patience which bides its time of living sympathy with all genuine art workers, of time spent neither in proud nor bashful solitude but in the busy art world with artists in the most catholic sense of the word—not in smooth and limited professional grooves but in the broad battlefield of life, where the lesson has been learnt perchance that there are others stronger and better than themselves, or at any rate others who, seeing with *other* eyes *other* aspects of things, do quite as nobly as they do.

One very great assistance to us in what I may call our personal inquiry is the free and open way in which architects have this year responded to the invitation to exhibit their sketches and studies of old works. Some of these were clearly never done with any thought of their ever being subjected to public criticism, and we cannot but be very thankful for this insight into the kind of study thus illustrated. This is particularly the case in respect to most of the drawings contributed by Mr. Hayter Lewis and Mr. Lamb. On the other hand, many of the drawings have been done apparently for little other purpose than to be exhibited, and look more like drawings done to order at so much the dozen rather than studies or architectural sketches. The drawings in this department of the exhibition which deserve more than ordinary notice as drawings are those by Canalletti, kindly lent by Mr. Tite; Mr. Watson's tenderly tinted sketches, Mr. Cole's church interior (No. 257), and Mr. A. B. Donaldson's beautiful drawing of one of the stained glass windows in Florence Cathedral. Before we begin our examination of the modern architecture, there are yet three drawings which demand considerable attention. I refer to the two designs for frescoes by Mr. Albert Moore, and the "Restoration of the Street of Tombs," by Mr. Cockerell. Of this last-mentioned drawing I am bold to say that, if Mr. Cockerell had never done anything else, he would have earned by this work a right to our esteem and admiration, not only as an artist, but as an antiquary and a scholar. Many of you will no doubt recollect that, some few years ago, Mr. Burges exhibited a pen and ink bird's-eye view of a thirteenth century town, which evinced the same high-class powers as those manifested in Mr. Cockerell's drawing, although in a totally different direction. In the mediæval town we had force of line, in the street of the tombs we have delicacy of colour; in the town we had an exceptional and strange figure as the central feature, in the street we have a group of figures illustrating an everyday event. Both meet, however, on that high antiquarian ground where not only the details of the architecture are truly set forth, but where the life and spirit of the times are strongly grasped. Now I have gone a little out of my way for the sole purpose of pressing upon our younger architects the great advantage of archæological study, or, in other words, of keeping alive the traditions of art. For myself, I have no doubt, not even a shadow of one, that the architectural failures of our age may be attributed, in a measure, to sheer ignorance of the history of art—an ignorance too often owing, not merely to indolence, but to things for which men are sometimes praised rather than blamed. Another form of the architectural blight—and one of the worst and most destructive—is the fretful, unhealthy ambition which a chance unmerited success often engenders. To a young man, an odd premium gained in an important competition, a building secured by some accident, such as often results from an array of pretty perspectives, or a free treatment of sky—either of such events is almost sure to exhaust the art in the young beginner by making him fancy that he is equal to his day and to every occasion that may present itself. To the students who are preparing themselves for the practice of architecture, I would particularly recommend the lessons which may be learnt from Mr. Cockerell's drawing, and beg them to look deeper into the past, and acquaint themselves more fully with archæological science than they are at present accustomed to do.

Turning now to Mr. Albert Moore's designs for frescoes, we have again reason for congratulation. For, although the drawings are somewhat slight and sketchy, and although only the smaller of the two has been actually executed in fresco, still, the presence in this exhibition of the designs of such a painter as Mr. Albert Moore is of itself one of the most hopeful features of the renewed energy with which the officials of the society have this year done their work. It may be perhaps from the paucity of artists fitted for monumental painting that we see so little fresco or secco in these days. And yet of this I have no doubt whatever, that until we have architects, painters, and sculptors working side by side, no great advance is possible to either art, but before we can be sure of any such working that shall be worthy of the name, painters must know a little more of the great art to which they have to unite their work than they do at present. In looking at Mr. Moore's design for the fresco executed by him at Rochdale it is necessary to know that all the lower part of the wall is painted red. So that, although the drawing before us may look somewhat fiery in its general tone of colour, the fresco does, in fact, look exceedingly luminous and tender, possessing only red enough sufficiently to unite the lower part of the wall with the roof. There is, however, one fault which is almost inexcusable—the figures are out of scale with the architecture. It is quite possible that the building is ill-designed, and that the painter looked upon the architect as anything but a brother artist. If such were the case, we think the painter would have done wisely to decline the work; if such were not the case, then Mr. Moore has entirely missed the great purpose of his art. In the second design prepared for the east wall of the Church of Austinfriars there are no architectural forms to rouse the ire of the artist; and working, therefore, in a better spirit he has produced a better work: note particularly the expressions of the angels, so intense, although their faces are invisible, and the exquisitely lovely group of women and children in the scene of the Passover.

I do not like passing to the consideration of the designs of modern architects without first mentioning as praiseworthy Mr. Watson's sketch (No. 212); Mr. Charles Turner's fifth sketch in No. 190; Mr. Perry's illuminations; Mr. Glover's measured drawings of Bridgewater House; and the central sketch in the top row of Mr. G. H. Birch's frame (No. 189).

The architectural designs this year have been arranged, broadly speaking, in four groups. On the right we have the Gothic works, on the left the Classic, on the screens photographs of eight of the eleven designs submitted for the Law Courts, and in the West Gallery the designs of that model competition from which we all expected a new National Gallery. It will be quite impossible for me this evening to criticise at any length the designs in these two national competitions; and to pop off a sort of rifle-shot criticism on men (most of whom, whatever we may think of them, are tried soldiers, and have done good service to art in one way or another) would be, to say the least, impertinent. At the same time, I cannot help saying that I think the National Gallery competition has been very much under-rated. Considering all the circumstances of the case—above all, the meagre instructions, the short time allowed, and the depopularising of what is commonly called Classic architecture, which has been gradually going on for the last half century, it having been received as a settled point that those forms and principles of Gothic art found to be so elastic for all other purposes were unsuited for this,—considering these untoward circumstances, such failures as we see are rather to be attributed to the unfortunate conditions expressed and understood than to the architect, who is more or less the slave of those conditions. And certainly the failure of conditions, *i.e.*, of the work of the authorities, should no more result in depriving the architect of the work for which he has fought than the failure of the counsel for the Crown should result in subjecting the prisoner to a second trial. Personally I have no wish to see any one of the designs carried out, but it is not a question of carrying out any design before us. The real question between architects and the public is, as Mr. Scott has before put it, whether the architect who has shown himself the best under a certain set of conditions imposed on him should receive the confidence, and, consequently, the commission, from his employers, or whether the failure of conditions with which he had nothing to do should reduce an earnest fight to mere vanity and vexation? I feel confident you will carry the previous question. Of the designs themselves, although the best are in their way inferior to the best of the Law Courts designs, there are among the latter two—I may even go so far as to say three—sets of drawings which are, I think, immeasurably below the worst of the National Gallery collection, and I feel tolerably convinced that the outcry which has been raised against the Galleries and the absurd praise which has been lavished on the Courts have nothing to do with the individual artistic treatment of given principles of construction, but, if it means anything at all, is the shout of victory which proclaims the end of the battle of the styles. If the shortness of time at my disposal prevents me from making any remarks on the defeated competition, it of course precludes criticism of the more popular work upon the screens. At the same time I cannot help saying that here also I should scarcely like to see any one of the designs carried out in its integrity. We have too much of the sash window in one, too much of the fortress in another, too much of the church in a third, and too much of the factory in a fourth to make us fall very desperately in love with one or the other. Taken as affording illustrations of the power some architects have of wielding or managing large masses of building the competition is a greater success than, perhaps, most of us expected. Taken as an illustration of art power in detail it appears to me a failure, even after giving due credit for the few and brilliant exceptions.

Passing now from the conflict between the picked knights to the common battle-field we may recognise the same triumph, for triumph it is, however much we may be disposed to mince matters or affect to be unconscious of the victory. Even Mr. Lamb who seems to have been never quite certain to which side of the field he belonged, has fought his best under the Gothic banner. As in former exhibitions church architecture is predominant. We have an exterior and an interior of the cathedral to be built at St Andrew's, a very common-place church, some fifty drawings of new churches and chapels and nine of what are called "restorations." Of these last we can have nothing whatever to say, as their authors do not send photographs of the buildings before restoration. They may be very careful antiquarian studies or they may be just the reverse. It would be very desirable if gentlemen who send drawings

of restorations would in future be kind enough to forward with them photographs of the buildings before they touched them, with a brief description annexed, so that we may know a little of what is really doing in this branch of practical archæology.

The most important contributions in illustration of our modern church architecture are those from Mr. Street, Mr. White, and Mr. Joseph Clarke, and it is rather interesting to note in passing that in the aggregate they occupy less space upon the walls than any one of those drawings which are noteworthy only for their great pretensions. It is a lesson which many of us have yet to learn that, as good wine needs no bush, so good art needs neither trick of pencil nor breadth of mount nor hugeness of scale to proclaim it. Many drawings have been excluded this year for excesses of this kind, and it is to be hoped that in future exhibitions here or elsewhere there will be such support from the men who have kept themselves aloof that the committee may be able by a much more extensive rejection to reprove that "vaulting ambition which o'erleaps itself" and turns the art of Architecture into ridicule. Of the three examples I have quoted all show a marked improvement on former works. Mr. White shows more strength and more repose. Mr. Street shows more sympathy with the English phase of Gothic; whilst Mr. Joseph Clarke positively takes us by surprise by his large increase of power. Of the other ecclesiastical buildings the small unpretentious designs by Mr. Edis, Mr. Barber, and Mr. Buckeridge deserve to be quoted in the list of good things, and, with an anxious desire to extend this list to its utmost limit, I may also mention Mr. Teulon's drawing (No. 67), Mr. Purdue's elevations, and Mr. Plumbe's work at Tottenham, shown in No. 18. I may perhaps also add Nos. 90, 91, 95, and 114 and 117. There are others which make a very fair show as drawings, but which as architectural designs do not deserve to be classed with those I have mentioned. If they were merely commonplace works one would gladly say a word in their favour, but many of them are so far below commonplace that we can but wonder and be silent. In church architecture the Classic school is strongly represented by Messrs. Thompson, of Glasgow, who contribute three or four designs of considerable merit, possessing far more of the genuinely picturesque character of old Greek work than anything I know of the ecclesiastical work of the school to which they belong. Of civil public buildings we have this year a fair show, but unfortunately most of the drawings are those of rejected designs. We have one of the designs for Wolverhampton Townhall, which I am informed was never submitted to the professional judge who was called in to award the premiums; one of the designs for Retford Townhall, the successful design for which has lately appeared in the *Illustrated News*; four of the designs for Grantham Townhall, one of which, that by Mr. Edis, gained the second premium; Mr. Lamb's competitive design for Townhall, Preston; two of the designs submitted in the Manchester Royal Exchange competition; and one of the designs for Middlesboro' Exchange. To a certain extent the rejected are always interesting, but the interest is very small compared to what it might be if we could see the successful by their side, and thus be enabled to estimate the justice or the injustice which has been wrought. Thus, if Mr. Edis could secure a premium by the design exhibited in No. 26, what could have been the drawback which left Mr. Giles's design unpremiated, a design which but for the hipped roof and one or two minor details is decidedly above the average. By far the most important of these rejected works is Mr. Watson's design for the Manchester Exchange, illustrated by four admirable drawings; but why has Mr. Watson left the path he followed with so much success in 1861 and 1863, when he gained the prizes at the Royal Academy for architecture by clever Gothic designs for an Exchange and a Townhall, the first of which was conceived in a much nobler spirit, although perhaps possessing more glaring errors than that now exhibited? A restless wandering to and fro from the ends of the earth, trying Italian Gothic one year and French Gothic the next, experimenting with the Renaissance to-day, and may be the Egyptian to-morrow, is the sort of thing which is no doubt very enticing to a young antiquary who has studied well the history of art, but which the young architect should, nay must, eschew, if he desires to see architecture once again a growing living art.

In ordinary domestic buildings the Exhibition this year is eminently satisfactory. Mr. Roger Smith's five large drawings are very noteworthy as models of composition, drawing, and tinting; here and there we see some very slight mullions and an excess of plate glass, but these are trifles which the author would probably have set right in execution. Mr. Hardwick gives us a quiet, charming, country house in No. 51; but what is it which compels so many architects to raise the central light in a square-headed window higher than the ordinary constructional level? It is as common with good architects as with bad; and is, in fact, one of those things no one can understand. One of the charms of this design is the sense of repose which pervades it, and which in a great measure is due to the large amount of wall surface which Mr. Hardwick has had the courage and common sense to leave undecorated. This is an important point for young architects to note, so apt are they to ruin their works by not properly estimating the value of plain wall surface. Mr. White teaches the same lesson in his very slight sketch for a house in Co. Wicklow, especially in the end elevation, which, by the way, is far superior to the composition in the front of the house. Mr. David Brandon should be marked especially for his house at Penzance (No. 99). Of smaller works, the best are No. 75, by Mr. Wallen, who has somehow got hold of an uncommonly red brick, and Mr. Turner's villas at Great Yarmouth (very roughly drawn).

In street architecture one of the most interesting designs just now is Messrs. Clarke and Christian's elevation for the New Architectural Museum. The photograph exhibited (No. 80) is on a very small scale, and scarcely shows anything beyond the general composition, which seems a trifle weak at the angles.

Mr. Aitchison's design for offices for the London and St. Katharine Docks Company (No. 171) is a very artistic production, far in advance of his other works; the brushwork upon it is worth most attentive study.

Of the designs which belong distinctly to the Classic school favourable mention may be made of that by Mr. Darbishire for the Midland Railway terminus; Mr. Currey's central portion of the new St. Thomas's Hospital, Stangate, and the Grosvenor Mansions designed by Mr. Ashton and exhibited by Mr. Legg. And here, if I consulted your patience and my own feeling, I should pass on to consider those drawings which, either from being hung in the west gallery or from illustrating exceptional works, have hitherto remained unnoticed. But in ignoring such a vast quantity of works, and allowing the positively bad work to escape under the shelter of that which is merely commonplace, I should be guilty of an injustice to the latter. As examples of the way in which the battle of the styles has been lost I may refer you to the largest and most pretentious-looking drawings on the Classic side of the gallery. Not only are they bad in architecture, but the drawings themselves are questionable as matters of taste, reminding one strongly of the illustrated advertisements we see at railway stations, telling us nothing whatever beyond the fact that their authors, to use the parlance of their class, are "doing a good stroke of business." Two of these designs are relieved to a certain extent by qualities which almost border on the amusing. Thus, in one we have "Classic" pilasters with their edges stop-chamfered; and in another, the genius of the architect rises in the margins on a sort of Jacob's ladder, to culminate in a coronet on a cushion. We should like to see the studies of some of the most prominent of these men, and to what particular buildings in the old world they owe their inspiration. Of exceptional works we have very good drawings in Mr. Moyr Smith's "Spirits Mad with Joy;" Mr. Talbert's "Furniture," and Mr. Buckeridge's "Bank at Oxford." Mr. Buckeridge also exhibits photographs of some rebuilt churches, but whether they are restorations or new designs is an open question. Mr. Driver's best work is shown in some small photograms of Denmark Hill Station, and Mr. Teulon sends an unsatisfactory drawing of the "Memorial to William Tyndale at Nibley." There are also two or three designs which I should have noticed but for the fact that they have been executed so long and engraved so often as to have become equally well known, stale, and unprofitable.

And now, in concluding, whilst we cannot but congratulate the honorary secretaries upon the unquestionable interest which they have laboured to secure for the Architectural Exhibition of 1867, we beg them to accept such congratulations, with a certain amount of qualification. Much, very much, remains to be done, not only by the secretaries, but by the profession generally, if these exhibitions are to continue to be of any real service to the architecture of the future. I shall not now discuss the question whether exhibitions of architects' designs are or are not desirable. For my present purpose, I take it for granted that they are. Then, I ask, why have we no drawings from representative men like Mr. Butterfield, and from those good knights of the Gothic army Messrs. Pearson, Nesfield, Shaw, and Blomfield, or from architects like Messrs. Bodley, Webb, or Woodyer. Then, again, where are the good men who usually exhibit? Mr. Scott, in spite of the Law Courts, is scarcely the man to have done nothing during the past year. Why do we not see upon these walls Mr. Burges's design for the School of Arts, Bombay, or his strikingly clever warehouse in Thames-street? What has kept Mr. Seddon, Mr. Waterhouse, or Mr. Nichols from us this year? and where are Messrs. Lanyon and Lynn, Mr. Crossland, and many other good provincial men whose works have always something or other to commend them? Of course if these men decline or neglect to support the Exhibition we must simply put up with what we can get. Moreover, the Royal Academy diverts many good things from us; part they accept and part they reject, but the Exhibition committee cannot reap the advantage they would like to reap from the Academy's rejections, owing to the time at and manner in which the work at the two galleries is carried on. That the Academy Exhibition of Architecture should be anything else but a failure, and that the hanging should be rather worse than a mere failure, are events which everyone takes as a matter of course. Would it not, therefore, be more satisfactory to the profession and to the public if for the future the Academy and the council of this exhibition would act a little in concert. It has occurred to me, and I make bold to offer you the thought, that if the Academy were to give up receiving architectural works *ad libitum*, and make their selection from the works which had passed the professional judgment of the Council of this Exhibition, it would not only save a vast amount of practical inconvenience, but would, I believe, result in a much more just and complete representation of that art it is our happiness and privilege to practise, and the life and well-being of which should be

amongst our chiefest cares. If, then, I have sinned against anyone, either by sin of omission or commission, I pray you to believe me when I say that it has been quite unconsciously, and that I have had no desire to extenuate or set down aught in malice.

SILICIOUS PAINTING.

SOME twenty years ago Dr. Fuchs, of Munich, discovered a method of painting which he called *stereochromy*. The want of a vehicle more enduring than those formerly in use, and less liable to injure the colours employed, led to this discovery. Dr. Fuchs' method consists in the use of soluble silicates as the fixing material, and has been applied with considerable success on the continent by German artists of distinction, and in this country by Mr. Herbert in the Houses of Parliament, and by others.

The adoption of decorative and monumental painting for the embellishment of public and private buildings has rendered necessary some changes in the older processes of painting, because the requirements are different. Wall paintings are more exposed to destructive influences than paintings on panel or canvas: the wall itself is more absorbent; the accumulation of dirt, which has from time to time to be removed, the impossibility of giving the same care to their preservation as to those of smaller size which are movable, render the employment of a different method of painting necessary, and one which will leave the picture in such a state that it may, so to speak, take care of itself, and be independent of any further attention than that which is required to keep it clean; and for the cleaning process, its surface must be such that it cannot be readily injured.

Oil painting is unsuited for wall pictures on account of the glossy surface which it leaves, and for other reasons, into which it is not necessary to enter here. All the expedients which have been tried to get rid of this defect have failed, because they have interfered with the permanency of the work.

Fresco painting is open to many objections. In a damp climate it is not enduring. It is well known that the face of a plaster wall is destroyed by damp; and a fresco painting is nothing more than a plastered wall with a coloured surface, rendered more perishable by the colours, which, to some extent, interfere with the coherence of the particles of lime and sand forming that surface. The painting is executed while the wall is wet; water and lime only are used with the colours; their adhesion, therefore, is effected by the same power which binds together the other constituents of the wall, viz., the union between the lime and sand; and inasmuch as most of the colours form no compound with lime or sand, they must tend to weaken by their presence the cohesion between these substances by interfering with their perfect contact. The manipulation in fresco painting is difficult, requiring great care and skilled labour of a particular kind, only to be acquired by long practice and considerable observation, and is, therefore, unfit to be entrusted to workmen of the kind usually employed in decorative work. From the slowness of the process, it becomes very expensive, and this alone would prevent its general use, even if it were in other respects satisfactory.

Silicious painting seems to supply all that is wanted for beauty and stability. It makes the surface of the wall almost impervious to moisture, it fixes the colours firmly to the ground, it leaves no gloss, and, as will be seen, is easy of application. But the process discovered by Dr. Fuchs seems incomplete and open to some grave objections, although the principle on which it rests is sound.

Silica is soluble when fused or boiled under pressure with excess of caustic alkali. The compound thus obtained is a viscid, sticky liquid, of syrupy consistency; for many purposes it is a better adhesive material than gum, and its effect as a fixing medium is to bind colours very firmly to certain surfaces; it binds them, however, as a gum, though in some instances it fixes them by a chemical action; but this cannot be depended upon as securing the stability of a painting, as it only happens where the colours used form chemical compounds with the silicate, and this is the exception. When a soluble silicate is applied to a surface containing a substance with which it readily unites, a portion of the silica in solution will combine with it; and in proportion as the silica is precipitated the alkali which held it in solution will be set free, and therefore the remaining silicate will become more alkaline and more soluble. This is proved by exposing a piece of stone, such as Caen stone, coated with silica, to the action of the atmosphere; the silicate, which at first dried with a glossy surface, gradually dissolves, being acted upon by the moisture of the air, and that which had penetrated to a slight depth into the stone behaves in the same manner, and loosens the particles on its surface.

This seems to form a serious objection to the use of soluble silicates, either for stone preservation or stereochromic painting: and it is a difficulty which those who have worked upon soluble silicates have found very troublesome to remedy The fact that silicate combines with lime, sand, and other substances used in the painting ground, is indisputable; but this very combination leaves behind that which in the presence of moisture has a destructive action on the ground which it is intended to preserve, and on the colours applied to it. In painting a picture, especially one of large dimensions and in ornamental painting, the colours are often laid on in thick masses; but if these colours do not combine chemically with silica they will be only mechanically fixed to the wall by the silicate; and as this silicate, which was soluble before application, remains so afterwards, unless it form an insoluble compound with some other substance, the simple action of damp continued for some time will loosen and eventually remove the colours. Now, many of the pigments used in painting, such as ochres, umbers, certain reds and blacks, do not combine with silica; and as they are frequently used pure or nearly so in the glazing and finishing touches, on which the effect of a picture mainly depends, they cannot be permanently fixed, and such is proved to be the case by the experience of those who have given the subject patient and careful investigation. There are doubtless many silicious paintings which have stood for several years; there are also distemper paintings which have lasted for many more. In sheltered situations and in interiors it is quite possible that this may be the case; but even here repeated applications of silicious washes have been made at intervals, after the completion of the work, and such a practice is recommended for refixing particles of colour which may after time have become loosened.

The above remarks are not intended to disparage Dr. Fuchs' discovery, which is, in truth, one of the most important to art ever made. To this modest and great man all who are interested in the advancement of art owe a deep debt of gratitude for his persevering labours, pursued for many years amidst much discouragement and many difficulties. Those who read his treatise on stereochromy cannot but feel delighted with the earnestness and singleness of purpose with which he laboured to attain the high end which he set before him. He thus concludes the account of his investigations:—"But, before all, I thank God, who graciously allowed his weak and aged servant to finish the preceding investigations so far that others may build upon the foundation that I have laid." He evidently saw that much remained to be done to perfect the process which he had originated.

This paper has been written to lay before those who feel interested in the matter certain facts which are the result of some years' experience, and also to induce those who are engaged in art pursuits to turn their attention seriously to a process which, by rendering their works lasting and in all respects better suited to supply an increasing want, will make their profession more remunerative and their exertions more conducive to the happiness and improvement of their fellow men.

If artificial ultramarine be mixed with a soluble silicate—for example, silicate of potash—and be laid on a properly prepared ground, it will become so firmly fixed that no amount of washing nor the slow action of moisture will remove it or affect its brilliancy. If, however, reds, such as vermilion, red ochre, some of the oxides of iron, or browns, such as umber or sienna, be similarly treated, they will not endure the same test. Why is this? Ultramarine contains 37 per cent. of silica and 27 per cent. of alumina, two substances with which a soluble silicate readily unites. It is well known in laboratories that test tubes and other glass vessels which have contained soluble silicates become corroded, and that it is impossible to separate the silicious crust from the glass. There is in all soluble silicates, unless specially prepared, an excess of alkali; this, no doubt, acts on the glass vessel, and, by partily dissolving it, facilitates the union of the silica deposited from the solution with the softened particles of its surface. In time the alkali becomes saturated with the silica of the glass vessel, and when this saturated silica is dry it is much less soluble than when excess of alkali was present. Alumina readily unites with silica in the soluble form, whether the alumina be in solution or not, though in the latter case the action is much slower. It also takes into combination with it a certain quantity of the alkali, forming a compound analogous to felspar. It is not, therefore, difficult to account for the stability of the product resulting from the mixture of ultramarine with a soluble silicate. This fact points out the direction in which investigations should be made for the improvement of silicious painting. It will be well to consider briefly, first, the method of preparing colours; then the preparation of the painting ground; afterwards the solution to be used as the painting vehicle; and, finally, the method of manipulation and the permanent fixing of the picture. Alumina forms very stable natural compounds with silicate, potash, soda, and lime. Felspar, which enters largely into the composition of granite, consists mainly of silica, alumina, and potash. Porphyry, red and green, is a very enduring substance, and is also a species of felspar. Basalt, labradorite, and albite are formed of silica, lime, potash, and alumina, variously combined. Labradorite contains lime and albite soda in union with silica and alumina. All these minerals are hard and enduring. It is quite possible to produce, artificially, substances approaching their composition which will resist the action of damp and other destructive agents to which paintings are always exposed. Judging from the behaviour of ultramarine, if the colours employed contained silica and alumina, they should adhere as firmly to the surface on which they are placed, and such really is the case. If alumina be fused with potash, aluminate of potash is formed, containing a large quantity of alumina. If this be dissolved, so as to form a solution of sp. gr. 1·12, it may be kept for several days; if a stronger solution be made it begins very soon to deposit alumina. The solution sp. gr. 1·2 mixed with silicate of potash sp. gr. 1·2 will remain liquid for twenty-four hours, or perhaps a little longer; after that it will gelatinise slowly. If, while in the liquid state, colours are saturated with this solution, and are allowed to dry, their particles will be very intimately mixed with silica and alumina chemically combined with potash; after drying for some time at a gentle heat the operation may be repeated, and any quantity of the silicate of alumina and potash may be thus mixed with the colours. Care should be taken that they be finely powdered between each application, and they should be stirred up so as to keep them from caking at the bottom of the vessel, which hinders the perfect contact of the particles with the liquid. After careful drying for some days they may be well washed for the removal of any uncombined potash. The admixture of silica and alumina does not interfere with the brilliancy or depth of the colours. This method may be used for all colours, but it is better suited for such as ochres, umbers, siennas, &c., which are changed in tint by exposure to a high temperature. The different pigments made from metallic oxides, such as iron reds, cobalt blue, chromic green, &c., are better prepared by precipitation, as silicates and aluminates, by the addition of the mixed silicate and aluminate of potash to any of the solutions of their oxides in mineral acids. The precipitate should be well washed, dried, ignited, and ground. Colours made by the same method as those used in painting on porcelain (*i.e.*, by fusion), where the colour is not affected by intense heat, answer perfectly well, as they contain silica, to which alumina can be added in the process of manufacture. Excellent reds, greens, browns, and some yellows can be procured in this way. The object of using colours which contain silica and alumina has already been stated to be the formation of coherent insoluble compounds with the vehicle used in painting, which will be subsequently described. —*The Laboratory.*

We are glad to hear that the ratepayers and inhabitants of Torquay have presented an illuminated testimonial to their late surveyor and waterworks engineer, Mr. E. W. Shaw, C.E. Accompanying the testimonial was a valuable level and staff, on which are inscriptions to this effect:—Presented to E W. Shaw, C.E., by the inhabitants of Torquay, as a token of their regard and esteem. The inhabitants have also presented Mrs. E. W. Shaw with a splendid dressing-case completely fitted up.

Archæology.

THE remains of the gibbet post of Spencer Broughton, who was hung in irons on Attercliffe Common, near Sheffield, Yorkshire, after being executed at York for the robbery of the mail coach which travelled from Sheffield to Doncaster, were last week dug out of the ground. It is solid oak, perfectly black, and quite sound, though embedded in the ground since 1792. It consists of a massive frame-work 9ft. 4in. long and 1ft. deep, firmly embedded in the ground to support the gibbet-post, which passed through its centre, and was bolted to it. Some 4ft. 9in. of this post is left, the remainder having been cut off when the gibbet was taken down, 37½ years ago. The remains of the post is 18in. square. This relic was discovered by a person named Holroyd in making excavations for the cellars of some houses in Clifton-street, Attercliffe Common, near Sheffield, opposite the Yellow Lion Hotel. It was conveyed into the garden of the above-named hotel, where it may now be seen. The jaw-bone of Spencer Broughton, with two teeth in it, was found in the Yellow Lion Hotel garden a few years ago. Hundreds of persons have paid the gibbet a visit.

The *Athenæum* publishes from a correspondent the particulars of a very interesting discovery which has recently been made at Pompeii. This correspondent writes:—But a short time has elapsed since I sent you a report of the discovery of a vessel full of water in Pompeii. It has now been analysed by Professor De Luca, who fills the chair of chemistry in our University, and pronounced to contain the same proportions of oxygen and hydrogen as are found in common fountain water of the present day. There can be no doubt that it was placed there so long ago as the reign of the Emperor Titus. A similar fact has, I find, occurred several times. In 1862 a fountain was discovered in the cortile of a house decorated with figures of wild boars, serpents, dogs, and masques. At the time that the catastrophe occurred the key of the fountain was turned round, and the water shut in remained there. These figures are now amongst the bronzes in the museum; but unfortunately, in order to attach them more closely, a hole was made in the stomach of one of the animals, and the water escaped. Everyone, too, who has visited the Museo Nazionale will have observed a large key, once belonging to an aqueduct in the palace of Tiberius, in the Island of Capri. In the interior, just under the screw, still remains a quantity of water; and one of the surprises practised by the custode on the visitor is, to move the ponderous article backwards and forwards, and make the water rattle. If the mild element has been found several times amidst the ruins of Pompeii, wine never was until last week. Wonders upon wonders! A glass amphora was then turned up with three or four fingers' depth of wine still remaining. Of course it is in a state of condensation—not hard, but rather in a gelatinous state. This, too, has been sent to Professor De Luca, and we may expect in a few days to hear of the quality of the wines which were served at the tables of the Roman patricians.

PARIS EXHIBITION.

ONE of the curiosities of the Exhibition is a planetarium, designed and constructed by Mr. Milton Barlow, an American gentleman, who has given fourteen years of his life to the work. In the centre of a circle, about 30ft. in circumference, is a brass ball which represents the sun, which turns upon its axis; attached by a slender steel rod to the mechanism which moves the sun is Mercury, and then Venus, and close to the edge of the outer ring is our globe with its satellite. The earth is connected with the sun by a series of wheels placed so as not to interfere with the revolutions performed by the two planets which swing between us and the chief luminary. When it is desired to set the planetarium in motion, the operator has merely to take hold of a handle fixed to the mechanism which moves the earth, and to push it round the outer ring; the sun immediately commences to turn on its axis, and the moon and planets to describe their peculiar orbits. Some idea may be formed of the difficulty of adjusting this delicate mechanism when we remember that what Mr. Barlow had to do was to invent not an instrument which would give the same result every time it was turned round, but one as true and variable as nature. To make the matter clear to the reader, we may add that there is an inner ring on which are marked the years of this century. If you want to know the position of the planets in May last year, you must push the handle of the planetarium backwards, and to obtain their position next year push it forwards. Push the earth back to December, 1865, and the five bodies represented will be seen nearly in a line with Mercury and Venus almost in opposition. Let the earth be pushed forward to July 5, 1867, and then at full moon Mercury and Venus appear almost in conjunction. Mr. Barlow, in short, has substituted wheels for mathematics, and makes clear to the eye what figures prove to the reason. Several of these planetariums have been purchased by the United States Government for different universities; and the space allotted to Mr. Barlow at the Exhibition was paid for by the American Commission, acting under orders from Washington. A small planetarium fit for a library might be obtained for £80, but the cost of such an instrument as the one above described is about £400.

It has been decreed that the prizes of the Exhibition shall be multiplied. It was originally ordained that there should be distributed 100 gold medals, 1,000 of silver, 3,000 of bronze, and 5,000 certificates of honourable mention. This was much too few for an Exhibition the most splendid that has ever been, and supported by no less than 42,000 competitors. It is now arranged that there will be 900 gold medals, 3,000 of silver, 4,000 of bronze, and 5,000 certificates of honourable mention; but whereas the 100 gold medals which were originally promised were to be worth £40 each, the 900 new ones are to be worth each only £10. The new arrangement has produced a great satisfaction in many breasts; but the juries, some of whom are scattered to the winds, have not a little difficulty now in readjusting the order of the prizes.

EARLY IRISH ARCHITECTURE.

AT a recent meeting of the Cork Archæological Society, Mr. Richard R. Brash, M.R.I.A., exhibited a ground plan and a finely-executed drawing of the ancient doorway of the church or the inch or isle of the bog of Monaincha, which is situated in the county Tipperary, about three miles from the town of Roscrea. It was formerly called Inis na-m Beo, or the island of the living. Monaincha, however, is no longer an island, the bog by which it was formerly surrounded having been cut, drained, and cultivated; and the ruins are now accessible to foot passengers. Giraldus Cambrensis, writing in 1185, thus alludes to this place:—"In North Munster is a lake containing two isles; in the greater is a church of the ancient religion, and in the lesser a chapel wherein a few monks called Culdees devoutly serve God. In the greater, no woman or any animal of the female gender ever enters but it immediately dies; this has been proved by many experiments. In the lesser isle, no one can die—hence it is called 'Insula Viventum,' or the island of the living." The remains stand upon what was formerly called the lesser isle, but from the changes of time it is now the greater, and only marked from the surrounding land by a slight elevation. It is an ancient Romanesque church of small dimensions, to which is attached what must have been a domestic apartment of the monks. This church is exceedingly interesting, as it is a pure and perfect specimen of that style of architecture which prevailed in Ireland before the Anglo-Norman invasion. The church consists of a nave and chancel. The nave is 33ft. in length and 18ft. in width, the walls being 2ft. 9in. thick. The entrance is at the west end by a semicircular-headed doorway, having three orders of arches sculptured with chevrons and other Romanesque decorations, over which, in the apex of the gable, is an angular-headed window similar to those found in our round towers. The nave has three semicircular-headed windows in the south side of very beautiful workmanship, though now much injured. The chancel arch is 9ft. in width, and of very beautiful and chaste design. Indeed, having examined a great number of churches both in this country and abroad, we can safely assert that we have seen nothing of the same class that exceeds it in beauty and symmetry. It has three orders of engaged columns at each jamb; these columns are (unlike those usually found in Norman work) of classical proportions. They have moulded bases resting on a plinth and sub-plinth. The caps have a bold abacus, the under part of the bell being fluted, as is very usual in Romanesque work. The columns support three columns of arches, which are carved on the faces and soffits in very beautiful and varied patterns, the entire surfaces of the arches being ornamented. The chancel is exceedingly small, being only 9ft. 6in. long, and 9ft. wide. It is lighted at the east end by a semicircular headed window, having moulded jambs and arch; the external reveals are also moulded. In the south side is also a semicircular headed window, the jambs of which are broadly splayed. At each side of this window is a small square aumbry. The external quoins of the chancel are ornamented with three quarter columns, a very unique arrangement, seen only in a few ancient Irish churches. To the north of the nave towards the east end, and entered from the nave, is a vaulted apartment 28ft. long and 13ft. wide, having very thick walls. This apartment is very dark, being lighted only by one small slit in the north, and in one corner is a stone stair which led to an apartment overhead no longer in existence. This building is of a much later date than the church. The dressings of the doors and windows of the church are of a light coloured freestone. The chancel arch was carved out of a reddish freestone. All the work was remarkably well executed. The church was certainly erected some time within the twelfth century, the building to the north probably in the fourteenth. The church was originally founded for Culdean Monks, under the invocation of St. Columba. It subsequently fell to the order of St. Augustine, who removed from thence and built a small monastery at Corbally, about a mile distant, the church of which still exists; its architecture shows this removal to have taken place in the thirteenth century.

THE PAVILION HOSPITAL, CHORLTON UNION WORKHOUSE, NEAR MANCHESTER.*

By THOMAS WORTHINGTON, F.R.I.B.A.

THE Chorlton Union is one of the largest and most populous unions in the kingdom. It contains an area of 11,549 acres; and the population, which was 169,579 in 1861 (the last census-year), is now upwards of 180,000—a larger population in fact, than any of the great metropolitan parishes, with the exception of St. Pancras, which has a population of 198,788, though the area of that parish is only 2,716 acres, or less than one-fourth of the Chorlton Union. The guardians, about ten years ago, erected a large workhouse containing accommodation for about 1,200 inmates (originally certified by the Poor Law Board for upwards of 1,500). The hospital consisted of detached blocks, placed at the extreme ends of the main buildings, arranged on the common but objectionable plan of a central corridor, with wards placed on each side. The growth of the population of this district, however, progressed at a rate so enormous that the workhouse building (though extravagantly large when erected a few years ago) forced upon the guardians the absolute necessity of further accommodation. The hospital had become frightfully over crowded, the total inadequacy of the space had compelled all kinds of infectious disorders to be indiscriminately mingled in the wards, and not unfrequently it had become necessary to put hospital cases in the body of the house. The new hospital was commenced in 1864, and is now completed; several of the wards having been occupied by patients for some months. On reference to the plan (see lithographic illustration), it will be observed that the building consists of five oblong blocks or pavilions, connected at the southern end by a long open arcaded corridor of communication. Each pavilion is three stories in height, and contains on each floor a ward 124ft. long and 24ft. wide, with beds for thirty-two patients. At the southern or entrance end are a spacious open staircase, a nurses' room 12ft. by 11ft., a ward scullery 12ft. by 10ft., a watercloset for the use of the nurse and attendants, and a hoist to raise food to the upper stories; at the northern end of the wards are two small projecting wings, one of which contains two waterclosets for the patients, a sink for cleansing the bed-pans, and a closet for brushes, &c.; the other contains the bath rooms, lavatories, dust shoot, foul linen shoot, &c., &c. All the above accommodation is repeated on each of the three floors; so that there are in each pavilion three wards of 32 beds each, making a total of 96 beds in each of the five pavilions, or 480 beds in all, with the several

* Read at a meeting of the Manchester Statistical Society, January 9, 1867.

minor rooms just enumerated. The heights of the wards are as follows:—

14ft. 6in. clear ground floor.
14ft. „ first „
Average 15ft. „ top „

The top ward is somewhat higher than the others, being partially in the slope of the roof. The number of cu ic feet of air space to be allotted to each patient, being of the first importance, was a subject of the most careful and anxious consideration. All thought of adopting the old standard was abandoned. It appeared desirable that such an air space should be allowed as would be likely to effect the most expeditious cures, and the most rapid removal of cases from the parish books. It was ultimately determined that each inmate should have an air space of 1,350 cubic feet, or thereabouts; which is more than double the minimum space required by the Poor Law Board, and about three times that allowed in several of the larger metropolitan workhouse hospitals. Second only in importance to the cubical air space per patient, is the distance to be maintained from pavilion to pavilion. In order to put myself in possession of the best information on this point, I determined to visit some of the best European hospitals.

In January, 1864, I made a minute inspection of the great hospital at Bordeaux, so graphically described by Mr. Roberton, in his paper "on the defects" of hospital construction and ventilation. (Read March, 1856.) The spaces between the pavilions here is barely 50ft., which the medical director and the architect, to whom I had the advantage of introductions, were of opinion was too small. At the Hospital Lariboissiere, Paris, the distance between the pavilions is 65ft.; but here, also, I found, from the principal architect of the Parisian hospitals, that the interval was too small, and that in any future hospitals which might be erected by the Government, a considerable increase would be made in this respect. At the Hospital St Jean. Brussels, built about 25 years ago, and probably one of the earliest examples of a hospital erected on the principle of detached blocks, I found the distance not more than 32ft. At the new Herbert Hospital, at Woolwich—the best example of a military hospital in this country—the distance is 64ft. This great national institution has been erected, at an enormous expense, on a site where land was not of high value; and it is much to be regretted that this distance was not considerably greater, as the arrangement of the buildings is in most other respects admirable. At the new St. Thomas's Hospital now in course of erection at Stangate, opposite to the Houses of Parliament, the pavilions are to be 125ft. apart, which, considering its situation, surrounded by houses, except on the river side, will probably be found not too much to ensure a tolerable circulation of air about the buildings. Taking into consideration the above precedents, and that the site of the proposed Chorlton Hospital was in the open country, it was thought that 100ft. would be a sufficient interval; and this distance was accordingly determined after long and repeated discussion. Moreover, at the Chorlton Hospital the pavilions are more completely detached and isolated than in any other case I know,—the air circulating completely round them, and through the open arches of the corridor, without interruption from galleries or screens. Too much importance cannot be attached to this point, as the health of the inmates must largely depend on the free admission of fresh pure air. The complete isolation of the blocks also prevents the spread of infectious disorders from one building to another, which it is well known among medical men is no uncommon occurrence in many of our hospitals. The cubical air space was thus fixed at 1,350ft. per patient, the spaces between the pavilions at 100ft., the height of the wards respectively at 14ft. 6in., 14ft., and 15ft., and the nature of the site seemed to suggest that the buildings should be placed in line, with one long corridor at the south end. The general outline of the plan was thus laid down; the details have been worked out with regard to the best sanitary result, although the buildings have been constructed on the most economical principle consistent with durability. The ventilation and warming of these large wards was a subject which naturally involved considerable difficulty. Of course the first essential of good ventilation is the provision of a proper allowance of air space; but with the most ample provision in this respect, it is necessary to have the means of changing the air contained in any hospital ward. There are various contrivances employed to admit the outer air in such places and in such a manner as to keep up an unceasing movement in the upper stratum of the ward, and a constant displacement of the foul gases which rise to the top of any room containing a number of persons, and above all in a hospital ward constantly occupied, daily and nightly, by diseased inmates. The great difficulty is, of course, to accomplish the object without causing currents, and I have attempted to do so by arrangements which I will endeavour to make intelligible. In the east and west walls, or the long sides of the wards, are placed a series of large windows 4ft. 8in. wide, and extending from 2ft. 9in. above the floor to the ceiling. These windows are in all cases facing one another, and are divided in their entire height into three subdivisions. The lower portion, for about three-fourths of the whole opening, consists of an ordinary double-hung sash; the upper fourth is pivoted, and works on a swivel with cords, to open at any desired inclination. On the top of this swivel light, and, in fact, forming a portion of it, is a continuous hopper-shaped frame, made of cast iron. This frame extends the entire width of the window. It is glazed at the front and ends, but a space at the top is left open about 2in. wide and the full length of the frame. This long narrow opening is covered with fine wire gauze, and admits a constant but imperceptible stream of the outer air, which is continually passing across the ward close to the ceiling, towards the corresponding opening in the opposite window. A slightly upward direction is given by the sloping form of the hopper, in order that the air may be thrown towards the centre of the apartment, and be so distributed as to avoid down currents. Any or all of the three divisions may be opened more or less, at the discretion of the attendant; but when all are opened to their full extent, the ward will in a very short time be flooded with fresh air. Besides this, however, there is the opportunity of obtaining a current from the two extreme ends of the ward, and flushing the upper part with fresh air without opening the doors.

This is effected by means of a glazed louvre, about 6ft. high and 4ft. wide, placed at the entrance end, over the door from the staircase; and at the other, or balcony end, by means of a large swivel window, similar in arrangement to those already described. The louvre, which is worked by a very simple mechanical contrivance with lever and screw; may be adjusted to admit more or less air as required, but practically they are very rarely closed. There are also, at various points in the walls, air shafts or flues discharging above the roof level; and the ventilation is further assisted by a considerable number of small air grids or channels built in the walls, at short intervals, close to the ceiling. These grids have a sloping lip on the inside, projecting about 5in. from the wall, with an inclination of about 45 deg., to prevent the air falling at once in a cold volume to the lower part of the ward. A corresponding grid is placed in the opposite wall in each case, and the air appears to take a direction generally across the ward, near to the ceiling. The air being thus admitted in very small quantities and at very numerous places, diffuses itself without perceptible draughts, and displaces the gaseous portion of the contained air which naturally rises to the top.

The form of the small air channels is such that they would hardly be observed if not pointed out, and are, therefore, not likely to be wilfully obstructed, especially as they are close to the ceiling, and therefore, out of reach. In the floor of each ward, at a distance of 6ft. from the outer walls, are a number of hit-and-miss gratings, with galvanised iron horizontal tubes or flues, to conduct the fresh air to the foot of the beds, should it be required in foul cases, or when it may not be desirable to open the windows. On the ridge of the roofs are revolving ventilators of large diameter, to promote the ventilation of the top wards, which are partly in the roof, so that the windows do not reach the highest part of the ceiling. The warming is effected entirely by means of large open fireplaces, three in each ward. They are placed in the positions marked on the plan; are 5ft. wide and 5ft. 6in. high to the upper part of the opening. An iron hood partly closes this opening; but in the hood is a large circular hit-and-miss grating, so that when the fires are burning brightly the grating may be opened, and a stratum of air up to about 5ft. 6in. high be drawn off up the chimney. Practically the flues draw so effectually that it is very rarely necessary to close these gratings. The entire sides and backs of the fireplaces are built of firebrick, the inclination of the sides being at an angle of about 45 deg.; so that the heat is reflected at a corresponding angle across the ward, and no difficulty has, I believe, been experienced in keeping up a proper temperature. The fire is contained in a basket of plain wrought-iron bars, all unnecessary metal being avoided. At the extreme northern end of each ward are the small rooms containing the baths, waterclosets, &c., and between these projecting wings is an open air balcony for the use of patients who may be convalescent. The access to this balcony is through the large window in the end wall, so that an infirm patient who cannot go down stairs may take the air without fatigue. A widely-extended view over green fields is obtained from these balconies. The waterclosets are contained in the left wing, and are extremely simple in construction and very inexpensive The entire basin and seat are of earthenware, without wooden seats or fittings. The cleansing is effected by means of a chain attached to the door, which raises the valve and flushes the basin each time it is used. A sink or trough for emptying the bed pans adjoins, and has a similar earthenware basin with a lead receiver on the top, flushed by means of a hand-pull. The divisions between the closets are of sawn slate slabs about 7ft. high, with a framework of cast iron; non absorbent materials generally have been used wherever possible in this department. In each wing is a small angle fireplace. The baths and lavatories are contained in the right wing, and the fittings here are generally of the best description.

The drainage is entirely outside the buildings; and in no case is a drain brought within the walls, except to receive the descending soil pipes or waste water pipes. It is throughout of glazed earthenware. In the three principal chimney stacks in each of the five pavilions there is a special flue built, discharging above the roof, to which the drains are connected for ventilating purposes. This flue is entirely independent of any other, but is placed between two smoke flues, which by their heat cause an upward current in the intermediate flue, and by this means the drainage is ventilated at fifteen points. On the top of these flues charcoal boxes will be placed, to destroy any gases which may rise from the drains. The cost of the five pavilions with the corridor as above described, including the gas and water supply and the various fittings referred to, has barely exceeded £23,000. Perhaps it would hardly be fair to describe this as representing the entire cost of a complete hospital for 480 beds, as the kitchens, stores, and administrative department generally are common to the workhouse buildings and the hospital, and to a large extent were in existence before the new pavilions were built; but making allowance for the probable cost of such buildings, and for the value of the land, £30,000 would be, perhaps, a reasonable sum at which to estimate the cost of such a hospital, with its own independent administrative department. This would give the cost of such a complete detached establishment at the rate of about £60 per bed. The Chorlton Workhouse Hospital has no architectural pretensions whatever; but the most careful regard has been given to all those sanitary arrangements which it was thought might contribute to the alleviation of the sufferings of the inmates.

LLANDOUGH SCHOOL.

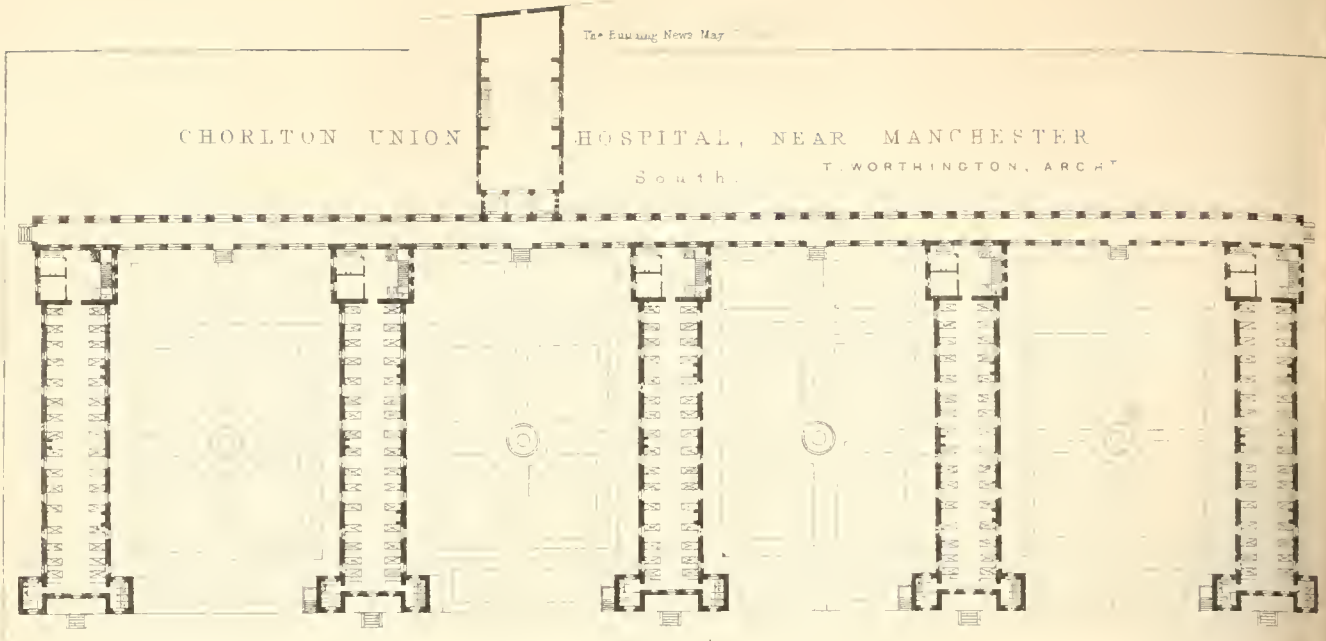
ONE of our illustrations this week represents a school recently built from a design by Mr. John Prichard, architect, at Llandough (not Llandaff, as written in some of our lithographic impressions), in Glamorganshire. It is merely a village school converted from a barn, and consists of one school room and a small residence for the teacher. It was built by Mr. Jarvis for £350. Though small and unpretending, the building embodies the qualities of strength and repose.

In Belgium and Holland linen is prepared beautifully, because the washerwomen use refined borax instead of soda as a washing powder. One large handful of borax is used to every ten gallons of water, and the saving of soap is said to be one half. For laces and cambrics an extra quantity is used. Borax does not injure the linen, and softens the hardest water. A teaspoonful of borax added to an ordinary sized kettle of hard water, in which it is allowed to boil, will effectually soften the water.

The Building News May

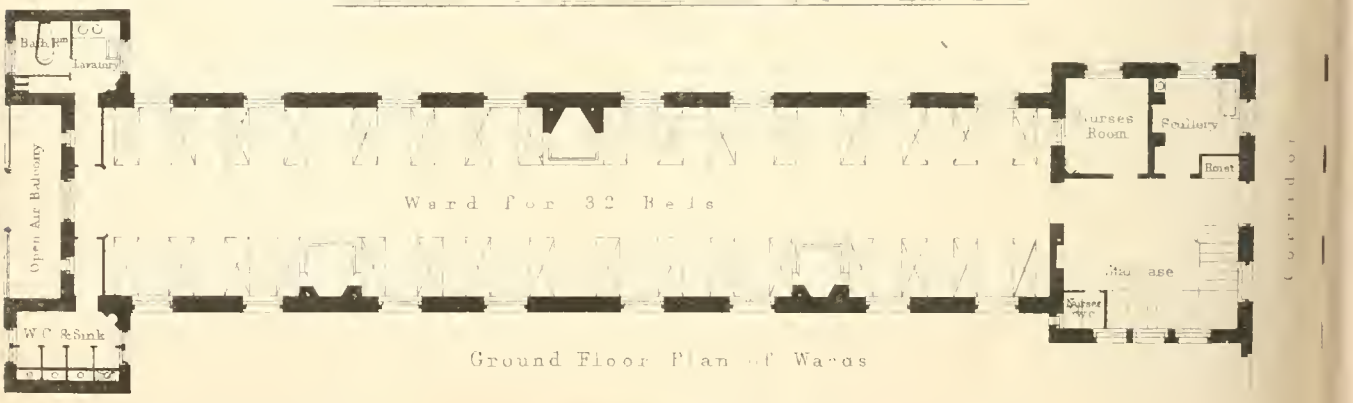
CHORLTON UNION HOSPITAL, NEAR MANCHESTER

T. WORTHINGTON, ARCHT



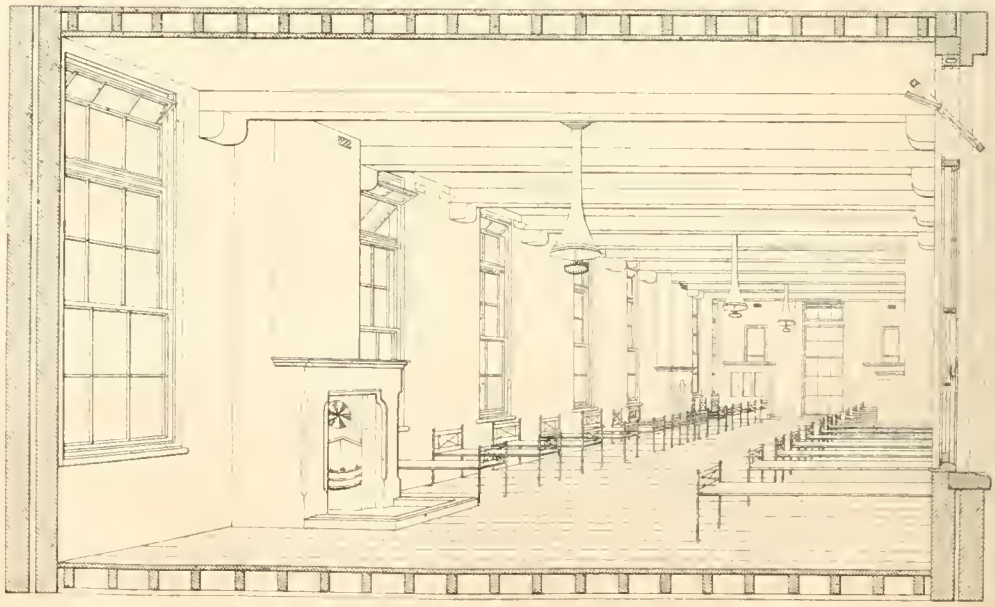
General Plan and Elevation.

SCALE OF 50 40 30 20 10 0 50 100 150 200 250 FEET



Ground Floor Plan of Wards

SCALE OF 10 5 0 10 20 30 40 50 60 70 FEET



Interior View of Ward

Lith by Whiteman & Bas

H. Albert L

Llanduff · Schools. — JOHN PRICHARD, ARCHT

TRADES' UNIONS' COMMISSION.

THE next witness after Mr. Piper, whose evidence we gave last week, was Mr. George Smith, of the firm of Smith and Taylor, the contractors of the Foreign Office. Witness took exception to the statements of Mr. Coulson, whose evidence implied that the work at the Foreign Office was scamped, that the Government did not get the proper quality of the work done, and there was a particular allusion to pockets. In reply to this, Mr. Smith said the work was perfectly solid, and he should be quite willing to allow the architects to cut in where they liked in order to prove that it was so. The instructions of his firm were always to make the work as sound as it is possible for work to be. "I have been now rather more than forty years in the building trade," said witness, "and I have never yet had a stain upon my character, and I do not think I am very likely to begin at my age doing scamp work." The Foreign Office work was piecework, the contractors under witness's firm being Messrs. Wilkinson and Bone. Instead of the work being "a swindle against the Government," as alleged by Mr. Coulson, witness believed that they will get a great deal more than the value, because the contractors would lose a considerable sum of money by it. There has been a rise of 15 per cent. in wages since the contract was taken, and the wages would absorb a great deal more than the profits. Witness also denied point blank that there was any truth in Mr. Coulson's statement that the work, though called piecework, was not really piecework. He thought that in the course of three years he should have had some representation from the men if they had felt aggrieved with the way in which the work was given out. Witness had been all his life opposed to one uniform rate of wages, and he intended, he said, to continue that opposition, believing that it militates against the well-being of the men and the well-being of the trade generally. Being asked if it is the practice now for London builders to make a regular allowance for the chance of strikes, Mr. Smith replied, "The only arrangement that we make with reference to strikes is to get a clause put into the contract that, in the event of a strike which is of general operation in the trade, and not the result of any feeling between the particular master and his men, there should then be an allowance made by the architect during the operation of that strike. If, for instance, the building is contracted to be done in two years, and a strike of that character occurs, we are not to be pressed for time. That is the only attempt that we have made to protect ourselves." His experience of unionists was that they were workmen of all sorts—good and bad, and average workmen. He had offered men higher wages on account of their greater skill than other men on the same work, but they have not been allowed by the union to receive it, or they have been subjected to so much annoyance that they have declared they would rather go. The difficulty of giving a man a lower rate of wages would equally exist. The greatest mischief arose from the fixed minimum. He considered that the operation of trades' unions of late years had tended very much to increase the uncertainty as to the estimate of the cost of works. Work now, though not less skilful than heretofore, was of a more sluggish character, owing, he believed, to the influence of the unions; nor was there that *esprit de corps* among the men which ought to exist. He wanted to see wages regulated upon the principle of supply and demand, and he believed that all these attempts by workmen to carry out an artificial system were injurious alike to men and masters. It was witness's opinion that if the men were not in the union wages would be kept up, besides saving all the machinery of the union. "The union cannot increase the quantity of work, and if the present state of things goes on, I have no hesitation in saying that work will be diminished; there will be nothing done but what is absolutely necessary."

The examination of Mr. George Francis Trollope followed. He gave an account of the circumstances of the strike of 1859—the nine hours' agitation—with which his firm was prominently connected. The firm had never had another strike. Witness went on to remark that he had no doubt at all that the operation of unions during the last few years had been to force up the rate of wages quicker than they would have risen if there had not been the action of unions, but he agreed with Mr. Smith that it is a very unjust arrangement to fix a minimum rate of wages for all men. The fixing of a minimum obliged masters to turn off men who are not up to the mark; those, for instance, who are advanced in years or otherwise incapable. Said witness, "I have told the men over and over again 'You are doing yourselves a great mischief; it may be all very well now in the time of railway works, when every man may have employment, but by fixing a minimum rate of wages, and that minimum a very high one, you are bringing about a reduction of work?' They say in answer to that, 'In contracts we quite understand that you must put in the best men you can, but with day work (this is their absurd reasoning), what does it matter to you, sir? You send me to a gentleman's house, and pay me 5s. or 6s. 8d. per day. You put a certain profit upon that and he pays it. I say to them, 'That is not just to begin with. If I send you to a customer's house and charge him £10 for wages, he will expect £10 value for it?' But some of the men seem to think that we have nothing to do but to sit at our desks and add 10 per cent. to everything that comes before us? It is our duty, in my opinion, to see that our customers have value for their money." Wages, if left to themselves, would always find their natural level by competition. One result of the high price of labour was to hinder people from building. Witness knew of his own knowledge that people say that builder's work has come to such an enormous price by reason of the wages that they really must have less work. Asked: Is there as a fact less work done?—At the present time I say there is; there is a very large number of operatives out of employment. He admitted that the argument of the men hitherto had been borne out by facts, because there has been such an enormous pressure for work owing to railways that almost every man who can handle a tool has been taken out at an unreasonable rate. He did not, however, think that that would last. There are more men out of work now than there were in the autumn—railway extensions being checked. The question was put to Mr. Trollope:—Supposing that the men have the union to fall back upon (when they are turned off) they are surely in a better position than if they stand alone? to which he replied, Then comes in the provident element. If they chose to subscribe during their time of work for a rainy day, nobody can object to that; indeed, we should all be delighted to see it.—Is not that what they do in the unions? That is one thing they do. As far as I and my partners are concerned, and I believe the generality of the masters, we are very desirous to consult the comfort and the advantage of our workmen; but that feeling unfortunately has changed of late years. In my younger days there used to be some sort of attachment between master and men, but that has entirely gone, and I say that it is the unions and nothing else that has brought about that result.—You believe that the effect of those unions is to loosen the tie between the workman and his employer?—That most decidedly has been so. Of course in a large establishment (and ours is a moderately large establishment) you cannot know 1,000 men, but you may know a great many men who have been in your employ for many years, and you may feel an attachment to those men. But when you find that you cannot come to those men and talk to them as friends; that, in fact, their individuality is lost because they are members of a union, it seems to me a most distressing thing. I have talked with them and argued with them, but in two or three days' time it is all obliterated by the influence of the unions; the union destroys the very essence of the relations which should subsist between master and men. It was a most unrighteous state of things, and he had often said that he was so disgusted with the system that he would be glad to leave the business altogether. Besides the question of a minimum of wages there were other ways in which the unions have interfered with the masters. Their tendency has been to bring all down to a dead level, and to repress the energy and zeal of the men. In reference to the question of apprentices witness said he did not think the unions had interfered. If they saw more than a certain number of apprentices in a shop they would object to it, but they had never put them in that position. His firm had never been interfered with in that way.

VILLA AND COTTAGE ARCHITECTURE.

SOME months ago we called attention to the earlier numbers of this publication. There is a widespread but mistaken belief that, in order to exhibit his skill, the architect requires large and important works. The converse is nearer the truth. The stately palace with its internal courts and symmetrical duplication of parts, will, as it were, take care of itself, and in works of this nature economy is never a primary object. The doors and windows are always better proportioned to the size of a building than is possible in a small house, and even the natural or artificial features which accompany it, such as trees, woods, roads, paths, &c., are more in accordance from the simple fact that at all events they cannot well dwarf the design. It will, therefore, be seen that the architect, although he may gain most fame from his large works, will draw most pleasure from his smaller and less important efforts. It is the villa, the cottage, the lodge, the rural chapel, which is designed *con amore*, and one of these perhaps little known structures the popular architect cherishes in his inmost heart as his darling design. The difficulties which attend the production of a good plan for a villa or cottage are of no common order. The site, to begin with, perhaps offers problems not easy of solution, and if, as is likely enough to be the case, the architect has no knowledge of landscape gardening, he will certainly pitch his house a few yards distant from the proper site, finding out his error only when it is too late to repair it. Granted, however, that he chooses the site correctly, his troubles are but commencing. Aspect, prevailing winds, unsightly objects in the landscape, have met with due consideration, and have been satisfactorily disposed of; still the house has to be designed, and every step in advance brings with it special difficulties and conflicting claims which must be met and, if possible, adjusted. The living rooms must not be in excess of the sleeping accommodation; in fact, the latter should always have the first claim upon the space at the disposal of the architect. The kitchen and offices must receive their full share of attention in the plan, or the household will not be contented, and the situation of the back entrance will have greater influence on the comfort of the proprietor than the inexperienced are aware. In almost all cases a storeroom is absolutely necessary; places must be provided for two kinds of coal, and a tool or root house cannot well be dispensed with. It should be borne in mind that every detached house habitable by well-to-do people will be improved by possessing a kitchen court or yard, walled or fenced in to hide certain indispensable though unromantic accessories. The water butt and dust-bin are useful in their way, and,

if ignored by the architect, have a disagreeable way of asserting themselves; therefore, by all means a kitchen yard. In short, it will be wise to consider no detail beneath notice, and as much as possible to put one's self in the position of the person for whose accommodation each portion of the plan is intended. Fancy yourself the cook, and you will not place the only window to the kitchen at the contraay end to the fireplace, thus forcing that useful functionary to stand literally in her own light. At the same time judgment must be exercised, for if the notions of each domestic are to be taken as final the architect will find that he has little space left for the master and the mistress. We will, however, suppose that the plan is finished, and that all requirements have been met; then comes the serious question of cost. The employer will at first abate no jot of his pretensions; he will not give up a cupboard, but he objects to pay so much money, and now comes the sickening part of an architect's profession. By degrees the employer realises that he cannot have so much and pay so little, and the architect has to cudgel his brains to knock out this, to reduce that, and, worst of all, perhaps, reluctantly consent to the ute of second quality material or workmanship. The design is spoilt, and being so far inferior to what first took the employer's fancy, is as disappointing to him as it is unsatisfactory to the architect.

The publication before us contains several examples of villas and cottages of varying merit, and derives its chief interest from the fact that it contains two designs by certain well-known architects for houses intended for their own occupation. Plate LIII., villa at Dulwich Wood Park, by Messrs. Banks and Barry, is convenient in plan, but does not bear any outward sign of being the work of a distinguished architect, the barge-boards, which are its only purely decorative feature, being neither elegant nor strong. A pair of gables, unless separated by a considerable length of ridge or parapet, can never look well; in this case they are separated by a recess 5ft. wide and 9in. deep—a space, in fact, just wide enough to contain the staircase window. The style chosen, a sort of suburban Tudor, is not the most manageable, especially when applied to a small house; the one under notice occupies an area of but 38ft. by 33ft. In similar cases an adaptation of the French style with mansard roofs and level cornices, will always be found preferable to any variety of Gothic. The Scotch style, with its gablets and corbie steps, is also well suited to the compact and somewhat lofty suburban house. Mr. Truefitt's design, Worcester Lodge, Holloway, Plate LV., for his own occupation, is quaint and artist-like. Without being by any means perfect, it has many points of merit. In Plate LVI. a view is given of a considerable portion of the front, showing an angle window in the drawing room, the effect of which is very pleasing. The front door seems to have two knockers, and is altogether unworthy of the house. Everything, including even the ironwork and gas fittings, was designed by the architect. The materials used for the external walls are washed stocks, with some few red bricks in bands, and in the window arches. It is with pleasure that we observe very sparing use of banded and variegated brick decoration. The stone, of which a little is used, is Portland. The area occupied by the house is 28ft. by 25ft., and the cost, it is hinted, was very moderate. We regard the statement, with items of the cost of most of the buildings, as the most valuable feature in this work; there is none which could make it more useful to the amateur intending to build. In some instances the charge for bell-hanging and gasfitting is given. In the numbers we have received the plates are not placed successively, so that no order can be observed in this notice. There is, for instance, a second view of a cottage *ornée* at Mill Green, Essex, by Mr. H. E. Kendall, jun., of which we can repeat what we said on the former occasion, that it is absurdly overdone, and that the alternative design is the best. There are many good points about it, not the least of which is the comparatively plain tile cresting, but the whole wants paring down—redundancies require to be lopped off. Without the superfluities the cottage would not look amiss. Messrs. A. and G. Thomson, of Glasgow, contribute a design for a double villa (Plate XLVI.), which deserves attention. It is not the usual double villa pointing one way, but two villas placed back to back in such a manner as to present the appearance of one house of some size. The plan might be advantageously worked out in some cases, but in the present instance, though we know nothing of the requirements of the proprietors of these villas, we cannot approve of a plan which only gives three bedrooms 15ft. square, and two bed closets, one of which opens out of the parlour, and the other out of the kitchen. Mr. Ewan Christian has a design for a parsonage in Essex (Plate XLII.); the arrangement is worth noticing. The exterior is plain, but in our eyes chimneys without plinth or base present but a sorry appearance. Plate XLVII. is a perspective view of the curate's house at Gotham, Nottinghamshire. The letterpress states that the conservatory is an inexpensive structure, "having for its decorative features, cresting to the ventilating-ridge and eaves, and spandrel-pieces to the heads of the lights, all executed in cast iron." The plate shows a gorgeous building upon which no expense seems to have been spared, and as the architect, Mr. Dutton Walker, assures the reader that the cost was but £503, anyone who desires a drawing-room, dining-room, study, kitchen, &c., four bedrooms, and a conservatory upon reasonable terms, had better employ him, and try by all means at the same time to secure the same builder. Mr. J. T. Rochead, of Glasgow, contributes his design for Strath Cottage, Dumbarton (Plate XLIX.), which contains as many faults as could well be crammed into one building; although in the Gothic style, it has projecting eaves, in spite of which the chimneys are at the apex of the gable with a little bit of roof in front of them. The want of harmony between the upper and lower stories is conspicuous, the one having little gableted dormer windows, while the other rejoices in a huge bay of hewn stone, 11ft. in the clear on the inside, and good enough for Windsor Castle. There is much more in this design that is worse than indifferent, but particular attention is called to Plate L., where the worst features of the building are given at large. It is a matter of taste whether the Classical or Gothic style is used, but whichever is chosen should be adhered to. Nothing can justify in a Gothic building the use of Italian balusters, piers, and balls. Messrs. Hine and Evans, of Nottingham, furnish plans of a villa which they have erected at Grantham. It is of no particular merit, though free from glaring faults, and is no doubt a comfortable residence. There is some good to be extracted from all the designs, even if only as an example of what to avoid. Very many are of interest, and they all derive value from the estimate of the cost not being a fancy one, but arrived at by the matter-of-fact process of producing receipted bills.

FINE ARTS.

THE ROYAL ACADEMY EXHIBITION.

No. II.

We hinted last week, as the result of a very casual survey of the present exhibition, that whatever its aggregate attractiveness, the Academic body had contributed comparatively little towards it, less, perhaps, than on many former occasions. Subsequent careful examination more than strengthens us in this impression, and leaves us, indeed, in doubt whether there must not be something radically wrong in a system of art education and honours which could produce so very unsatisfactory results as we see here accumulated around us. We described some of the performances of the members of the Academy last week, and they were the most prominent ones, those which people are most likely to look at and to talk about. We think we may safely say of those objects generally, that whatever individual tastes might see to admire in this or that specimen, there is, with the exception of Mr. Frith's picture, not one of them which tends to show onward progress in our art as a school, or to elevate the status of the painter. A closer scrutiny leads to a still more unsatisfactory conviction. Taking stock of the remainder of the Academic body, we find an all-pervading weakness and a positive degeneracy from their former achievements, works produced when they were working for their laurels, under the shade of which they now seem to consider that they repose in inaction,—"rest and be thankful."

To begin with one of our greatest names. Mr. Maclise, who has been much absent of late years on account of his public engagements at the Palace of Westminster, returns only to show how little the practice of glass painting in enormous battle pieces has done to mature the more genial spirit of poetic art within him, or even to improve him in the principles and technics of his calling. In the scene from "Othello," Act iii., sc. 3 (No. 123), where Desdemona asks,

> Why is your speech so faint? Are you not well?

in reply to which he complains of a pain in his forehead, which she proposes to cure by binding it hard—the critical moment before the great handkerchief scene — the artist betrays a sad lack of perception for the character of the situation. Desdemona is insipid to a painful degree, and she is represented as awkwardly pushing Othello in the short ribs with her left hand, whereas her attentions should have been to his head. And then the crowdedness of composition, confined within some pillars, without air around, or elbow room for what is to follow. In (No. 216) "A Winter Night's Tale," suggested by Shakspeare's lines in "King Richard II.," Act v., sc. 1,

> In winter's tedious nights, sit by the fire
> With good old folks, and let them tell thee tales,

the composition is more elaborate than in the former, but the study of every portion of the group, indeed, of every figure, is painfully laboured, added to which there is that particular hardness of outline, wholly unsubdued by atmospheric influences, which the artist was always addicted to, and which it is to be apprehended at his time of life he will never get rid of.

Another name, once of high promise. Those who remember Mr. Poole's earlier performance, the "Solomon Eagle" and "The Moors Beleaguered in the City of Valentia," with which he startled the world whilst yet an "ontsider," will lament his hopeless falling off of late years under the upas-like influence of monopoly and protection, and never more strikingly so than in his little scene from "King Lear" (No. 59), and the more intense littleness of his "Path over the Hills" (No. 200).

Mr. Faed, too, who came upon us a few years ago with such freshness of domestic character and feeling, has already passed into mannerism; repeating his accustomed rustic models a little altered in the attitudes in his one poor exhibit (No. 107) "The Poor, the Poor Man's Friend." Not to go into other particulars of this production, the appearance of an old blind man, making his way up to a cottage door, without stick or dog, is certainly rather awkward.

Mr. Cope's single canvas "Shylock and Jessica" (No. 312), is provokingly poor and vulgar, the colour tawdry and dabby. Mr. A. Elmore, who also contents himself with one specimen of his genius (No. 184), puzzles us to divine the merits of "The Tale of Scandal" it is supposed to commemorate, and which is suggested only by an extract from the "Diary of a Traveller in the East." Mr. F. Goodall is inoffensive, but sadly unim-

pressive, in his "Meeting of Abraham and Rebekah" (No. 81). Mr. Hart is positively outrageous in point of composition, drawing, and colour, in his "Submission of the Emperor Barbarossa to Pope Alexander III." (No. 378.) The position of the Emperor, prostrate on the ground, is painfully abject; —we pity the model who sprawled for it, if there was one, but a wicked roll of his eye seems to indicate that he is not sincere in his assumed humility. Mr. T. Landseer's "Visit of Oliver Cromwell, with some of his Officers, to Allerton" (No. 55), presents us to a stiff assemblage of leathern jerkins and armour, painted in the still-life fashion.

The recently elected Associates, some of whom we have previously spoken of, hardly come up to the mark they attained before their election. Mr. Calderon wants his usual vigour and purpose in "Home after Victory" (No. 356), showing a young knight of the olden time receiving a congratulatory deputation at the parental castle gate.

Mr. J. Pettie shows some humour in "The Doctor" (No. 25); but the conception and working out of "Treason" (No. 321), a group of conspirators, all leaning with their heads together, over a table are marked by exaggeration. Mr. Yeames puts a very little boy into a very long empty room, to feed him "On Bread and Water" (No. 139); vacuity being unpleasantly suggested to more senses than one. In his more ambitious picture "The Dawn of the Reformation" (No. 304), where Wycliffe distributes copies of the Bible to the "poor priests," his disciples, bidding them preach it throughout the land, he fails to realise the grand simplicity of his theme, whilst in drawing he is often timid, crude, and faulty. Mr. G. F. Watts continues to paint portraits in the same affected style as heretofore, imitating the effect of canvases upon which time had worked for some two or three centuries; thinking, perhaps, thereby to put himself on a level with the old masters. The result is simply absurd—witness more particularly his "Lamp-light Study" of Herr Joachim, the violinist (No. 619).

In landscape painting the Academy has long shown a lamentable deficiency which, from motives which we are at a loss to understand —may it be a feeling of delicacy towards veteran members?—they have been at no pains to supply. Mr. Creswick and Mr. Lee are gone to art as well for perceptive faculty, for feeling, for nature, and for handling. It is painful to look upon their cold and tremulous efforts. Mr. Stanfield still shows his silvery limpid pencil in "A Skirmish off Heliogoland" (No. 199); and Mr. E. W. Cooke surpasses his wont in his "Canal of the Guidnier, Venice" (No. 223). But Mr. T. Sydney Cooper, who used so to charm us with his cattle groups along the lower banks of the Thames, having apparently painted himself out in that line, now comes before us with a group of donkeys and goats, and donkey-chaises, and goat-chaises, "Waiting for Hire" (No. 410), as we presume on the cliffs of Margate, all painted with miniature detail, but in the hardest possible manner, and in a total absence of atmosphere. Mr. Hook has four of his favourite bits of sea coast and fisher life, painted with his usual truthfulness and bright liquidity of colour, of which our favourite is that entitled "Herrings from Banff: fishers cleaning their nets." Mr. Vicat Cole, who is not yet one of the Academic body, has deserted the Surrey cornfields, in which he achieved his early triumphs, for the sea, of which he gives us two examples, one of which (No. 489) depicts a storm in the neighbourhood of a rock under the aspects of evening with considerable power.

It affords us pleasure to close with a few words of well-deserved praise, which we hope may prove words of encouragement to a young artist of hereditary claims to art, which, if he goes on as he has begun, he will fully substantiate and justify. Mr. G. D. Leslie, the son of the late Royal Academician, has three canvases, which cannot fail to command attention, as they will justify attentive examination by the intelligence and feeling no less than by the artistic ability displayed in them. Of the three, "The Cousins" (No. 5), a genuine English farmstead, with its domestic relations pleasantly told, is perhaps most to our taste. The others are "Ten minutes to Decide" (No. 131), another country homestead, with a little story attached to one fair one of its occupants; and "Willow, willow" (No. 656), suggested by the ditty in "Othello" beginning,

> The fresh streams ran by her and murmured her moans,
> Sing willow, willow, willow.

LONDON UNIVERSITY BUILDING.

THE annual meeting of the Convocation of this University was held on Tuesday evening at Burlington House, Piccadilly, when Dr. Carpenter, the registrar, produced on the part of the senate certain plans of the new building, and stated that it had been found impossible to produce photographic representations of the elevation, because the original design was in the library of the House of Commons. He further stated that Mr. Pennethorne, the Government architect, had shown a disposition to meet the views of the senate as to the internal arrangements, but the Board of Works would not allow any interference with their elevations. The elevation that is withheld is simply the front on Piccadilly, and nothing more. Of course the public have, if possible, less interest than the senate in the appearance the building will present from the only spot whence it will be visible. But still they have some interest, and the voice of curiosity is now and then lifted up, and questions are asked as to the probable appearance of the University of London. Judging by the sacred elevations in the library of the House of Commons, it will present an aspect of general mediocrity, relieved at intervals by features as devoid of use as they are deficient in beauty. The old story may be repeated *ad nauseam*. The design may be described as Gothical not Gothic. The arches to the entrance are segmental —of the music-hall type. The statues are placed on the top of the pinnacles, excepting at the corners, where two larger and more impertinent pinnacles arise, each surmounted by a canopy containing a figure. The roof is much variegated in the slate line, and is not deficient in the article of ornamental iron cresting; but beyond this the building presents no feature worthy of note. Where all is indifferent it is difficult to select portions for special condemnation. The alternative Classical design by the same architect is much better. The central portion is positively elegant, and a few alterations in the wings would make the whole worthy of the site it is intended to occupy. This design is in the Greek style, and in his endeavour to keep the style pure, the architect has made more sacrifices than the ideas of the day will tolerate. Why cannot architects treat Greek art as they would Gothic? The *abandon* of Gothic and Renaissance art, by its irregularity, gives picturesqueness, and there is no real reason why Greek architecture should not be treated with almost as much freedom. People seem to fancy that the Greeks possessed no buildings excepting temples, because little else remains but the ruins of those structures. Of the other designs it is scarcely necessary to speak, as they are for the present shelved. That by Messrs. Banks and Barry is as ordinary as can well be imagined, hardly good enough for a terrace in Pimlico. That by Smirke, approved by a former Government, is not quite so good, and on viewing the drawings the question naturally arises, how did they get here, and what will be done with them? The former question is not a particularly hard one. Gentlemen in official positions are very apt to fancy that taste and judgment are to be found ready made on a Treasury bench, and when that fancy has once taken hold, the rudest shocks of failure can scarcely dispel the illusion. As to the ultimate destination of the drawings it is impossible to speak with any certainty, but we hope that some pressure will be brought to bear on those in authority, which will protect the senate of the London University from having thrust upon them a design of which they do not approve, and relieve the public from the apprehension they justly feel that official dilettanteism will mar another site and deface another thoroughfare.

THE NEW ROYAL AMPHITHEATRE, HOLBORN.

A SPIRITED attempt is about to be made to revive the glories of the peaceful sawdust ring. On the site of the Metropolitan Horse Bazaar, Holborn (nearly opposite the Inns of Court Hotel), is now rapidly progressing towards completion an amphitheatre, which will vie with any building in London in the beauty and elegance of its decorations and its admirable arrangements for the safety and comfort of the public. The Royal Amphitheatre, which will be under the management of Mr. Thomas M'Collum, is announced to be opened on the 25th inst. The entire span of theatre is 76ft. in the clear; the whole length is 130ft. The width from box to box is 60ft., length from proscenium to box is 68ft. The Royal box is situated in the centre of the house, facing the stage, and the retiring room for same is immediately behind. There are no stage boxes whatever. The architects found that in no instance whatever could a second row of persons in a stage box see the stage, much less be able to see clearly the ring of an amphitheatre; they therefore adopted an entirely different course, and arranged the dress circle at the side where the private boxes are usually placed, putting the private boxes in front of the house; they have, in addition, designed one row of stalls in front of the private boxes entirely round the house; these stalls hold 200 people, the seats for which are so managed that as persons rise to allow others to pass, the seats fold against the back self acting, so giving an additional space of 1ft. 6in. for passing room. There are 26 private boxes. The amphitheatre (propre) holds about 700 persons. The gallery is approached by a stone staircase 5ft. wide. The front row in gallery is appropriated for gallery stalls, 150 in number, each seat being a stuffed cushion with a comfortable back. The other part of gallery will seat about 550 persons, besides having a large promenade behind, from which place every part of the ring and the stage can be plainly seen. The stage is only 20ft. deep, but the proprietors consider this sufficient for the class of plays they propose to bring before the public. The building has three entrances. Messrs. Thomas Smith and Son, of Bloomsbury-square, are the architects. The mouldings are by Jackson, of Rathbone-place, and the decorations by Green and King, of Baker-street. All the entrances are fire-proof, and all the staircases of stone; and especial care has been taken to provide facilities for clearing the building in a few minutes, should that necessity ever arise. Ventilation is promoted by an immense air-shaft, which runs through the entire structure, and the lighting has been entrusted to Messrs. Defries and Co. A crystal sunlight, 9ft. in diameter, and containing 960 burners, will illuminate the whole of the auditorium. In all probability before the expiration of another twelve months we shall have two more new theatres in London. One will be in Long Acre, in the building presently known as St. Martin's Hall. The other will be erected on the ground in Leicester-square, now occupied by Pagliano's Sablonière Hotel, and once the residence of Hogarth.

HINTS TO MECHANICS.

THE proper shape of a tool employed for turning metal can only be determined by experience, aided by a philosophical knowledge of the laws which govern motion. The relation of the curve or straight line to the ends desired to be attained must be as carefully considered as that of any motive agent whose action is correspondingly valuable to man. A tool which has merely a very sharp and hard edge will not accomplish the same useful results as one which is constructed upon philosophical principles with respect to its shape and position. It would save a great deal of time and expense in machine shops if a more correct knowledge generally prevailed among those who forge tools, so that they might form them as nearly right as possible while "the iron is hot." Much valuable time is wasted in grinding down tools to the proper shape after forging, a great deal of which time might be economised. If we consider the first principle of a cutting tool, we shall find it to be that of the wedge, and that in its performance it separates the atoms comprising a whole by cleaving them asunder with more or less force, as its shape is correct or incorrect; but the way in which the action of that wedge is to be applied is the secret

of the whole art of tool making. Speaking of tools, we do not in this connection recognise any but roughing tools. Let us suppose a round shaft to be in the lathe, and the tool applied to it; the first consideration is whether the one in hand is such as to act with economy, and produce good workmanship. The surface of the shaft is to be turned down one-fourth of an inch, and it is a well-known law that all revolving bodies throw off at a tangent with their circumferences whatever is loosely attached to or detached from their surfaces. In obedience to this law, the object to be attained is to turn the surface of the iron so that its refuse will run in a tangent. Now, supposing the tool to be moving laterally, as it does in operation, if the edge be inclined at an angle of 45 deg. the "chip" will first endeavour to pass off at a tangent, but, as it meets with resistance from the cutting edge and the surface, it will deviate from that direction, and, running down the angle of 45 deg. a corrugated and very brittle chip is produced. If we alter the edge of the tool so that its point reaches high above the "centres" of the lathe, and set its angle sloping partially, instead of arbitrarily to the right, while its cleaving edge forms a tangent (or nearly one) with the circumference, the chip produced will run off the tool in a true spiral, and vary but slightly from the path we claim it should travel. In the first mentioned instance, the turning produced, although apparently even and true, is not and cannot be so even and perfect as that produced by the second tool set forth. The fact of the cutters being high above the centres of the lathe prevents the work from rolling upon and "chattering" it, as it is called. Moreover, by testing the heat of the two chips, produced as described, as they leave the tool, it will be found that the last-mentioned is not so hot—consequently the tool worked with less friction on the metal, and therefore less power was required to drive the work. When we consider this fact, we directly recognise its great value; for, if we admit that one instrument is more economical of power than another, we must admit that the freest working one will remove more iron in a shorter space of time. From this recognition, the pecuniary value of the instrument becomes evident. But in discussing the quality of tools which have keen edges and cut "clean" we do not allude to "fancy tools," made merely for experiment. It is only the practical advantages to be derived from an experiment that makes it valuable; by the form of the chip taken in working his lathe, we can, in some measure, judge of a craftsman's skill. A revolution in the shape of cutting tools is gradually taking place in our best machine shops; ten years ago the "diamond point" was regarded as the *ne plus ultra* of roughing tools, but those now in use are very different in shape, and are difficult to describe without illustrations. Every man, of course, makes his tools to suit himself, but as each handicraft is improved by individuals composing it, we ask the attention of our workmen to their cutting tools, and try what progress can be made in this direction.

Building Intelligence.

CHURCHES AND CHAPELS.

It has been determined to erect a new church for the parish of South Huish, Devonshire, the old church being in a very ruinous state. The tender is £1,053, and has been given in by Mr. Harvey, of Stonehouse.

A new Catholic church, dedicated to St. Joseph, was opened on Sunday, at Birkdale, near Southport. The foundation stone of the edifice was laid on October 15, 1865, Mr. E. W. Pugin being the architect. The church will seat about 300 persons.

A new chapel, in connection with the United Methodist Free Church persuasion, at Chorley, was opened on Sunday. The building is of a plain Gothic description, the schools being underneath. The new building is estimated to cost about £1,500; and in the chapel there will be accommodation for 350 persons, and in the school for 250.

The ceremony of re-opening the fine parish church of Gresford, after the restoration of the interior, took place last week. The building is a stately specimen of the Tudor period of architecture. The restoration also includes an entirely new flooring, with an encaustic tiled chancel pavement, and the paint and whitewash of past ages cleared from the panelled ceiling and venerable walls. The church has been reseated, the seats to be absolutely free, open, and unappropriated for ever. The architect is Mr. G. E. Street, R.A., and the principal contractor Mr Yates, of Shiffnal. The cost of restoration amounts to £2,721.

BUNBRIDGE (IRELAND). — Seapatrick Church, Bunbridge has been reopened after alterations and additions at a cost of about £2,000. Over 300 additional sittings have been provided. Mr. W. J. Barre, Belfast, was the architect; and Mr. B Maginnis, Newry, the builder.

KENSINGTON.—The foundation stone of a new Catholic church, at Kensington, dedicated to "Our Lady," was laid on Tuesday by the Archbishop of Westminster. The site of the new church is in Newland-terrace, Kensington, and the design is by Mr. George Goldie. The style of the church is purely Gothic. It will be 144ft. long, 59ft. wide, 65ft. high, and when completed will afford accommodation for 1,200 persons.

KILLANEY.—The parish church of Killaney, near Ballynahinch, was consecrated recently by the Lord Bishop of Down. The church consirts of a nave, transept, tower, and spire, and is constructed to accommodate over two hundred persons. The building generally is of hammered stone, with dressings of Scotch stone to the windows and gables; the spire is of Scotch stone; and the octagon tower is hammered stone with Scotch stone dressings. The windows are filled with cathedral glass of an amber tint. The architects were the architects to the Ecclesiastical Commissioners; the builders, Mr. James Henry, of Belfast.

OXFORD DIOCESAN CHURCH BUILDING SOCIETY. —At the quarterly meeting of this society, held on the 3rd inst., the Bishop of Oxford in the chair, vouchers were produced for the following payments since last meeting:—Pangbourne Church, £100; Abingdon Church, £300; Drayton Beauchamp Church, £50; Upper Heyford Church, £60. And the subjoined conditional grants were made:—Lee Church, Bucks (rebuilt), £100; Harwell Church, Berks, £50; Fingest Church, Bucks, £20; St. Lawrence, Reading, £200; Farnham Royal, Bucks, £60; Abingdon, £100; Worminghall, Bucks, £5; St. Luke's, Maidenhead, £80; Aylesbury Church, Bucks, £200; Langford Church, Oxon, £50; Lower Heyford Church, Oxon, £50; Edlesborough Church, Bucks, £80; Bletchley Church, Bucks, £80; Abingdon Parsonage House, £100; Headington Quarry Parsonage House, £50; Little Faringdon Parsonage House, £50; Claydon, Banbury, Parsonage House, grant confirmed, £50.

SOUTHWOLD. — The richly-painted roof of the church of Southwold, which has been for some time under restoration at the hands of Mr. Phipson, has been again displayed on the completion of the works. The design is a very careful copy of the original painting, which, although far gone, was in sufficiently good preservation to enable a transcript to be produced. The principals, purlins, cornices, hammer-beams, and other members are picked out in various colours and patterns, the prevailing one being a chequered roll moulding, in some parts red and white, in others red and black,—a very common ornament in the time of Henry the Seventh, the date of the roof itself. The panels, with the exception of those in the last bay to the westward, are blue, with gold stars. The western bay, under which the rood-loft originally stood, is more highly ornamented than the others, all the panels being filled with figures of angels holding scrolls or emblems. On the ten scrolls are inscribed portions of the song of Zachariah; the ten angels which alternate with these hold the emblems of the Passion. All the hammer-beams in the church are very beautifully carved with figures of angels; these were, until lately, much injured, by losses of heads, hands, and wings. These members have been supplied. As to the general repairs of this edifice, the woodwork, clerestory windows, and battlements have been restored, a new four-light east window has been inserted, and other works have been executed, to the cost of about £1,700. Much remains to be done.

BUILDINGS.

The extensive piece of park land adjoining the Nottingham Forest, known as the residence of Mr. Edwin Patchitt, has been purchased by Mr. Thomas Simpson, architect, of that town, who intends laying out the same for first-class building sites. The land occupies a commanding situation and a fine neighbourhood.

LIVERPOOL.—On Tuesday last, the foundation stone of new schools in connection with Holy Trinity Church, Liverpool, was laid by Miss C. Wright, at whose cost they are to be erected. The materials in the building are local grey stock bricks faced with red pressed bricks from St. Helen's, the bands of Bolton bricks. The sills and dressings will be of Stourton stone, the stairs and steps of Yorkshire stone, and the timber Baltic pine. The schools will accommodate about 600 children. Mr. John Westmoreland is the contractor, and Mr. James Francis Doyle the architect.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the EDITOR, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—R. W. E.—R. T.—T. D.—R. B.—R. S.—K. and Co.—J. O.—J. M.—E. L. C.—M. W. and M.—E. L.—J. R. W.—D. T. K., New York.—M. Y.—T. A. M.—K. T.—G. T. R.—P. L. and Sons.—R. W. J.—J. R. J. W.—R. W. J.—E. W. P.—P. and Son.—A. R.—J. B.—J. H.—S. and F.

G. T., Truro.—Of course we intend to give illustrations of Mr. Street's design for the new Law Courts, and most likely next week and the following week.

A. H., East India-road.—The number of the BUILDING NEWS containing the Index was issued with our number for January 4.

Correspondence.

SEFTON PARK PLANS.

To the Editor of the BUILDING NEWS.

SIR,—Will you kindly allow me to offer a few remarks on your very able article and critique of the Sefton Park Plans for the borough of Liverpool? Being a competitor, and hoping to profit by the experience of others, I went to Liverpool to see the exhibition of these designs, and I must confess I was surprised to find so many men enter into the competition, having such very limited ideas of what a public park should be. This, *en passant*, as it is not my intention to review the plans, but to correct one or two statements in your report which are I think erroneous. You say that none of the plans could be carried out without very great modification, also that all figures are fallacious. With regard to figures you estimate the cost at from £250 to £300 per acre. The total area of the park is 370 acres, from which deduct 160 acres as required by the council for building land, you then have 210 acres to be dealt with in the estimate. The cost of carrying out my plan is £62,262 15s. 5d., or £296 12s. 4d. per acre, a close approximation to your own figures. This 210 acres I have disposed of in my plan so as to meet the requirements of the committee to the fullest extent. Having made a journey to Liverpool to view the ground and collect information about the price of labour, materials, &c., I have good grounds for saying that my estimate is near the mark; and that my plan can be carried out advantageously may be abundantly proved by a perusal of the explanatory report which accompanied it, and to which I trusted instead of elaborate drawings, which I had no reason to suppose were either requisite or would be admitted (see the printed conditions).

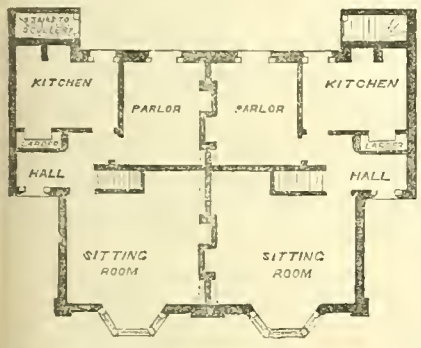
In your concluding remarks you allude to the old race of landscape gardeners being extinct, with no new species to follow them. I must admit that many landscape gardeners of the present day are too fond of copying the geometrical figures of a carpet or a shawl, or (in dealing with a large extent of ground) to pin their faith to the belief that a number of tortuous roads leading to nowhere, or what is quite as bad, going the farthest way round, are necessary to add to the beauty of the landscape; nevertheless, I do hope we have young men amongst us yet, who will stand up for the old school, and who still believe that to be a successful landscape gardener they must copy the beauties of nature instead of making her subserve to theories of their own. With regard to the last sentence of your criticism on my plan, that a certain main feature "will be useful in carrying out any of the plans," I shall merely remark that no council or committee have any

right to the designs of any other plans than those to which premiums are awarded, and to copy any portion of them without the consent of their owner would be to appropriate that which does not belong to them. The award of the first premium is certainly not in accordance with the printed instructions issued by the council; besides which the plan (No. 2) contains much that would be objectionable to the residents in the "first-class villas" for which the instructions stipulate. —I am, &c., MAURICE YOUNG.

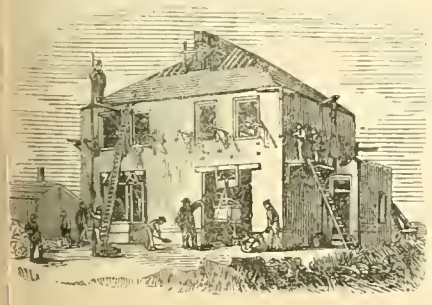
Milford Nurseries, near Godalming,
May 11.

CONCRETE BUILDINGS.

SIR,—In your paper of the 12th ult. is an account of a discussion at the Society of Arts on the subject of building in concrete. I can corroborate all that was said by Mr. W. E. Newton, C.E., who has had considerable experience in the matter, but I should not have troubled you with any observations of mine had not Professor Kerr on that occasion made some grievous blunders, and proved he knows very little about the strength of Portland cement concrete. In your remarks on the subject of concrete you say, "If it can be proved that concrete is as strong as, and at the same time cheaper than, bricks for building, then the question of improved dwellings for the people will be answered." I think Mr. Newton, in his speech at the Society of Arts, and in his subsequent letter, completely settled the question of economy of construction, and it will be seen from what I have stated I can fully corroborate him. As some proof of the applicability of Portland concrete walls and constructions, as described by Mr. Newton, I beg to forward you the plans of four eight-roomed villa residences I am now build-



ng at Gravesend, and a photograph of a pair of them in their present state and course of construction. You will see by the ground plan that the fireplaces are half their width out of the centre of the room. By this arrangement I am enabled to set all the flues in a 15in. wall. As modern stoves are only 9in. deep I get a back 6in. thick. This arrangement will also give 50 cubic feet more space in each room—a great desideratum in building houses for the working classes. The cost price of these houses will not exceed £140, finished with the best materials and workmanship. The inspection and critical examination of these houses by architects and builders is invited. Those who have seen them are so satisfied with their great strength, durability, and dryness that although not yet finished I have offers for the purchase of the four at a price that will leave me a nett profit of 45 per cent. As regards the strength of Portland cement concrete in comparison to brickwork, I can at once settle that question. In the photographic view of the houses I am now building at Gravesend, you will see that I am standing on a bracket or lever fixed in and ex-



tending 6ft. 6in. from the weakest part of the wall, viz., a pier 2ft. wide between the windows. This pier is 9in. thick, and eleven days old. If the lever were placed inside the building there would be some support from the window-frames, as they would form a rebate, but being on the outside the reverse is the case. There is also a block of concrete 3ft. long, 12in. deep, and 4½in. thick. It is suspended from the breastsummer in the opening for the bay windows. This block is made with 7 parts of crushed stone to 1 part of cement. A large box, 3ft. long, 2ft. 3in. deep, and 18in. wide, loaded with flints, stone, and brickbats, closely packed, is suspended from the block. I calculate this weight at about half a ton, but I have no doubt the concrete block would sustain double the load.

Professor Kerr asked, "Did anyone mean to say he could build a wall, 30ft. long and 25ft. high, 6in. thick?" Mr. Newton said, "Yes;" and I say "Yes;" and as Professor Kerr's knowledge of the subject is so very limited, I am willing, in order to satisfy him and others, to give the following challenge:—

First, to attach one of my brackets, 6ft. 6in. long, to a pier built in concrete 9in. thick, and my opponent to do the same with a pier of ordinary bricks and mortar, 14in. thick, 2ft. wide, and eleven days old. The bricklayer is to carry up the pier without knowing that it is to be subjected to any test. The builder of that pier which sustains the heaviest load and strain to receive £50, which shall be forfeited by the other side.

Secondly, subject to the same conditions, let a block of bricks and mortar be made the same size as the block of concrete, and the same age, that will carry one-twentieth the weight of the concrete block of the same dimensions, and I will forfeit £50.

Thirdly, I will build a wall in concrete, 6in. thick, 30ft. long, 23ft. high, using my bracket scaffolding, as shown in my pamphlet, in competition with a brick wall of the above dimensions and 9in. thick; both walls to be built with my bracket scaffolding, and each wall to be built 18in. every day, wet or fine weather. If the brickwork stands the test mentioned I will forfeit £50 and the cost of the wall, and if it will not stand the test mentioned as above the same shall be forfeited to me. All my concrete shall be made at half the cost of my intended opponent's brickwork. Mr. Rogers's simple and inexpensive design for a block of dwellings, described in your paper, appears to me to be well adapted to meet the wants of the labouring classes, but I have some little improvements to suggest. For instance, the chimney-breast may be dispensed with, as shown in my ground plan, &c. I estimate that the block can be erected in concrete for the sum of £13,500. The great desire you have always shown in your valuable paper to solve the question of building houses for the working classes and also for the public in general in an economical manner, and your wish to ascertain the applicability of concrete for building purposes, have induced me to address you at this length, and if the challenge I have given be not taken up I think I may then assume that my propositions are sound, and that I may say the question of building improved dwellings for the people is answered.

I am, &c., JOSEPH TALL.

604, Old Kent-road.

P.S.—Since I forwarded my letter I have further tested my work, and instead of 6ft. 6in. I have made it out in length 8ft. With my weight the brace to the bracket gave way. This will enable you to form some idea of the immense strain. The brace is a ½in. rod of wrought iron. I have no hesitation in saying that bricks and mortar 21in. thick and the same age would not stand out half the strain.—J. T.

CHURCH ARCHITECTURE.

SIR,—If your correspondent, Mr. Fennell, had read a little more attentively my remarks on a suggested plan for a modern church, which you did me the honour to print, he would have seen that not only did I not claim the application of the Greek cross plan to a church as a new invention (which, indeed, would have been absurd), but that I referred to that identical plan of Wren's to which he alludes, as having suggested and formed the basis of my own plan. I was not aware that such a plan had been applied to an English parish church before; and it appears that the church at Addleston, which he mentions, has not what I consider the most important point in my plan, viz., the central position of the organ and choir, and the symmetrical arrangement of the east end. If the elevation and section had been given, I think it would have appeared also that there was a certain degree of novelty of treatment in the design; though whether such treatment had any merits besides that of novelty is not for me to say. A harmonium in a small church may be disposed anywhere, but the placing of a large organ in a large church is a more difficult matter; and I wish to take the opportunity (being myself a practical organ-player, and speaking from experience) of protesting against the absurd fashion in vogue at present of bottling-up the organ in a little corner or recess of the church, hardly large enough to contain it. Even architecturally this is bad, as a large organ may be made a very grand feature in a building, but practically it is still worse. Many times have I heard the remark from a distressed organ-builder, called upon to bury his instrument in one of these holes, that "no instrument could sound well in such a position;" and I have heard one of the first of living organists repeatedly express the same opinion. But so careless do the architects appear to be on this point that we daily see the plans of churches with the "organ chamber" delineated, as if no other arrangement were possible. What would be thought of a man who bought a grand piano and put it into a box?

Let me offer the following suggestions as to the placing of the organ in a church:—

1. It should be as near the floor as possible. This greatly increases the resonance and travelling power of the sound.

2. It should have as much free space as possible round it. The reason most cathedral organs sound well is, not that they are a very superior class of instruments, but that they have plenty of space to speak.

3. It should be protected as much as possible from the influence of atmospheric changes, and should never stand against two outside walls. Those who know the extreme delicacy of the internal wooden mechanism of an organ will understand the importance of attending to this.

4. Sufficient space should be allowed, to obviate the necessity of crowding the interior work; a point on which the organ-builder should be consulted when possible.

5. When the large pipes are made use of in the design of the case (supposing the architect condescends to design the same), the largest pipes should always be kept at the sides and the smaller ones in the centre. This is both more convenient for the builder, and better for the instrument, than placing the larger pipes in the centre.—I am, &c.,

H. H. STATHAM, JUN.

Liverpool, May 13.

MANCHESTER TOWNHALL COMPETITION.

SIR,—As you were kind enough to give insertion to our former letter on the Manchester Town hall competion, we have much pleasure in forwarding the circular that we have received from the Town Clerk, in consequence, we presume, of our communication. The importance of the competition, and the interest which the public may be presumed to take in it, demand that the scheme adopted by the Town Council should be thoroughly scrutinised, and we think that the authorities are bound to aid in any plan for ensuring confidence in the competing architects and fairness in the ultimate award. Intending competitors have recently received notices from Manchester stating that, firstly, the time for sending in the preliminary drawings is extended, which, as it has been suggested by the architects themselves, needs no comment. Secondly, that no public exhibition of the preliminary drawings shall take place, and that under no circumstances shall competing architects see them. This arrangement must, we think, give satisfaction to everyone concerned, and we pointed out in our last letter of the 26th ult. that ambiguity on this point was most objectionable. This leads us to the main object of these remarks, which is again to show how much more confidence a distinct promise on the part of the authorities of the employment of unbiased professional judgment, such as we before suggested—in both adjudications—would give to architects, more particularly as in this case the perhaps natural prejudice of Manchester men in favour of their own architect townsmen has been pretty well exemplified; and, furthermore, popular rumour has already assigned, as we read in last week's BUILDING NEWS, the carrying out of the job to a Manchester architect. Now, of course, this is a very small straw on the current, but it serves to show the direction. No doubt the officials would repudiate any participation in this report, still, from the limited knowledge that the

great mass of the public have of architects and their works, the origin of it may lie more deeply than a mere superficial "canard," got up by the public for their own delectation. Of course, if Manchester plans and elevations are the best, they would, and should, be selected; but we do think that the whole atmosphere would be rendered clearer by a plain statement by the council that other competent judges should assist them in the selection of designs which will probably want much nice and difficult discrimination.—We are, &c., TWO INTENDING COMPETITORS.

Townhall, Manchester, May 8, 1867.

SIR,—I am instructed by the council to inform you that the time at which the designs are to be sent in—in the preliminary competition for the new townhall—has been extended from July 1 to August 4 next; and also that it has been determined that there shall be no public exhibition of such designs, and that under no circumstances will such designs be allowed to be seen by any competing architect.—I am, &c.,

(*Signed*) JOS. HERON, Town Clerk.

MODERN ARCHITECTURE.

SIR,—Considering the generally favourable criticism of most of the best reviews upon the chief of the Law Courts Designs, and especially upon that which I consider the best, I shall not prolong the discussion. Your readers, for the most part, know perfectly well the standing of the various members of the profession, and are most of them capable of judging of the merits and demerits of a building and so I have no fear of their being much influenced by such writing as the *Westminster Gazette* writer has favoured us with. Such criticism, when addressed to those who are acquainted with the subject, refutes itself.—I am, &c.,

YOUR CORRESPONDENT.

Intercommunication.

QUESTIONS.

[378.]—ORNAMENTAL DESIGN.—I shall feel obliged for any information respecting the registering of designs for ornamental work in plaster, or any other composition, to protect new designs from being recast and copied by other persons, and what is the cost per design registering. This is I consider a very important question, because so much of this sort of work goes on, casting from designs belonging to a modeller and designer who desires to keep them select. F.G.

[An ornamental design in plaster or composition can be registered for three years by lodging two illustrations of the design in the Government Designs' Office, London, with a fee of £1.]

[379.]—ROYAL INSTITUTE.—Can any of your readers inform me what are the steps necessary to be taken in order to become an Associate of the Royal Institute of British Architects, and what is the qualification or nature of the examination. A. H.

[See answer to question 181, Jan. 4.

[380.]—CONCRETE.—Will any reader kindly inform me of the address of Mr. Tall, the inventor of the apparatus for building with concrete; also of the cost of his apparatus for building houses; are the internal walls of concrete houses constructed of concrete or 4½in. brick? Would common engine ashes of the proper fineness be a good substitute for gravel, or would old broken bricks do in building concrete? What is meant by brick ballast, and how is it made? J. B.

[We refer our correspondent to a letter from Mr. Tall in to-day's BUILDING NEWS. We have no doubt that Mr. Tall will be happy to answer any inquiries on the subject of his apparatus.]

[381.]—ARCHITECTS' CHARGES.—I have been anxiously looking for an answer to "A. B.'s" questions in your columns of April 26. The reply given by "Looker-on" is to my mind unsatisfactory. Will you kindly allow me to submit the questions proposed by "H. B" in an amended form. 1. What is the usual percentage charged by architects for drawings, specifications, and the carrying out of alterations and additions to old property? 2. Is it customary to charge said percentage on all old materials valued as new that may be used in the new arrangement, and would such charge include value of any portion of the old work left standing and forming part of the altered property? 3. Is it customary to charge by time or otherwise for taking dimensions and making plans of the old building in addition to the above percentage? 4. If after tenders have been obtained for this kind of work it is abandoned and not carried out, what is the usual percentage? INQUIRER.

[382.]—GAS METERS.—I would like to ask some of your practical correspondents to inform me which kind of gas meter is best for a church, viz., a dry or wet meter, and how many burners may be used with a 30 light meter for each burner to give its proper light. URBAN.

[383.]—VENTILATION OF BARRACKS.—Will you inform me through the medium of your valuable paper what is the kind of ventilator used in the roof of the Guards' Barracks, Chelsea, if patented, and where obtained. In so doing you will oblige THOMAS DAVID.

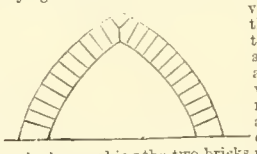
Langharne, St. Clears, South Wales, May 13.

[384.]—LARGE RAILWAY CURVES.—I shall feel obliged if any of your readers will inform me of the method of striking the large curves as used on the railways, as I have sometimes to make moulds for them and am puzzled to find a radius rod to work at such a long length. J. STREET.

[385.]—JOHN'S CEMENT.—I have some plastering to do on walls and ceilings which is to be finished with John's cement, and wish to know through "Intercommunication" the proper method of mixing and applying it, and if the rendering coat for the walls should be hair mortar. PLASTERER.

[386.]—BIRD'S-EYE VIEWS.—I should feel extremely obliged if any of your readers would (through the medium of your valuable "Intercommunication" column) acquaint me with the method of laying down the plan and obtaining the vanishing points, and give me any other information necessary to enable me to get out a bird's-eye view, say of a square of houses. I may say that I am able to do either perspective or isometrical views, but have never been taught the way of getting out bird's-eye views; and though I have purchased various books on perspective none of them seem to treat at all upon what I want to know. I thank you for the use of your columns and hope your "Intercommunication" has interested and instructed others as much as it has me S. S. S.

[387.]—GOTHIC BRICK ARCHES.—Can any of your readers kindly inform me the most practicable way of keying in Gothic brick arches? I am superintending a very handsome church, the designs of which are in the Gothic style inside and out, and are drawn as sketch, as I proposed when plans were being made, &c. They consider a different form. I set out for courses from springing, making the two bricks mitre at key, so as to appear as one equal to the others for soffit; the top fills in accordingly; also a larger brick from springing to meet radius of arch. You will oblige me by stating the same in your valuable paper. SAXON.



REPLIES.

[316.]—FIREPROOF BUILDINGS.—I read with considerable interest the remarks of "Asbestos" in reference to this subject, and I believe that he has, at least, hit the correct principles upon which to work. It seems to me, however, that his plans are somewhat incomplete. Why not have the whole of the columns or pillars in a warehouse as well as the girders tubular, and connected on the arterial system "Asbestos" recommends? Each pillar of cast iron might be fitted with a cross-piece or head also tubular, and of the same metal. The beams, of hollow plate iron, might be fitted into the cross-pieces and firmly fixed by set-screws. The joints might either be faced or made with cement. By this arrangement the whole of the pillars and beams would form a continuous thoroughfare for water with which they could be supplied from a cistern on the top of the building. The rainfall would partially if not entirely feed the cistern, and if thought necessary the arteries might be always charged. Taps fitted into the pillars at convenient places would allow of water being drawn at any moment for common purposes. Expansion of pillars and girders—so fatal to many so-called fireproof buildings—would be an impossibility under these circumstances. On the under side of the beams jet pipes furnished with valves should be attached. By means of wire cords and levers the valves could be opened or shut from the inside or outside of the building. At the tops of the pillars, opening into the floor of the cistern, valves ought to be fixed and so made as to open downwards. These might be common drop-valves and would be self-acting. In case of fire any or all the jets might be opened and set in full play. If the supply of water from the cistern were found inadequate the fire brigade would readily attach their hose pipes to plugs at the end of each beam on the basement and inject water into the whole of the arterial system. The pressures thus applied from below would close the cistern valves, and be expended wholly in discharging the water through the jet-pipes upon the burning materials. By running out all the water from pillars and beams and opening the whole of the valves, a considerable step towards the ventilation of a large building would be achieved. With as much brevity as possible I have thus endeavoured to make plain my own ideas on this vital question, and I trust they may be acceptable to the readers of the BUILDING NEWS, should you, Sir, kindly give them currency through its valuable columns. N. J.

[334.]—REPAIRS.—The answer of "C. C." contained in your column of the 10th inst., appears to me to be incorrect. He seems to be unacquainted with the fact that the Metropolis Building Act, 1855, abolishes the classing of houses into 1st, 2nd, 3rd, and 4th rates, &c., and to have based his reply upon the old repealed Act. The Act now in force will not allow the raising of an existing wall above the height which would be allowed if the wall was entirely new, but rooms may be added by placing a curbed in lieu of other description of roof, and for this reason: the method prescribed in the Act for the measurement of walls and heights of stories directs the heights to be calculated to the under side of the tie of the roof (or in cases where there is no tie to the middle of the vertical height of the [illegible] case of attic rooms in a curb roof the floor joists of the attics form the tie of the roof. A. H.

[334.]—The reply of "C. C." in your issue of the 10th inst., under this heading, appears to me unsatisfactory, inasmuch as the section relating to the raising of existing buildings, which he quotes in answer to my question of the 12th ult., is not now in force, the said section contained in the Act 7th and 8th Vict., cap. 84, having been repealed by the subsequent Act, 18 and 19 Vict., cap. 122; and I can discover no clause in the present Act stating that the thickness of the walls of the raised building must be of the dimensions prescribed for those of new buildings in the table of sections of walls of dwelling-houses on page 11. J.

[371.]—PLASTER CEILING.—Your correspondents, "Stephen Lewis" and "F. G." of last week (May 10), have well met this query, "How to make a good plaster ceiling which will not crack?" so far as they go. They say strong joists well seasoned, good and strong laths, but they have left unnoticed three principal causes of ceilings cracking. 1. Inferior and improper brickwork which slightly settles and fractures or slightly buckles, thus drawing one portion of the ceiling from the other. In London two-room deep houses the shrinkage of the heads and sills of the centre partitions bring down with them and crack the ceilings and frequently cause the centre drip of gutters of V roofs to sink and act as it were as a funnel to conduct the water into the house. 2. The notching of joists down on to the plates. For instance, notch joists 2in. down on a plate, the shrinkage of that 2in. of the joist which occurs draws the ceiling upwards towards the top of the plate; this would not occur if the joists were simply spiked on to the top of plate or the plate made thicker and notched out to receive the joist. 3. It is an almost invariable practice amongst builders to use for plasterer's work loamy earth in lieu of sharp clean sand. All soluble matter, except the lime, should be excluded; loamy earth or dirty sand in setting shrinks and so must either come away from the surface to which it is meant to adhere, or greatly crack as it hardens. This last is a very important point, and were I anxious to have work of a very superior first-class character I would not only use sharp sand but have every particle washed as for Portland cement rendering. A. H.

[373.]—BLOCKS AND FALLS.—"Hydraulic Lift" wishes to learn more of the application of blocks and falls, or rather of the principles upon which their application depends. His question is rather of an elementary nature, but still it is not an unimportant one, and I will attempt to assist in its solution. The action of the pulley is really a modification of that of the lever. Supposing one end of a "fall" to be attached to a hook, and that to a movable pulley on the rope a weight be attached, then is it not evident that when an attempt is made to raise the weight half the load will be borne by the fixed hook and that the hand has only the other half to sustain? In order, however, to lift the weight a certain distance the hand must travel twice as far. Thus, to raise the weight one foot the hand must draw each rope one foot. The whole rope is therefore shortened two feet, while the weight is lifted only one foot. This applies to the single pulley or snatch-block, but it follows from the premises that the greater the number of pulleys or sheaves in a block the more easily will the weight be moved. The difficulty in this case divided amongst the number of ropes or parts into which the rope is cut is as it were divided by the pulleys. Several sets of pulleys thus connected are known as a "tackle." Pulleys, then, act, as has been said, on the principle of the lever, the deficiency of strength of the power being compensated for by its superior velocity. CRANE.

[374.]—PURIFYING WATER.—There is no doubt that the quality of the water used for domestic purposes has an immense influence on the health of those who use it, and that was fully demonstrated during the last year's visitation of the cholera, when it was incontestably proved that many deaths resulted from drinking bad water. Whether the desideratum of "Hydropath"—that of furnishing the public with a simple plan of testing the character of the beverage supplied by the water companies—is attainable I am not quite prepared to say. Much responsibility rests with the latter bodies in purifying the article before distributing it. If this were effectually accomplished we should have far less of sudden deaths in unhealthy seasons and less of slow poisoning at ordinary times. Without chemical knowledge I fear no analysis of water can be effectually made. Filtering is, however, a great safeguard, and this may be accomplished cheaply in every household. One mode of procedure in this direction I may suggest. Let a six-gallon stone bottle be obtained and its bottom knocked out, then let the vessel be inverted and placed on a stand—a stool will do very well. Deposit some pebbles of the size of marbles in the neck. Put another layer of smaller stones above the first until the shoulder of the jar is filled or covered. Above the stones deposit next a thick covering of animal charcoal, upon the top of which place a sheet of fine perforated zinc to prevent the wash of the water disturbing the charcoal. Use about two pounds of the latter, which will last for six months. The inverted neck of the bottle may be made to pass through a hole in the stand, and the water supplied to the filter will percolate and run in great purity through the medium of a tap, or a punctured cork, into a vessel below. This arrangement is homely, no doubt, but on that account it may gain more general adoption, and, at any rate, it is highly efficacious. As we are approaching a critical season of the year I sincerely trust this or similar preservatives may be largely employed and that without delay. AQUA PURA.

[377.]—LAYING STONE.—When stones are specified to be laid upon their natural bed, a good mason understands that they are not to be pinned up behind, or dip to the foundation, but to lay perfectly horizontal. The natural bed of a stone is the upper surface of rock before being disturbed. When cut endwise it is called toothed, that is, cut at right angles to the bed of stratification. It is very important that blocks of stratified stone should rest upon their natural bed, for nothing about a building looks more unsightly than a piece of base course or other small block, peeling off in thin layers about the thickness of a five-shilling piece. This unsightly piece of work would be avoided by placing the stone upon its natural bed. Your correspondent, "G. I.," must observe that it requires a practical eye to detect the natural bed in some stratified stone, but an observant mason can do this.

WILLIAM WATTS.

Ashton-under-Lyne and Staleybridge Waterworks, May 13.

STAINED GLASS.

The Dean of Durham proposes giving £1,000 towards placing a new stained glass window in the present west window of Durham Cathedral. It comprises a seven-light window and numerous tracery openings. It is about 35ft. by 25ft. wide, and will greatly enhance the present beauty of this noble and ancient cathedral.

TUNBRIDGE.—A stained glass window, by Wailes, of Newcastle, has been placed in the parish church here, to the memory of the late Rev. Sir C. Hardinge, Bart., who was vicar of the parish for more than half a century. It is of the Perpendicular Gothic, is 29ft. in height, and comprises five large lights in addition to an elaborate tracery under the arch, the whole of which has been filled in with stained glass. The total cost has been about £250.

WAGES MOVEMENT.

The stonemasons at Oldham are on strike in consequence of the employers having refused to comply with a set of rules submitted to them by the men.

The bricklayers employed on the new railway station and other works at Crewe have returned to their work after having been on strike for five weeks. They have resumed work on the same terms as before, the advance demanded by the men, of from 30s. to 33s., and in some cases 30s. to 36s. per week, having been refused.

A "Solicitor," writing to the *Morning Star*, points out that the action of trades' unions, in endeavouring to limit the number of apprentices taken by a master, has been sanctioned by Parliament in the 6th and 7th Vict. cap. 73, which provides that no attorney shall have more than two articled clerks at one time. He states that this provision was introduced by the profession in order to limit their own numbers, and asks why the working men of England should be blamed for following the example of the most astute practitioners in the world.

The bricklayers' labourers are on strike for an increase of wages. The joiners have given notice that they will cease working on June 1 at all places where non-society men or persons who have not served a regular apprenticeship to the business are employed. The cabmen struck last week in consequence of their employers refusing to grant them a cessation from work for half a day on every alternate Sunday. Several attempts were made to come to a settlement, but they proved unsuccessful, and now the places of the old cabmen have been filled by others.

The washerwomen of Rouen have struck work, to "better themselves." They get 1f. 25c. (1s.), and a glass of brandy (*la goutte*) per day; they want 2f., a glass of brandy and a cup of coffee.

LONDON.—The painters in the employment of Messrs. Corbett and M'Clemont, of Chelsea, have turned out on strike, or as they put it themselves, "been compelled to resign through the firm not meeting their just demand of increase in wages." There has been a long, dreary, dragging dispute about the 7½d. an hour; the price was raised for a while to 7½d., but the firm stated that they could not afford it, and reduced again to 7d.; hence the turn out.

WOLVERHAMPTON.—The masons of Wolverhampton struck work on Saturday, they refused to accept arbitration and declined to be influenced by the arguments advanced at a conference with the employers. They seek to make it a fundamental stipulation that they be paid by the day instead of the hour, and it is for the establishment of this point that they have now struck work.

LEGAL INTELLIGENCE.

ACTION AGAINST A BUILDING SOCIETY.—The case of Harold *v.* Rose and others came before the Court of Queen's Bench last week. This was an action against the defendants, trustees of a Benefit Building Society, heard before Mr. Justice Mellor, at Liverpool, to recover £300, when the jury returned a verdict for the defendants. Mr. Holkar now moved on behalf of the plaintiff for a rule for a new trial, on the ground of surprise. It appeared that the plaintiff carried on a butcher's shop in Liverpool, and kept a coal yard, and in April, 1857, he married a widow named Little, who had one child, but was possessed of no means. In 1862 or 1863, the plaintiff and his wife quarrelled, and she and the child ultimately left him and went to reside with some relations. Soon after the separation the plaintiff found out that his wife had invested £300 in this society, and on taxing his wife with it she acknowledged it. The plaintiff's case was that the money belonged to him, being the proceeds of the butcher's shop, which was left entirely to her management, and which he believed she was saving for his benefit, and that on further pressing her she admitted it, and said she had invested the money in the child's name. On the other side the wife's brother and brother-in-law were called, and they swore positively, and produced vouchers and evidence to show, that they had each advanced £150 for the benefit of the child in providing for her and educating her, and that afterwards the principal was to revert to them. The learned counsel now moved to set aside the verdict, and for a new trial, on affidavits on the ground of surprise.—Rule refused.

THE FACTORIES' ACT AND THE PIPE TRADE.—At the Halifax Borough Court, last week, Mr. William Ackroyd, a pipemaker, was charged with an infringement of the Factories' Act of 1864, by employing a woman named Mary Hutchinson as follows:—Mr. Lakeman, sub-inspector of factories, said that the manufacture of earthenware was one of the trades dealt with by the Act of 1864. Last March he found Hutchinson working in Mr. Ackroyd's shop, and warned Ackroyd about it. On April 30 he visited the place again, and found Hutchinson working at nine minutes past six o'clock in the evening. Defendant said the woman was not working. Hutchinson was also called, and said that although she had a pipe in her hand she was really not working. The Bench considered the case proved, and fined Ackroyd £1, with 8s. 6d. costs.

General Items.

It has been previously announced that the ceremony of laying the foundation stone of the Hall of Arts and Sciences at South Kensington will be performed on Monday next by the Queen. Her Majesty is expected to arrive at the site of the Hall at half-past eleven o'clock.

By the will of Mrs. Locke, widow of the late Mr. Joseph Locke, M.P., there has been bequeathed to the Institution of Civil Engineers the historical full-length portrait of that distinguished engineer, by Grant, together with a sum of £2,000, free of legacy duty.

A new additional bridge is about to be built at Paddington, over the canal, at a cost of £4,000. It will directly connect Maida Hill and Kilburn on the north, with Bayswater and Kensington on the south, and save a roundabout of nearly three miles.

Nine thousand dollars premium is offered for the best design for the Illinois State House, U.S.

We are requested to state that at a general meeting of the members of the Albert Institute, Windsor, the selection of Messrs. Bacon and Bell's plans for adoption by the building committee was ratified by a very large majority.

A machinist connected with one of the Boston theatres has invented an arrangement by which stage carpets may be removed without the intrusion of untidy-looking supernumeraries in front of the curtain. A wire at the prompter's desk is made to reverse the hooks upon which the carpet is fastened, near the footlights, and thus release it, when it may be pulled in from behind.

A foreign journal gives the following recipe for preparing a varnish that will dry perfectly in from ten to twenty minutes, is entirely free from smell, and cannot be affected by the atmosphere. Take 100 parts of water, 12 parts of shellac, and 4 parts of borax; melt in a copper vessel at a moderate heat, stirring constantly; then cover the vessel, let it cool, and pour the contents into bottles, which should be well sealed. The varnish may also be mixed with oil paint if desired; or any colour that is wished for may be combined in powder with the varnish, and this will produce a paint possessing great brilliancy, and which will dry in a few minutes after being applied.

We are sorry to see that complaints are again rife respecting Hucknall Torkard Church, the burial place of Lord Byron. The *Pall Mall Gazette* informs us that the church has now been closed four weeks, having been abandoned by the congregation as unsafe and unfit for Divine Service. As there is no other church in the parish, the service is now conducted by the Rev. George Otter, in the National School-room, which, however, is very inadequate for the requirements of the village. The effort recently made in the parish to raise funds for the rebuilding of the church only procured promises of £500, and that being so small it has never been collected.

Fill a wide-mouthed glass jar with water, and cover it over with a piece of foundation, such as is used by ladies in their bonnets (or used to be when they wore them), and cover that with a layer of peas, pressing it down so that the peas will lay in the water. They will then swell and sprout, the roots growing down into the water, their fibres presenting a beautiful appearance. Set this in a window, and vines will grow up which can be conducted to the sill. The whole is very handsome—so says an American paper.

The following pensions on the Civil List, which exhaust the amount available for the current year, have been recently granted:—£100 a year to Mrs. Chisholm in consideration of the valuable and disinterested services rendered by her to emigrants in New South Wales; £100 a year to the family of the late Dr. Petrie, being pensions at the rate of £25 a year to each of his four daughters, in consideration of the eminent services rendered by him to archæological science, both as an author and as a public servant; £100 a year to Lady Harris, widow of Sir William Snow Harris, in consideration of her husband's valuable invention of the system of lightning conductors; £100 a year to the Rev. Miles Joseph Berkeley, on account of his eminent services, as a botanist, to practical horticulture and agriculture; £95 a year to George Cruikshank, Esq., on account of his great merits as an artist.

Glycerine is found to be an excellent material for smearing plaster of Paris moulds before taking a cast. It is easily applied with a brush, and after the cast has set, it readily separates without the least danger of splintering or cracking. It is said to possess many recommendations over the soap and water usually employed for the same purpose.

The Improvement Committee of the Liverpool Town Council met on Friday, and accepted the contract of Messrs. E. André, of Paris, and Lewis Hornblower, of Liverpool, for completing the New Sefton Park. The terms arranged are 5 per cent. on the outlay. With great generosity the committee gave Messrs. André and Hornblower a cheque for the 300 guineas premium, which, according to the conditions, might have been absorbed in the commission. The works are to be commenced at once, and the park is to be completed in two years. There will, of course, be very considerable variations made from the original plan. The cost will also, it is believed, be very considerably increased.

Mr. Tite has laid before the House of Commons a Bill giving power to the Metropolitan Board of Works to require that all new pipes to be laid under the surface of the Thames Embankment, and the streets constructed, or authorised to be constructed, by the Board, with subways, shall be laid in the subway. The Board may also require that pipes already laid down be removed into the subway, submitting to arbitration the question of payment of the cost of such removal. The Board may demand rent for the use of the subway, subject to arbitration if the amount be disputed. This Act is intended to be adopted also in future Acts for the construction of new streets.

The charges for the maintenance and repair of the various royal palaces in England amount, for the financial year 1867-8, to £41,495. Of this sum £17,651 is required for palaces in the personal occupation of her Majesty—viz., Buckingham Palace, Windsor Castle, with Adelaide Lodge, in Windsor Home Park, Frogmore House, and the White Lodge, in Richmond Park. A sum of £19,353 is required for the Palaces of St. James, Kensington, and Hampton Court, and the establishments at Kew, Richmond, and Bushy, which are held under grace and favour; and the remainder of the vote is expended in repairs and fittings in apartments at St. James's Palace, which are partly occupied by the Queen and the royal household.

We read that Dr. Jacobsen, of Hamburg, has invented a new whitewash, which is said to be as durable as paint and very beautiful. He dissolves 50 parts of glue in 150 parts of water. He then adds two parts of a solution of caustic soda, specific gravity 1·34, and boils. A flocculent precipitate separates, which may, however, be disregarded. When the above mixture has cooled, he adds 50 parts of commercial water-glass solution, and then stirs in enough oxide of zinc to give a proper consistence for painting. If necessary, the mixture must be passed through a mill to make it smooth. This composition, it is said, is well suited for either wood, metal, or brickwork. Two coats should be laid on, and when they have perfectly dried, a solution containing 10 per cent. of chloride of zinc should be applied. This will give a beautiful gloss, and great durability to the composition.

The report of the Royal Commission on Railways has just been issued. It refers principally to Irish lines, and is opposed to the proposal that the railways in Ireland should be taken by the Government, but as it has been the estimated policy to assist railways and other public works in Ireland, the Commissioners recommend that, when Parliament thinks fit to make advances to Irish railway companies, the money should be lent for a fixed period of considerable length. It is recommended that Parliament should relieve itself of all interference with the incorporation and financial affairs of railway companies, leaving such matters to be dealt with under the Joint-Stock Companies' Act, and should limit its own action to regulating the construction of the line and the relations between the public and joint-stock companies so incorporated. Railway companies should be allowed to fix their own charges to the public, but they should be required to give a reasonable notice of any intended rise. At least a week's notice, too, should be given of alterations in the time tables. The Commissioners despair of ensuring the punctuality of trains by legislative enactment. As to finance, they think that, with the object of affording a more accurate view of the operations of the railway companies, and of making any undue extravagance apparent, and thus stimulating economy, the companies should render their accounts to the Board of Trade. In respect of the resolution concerning the Irish railways, Mr. Monsell and Sir Rowland Hill are dissentients.

MEETINGS FOR THE WEEK.

MON.—Royal United Service Institution. — "Fleet Manœuvring," by Commander R. W. Pellew, 8.30.

TUES.—Institution of Civil Engineers. — 1. Renewed Discussion upon Mr. Chance's Paper "On Optical Apparatus used in Lighthouses." 2. "Experiments on the Removal of Organic and Inorganic Substances from Water," by Mr Edward Byrne, 8.

WED.—Geological Society, 8.

FRI.—Linnean Society.—Anniversary Elections, 3.
Architectural Association.—"Our Architectural Future," by Mr. W. Burges, 7.30

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

2493. T. LYTHGOE. IMPROVEMENTS IN WATER-CLOSETS, ASHPITS, CESSPOOLS, AND SIMILAR PLACES. Dated September 27, 1866.

The object of this invention is to filter the refuse of waterclosets and similar places so that the refuse liquid which escapes shall be almost pure water, and, consequently, not liable to pollute rivers or streams into which such refuse runs. The inventor accomplishes this desirable object object by allowing the refuse to fall on a perforated trap, lid, or casing, so that the liquid shall pass through the said perforations into a reservoir under it; the perforations are made conical, that is to say, large or bell-mouthed at one side, and small at the other side, which will thus filter the liquid, and by boring or making the said perforations on both sides of the lid or casing it can be used either side up, so that if the holes or perforations become stopped, by turning it they will become opened or cleared. In the reservoir the inventor makes another filter the same as the one described, which allows the liquid which has already passed through the first filter to fall into another reservoir, thus making a double filterer, and, if found necessary, he increases the number of filterers and reservoirs as may be desirable. From the last reservoir he passes a pipe to the flue or shaft of the chimney which will carry off any offensive smell that may arise therefrom. *Patent abandoned.*

2511. S. PRICE. IMPROVEMENTS IN APPARATUS FOR LIFTING OR ASSISTING TO LIFT AND FOR SECURING WINDOW SASHES, SHUTTERS, AND OTHER LIKE FRAMES AND WEIGHTS. Dated September 28, 1866.

In the specification of former letters patent granted to present patentee, dated November 23, 1864 (No. 2924), he described an apparatus consisting mainly of a spring barrel for lifting or assisting to lift window sashes and other like frames. Now the chief object of the present invention is to enable him where one or more spring barrels are employed to dispense entirely with sash lines, cords, or chains. The present improvements consist in forming round the spring barrel—which is fitted in any convenient part of the frame—a series of cogged teeth, and in fitting in a groove formed in the side of the window sash a rack, the teeth of which gear into the teeth on the spring barrel. As soon as the sash is commenced to be raised, the spring of the barrel comes into play, causing the barrel to rotate, so that the cog teeth, by gearing into the rack, lift or assist in lifting sash. *Patent completed.*

2532. J. CAVANAH. AN IMPROVEMENT IN WATER-CLOSETS, CISTERNS, AND SOIL TRAPS. Dated October 3, 1866.

This invention consists, firstly, in the construction of the valve through which the water is conducted to the pan of the watercloset. This valve is so constructed that when at rest it is or may be worked as required by means of a spring and washer, which spring may be made of either steel, iron, brass, india-rubber, or other suitable elastic material, and may be either flat, spiral, or of other suitable shape, in order to press tightly over the valve pipe and prevent the passage of any water. When the passage of water is required, the valve may be lifted by a lever, handle, rod, chain, or other suitable means The spring and valve may be applied to any part of the cistern, water pipes, or basin, as may be found most desirable. The invention consists, secondly, in an improvement in the soil-trap, which may be made of iron, earthenware, or other suitable material. This trap is constructed with an opening in the top or other convenient part of the trap, for the purpose of cleaning it out when required. This opening will be fitted with a lid or stopper which will be airtight when fixed, and will be removed when the trap or pipe may happen to become stopped or require cleaning. *Patent completed.*

2559. J. H. JOHNSON. IMPROVEMENTS IN GRATE BARS. (A communication.) Dated October 4, 1866

This invention relates to an improvement in that class of grate bars which consists of a number or group of ribs cast together with spaces between the ribs; and the improved grate bar consists of a deep and shallow rib or ribs combined in one casting, substantially as described, so that the bar may be more easily moulded and cast, may afford a better circulation of air between the ribs, may be less liable to be choked with cinders and slag, and be lighter and, consequently, more economical than ordinary grate bars having a number of ribs of uniform depth. *Patent completed.*

2582. J. H. ROBERTS. A NEW AND IMPROVED FASTENING FOR WINDOWS AND OTHER PLACES. Dated October 8, 1866.

This invention is performed as follows:—Upon one sash, say the outer, the patentee secures a plate formed with a slot in which a button or stud is free to move backward and forwards. Upon the other sash he secures another plate, which has a third plate hinged thereto, the hinged plate being capable of moving so as to come upon the first-named plate. This hinged plate is likewise formed with a slot corresponding to the first-named slot, and terminating at one end in a circular or enlarged aperture, corresponding to the button or stud. To secure the fastening it is necessary to bring the hinged plate on the inner sash upon the plate on the outer sash, so that the button enters the circular or enlarged aperture, and then to push the button along the slots. To release the fastening the reverse movements have to be made. The slots in the plates may be formed in any direction desired. Sometimes the patentee forms a thumb piece or projection on the hinged plate for convenience of moving it. *Patent completed.*

2586. J. ROBERTSON. IMPROVEMENTS IN FURNACES, AND IN THE FIRE-BARS TO BE USED THEREIN. Dated October 8, 1866.

This invention relates to furnaces or fireplaces and fire-bars, and has for its object the consumption of the smoke and gases arising from the fuel; also the protection or preservation of the firebars. In carrying out one portion of the invention, the patentee employs a plate or slab of fireclay or iron, having perforations through it, and placed at the back of or on the firebars, and resting on firebricks at both ends. This plate extends across the whole width of the furnace, and is open at the bottom to admit air from the ashpit, or from a tube extending from the front of the ashpit to the back of it. A series of tubes of fireclay or iron is made to fit into the perforations in the plate, such tubes being open at the bottom to admit the air passing through the perforated plate. The tops of these tubes extend to or near to the bottom of the boiler, and they are also provided with small perforations in the sides towards the flue from the top to the bottom for the air to pass through them in that direction, so as not to obstruct, but rather to assist, or increase, the draught. The action of the fire on these tubes heats them to a high degree, and, consequently, heats the air passing through the small perforations in them, and as none of the smoke or gases can pass away up the flue without coming into contact with the divided currents of highly heated air from the tubes, the consumption of smoke and other inflammable gaseous products of combustion is effected. The action of the cold air inside the tubes preserves them from being burned, and after the smoke or other gases are consumed, the hot air rom the small perforations will assist in keeping up the steam. *Patent completed.*

Trade News.

TENDERS.

BETHNAL GREEN.—For new Vestry Offices, Church-row, Bethnal Green:—Lark, £1,743; Henshaw, £1,448; Hoy, £1,237; Wood, £1,200; Page, £1,189; Forrest (accepted), £1,167.

BARNES, SURREY.—For alterations and additions to Elm Grove. Messrs. Goodman and Vinall, architects:—Brass, £1,806 15s. 11d.; Rhodes and Roberts, £1,804; Jackson and Shaw, £1,677 0s. 10d.; Adamson, £1,594 10s.; Sanders, £1,500; Wilson (accepted), £1,491 5s. 1d.

CITY.—For rebuilding No. 20, Budge-row, E.C., for Messrs. Peter Lawson and Son. John Wimble, architect:—Ashby and Horner, £7,360; Piper and Wheeler, £7,200; Brass, £6,954; Killby, £6,890; Myers and Sons, £6,852; Hart, £6,780; Adamson, £6,698.

CITY.—For rebuilding No. 32, Watling-street, E.C., for Mr. T. R. Duggan. Mr. John Wimble, architect:—Hart, £2,523; Killby, £2,498; Tye and Andrews, £2,475; Colls and Son, £2,400; Adamson and Son, £2,351; Ramsey, £2,337; Hill and Son, £2,240; Newman and Mann, £2,085; Mortar, £1,943.

CLERKENWELL.—For repairs to 13 and 14, Northampton-street, Clerkenwell. Mr. W. P. Griffith, architect:—Devereux, £346; Patman, £285; Lidstone, £249 10s.; Martin, £204 3s.

ERITH.—For additions and alterations to villa at Erith, Kent. Mr. Herbert Ford, architect. Quantities supplied by Mr. J. P. Rolfe:—Pritchard, £1,570; Brass, £1,504; Crabb and Vaughan, £1,483; Browne and Robinson, £1,453; Turner and Sons, £1,442; Piper and Wheeler, £1,390; Henshaw, £1,252; Mann, £1,155.

EAST GREENWICH.—For workmen's cottages at Morden Wharf, for Messrs. Hollick and Co. Messrs. Goodman and Vinall, architects:—Kitson (accepted), £1,075.

FLEET-STREET.—For additions to 154, Fleet-street (late Portugal Hotel). Mr. W. P. Griffith, architect:—Dimsdale, £387; Mather and Read, £370; Lidstone, £360.

HIGHBURY.—For addition to 11, Highbury Park. Mr. W. P. Griffith, architect:—Lidstone, £569 10s.; Patman and Fotheringham, £498; Harvey, £386; Dimsdale, £354.

HOUNDSDITCH.—For new warehouses in Houndsditch. Mr. T. C. Clarke, architect:—Lawrence and Sons, £5,987; Conder, £5,759; Colls and Son, £5,585; Scrivener and White, £5,577; Henshaw, £5,470; Browne and Robinson, £5,444; King and Sons, £5,420; Brass, £5,386.

JARROW-ON-TYNE.—For new reservoir, engine-house, and other works at Springwell Paper Mills, Jarrow-on-Tyne, for Messrs. W. H. and A. Richardson. John Tillman, architect, Sunderland:—T. and A. Cooke, £2,230; John Hodgson, £2,226; James Young, £2,082.

LEABRIDGE. — For new Metropolitan Police-station, Leabridge-road. Mr. T. C. Sorby, architect. Quantities supplied by Mr. J. Scott:—J. and E. Bird, £3,850; Foord and Son, £3,798; Haward, £3,730; Macey, £3,569; Lathy, Brothers, £3,550; F. and F. J. Wood, £3,433; Hill and Keddell, £3,396; Higgs, £3,378; Patman and Fotheringham, £3,345.

LISSON-GROVE.—For alterations, Nightingale Tavern, Alpha-road, Lisson-grove. Messrs. Finch, Hill, and Paraire, architects. Quantities by Mr. Gate:—Langmead and Way, £2,726 8s. 3d.; Eaton and Chapman, £3,067; Richards, £3,389.

LONDON.—For new wing to the Royal Hospital for Incurables. Mr. W. P. Griffith, architect:—Browne and Robinson, £12,460; Patman and Fotheringham, £11,988; Ennor, £11,810; Mansfield, Price, and Co., £11,606; Wood, £11,383; Hill and Keddell, £11,295; Webb and Sons, £10,987; Sims and Marten, £9,888; D. King and Sons, £9,360.

MONKWEARMOUTH.—For a United Methodist Free Church and Schools, to be built in Hood-street, Monkwearmouth. John Tillman, Sunderland, architect:—John Hodgson masonry and plastering, £355 6s.; Elliot and Hudson, joiner and carpenter, £309 14s. 5d.; Robert Preston, slater, £50; Thomas Whinham, painter and glazier, £57 7s.; William Whinham, plumber and gasfitter, &c., £125 10s.

SOUTHWICK.—For a United Methodist Free Church and Schools to be built at Southwick. John Tillman, Sunderland, architect:—John Hodgson, masonry and plastering, £547; John Lazenby, joiner and carpenter, £450; John B. Thirkell, plumber and gasfitter, &c., £103 14s.; Thomas Whinham, painter and glazier, £75; Dawber and Son, slating, £41. 10s.

SOUTH NORWOOD.—For building a pair of semi-detached residences for Mr. W. F. Stanley. Mr. T. C. Sorby, architect. Quantities supplied by Mr. J. Scott:—Wheeler, £2,397; Lathey, Brothers, £2,063; Cubitt, Brothers, £1,990; Smith, £1,986; Sawyer, £1,979; George, £1,960.

TOTTENHAM.—For additions and alterations to Bruce Castle, for Sir Rowland Hill, K.C.B. Messrs. Goodman and Vinall, architects:—Henshaw, £1,536: Browne and Robinson, £1,530; Brass, £1,497; Jackson and Shaw, £1,350; Humphreys, £1,350; Piper and Wheeler (accepted), £1,347.

PROPERTY SALES.

MAY 10.

AT THE MART.—By Messrs. Norton, Trist, Watney, and Co.—Freehold residence, with stabling, coach houses, conservatory, greenhouses, grapery, farm buildings, grounds, and meadow land; also five cottages, the whole containing about 11½ acres, situate at Sydenham, Kent—sold for £21,000.

Freehold residence, known as Mart House, Bexley, Kent, with stabling and meadow land, containing about 6½ acres—£4,000.

Freehold estate, comprising the Moors and Little Court farms, containing 79a. 1r. 19p., situate in the parish of Felstead, Essex, let at £104 7s. 6d. per annum—£2,500.

Freehold 4a. 3r. 3p. of meadow land, situate at Paslow Wood Common, High Ongar, Essex, let on lease at £6 6s. per annum—£240.

Freehold premises, known as the Kent Brewery, Bexley, Kent—£1,630.

By Messrs. Rushworth, Jarvis, and Abbott.—Leasehold residence, No. 41, Grosvenor-place, Hyde Park-corner—£4,500.

AT THE GUILDHALL COFFEE-HOUSE.—By Mr. Frank Lewis.—Leasehold seven houses, Nos. 8 to 13, William-street, and 1, Pitt-street, Southwark, producing £170 19s. per annum; also leasehold ground rents amounting to £15 10s. per annum, secured on houses in Pitt street, William-street, and William-court, term expiring 1869, at £31 per annum—£90.

Leasehold two houses, Nos. 1 and 2, Gloucester-villas, Lavender-road, Battersea, producing £52 per annum, term about 71 years unexpired, at £7 4s. per annum—£455.

Freehold building land, with the carcases thereon, situate at Twickenham—£420.

Freehold house, situated as above, and let at £18 per annum—£300.

Freehold ground rent of £15 per annum, arising from house and land, situate as above—£360.

MAY 13.

AT THE MART.—By Mr. J. Taylor.—Freehold building land, situate in Canham-road and White Horse-road, South Norwood—Lot 43, sold for £104; lots 44 to 48, £80 each; lots 49 to 52, £82 each.

By Messrs. Jackson and Son.—Freehold residence, known as Wheathampstead House, with gardens, grounds, and paddock, in all about 7 acres, situate in the county of Hertford—£2,380.

MAY 14.

AT THE MART.—By Mr. P. D. Tuckett.—Freehold mansion, known as Collier's Wood, with park, farm yard, grounds, gardens, two cottages, stabling, and 52a. 3r. 17p. of land, situate at Lower Tooting, Surrey—£19,550; timber, £885; fixtures, £285.

Freehold 1a. 1r. 16p. of meadow land, known as Little America, situate as above—£410.

Leasehold residence known as Falmouth Villa, Albert-road, Queen's-road, Peckham, let at £50 per annum, term 55½ years unexpired at £10 10s. per annum—£550.

Leasehold residence, known as Sydenham Villa, Albert-road, aforesaid, let at £50 per annum, term and ground-rent similar to above—£550.

Leasehold residence, No. 1, Sandwell-villas, Garden-road, Wandsworth-road, let at £55 per annum, term 87¼ years unexpired, at £8 per annum—£610.

Leasehold residence, No. 2, Sandwell-villas, let at £42 per annum, term similar to above, at £6 per annum—£500.

Leasehold residence, No. 7, New Cross-road, let at £45 per annum, term 56¾ years unexpired, at £6 2s. per annum—£480.

Leasehold residence, No. 29, New Cross-road, let at £45 per annum, term similar to above, at £8 10s. per annum—£400.

By Mr. George Gouldsmith.—Leasehold residence, No. 6, Charles-street, Lowndes-square, with coachhouse and stable in the rear, term 17 years unexpired, at £130 per annum—£360.

By Messrs. Elgood and Son.—Leasehold residence, No. 41, Albany-street, Regent's Park, let on lease at £90 per annum, term 50 years unexpired at £26 per annum—£850.

Leasehold two houses, one with shop, Nos. 26 and 27, Norfolk-street, Middlesex Hospital, producing £100 per annum, term 19 years unexpired, at £2 per annum—£1,025.

MAY 15.

AT THE MART.—By Messrs. Norton, Trist, Watney, and Co.—Freehold residence, known as Portland House, No. 4, Portland-place, Hammersmith-road—sold for £2,470.

By Messrs. Prickett and Son.—Copyhold two houses, situate at Fortis Green, Muswell-hill, let on lease as £10 per annum—£400.

By Mr. Nightingale.—Copyhold residence, known as Park Cottage, with stabling, situate at Kingston Vale—£1,000.

Copyhold beerhouse, known as the "Hand and Flower," and a cottage adjoining, situate on Ham Common, Surrey, let on lease at £28 per annum—£180.

By Messrs. Price and Clark.—Freehold ground-rent of £26 5s. per annum, arising from No. 11, Kensington Park-gardens—£670.

Freehold two coach-houses and stables, Nos. 10 and 11, Wilby-mews, Ladbroke-road, Kensington Park-gardens—£990.

By Mr. C. C. Taylor.—Leasehold two houses, Nos. 17, New-street, and 7, Old Suffolk-street, Mile End, terms expiring 1906, at £4 1s. 3d. per annum—£490.

THE BUILDING NEWS.

LONDON, FRIDAY, MAY 24, 1867.

LIMESTONES.

LIMESTONES possess many peculiar advantages over sandstones, and consequently their use for constructive purposes is of the greatest importance. They are far more available for ordinary works than sandstones. They are much cheaper, because they are more easily worked. They surpass the sandstones in durability. They are more varied both in appearance and quality, and the most useful of them are more thoroughly distributed. Their colour is also more pleasing than that of sandstones; and with all these important advantages they possess what is a great feature in constructive materials—viz., susceptibility of the greatest ornamentation. Agricultural chemistry divides limestones into two classes—(1) common, which is a nearly pure carbonate of lime; and (2) magnesian, which is a mixture of carbonate of lime with carbonate of magnesia. These are, of course, only the main constituents, for many varieties possess small quantities of phosphate and sulphate of lime. But the principal material of the limestones and the oolites is carbonate of lime. Some are not pure limestones, since clay is found to be mixed with the carbonate of lime. Limestones vary according to the different localities in which they are found, particular forms of it being often confined to certain geological formations over wide areas. It is, therefore, considered by geologists to be more difficult to ascertain, by an examination of its lithological characters, what is the geological formation of a certain limestone, than is the case with any other kind of rock. This is more especially the case with the argillaceous or arenaceous rocks of the silurian, carboniferous, oolitic, and cretaceous formations. There are compact and crystalline limestones. The former are hard, smooth, finely-grained, of a dull, earthy fracture, or a sharp, splintery one. They are generally of a bluish-grey colour, but are sometimes yellow, black, red, white, or mottled; some will take a high polish, and are, therefore, used for ornamental marble, especially if the colour be an agreeable one. The latter—the crystalline limestone—frequently resembling loaf sugar in texture, are either coarse or fine-grained, varying from a rough granular rock of various colours, to a pure white, fine-grained one. The limestones mostly used for building purposes are those known as simple limestones, oolite, and magnesian.

The limestones and oolites best known are those obtained from Portland (Dorsetshire), Ancaster (in Lincolnshire), Ketton (Rutlandshire), Barnack (Northamptonshire), Chilmark (Wiltshire), and Ham Hill (in Somersetshire). The Caen varieties are also well known in London. *Portland* stone is the best and most important, and requires a separate article.

Chilmark is a compact stone. Salisbury Cathedral, Wilton Abbey, and other buildings in the south of England, have been constructed of this material. An analysis of this stone has given the following result:—Silica, 10·4; carbonate of lime, 79·0; carbonate of magnesia, 3·7; iron alumina, 2·0; water and loss, 4·2. The weight per cubic foot is 153lb. 7oz. It is composed, therefore, of carbonate of lime, with a moderate proportion of silica, and occasional grains of silicate of iron. The colour is a light greenish brown.

Barnack stone, though now replaced by stone from the Casterton quarries, has had a wide reputation. Peterborough Cathedral, Croyland Abbey, Burleigh House, and nearly all the mediæval buildings of Cambridgeshire and the north of Suffolk, have been erected of this excellent material. It is considered that Casterton stone is equally good. Barnack stone is composed of carbonate of lime, compact, and oolitic—so called because they resemble the hard roe of a fish, or a conglomerate of globular eggs—with shells, often in fragments, coarsely laminated in planes of beds. The colour is light whitish brown. An analysis gives the following result:—Carbonate of lime, 93·4; carbonate of magnesia, 3·8; iron alumina, 1·3; water and loss, 1·5. The weight per cubic foot is 136lb. 11oz. Three years ago it was sold at 1s. per foot at the quarry, and delivered in London at 2s. 3d.

In the midland counties, *Tottenhoe* stone has been largely used. Tottenhoe is in Bedfordshire. Luton Church, Woburn Abbey, and Dunstable Priory, among other buildings, have been erected of this material. It is an argillaceous limestone, of a greenish white colour. We believe it is to be had in London at 2s. 5d. per foot.

The *Ancaster* stone is not well known in London. It is a durable stone, and is of a cream colour. Its composition may be thus described:—Fine oolitic grains, cemented by compact and often crystalline carbonate of lime, and according to analysis:—Carbonate of lime, 93·59; carbonate of magnesia, 2·90; iron alumina, ·80; water and loss, 2·71. Its weight is 139lb. 4oz. per cubic foot; and the price per foot ordinary block, at the quarry, which is eight miles from Ulverston, is 8d. We believe it is delivered at King's Cross at 1s. 6d. per cube foot.

Bath stones are undoubtedly next in importance to Portland stone. They are easily worked and obtained, are remarkably cheap, of good appearance, and are found in abundance. The qualities of the different quarries vary considerably. Some are utterly unfit for exterior purposes, and architects and builders are frequently deceived by them. Great care should, therefore, be taken in the selection of this material. Bath stone is of a rich cream colour. Analysed it gives the following results:—Carbonate of lime, 94·52; carbonate of magnesia, 2·50; iron alumina, 1·20; water and loss, 1·78. The oolitic grains are fine, and there are fragments of shells. A cube foot weighs only 123lb. It bears a crushing weight of from 1,800lb. to 2,000lb. per square inch of surface. The chief quarries are the Box, Coombe Down, Farleigh Down, Hindon, and Corsham Down, and many of the quarries are of great antiquity. It is estimated that the annual consumption of Bath stone exceeds 100,000 tons. The Box and Corsham quarry has supplied buildings in Bath, London, Plymouth, Liverpool, Manchester, Birmingham, Derby, Nottingham, Leicester, Oxford, Dover, and to almost every county in England. The stones occur at intervals in a series whose total thickness is from 60ft. to 120ft. It consists of the following subdivisions:—

	Thickness.
1. Upper ragstones	25ft. to 50ft.
2. Fine freestones or building bed	10ft. to 30ft.
3. Lower ragstones	25ft. to 80ft.

"The upper ragstone," says Mr. Ansted, "consists in the upper part of coarse, shelly, and irregularly bedded limestones, with a few underlying beds of white, fine-grained stone, highly oolitic, and consisting of comminuted shells. Below these are tough, argillaceous bands of pale brown colour and smooth texture. There are no workable bands in this series, but immediately below it are the fine-grained building beds, varying in number and thickness, and distinguished from each other by structural condition, by the size of the oolitic grains, and by the presence of siliceous particles to a greater or less extent." The lower ragstone includes numerous shelly beds, with frequent false bedding, resting on fuller's earth. It is important to consider this, since the lower beds look like fine-textured oolitic limestones, but are easily injured by exposure to the weather. It is admitted on all hands that in the use of Bath stone much depends on its being properly bedded. If it be laid on its right bed it is not found to decay when exposed to atmospheric influence. The Rev. H. T. Ellacombe, of Clyst St. George, in a letter a few years ago to a contemporary, gave several instances of this. Stone had been used for the rebuilding of the tower of the church, for the new schools and master's residence, but the frost had not had the slightest effect upon any of the projections, nor on the pointing, done weathered fashion, with fine blue lias lime and coal-ash mortar. In every case, no stone was placed on its wrong bed. "The dark veins," he added, "cross the bed at right angles; and, by observing these, the bed is easily detected, and should be insisted upon when Bath stone is used. Portland-place was the first spot in London where Bath stone was used; there anyone may see how it has stood the weather, and how it is bedded. The work was done by Bath masons, and bystanders were astonished to see stone worked with carpenters' tools; so I have been told by old men. I believe this stone was supplied from Coombe Down." It is not always so easy a matter for inexperienced persons to decide off-hand which is the right bed of the stone as it comes from the quarry. It has, therefore, been frequently suggested that quarrymen should make a chisel mark on the stones as they are quarried, so that masons might not make mistakes. The stone from Corsham Down is supplied at the quarry at 7d. per foot, ordinary block; Box Ground, 6½d.; and Farleigh Down, 5½d. The Coombe Down is delivered at the Great Western Railway Station at Paddington, at 1s. 2½d. per foot. We select the following buildings in London, where Bath stone has been largely used externally, and give the dates of each erection, so that our metropolitan readers may judge of the external appearance of the stone after some years' wear:—Buckingham Palace (Monkton Farleigh), 1826; Strand entrance, Exeter Hall, 1831; Apsley House, Piccadilly, 1828; New College, Finchley New Road, 1851; Houses, Dean's-yard (Box quarry), 1853; Lincoln's Inn-fields, Inns of Court Hotel, 1865. The following episcopal churches:—All Souls', Langham-place, 1825; St. James's, Liverpool-road, 1838; St. Thomas, Orchard-street (Boxhill), with brick, 1858; St. Anne's, Wandsworth, with brick, 1802; St. Paul's, Westminster-road (Boxhill), 1851-7; Christ Church, Woburn-square, with brick, 1832. We find the following Roman Catholic churches built of this material—viz., Duncan-terrace, City-road (with brick), 1841; St. Mary's, Grove-road, St. John's-wood, 1834; St. George's, Lambeth-road (Coombe Down in ornaments, Caen stone mouldings, &c.), 1848. Henry VII.'s Chapel, Westminster, was refaced with Coombe Down stone in 1809-22, but it is now mouldering away.

The *Ketton* oolite, which has been used for most of the Cambridge colleges, for buildings in Northamptonshire, Bury St. Edmunds, Bedford, Stamford, &c., is of a warm cream tint, and is said to be of a lower specific gravity than Barnack, and rather superior in resistance to crushing weights. Its composition is as follows:—Oolitic grains of moderate size, slightly cemented by carbonate of lime; according to analysis: carbonate of lime, 92·17; carbonate of magnesia, 4·10; iron alumina, ·90; water and loss, 2·83. The weight per cubic foot is 128lb. 5oz., and the price at quarry 1s. 9d., or, in London, 3s. 4d. We may add that the upper part of St. Dunstan's, in Fleet-street (1831), is of this material. The quarries are extensively worked, and the stone is sent to all parts of England for building purposes. The quarries have their main outlet at Stamford.

The *Ham Hill* limestone consists of compact carbonate of lime, with shells, chiefly in fragments, coarsely laminated in planes of beds. Analysed, it gives the following results:—Silica, 4·7; carbonate of lime, 79 3;

carbonate of magnesia, 5·2; iron alumina, 8·3; water and loss, 2·5. This stone is of a deep ferruginous brown colour. It has its main outlet at Bridgewater and Yeovil. According to Professor Hunt, some of it is a conglomerate of the red sandstone formation; other quarries are in the inferior oolite. Three quarries alone yield an annual produce of 7,000 tons. The price at the quarry is 1s. per foot, ordinary block, and 3s. per yard 3in. tooled flags, faced on one side.

Then we come to the stone imported from *Caen*, in Normandy, which resembles in many respects Bath stone, certainly in its beautiful colour, texture, and facility of working. It is, however, lighter than Bath, as it weighs only 120lb. to the foot cube, while Bath weighs 123lb. It is a harder stone, is somewhat less absorbent, and its resistance to crushing weights is much superior. Like Bath stone, it can be sawn with a common dry saw. Some of the quarries near Caen have been worked nearly ten centuries. The Allemagne and Aubigne stones are considered to be the best, although some of the poorest stones have been imported into this country and have soon decomposed, while some of the better kinds are scarcely known. Professor Ansted observes of all these stones that they are remarkably pure, and not very shelly. "The carbonate of lime is often sub-crystalline, and threads of calc spar traverse the stone at intervals. This is the case, however, very generally with the oolitic limestones. The Inferior oolites, as well as the Great oolite, yield good building stones in the West of England, but they are not superior to Bath stone, and are all liable to injury from exposure to the acid vapours present in the atmosphere of London and other large towns in England." Schomberg House, 81 and 82, Pall Mall, is partly built of Aubigne stone. The following buildings are also erected of Caen stone:—Rev. W. Brock's chapel, Bloomsbury-street (with brick, 1848; cleaned down ten years afterwards); St. Martin's Schools, Long Acre (with brick), 1850; upper part of Mark-lane Chambers, 1856; No. 116, Piccadilly, 1850; Conservative Club, St. James's-street, 1844; the east façade of Buckingham Palace (which has been painted over), 1847; St. Jude's Church, Turk-row, Chelsea, 1844.

The limestones of *Devon* are supplied at the local quarries, Exeter, at 3s. 5d. per ton, at Torquay 8d. per ton, the latter being used for walling.

Of *Portland* stone and the magnesian limestones we hope to give our readers some practical information in separate articles.

TRADES' UNIONS' COMMISSION.

MR. ALFRED MAULT, secretary of the General Builders' Association, was examined at great length before the Commission, his evidence occupying thirty-six pages. Mr. Mault stated that his association was established in August, 1865, and has its central offices in Birmingham. The objects of the association are generally "to secure the good of the trade, which cannot be secured by individual action, especially in relation to systems of contract, and to the action of the trades' unions." Being asked to explain what he meant by "systems of contract," witness said that in every contract there is a clause running to this effect, that the decision of the architect in relation to all matters involved in the contract, both as to the quality of the work, the intention of the contract, and the payments for the contract, is to be final and binding upon both the proprietor and the builder. "We hold that that is very unfair, because the architect is appointed by the proprietor, and can be removed by the proprietor, and consequently the whole of his leanings (to say nothing else) will naturally be towards the proprietor's view of any question that may arise as between proprietor and builder." It was further explained that the association was founded upon the principle that every master has a perfect right to conduct his business as he thinks fit, so long as he can do it efficiently and sufficiently for his own objects. The General Association is formed of an aggregation of local associations. These comprise now about eighty towns all over the country, principally in the west and north of England, and three or four towns in Scotland. The General Association does not interfere in the affairs of any local association, except at the express invitation of that local association; and then, in matters connected with the intercourse between masters and men, if a dispute arise, the rule is that the General Association will not take any action in favour of the masters of any local association until those masters have offered to the men to settle the matter in dispute by arbitration, and the men have refused to have it so settled. Witness was sorry to say that arbitration had not been accepted very many times, but in every case in which it had been accepted it had proved acceptable to the men themselves, as well as to the masters. According to the last census there were in Great Britain 856,472 persons immediately connected with the building trade, and from the annual reports of the various trades' unions throughout the country, witness estimated that among the carpenters and joiners there were about 21,000 unionists, or 10·3 per cent. of the whole number of operatives connected with that branch; of masons, 20,000, or about 17 per cent.; of bricklayers, 15,000, or 18¾ per cent.; of plasterers, 6,000, or about 30 per cent.; of plumbers, glaziers, and painters, 8,000, or 9¾ per cent.; of brickmakers, 2,500, or about 6 per cent.; of labourers and the other trades not mentioned there might be 18,000 connected with the unions. This estimate gives a total of 90,500 unionists, or about 10½ per cent. of the whole number of operatives of all branches connected with the trade. From those figures the non-union labour is vastly in excess of the union labour of the country. In stating the effects of trades' unions as far as the interests of his association were concerned, witness said, "I do not want to say anything that may appear at all hard as regards the working men—we respect them very highly, and our great end and object is to cultivate as friendly relations as possible with them, and what we do in association is done principally with the view of restoring those kindly feelings that ought undoubtedly to prevail between people who are so much connected as the masters and the workmen in any department of the building trade especially must be." As to picqueting, Mr. Mault's evidence went to corroborate what had been said by previous witnesses. He also mentioned cases where picquets had been convicted for interfering with the master's manner of carrying on his business, and for threatening masters as well as men. These unions act, said witness, as if monopoly in labour were already established, in that they enforce the payment of a purely arbitrary price for labour. Instead of tending to the equalisation of wages the tendency of the operation of trades' unions was just the opposite. Wages vary in England from 8d. to 4⅝d. per hour. For instance, carpenters and joiners at Chester get 6d. per hour; at Shrewsbury, 4⅞d.; at Southport, 6¾d.; and at Wigan, 5⅝d.; and so on. Asked: Are you aware of many cases in which under the pressure of a time contract a builder has been obliged to yield to a demand for an increase of wages?—That is a very common occurrence.—Does the apprehension of the interference of the union seriously embarrass a builder in making his contracts?—So seriously that we recommend the whole of the towns in the union with us to come to an understanding, and not to tender for work unless they are protected by a strike clause. He thought it would be better for both parties that the men should be paid according to their skill and industry in each case, and he thought, taking the country generally, that the rate at which they would be so paid would remain as high as it is at present without any union on the part of the men. Asked: If he knew of any instance in which the men had refused to conform to a rule which had been agreed to between masters and men?—Witness replied, Yes, last year, at Birmingham. The men having signed a code of rules and accepted it, refused to conform to it, on no other ground except that the arbitration went against them. (Mr. Applegarth here said "The carpenters were not implicated in that at all. Our men make it a boast that they succeed in settling these things by arbitration.") Witness substantiated this statement, remarking, "When the bricklayers of Birmingham struck against this arbitration, the carpenters loyally kept to the promise that they had made to the masters." In answer to the question, how would a workman be able to be supported in a dispute with his master without the existence of the unions? Mr. Mault said, I think that the ordinary fellow feeling of the workmen would be sufficient without any organisation.—How is he to subsist while he fights his battle with his master?—By going and getting the wages that he wants from another master.—But how is he to subsist in the meantime while he goes about seeking employment elsewhere?—That is not a question for me.—But it is a question for him surely?—It is a question of the man's own provident habits. I should say, let him pay into a friendly society by all means, or into a society which will support him when out of work.—Witness went on to say that he thought that the bargain one master against one man would be a fair one; it had always told to the advantage both of masters and men, and was more conducive to the general progress of the country. He knew some masters who were called black masters because they employ only non-union men, but that had grown up from the connection of the master with a strike or something of that sort. He was also of opinion that the employer ought to be allowed to judge for himself whether he would have the work done by piecework or by the day, and not only the employer but the general public: "and the general public have decided that they will have the great bulk of their work, as far as we are concerned, done by piece, and that being so, I do not think that any other persons should interfere."—He stated that trades' unions always opposed piecework. The masters held that opposition to be bad. He did not think piecework was bad work as a rule. In answer to another question, witness said that in many places there was a rule in existence with reference to apprentices, limiting their number. The masters were forced to accept that rule, although they objected to the principle it involved. He knew of instances where the rule had caused disputes between masters and men, and had actually led to a strike. His objection was that in large towns, such as Manchester, where many of the masters employed 80 or 100 bricklayers, the operation of the rule which compelled a master only to have one apprentice at a time, would be that in the course of ten or twenty years, when the present generation of bricklayers died out, there would not be a quarter of the number to take their places.

A PHILOSOPHICAL VIEW OF ART.

The Future.—(*Concluded.*)

PRACTICALLY applying the law of progress to architecture in its present experimental and semi-scientific stage of development, we have now to consider its advance under conditions somewhat at variance to that definitive or positional state under which it will take its proper place in the grand scheme of co-ordinated science. It must be admitted by all that our present method of designing is an eclectic one, and imposes very

little scientific culture or training upon our artists, and the inevitable result is the want of principle or moral aptitude in a very large proportion of our works of art. Generally speaking, they are as deficient in logical correctness or fitness as in the æsthetic qualities they display, and this assertion applies more forcibly to architecture as now practised than to any other branch of art study.

Ridiculously far-fetched and absurd as are many of the ceramic, textile, and metallic designs submitted to public notice, the fantastic ideas and shapes capricious Fashion conceives in jewellery and ladies' dress are less irrational in their way than the mediæval appendages, dim lights, loopholes, machicolated cornices, and overpowering campaniles that diffuse an antiquated gloom in our architectural conceptions for our churches, townhalls, and courts of justice. In the first case, the idea of the artist is simply one of embellishment, generally accessorial to something else, and the work itself is very limited in its power; it does not make much difference whether ferns or rosebuds or chain patterns bespatter our carpets, damasks, or dresses, or whether golden spikelets or acorns bedeck the ears of the fair; but the case is different when the appropriation of the work has a twofold aspect—when the intellect and imagination are both to be gratified. There must then be a compromise of conditions, the preponderance being given to those on which the destination of the structure depends.

Architecture accordingly stands somewhere midway between the useful and the decorative, the logical and the æsthetic; and its scientific practice can only be arrived at by properly defining the limits of each element in the different classes of building which can be legitimately ranked as architectural. Now, I think it will be conceded as an initial hypothesis that wherever one ruling idea predominates it partakes either of the utilitarian or æsthetic character; and, therefore, the work should clearly exhibit that character in its integrity. Under such a category the two opposite conditions of building are to be considered—viz., simple constructive building, in which use is the primal and ulterior end, and simple religious or monumental building, in which a dominant conception regulates the inferior and subsidiary offices, and under which materials and constructive science become more passive than instrumental agents. Between these two opposite classes, combining more or less of each, stands by far the largest portion of our modern complex architecture. Now, the primitive conditions of the art were comprised in one or the other of the two opposite classes. Pure necessity created the simplest type of building, and the primitive religious conception was embodied either in the simple sacrificial temple or in the monumental structure. There was, consequently, no conflict of ideas; there were few conditions of structure to compromise, for really the only primitive architecture—the monumental or religious—involved little science and no complexity of structure. I think, then, that our hypothesis—namely, the primitive preponderance of one idea—explains satisfactorily, and in accordance with our great law of progress, which began by the simple and proceeded to organic complexity, the early development of architecture. Its subsequent unprogressive aspect becomes thus easy by inference—namely, the diversity of ideas occasioned by civilisation, and their combination and compromise or conflict that it necessarily gave rise to in this art.

It is clear, then, that the conditions under which architecture first advanced were highly favourable to its æsthetical perfection; the conception was at once, without a difficult process, transmitted into the material object, the transition of the subjective to the objective was easily effected by a simple step. This transition, as we have seen in our historical sketch of thought, became more difficult as the gradual estrangement between these two mental phenomena proceeded with the simultaneous advance of the speculative and experimental. Accordingly, to rightly estimate the combined value of the above conditions in a modern work of architecture, we must separately consider them, attaching to each its proper limits and appropriation in the organic structure. First, then, under the material conditions we have durability, construction, and convenience, as essential to every building; and, secondly, under the æsthetic conditions, we have to estimate the degree of expression or beauty each of these is capable of receiving without detracting from its legitimate office or attaching an undue prominence to it as an element of a coherent whole. The appointment of the structure and the materials used must determine the precise degree of beauty or ornament assignable to each of these conditions. Thus, it has been asserted that the duty of the architect is to ornament his construction; but it would be quite inconsistent for us to panel our walls, as is sometimes done externally, or to fill between our timber roof principals the same class of ornament as we apply to our walls. We may add also, the external and internal requirements of our edifices require a modification of treatment; thus, we might spangle our vaults internally with star-like perforations, or fret them with a network of ribbing, but it would be manifestly absurd to treat them in such a manner externally, and yet our staunch constructionist, who would conceal nothing, would have us do so. According to such logic the law of a higher condition would be sacrificed to mere construction—a fundamental error fallen into by many in their love for exhibiting to a nail and joint the anatomical structure instead of making it subordinate as one of the lowest means to the desired result. It is the perfected beauty—the just subordination of the material to the higher attributes of art—that is to be aimed at, and the only criterion of this is the destined position the building is to occupy as a fine art work. A laboured and mechanical appearance is always destructive to repose, a paramount quality in every work of fine art. "The end of art is to conceal art" is an aphorism as often set aside altogether as it was once too designedly (mis)-applied as a cloak for deception. The destination and purpose of every structure should become a law unto itself, and a moderate artist will content himself in developing the capacities of his materials just to that point which harmonises best with his design as a composition. To this end the employment of suitable materials and their treatment become important considerations under the first two of our general conditions. Of the materials that compose our organic art we observe gradations in their workable capacities susceptible of more or less æsthetic refinement, sometimes answering only constructive ends, and at other times rising to the highest art, and capable of stirring the higher feelings of our nature. Thus we have—

Materials.	Constructive Use.	Æsthetic Perfection.
Stone	Scientific masonry.	Carving and sculpture.
Bricks	Walling, arching, &c.	Moulded brickwork.
Timber	Carpentry, in trussing framing, &c.	Joinery, moulded and carved work.
Iron	In compressive, cross, and tensile strains.	Cast and wrought metal work.
Glass	Light transmitting substance.	Moulded work and glass staining.
Calcareous and plastic substances	Mortars and cements, paving, stuccoing, &c.	Cast, moulded, stamped, and encaustic work.
Terra cotta	Window and door-heads, &c.	Ditto.
Other artificial compositions—papier mâché, vulcanite, Parkesine, &c.	Limited in application.	Moulded and stamped ornament.

From the above classification, comprising the greater portion of the material elements and their degrees of artistic refinement in architecture, it is easily perceived how the first-mentioned materials—those the earliest employed—were readily converted from constructive use into fine art perfection; and how passively they became the vehicles of a simple idea and a primitive construction, in which compression was the chief principle involved. In our more complex arrangements, instead of two or three, often all the above-enumerated materials enter, and their constructive adaptation makes their transition into the æsthetic category a somewhat difficult process. Our modern attempts at ornamental brickwork indicate this. We can combine our courses and mould our bricks; but we have our arches and counter-arches, abutments, and skewbacks, and other practical intricacies, to consider and overcome, unless we use, as is often very effectively done, stone lintels and heads to our window and door openings, or adopt what I consider quite as good—viz., terra cotta. The fact is, our middle or constructive rank has, since our early progenitors conceived and built, interposed a formidable condition between our materials and their expressive or æsthetic capabilities, owing, as I have before observed, to the inordinate advance of our scientific and industrial life.

Thus the position architecture will occupy in the future will depend chiefly on the co-ordination or balance of the arts allied to it, so that each will take its place according to its relation and dependence in the whole composition, instead of the present irrational practice of exhibiting a finesse in one art at the expense of all the others. Such a balance of the ingredients of architectural design bears an analogy to that adjustment of political power and moral strength which constitutes the harmony and perfection of social life, and may be further compared to that perfect union of the physical, sensuous, and spiritual elements of our humanity in which is sublimated the happiness of the individual man.

The cultivation of the feelings, no less than that of the body and mind, is essential to the completeness of the human race; and no study can so adequately fulfil such a condition than the beautiful in thought, in form, in sound, and in colour; and, as Goethe has said, the beautiful includes the good, and adds something to it—to use Mr. J. S. Mill's words in his inaugural address, recently delivered to the University of St. Andrews. Architecture occupies a position in our complex civilisation somewhere between thought and sentiment and the material wants of our present existence, and consequently its real rank in the hierarchy of art will remain uncertain till these elements have assumed that definitive order in the great scientific and social polity of the future. At no time more than at the present has special study and practice been so pursued; and such a tendency, while it temporarily creates a spirit of narrowness and exclusiveness in the artist and practitioner, is at the same time elaborating and perfecting a system of organic law as greatly important to art as to science and humanity. Greatly as it may shock the mediævalist, the general dilettante and orthodox critic, much that we respect and revere must undergo a partial if not entire revolution in the future reconstituted system; and already our modified religious belief and worship has suggested plans for our churches as contrary to our old ritualism as they are consistent with modern thought and science.

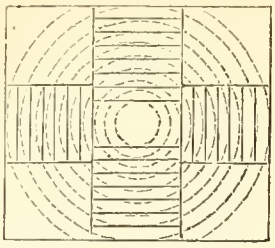
G. H. G.

A CHAPTER ON FLOORS AND FLOORING BOARDS.

WHAT will they write a chapter upon next? I dare say some of your readers will ask, and very proper such a question might appear, for flooring boards and flooring will remain flooring still; but with the introduction of machinery, the great cost of labour, and the fierce competition now raging in every branch of trade, flooring, like all other things, has been submitted to great changes,

and it is these changes I propose to form the subject of the present chapter. Glancing on the old times of hand labour, when that great agent steam was unutilised, and movements of powerful machinery to relieve man of his most onerous duties slumbered as a dream in the minds of scientific men, only to be developed by a wise posterity, we alight upon times when native grown woods formed the base of operations. That they were costly and regarded as luxuries we may well believe, for we find houses in limestone districts with floors of common lime or mortar, and the same in the midland districts, which abound with gypsum, for there plaster floors were common up to very recent times. Where we find wood floors possessing any age they were only used as chamber floors, the sitting-rooms, or in many cases the bedrooms, on the ground floor being composed of porous bricks, which bespeak the silent growth of consumption in the young and rheumatics in the old. Amongst the older class of wood-flooring we find elm and larch, the latter being much prized from the smoothness of its wear, but for the better class oak ruled supreme; and proud was the nobleman who boasted of his polished oaken floor, the wood of which was grown on his own estate; and in some cases, as at Haddon Hall, they even went so far as to assert that their great ballroom floors were made from one entire tree. Amongst the many luxuries prevailing with our last Stuart king costly floors of cedar formed a conspicuous item.

In the earliest times they were content with rough sawn or even chopped boards, rudely fitted with irregular edges, then came parallel wrought boards, and lastly foreign timber. With the introduction of foreign timber came a sweeping change; carpenters were bred as it were upon the wood itself; we find it used for almost every purpose, and manipulated in such a superior style that we are led to ask the question, "Where did this new race of carpenters come from?" Where is the carpenter who has not heard of "clean floors," and who has not wondered where the old workmen obtained their wood from; floors without a knot, without a touch of sap, or even a nail being seen on their surface. "Clean" was the term by which they were designated; and clean they were, every board being as like the other as two peas, each with a beautiful flowing grain up the centre. As the secret of this class of floor is not generally known, it may be as well to give a little information on the subject. It must be borne in mind that foreign timber was not introduced into this country because of its economic character, as there were plenty English grown woods ready to hand, but it was introduced chiefly for its beautiful quality. Christiana and Archangel being the ports, as they are at the present day, for producing clean and close grown timber, were the first ports to ship the yellow pine to England; in every instance they were in the squared or hewn form of timber, the system of sending it ready converted being a custom that grew out of a trade being formed with foreign countries. We must imagine one of these beautiful timbers in the hands of the sawyers for conversion into flooring boards. Their first process was to take a 7in. or 8in. plank out of the centre of the balk, and afterwards turn it down and convert the whole of it into boards. Each board would thus possess the grain (or feather, as it was called) down its centre. The outer planks were treated the same way, being turned flat, and having a 7in. or 8in. piece taken out of the centre to be cut into board in a similar manner. The accompanying diagram will best explain the system. It will thus be seen that the corner and heart pieces were used for other purposes. The boards were prepared and thicknessed half an inch on from each edge on the bottom side, the remainder of the thicknessing being done with the adze at the point where they laid across the floor joist. The first board was nailed down by its edge or fixed with wood buttons to grooves in the



sides of the joist. The next board was fastened by having wood or iron dowels driven into the edge of the board, and this system was pursued board by board throughout the entire floor. If the floor was for a ball-room, picture gallery, or a first-class room or corridor, it was generally polished with linseed oil and finely-powdered brickdust, and by constant labour and attention an effect was produced that even the modern system of French polishing cannot supersede. With the levying of duties upon foreign timber, and a scale affecting the various sizes, the custom of importing converted timber was naturally fostered; planks of 12in. and upwards were subjected to a higher rate of duty than those of narrower width; hence the custom of our deals being imported 11in. broad to avoid the high duty. 9-inch and 7-inch deals were seldom seen, and as wood flooring came more into demand this foreign converted timber was cut up for flooring purposes; in some cases they were cut down to 5½in. in width, but more generally we find the wood floors of old houses to be 11in. broad.

As time moved on, and economy became more fully developed, we find narrow deals and battens to have been in great demand. The latter class are those generally set apart for flooring purposes; but as they are made from the smallest class of timber, or from the upper portion of the trees, the old system of obtaining boards on what may be termed geometric principles was entirely lost sight of, and it is this adoption of the latter class of wood, and the discontinuance of hewn timber being imported from the ports of Archangel and Christiana, that makes up our sum of wonder when we compare the wood-flooring of to-day with those of a century gone by. What shall we say of preparing flooring? Well might the better class of old tradesmen refuse to do such laborious work, and well might so many carpenters be seen walking the streets, bound down with weight of toil, to be the byword and the jeer of every boy; "There he goes with a billy on his back," "His job's to flog floor boards," &c., being common remarks. It used to be argued with good reason by these poor men that "somebody must do it." The idle apprentice would be told by his master that he would be fit for nothing but to dress floorboards; and in many instances with men of no principle their apprentices were taught little else during their seven years' servitude. Instances are numerous where such youths have grown up with lasting deformities. It might have been some of these poor fellows that named one of their tools "the trying plane." The workmen of to-day ought to be glad they have lit upon the present century, when steam power and machinery are doing that laborious work which was beyond the strength of man—when it has removed the load of deformity from their shoulders and placed them in a position of comparative ease. We have no doubt but they are thankful, and that they care not to be reminded of participating in the strikes which were got up in opposition to the introduction of wood-working machinery. Let us now consider a matter which is forcing itself seriously upon us. We have perfected our machinery and we have grown proficient in the management of it, we lead a life of comparative ease observing it perform the work which our forefathers laboured at so incessantly; we have thus become nabobs in a little sphere, and have, by dint of perseverance, succeeded in obtaining better pay for a little than was formerly obtained for a great amount of toil; we have also succeeded in obtaining our living with a less number of hours, and we may be said to have reached the summit of our desires. Free trade has no doubt done this; and free trade is the watchword of the day. Free trade allows our beautiful machinery to go to foreign countries where labour is cheaper and the hours of toil are unaltered. Free trade allows the produce of this machinery to be brought amongst us, and cause a dearth in some particular class of our native employment. Perhaps there is no branch of trade that is destined to suffer to such an extent by these measures as the manufacturing of woodwork. As the present chapter is strictly confined to the subject of flooring boards we will stick to the text. Ten years ago about 25 per cent. of the mill sawing in this country consisted of converting battens into flooring and other boards; by the perfection of machinery in Sweden and Norway they are now able to supply us with our boards ready sawn, and the rapidity with which foreign sawn boards have grown upon us leads us to say that the imports of timber in a short time will be all ready-sawn boards. They are sending them all sizes from the range of the Baltic ports, from St. Petersburgh down to Gottenburg, and they are affecting the employment of labour in our saw mills to a serious extent. This is not all, they are laying down machinery for preparing flooring boards and are already sending cargoes of planed, tongued, and grooved flooring into the port of Hull and other places. The influence of it is very little felt at present, because the machinery in active motion is in Norway preparing the better class of boards which forms only an unimportant feature in the flooring trade of this country. In a few months' time several of the Swedish ports will be in active work preparing low-priced flooring for the English market. The difference in favour of the foreign prepared boards compared with those of our own manufacture will be from 10 to 20 per cent., a sum which is double that needed to stamp out the trade of floorboard-preparing in this country. Some will say that the foreign boards cannot be brought in a merchantable state across the sea. This must be denied upon inspecting the foreign boards, for they are as clean as if only removed from one street to another; and with the powerful steamers which are now trading to Gottenburg and other northern ports in two or three days' sail, bringing on their return all kinds of foreign produce, it reduces the distance of these foreign ports to the level of a neighbouring town. W. S.

FAILURES IN CONSTRUCTION.

"REMARKS upon Failures in Construction" was the title of a very able and exhaustive paper read at a meeting of the Royal Institute of British Architects, on the 8th ult., by Mr. Edwin Nash, Fellow of the Institute. Mr. Nash introduced his subject by some general remarks, in the course of which he observed that "failures in construction often teach more than successes, inasmuch as experiences dearly bought leave an indelible impression, and open our eyes to circumstances not before perceived; and this trite observation is exemplified when any part of the structure shows results in the stability of the materials different from those intended, and exhibits some ill consequences, be they great or small." He then passed on to consider, first,

FOUNDATIONS.

A very large proportion of failures may be traced to imperfect foundations, and too much care and sagacity cannot be exercised by the architect in arranging his underworks, keeping in view the principle that uniformity of bottom is of far more importance than anything else. We may imagine that he may build upon woolsacks if the whole be of that nature, and it is possible to build well upon a uniform bed of peat by carefully spreading the weight over the whole surface, and

many structures have been so built, and, as respects London, most of the houses in the neighbourhood of Finsbury-square and circus stand on a somewhat peaty bed, and the site of the beautiful mansion erected in 1816 for the London Literary Institution had a bed of that sort. If the whole of that building had been founded upon the undisturbed surface of the peat instead of cutting through it for the main external walls only, as was done, there would probably have been few or perhaps none of those irregular settlements which were occasioned by some subsidence of the internal walls, from the drying up of the peat a long time after the building had been erected, and which rendered underpinning needful. I do not mean to say that soft bottoms are to be coveted, but, on the contrary, I should like every architect to revel in the luxury of a hard one, such as chalk, which is about the best soil that can be had, very much on account of the homogeneity of its nature.

When adding to old buildings it is often necessary to allow parts of old foundations to remain, and to build new work upon them; and though it is bad in practice, and has been sometimes attended with bad results, it cannot always be avoided. The settlement of new work built against old work is commonly understood, and the settlement is very wisely allowed to go on with as little check as possible, so that it may not drag upon the old; yet in those cases in which one has to build not merely against, but amongst and upon old work, there is a danger of irregular settlements and perhaps of fractures, or something worse: instances of this might be given, and they suggest the great desirability of making a complete rooting up of the old work, so as to have a clear site for making a fresh and uniform bottom for the whole of the new portion.

CUSTOM HOUSE.

The astonishing falling down of the Long Room at the Custom House, in 1825, was a remarkable illustration of these points. It was not occasioned by defective design or workmanship in the building itself, but by defective arrangements in preparing the foundation. The site was a confused mass of irregular old walls, sewers, ancient quays, and rubbish, the *debris* of numerous works that had been formed there in successive ages. It was through and amongst this chaos that a foundation of wood piles was unwisely driven, and it is therefore not to be wondered at that untoward mistakes and irregularities occurred, whereas if all rubbish and incumbrances had been cleared away (at great cost perhaps), there would have been a free field for operating upon with certainty; the absence of this precaution, and, in fact, the working so much in the dark, was the cause of an imperfect foundation, and especially of a small mistake at one part, that occasioned the failure of one pier, which brought on the fall of many piers, and the destruction of the greater portion of this large and costly edifice. The building had two stories of vaults formed with a very extensive series of stone and granite piers carrying brick arches, and each pier stood (or was intended to stand) upon nine old timber piles, forming a square, covered with planking. Some of these piles did not drive properly into the ground in consequence of the unseen obstructions they met with, and the entire site being incommoded with vast heaps of rubbish, it was no easy task to get all set out and executed in accurate position. This was particularly proved in respect of one of the piers, under which the middle row of the set of piles belonging to that pier was mistaken for the outer row, and the square group not thus planted on one side, and, it becoming afterwards obscured by the loose rubbish placed round it, the stone pier, when built in its right place, did not coincide with the wrong place of the piles—in short, half of the pier had no foundation whatever, but hung over the mere rubbish, while the other half just balanced upon the edge of the group of piles, and, although a considerable time elapsed before this pier fell, yet when it did slip off the piles it had nothing but soft uncompacted rubbish to receive it, and consequently it went down to the astounding degree of 4ft. or 6ft., burying itself to its neck, and urged downwards by the extra pressure given by the other piers and arches above, which, having lost their equilibrium, sank over towards this descending pier, and the two stories of vaults eventually fell as a disastrous ruin. The important law suit, the "Crown *versus* Peto," arose out of this unhappy affair. I may add that, whatever may have been the architect's opinion as to a suitable foundation for this building, the piled foundation was no part of his own scheme, and was not included in the builder's contract, but that it was the mode advised by another of high authority and reputation.

The ancient practice of a plentiful use of concrete had not then been fully revived, though this immediately followed; and it was even extensively used at the reparation of the Custom House itself, and since then, wherever there has been a site of analogous character, concrete has been used as a complete bed all over, in fact, concrete bottoms have now become universal, and in the present day at the new St. Thomas's Hospital, the architect proposes to make a general clearance, and to cover the entire surface with a very deep bed of that compact material. At Fishmongers' Hall there was not only the concrete but a complete frame of timber running through all the footings.

VARIETY OF HEIGHT.

Variety of height often causes irregular settlements, and it is commonly seen that lofty towers, when engaged in the body of a building, sink down to a greater degree than the less weighty parts, and thus damage the connection of the work. This may be seen in the engaged tower of St. Martin's Church, at Trafalgar-square, where the work around has been broken by the extra pressure; and there are numerous instances of the like result. This circumstance indicates not only the necessity of particular hardness and spread in the foundations of towers, but also the desirability of not engaging them too much in the body of the building, and it is noticeable that Sir Christopher Wren (although some of his buildings show the defect now alluded to) was fond of keeping his towers distinct from the general mass, an arrangement which, as a general rule, is also æsthetically preferable. Indeed, it seems to point out that each particular height and weight requires a corresponding difference in the strength of the foundation, and that the higher parts should be erected proportionately in advance of the lower parts; yet much refinement in this respect would cause complication, and might defeat the end in view.

WATER IN FOUNDATIONS.

Water in foundations is a fertile source of injury to buildings, and often brings them down; and where they do not fall it causes bad settlements. The examples are more frequent than is perhaps imagined, but only a few instances of falling down from this cause need be named:—In 1856, four new houses at Paddington; in 1860 a house in Clerkenwell; in 1861, a bridge on the Great Northern Railway; in 1862, the piers of a viaduct on the Hammersmith Railway, killing six men, where water from a ditch seems to have saturated the bottom of one only of the piers; in 1865, a railway bridge at Beckenham by flooding; in 1866, houses at Penge from saturation. As to the irregular settlements caused by water, it may be observed that within the clayey districts of the metropolitan area, they readily occur, the soil being peculiarly unfit for saturation, as it thus becomes sodden and almost liquid; indeed, it does not well bear changes of any kind, inasmuch as it shrinks and swells almost as certainly as the barometric fluid, and there are very few houses in the suburbs without some crack that might be traced to the imperfections of the soil they stand upon. Depth is the great thing in this clayey soil; it is more important than breadth, because depth gives a greater removal from the influence of the weather and from other disturbances, such as the formation of a deep sewer in the neighbourhood of a building after it has been some time erected, the sewer having the effect of drawing moisture out of a very extensive area, thus allowing the soil to shrink, and the stability of a house to become disturbed. In all cases where there is any possibility of rain or other water accumulating in the bottom during the process of building, it is important to have the drains laid and in action before commencing to build. Clay, if perfectly quiet, is not a bad soil to build on; but if weather or springs affect it underneath a building, it is almost as bad as sand affected by similar process. The blue clay under London is a very compact body; but the yellow clay is not so reliable, and there being alternations of gravel and sand with the clay, it is sometimes found that water drawn from newly sunk wells has the effect of drawing out particles of earth from these looser strata, which consequently subside and permanently injure the buildings that stand above. An enumeration of irregular settlements in London would form too long a catalogue.

QUAY ON THE THAMES.

I will now refer to a steamboat quay on the Thames, the front retaining wall of which fell down in 1843, after it had been six years in use, and it gave symptoms of its dissolution long before the catastrophe. The outer part of the broad gravelled quay, artificially formed upon the foreshore of the river, appeared to be on the move previous to any signs of failure in the river wall, and I noticed this disturbance on several occasions without then having the least idea of what was about to happen. Now, if we turn to the section, we shall see how the work was planned. Observe the level of low water,—it is at least 3ft. 6in. below the bottom of the retaining front wall; but this seems to have been thought of no consequence, inasmuch as the work below the footings of that wall was a breastwork of iron piles at short intervals, and iron face-plates closely fitted together and tied in by long land ties and backed by concrete, thus holding in the artificial foundation or embankment upon which the wall was to stand. The concrete extended up to the base of the wall, but, as most of it got washed away bodily during its deposition, it was replaced by washed gravel, with 2ft. of concrete above it, underneath the wall, which was started upon a footing of 6-inch York landings, with the front edge of them resting on the head of the iron piles, and this particular circumstance will want further notice presently. The wall then went up as on the section, being five bricks thick at bottom, and three bricks thick at high water level, all in cement, and well bonded with iron hooping, and there were counterforts at intervals, and tie rods midway held in the timber guard piles that were socketed into the head of each alternate iron pile, the piles being about 5ft. apart in the clear. Now, how came this to fall down? In the first place there was no cofferdam, and the concrete could have had no proper protection from the water of the river, and consequently could not very readily harden. Moreover, the wall ought to have commenced under low water line, instead of above it, for the bed of the river having been lowered to the line on the drawing to allow steamboats to lie close up to the dummies or barges at all times of tide, the water flowed freely over the two upper ranges of iron face-plates for a height of about 8ft., half of which, being above low water, was subject to the change of being wet and dry daily. Now, supposing any imperfections, however slight, in the joints of that part of the work not covered by the shore at which water could enter, there would be a daily entrance and daily discharge of some quantity of water below the base of the wall, and if it did find any degree of entrance anywhere, it would at last reach the embankment behind, enforced by the pressure of from 16ft. to 18ft. of water, added to which there would be the drawing effect of a rapidly falling tide; and this insidious agency of water in constant action, perhaps slight at first, would in time carry away a portion of the earthwork of the embankment below and behind the brick wall, and this at an increasing ratio; and all this appears to have occurred, assisted perhaps by land water from behind, which would aid the running out of particles of earth when the tide was down. The broad roadway or quay surface (as I have said) first became irregular, and then slowly shrunk downwards, and after a time the wall tended inwards, and did not appear to go down bodily like the embankment itself; and this must have been because its front edge was firmly lodged on the top of the iron piles, which going into the ground a long way below the disturbance we have been noticing held more firmly to their place, and caused the wall to tilt over inwards. The whole of the middle portion of the quay went to pieces as a complete wreck, but the rounded ends, which had been piled with three rows of wood piles within the outer iron piles, stood firm.

I think the case not only illustrates the danger of letting a foundation have any chance of disturbance by water, but it also particularly shows how injudicious it is to let a foundation stand upon two kinds of support. This wharf wall should have been either wholly of brick from bottom to top, or wholly of iron from bottom to top, like the iron and concrete walls at Freshwharf, by London Bridge and at Brunswick-wharf Blackwall, and like some others wholly of iron.

I must add to these remarks that the engineer disapproved at the time of the omission of a cofferdam, which would have made it possible to carry out his original design in a proper manner,

but as it belonged to a joint-stock company, its members thought this requirement of the engineer was needlessly expensive, and over-ruled him.

As a contrast to the above I will just point to a section of the wharf wall at the Houses of Parliament, where the work goes down a good distance below low-water line, and has no kind of irregular support at the bottom, and consequently no likelihood of failure. Another good wall is that of Billingsgate wharf; the only questionable part (if it was carried out as per section) being the second or internal wall, which is shown as standing on the heads of piles, which, though a good foundation for the wall itself, might, from its being tied to the front wall, which has no piles, have occasioned a little difference in their settlement, though no effect of the kind is observable in the structure.

PILES.

Let me reiterate a remark often made respecting wooden piles, viz., that if durability be essential, they must be far removed from atmospheric changes, and then, in such circumstances, the timber may even become fossilised after sufficient lapse of time; but I am unable to perceive the suitability of pile foundations for any part of London, except the river margin, though they seem to have been very common during the last century, and instances are constantly occurring in which buildings of that era show severe cracks, and require underpinning, when it is found that the irregular sinking has been occasioned by the decay of timber. The drawing out, instead of the cutting off of piles used for dams, is a well-known imperfection in practice.

RAPID BUILDING.

Rapid building is a well-known cause of failure, and many disasters arise from it, particularly during the more humid portions of the year, and if the fragile houses that are run up round London did not get some rest on Sunday, the crooked, overhanging, and falling walls would be even more numerous than they are. But even some well-built structures have failed through haste, and several of modern date might be mentioned. Excessive care is needful with foundations, when it is necessary to build rapidly, besides those other precautions that are common in respect of quick-setting material, and plentiful bond, &c.

INVERTS.

Inverted arches are of great value for spreading weights if they be properly applied, but they have been known to fail from the radius being too great in proportion to the width. I will name one of the buildings of St. Thomas's Hospital at London Bridge, erected in 1834, and recently taken down. The opening was about 12ft, and the drop of the arch about 15in.; its extrados was just above the footings, and its skew backs were in the main end wall of the four-storied ward buildings, no brickwork being above the intrados, and soon after the roof was on the arch broke in the middle and showed a disposition to spring upwards, but no evil result occurred. The spread of bearing in this case would have been better obtained by a wide extent of footings, and no invert, and I am of opinion that flat inverts under very distant piers, such as the columns of a church, are not only useless, but are really dangerous. Inverts should in many cases be bricked up in the solid of a wall, and, if that cannot be done, it will be better to have large, wide-spreading, and deep bases and footings. In the few churches that I have built I have never put an invert to any column, and I remember that in 1844 I heard Professor Hosking at King's College express similar views to these, and yet it is singular that the same authority, only two years previous to that date, published what may be called a recommendation of shallow inverted arches between the piers of large bridges; but this suggestion has surely never been made use of, it being quite unsuitable for any bridges but those of small span.

CRUSHING.

Crushing of material is a subject that necessarily comes much under the architect's observation. In 1848 the columns of a new church were formed of chalk; this was, of course the grey chalk, which is a sound homogeneous material, and if kept dry will sustain a good weight, but in this case wet got to it and some frost, and it went to pieces. There is a beautiful modern church at Weybridge, in Surrey, with chalk columns carrying the nave arcades, and when I saw it a few years ago all was in an excellent state; yet it seems to me that when we look at the adverse conditions to which building operations are exposed, it is scarcely wise to use so absorbent and so light a material for bearing purposes. Some kinds of chalk are not unfit for other uses in a building, and a good application of it for ornamental work may be seen in the late restoration of St. Cross Church at Winchester.

In the case of a Bath stone column in a modern building, from which sprang four large arches, it failed from crushing, or rather it was from breakage. The shaft was a cylinder of 2ft. 3in in diameter upon a base 3ft. 3in. square, and it was the moulded base stone that broke. The weight on the column was about 68 tons, that being 17 tons per square foot, which is less than one-third of the smallest weight that is sufficient for crushing according to experiments, which have shown that it takes at least 54 tons per square foot to crush good Bath stone. The discovery of the failure was made soon after the building had been roofed in, and all was in very perilous condition, inasmuch as if this shaft had come down nearly the whole building would have followed The stone that broke was the one used at the ceremony of what is called laying the first stone. It was 1ft. 6in. thick, and 3ft. 3in. square, and in the centre of the stone beneath it was a small hollow for a bottle of coins, so that there was no bearing in the immediate heart of the work; but the failure was not caused by this, but by the improper manner in which the stone was bedded by a noble personage, or rather I should say by the masons who prepared the bedding for his lordship. The foreman thought he must have the mortar peculiarly smooth and good looking, which was an error to begin with; he then put four stout patches of it on the lower stone, one near each of the four corners, where it got somewhat dry during the time consumed by the ceremonial; and after that time some fine liquid mortar, very much like grout, was put over the general surface, and his lordship trowelled it about, but the four patches were not flattened down nor made homogeneous with the other mortar, yet the stone was then lowered, leaving the four patches as the most solid portions. All stood well for nearly a twelvemonth, until the entire weight came on, and then a crack was observed at E on drawing, another followed at F, and another at each of the corresponding portions of the square. The alarm being given all had to be shored up, the broken stone removed with much difficulty and new put in, and, after getting out the shattered stone, the four patches of mortar were still distinctly visible, and were evidently the cause of the failure, for you will perceive that none of them came under the periphery of the shaft, and, as those points bore the weight, there was in fact no general bed, and the stone had not sufficient strength to carry the building upon four legs as it had been doing. The lesson to be learnt from this is, first, that the ceremonial foundation stone should never be one that has to do a great amount of duty, because at such ceremonies the workmen are apt to be bewildered and to perform the work in a way that looks more pleasing than solid, and, secondly, that fine mortar and thin joints are not so good as more hearty material and stouter bed, and, thirdly, that when a circular column stands on a square stone it is well to have the joint at the four corners of the square sawn out a little, to relieve the horns which might break off, or so to alter the form as to make this needless.*

THE HALL OF ARTS AND SCIENCES.

THE Queen on Monday laid the foundation stone of the new Hall of Arts and Sciences at South Kensington. The projection of this undertaking is due in a great measure to the late Prince Consort. It appears that soon after the closing of the great Exhibition of 1851, representations were made to the Commissioners from various quarters of the want that was felt throughout England, and especially in the chief commercial cities, of a central institution in London for the promotion of scientific and artistic knowledge as applicable to productive industry. The Commissioners, of whom the Prince Consort was president, devoted their surplus funds to the purchase of an estate at South Kensington, "with the view of providing a common centre of union for the various departments of science and art connected with industrial education." Plans were then drawn out directed towards the object in view, and in these plans the central hall, now about to be erected, "formed a prominent and essential feature." The death of the Prince Consort for a time put an end to the project; but the idea of a central hall is now revived. The hall will be available for national and international congresses, concerts, distributions of prizes, art conversazioni, exhibitions of works of art and industry, and of agricultural and horticultural products; and "any other purposes connected with science and art." "The hall will be elliptical in form, and will measure on the longer axis 320ft., and on the shorter 308ft. The height from the floor of the arena, which is the lowest part of the interior, to the skylight in the flattened dome that covers the whole will be 135ft. The materials will be red brick, with terra cotta ornament, such as is now being used on the new buildings of the South Kensington Museum. The dome, of iron, will be covered outside with lead, and inside with fibrous plaster, which will admit of any amount of applied decoration. The interior will be arranged as an amphitheatre—in the centre the arena, next tiers of open seats, above which come the 1,000 guinea boxes, and above these the boxes at 500 guineas. Over the latter will run a balcony, the wall space of which will afford hanging room for pictures; while highest of all will be a large picture gallery lighted from the top. The rough sketch of the plan was produced by the late Captain Fowke, and has been carried out by Lieutenant-Colonel Scott, R.E., assisted by Mr. Townroe, a pupil of the lamented Mr. Godfrey Sykes. The contractors are Messrs. Lucas, who have undertaken to advance the money for the boxes and stalls not yet taken up, in the belief that when the hall is completed numbers of persons will be only too glad to relieve them of their responsibility. All the first tier of boxes, costing £1,000 each in perpetuity, have been already taken up, and a considerable number of the £500 boxes. The seats in the arena will accommodate 800 persons; those in the amphitheatre, 1,360; and certain boxes on the ground tier can be opened to hold 360. The first tier will consist of 43 boxes, each accommodating ten persons, and each furnished with a small room behind; while the upper tier will have 86 boxes, each holding five persons, and having also a small room in the rear. Behind each tier of boxes will run round the building a corridor 9ft. in width. The lighting at night will be by jets of gas following the horizontal lines of the building and that by day will be aided by certain lunettes which will be filled with stained glass. Above these lunettes will be frescoes. There will be three carriage entrances under cover, and twenty six entrances for visitors on foot, so that in case of accident or alarm the building, which, however will be fireproof, could be emptied, even when at its fullest, in something less than five minutes.

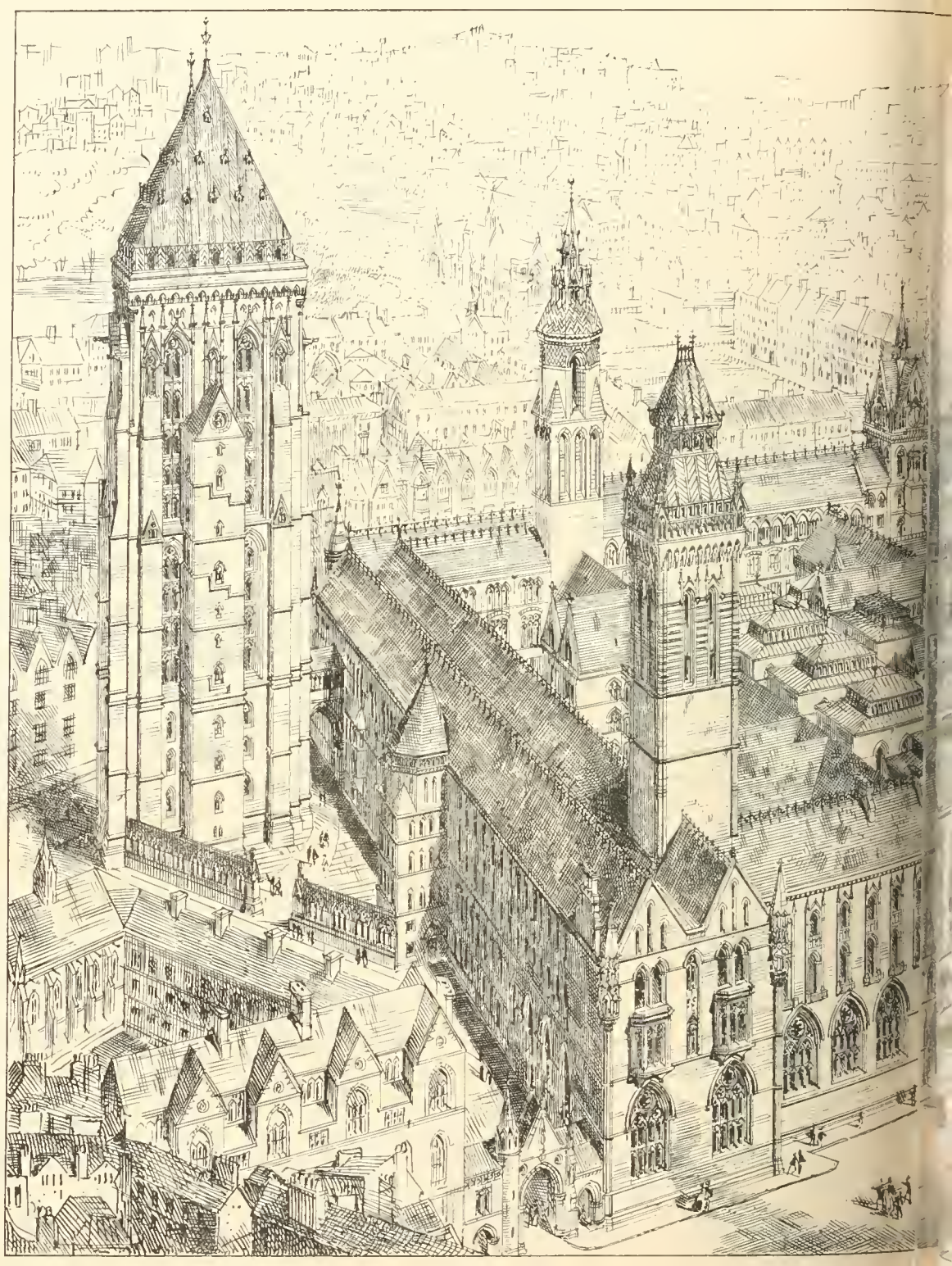
In the interior, about one-fourth of the amphitheatre will be set apart, when occasion requires as an orchestra, which will afford accommodation for a thousand performers. At the back of this orchestra will be erected the largest organ in the world, 65ft. long, 25ft. deep, and 70ft. high. It will cost £7,500, and will be furnished with ninety stops and fourteen sets of couplers. The contract has been taken by Mr. Willis. The estimated cost of the building is £200,000. It will be under the direction of a provisional committee of which the Prince of Wales is the chairman; and the management of the hall will be vested in a governing body under the authority of a royal charter.

DESIGN FOR THE NEW LAW COURTS.

THE subject of our double-page illustration this week is the bird's-eye view, from the south-west, of Mr. George Edmund Street's design for the new Courts of Justice. Next week we hope to give a detail illustration of the same design.

We have this week to record the death of Mr Edward Humphrys, who was one of the most successful engineers of the age. Mr. Humphrys was born at Penzance, in Cornwall, in the year 1808. He afterwards removed to Bristol, where he worked as a harness and boot and shoe maker The bent of his mind, however, lay in another direction and he took to engineering. About thirty years since he came to London. From that time almost up to the hour of his death, he steadily marched on as one of the most successful marine engineers of modern times. His works at Deptford are known all the world over, as from them have issued many of the largest and most powerful marine engines ever constructed.

* To be continued.



DESIGN: FOR: NEW: COURTS: OF: JUSTICE
BIRDS EYE: PROSPECT: FROM: SOUTH WEST
GEORGE: EDMUND: STREET: R: A: ARCHITECT

ST. MARTIN-IN-THE-FIELDS NEW WORKHOUSE.

THE present workhouse of this parish, in the rear of the National Gallery, Trafalgar-square, is required for an addition to that Institution, and the Guardians have secured a plot of land of about seven acres in extent at Wimbledon, upon which they propose to build a new workhouse to supersede that at present occupied.

The principles, amongst others, were laid down by the Board, that in the new house the aged, invalid, crippled, and otherwise defective people, for whose accommodation the new house is mainly intended, should be accommodated on the ground floor of the building, where they would be at once within more easy reach of the muscular assistance, medical aid, and other attention of which they are in need, and also located most conveniently for obtaining outdoor exercise. This arrangement is properly held to be the most convenient both for this class of inmates, and for the attendants upon them. The apartments of the nurses, servants, porter, master, and matron, it was also recommended should be on the ground floor, and in proximity to the kitchens, laundry, waterclosets, lavatories, baths, dining-hall, lay-halls for males and females, and the chapel. The less infirm of the inmates it was recommended should occupy the first floor, the more able-bodied the second floor, and the able-bodied the third floor, if such should be required.

The Board invited six architects to send in drawings, for which they undertook to pay fifty guineas each, and from which they would select one, the author of which should be their architect. The instructions provided that the cost should be about £25,000; that the number of inmates to be provided for should be 400; twenty of each sex to be provided with 820 cubic feet of space, and the remainder with 500ft. of cubic space in their dormitories; that six married couples should be provided with separate sleeping rooms—all honour to the Board of St. Martin!—that there should be oakum sheds, tailors', shoemakers', painters', and carpenters' shops, a dining-hall, a chapel to seat about 300, chaplain's room, doctor's room, &c., with accommodation for committee, clerk, master, matron, nurses, &c.; the materials to be of red brick and ground Bath stone; scale one-eighth of an inch to the foot; block plan twenty feet to an inch. Designs, every one of which is meritoriously careful, have been sent in by Messrs. H. M. Burton, Spring-gardens; W. Lee, Cornhill; H. R. Cotton, Long Acre; T. S. Cross; Kendall and Mew; and Marrable. The estimates of the competitors, whatever architects' estimates may be worth, range from about £28,000 to £30,000. The plot of land upon which the new workhouse is to be erected is triangular in shape, but sufficiently wide, about 400ft. at the broadest end, which fronts the highway, to admit of a block or arrangement of buildings, sufficient for all requirements, disposed in almost any manner that the several architects might prefer.

The competitors have not adhered very closely to the instructions in all respects; Mr. Burton and Mr. Marrable have observed them more carefully, we think, than the others. Both of these architects present plans notable for compactness and the facilities they afford for efficient internal administration. Mr. Lee's design is next in this respect, and if his straight line, relieved front, and the general ornate and imposing character of the design are taken into account and his estimate is to be depended upon, his plan is likely to be pronounced the favourite. His internal arrangements, ventilation, and general accommodation are worthy of the grand façade he presents, which shows its clock-tower, and six ornamental ventilating shafts, adorned with metal finials, and, in all, a building certainly free from the extreme degree of meanness in such buildings which he deprecates. Apart from the instructions given to architects it might have been expected that the essential advantages which the competitors would seek to combine in a home destined exclusively for the occupation of infirm persons, would be as compact an arrangement as is compatible with efficient ventilation and ample light; access by the infirm to the open air, and to the parts of the establishment they need to visit, such as the dining-rooms, chapel, &c., without the necessity of ascending stairs; and, generally, such internal arrangements as may best afford complete supervision by the officers, means of speedy communication between one part of the establishment and the other, contiguity in the rooms necessarily connected, such as dining-halls and kitchens, store-rooms, &c.; and dormitories and nurses. Some of the designs sent in are well adapted for hospital purposes, but scarcely for the uses of a workhouse for the infirm. It may here be stated that the able-bodied paupers of St. Martin's parish will be taken in after the new house is erected, at St. James's or St. Margaret's, as may be agreed on, and that the infirm paupers belonging to such parish will be sent to the new house at Wimbledon under arrangement. Mr. Burton's plan has a principal frontage of 330ft., with side wings receding from the front, showing an elevation of 260ft. on each side. The chapel and dining-halls are in the centre, and both on the ground floor. He provides a covered way communicating with all parts of the buildings, including the workshops, laundry, &c., which he places in the rear. The elevation is relieved by a central tower and four projecting blocks, pavilion roofed, with metal finials. The arrangements in Mr. Burton's alternative plan, of which there are unfortunately no elevations or sections, provide admirably compact accommodation. Its essential feature is a series of blocks projected from an open central octagon, or rather which ought to be left open by the removal of the chapel to the rear or elsewhere. This plan of Mr. Burton's has the merits of compactness, good light, and the best facilities of ventilation. He proposes to warm by Colonel Galton's ventilating grates, and to ventilate by Watson's siphons. The officers' rooms are conveniently grouped near the front of the building; the married couples' rooms are on the first floor, and lavatory and closet accommodation well placed and abundant. Mr. Cotton's plan provides, by its projecting wings to back and front, for complete detachment and good ventilation, and has its distinctive merits, but its demerits also. The beds must either be placed under the windows or about a foot apart in pairs. The chapel is placed over the dining-hall, which is objectionable. Mr. Cotton proposes to ventilate by the windows, and Sherringham ventilators between them, and to warm on Galton's principle. Mr. Cross's plan shows a frontage of 500ft., with a 6ft. and 8ft. corridor extending nearly its entire length. He also places the chapel on the first floor. Whatever other merits this plan may possess, compactness is certainly not one of them; it seems undesirable that so much wall surface should be exposed to be baked, or frozen, or otherwise directly acted upon by the atmosphere; and the long distances from the centre to the extremities of the building are a serious objection. Mr. Marrable adopts an octagon for the main building, but the rooms are too much crowded, and on the ground floor sixteen of these rooms have five angles each on their boundaries. The centre of the octagon, moreover, contains the chapel, which ought to be placed elsewhere, and the space left open. Mr. Marrable's accommodation, with this exception, is ample, and conveniently arranged. He places the married couples, stables, washhouses, workshops, &c., in detached buildings, and has excellent provision for warming and ventilation. Messrs. Kendall and Mew present an excellent hospital plan, with detached wings; but it is open to the objection that the day rooms for males and females are far too small, 28ft. by 20ft. each; that the chapel is upstairs; and that there are too many stairs in the building, each of them likely to be productive of an undesirable sort of ventilation. We can only hope that the guardians may arrive at a wise deliverance; they have been instrumental in bringing together an interesting assemblage of valuable designs thoughtfully elaborated, and none of them deserving to be lightly thrown aside.

DEATH OF MR. CLARKSON STANFIELD, R.A.

THIS great marine painter died after a lingering illness, at his residence in Hampstead, on Saturday, at the age of 74. Born in one of the maritime counties of the north, he was bred to the sea—a circumstance which exercised a marked influence on the bent of his artistic genius in after life. Justly celebrated, however, as he was for his sea pieces, so great was his versatility that he equally excelled as a painter of landscapes and picturesque architecture; and there was still a fourth branch of his art which, though it does not rank as among the highest, he had the merit of practically creating, and in which he stood unrivalled. His influence in this latter sphere has done much to improve the taste of the great mass of the people, and to elevate a department of art which had before his time been too much neglected; indeed hardly cultivated, as art, at all. Under his pencil the scenery of the stage assumed an almost classic character, and the art of scene-painting ceased to be a synonym with whatever was the opposite of perfection. Mr. Stanfield occupied a long time the post of decorator at Drury Lane Theatre. Having in 1824 joined the society of English artists, he devoted three years to the study of painting, and at first he applied himself to landscape painting. He came before the public in 1837, at one of the exhibitions of the British Institution, through a painting of large size, representing "Wreckers off Fort Rouge." In the same year he sent to the Royal Academy the fine production, "A Calm at Sea." From that time his works came forth in rapid succession and with increasing excellence and finish. When he was 56, his great work "The 'Victory' towed into Gibraltar after the Battle of Trafalgar" came out; then, after another two years, the "Siege of St. Sebastian." One of his finest works, "The Capture of the Smugglers," was produced when he was 64. In addition to the sea pieces properly so called, Mr. Stanfield painted a number of landscapes from scenes in all parts of his native country, and the Continent, Ireland, Holland, Italy, France. His favourite land scenery was lake and mountain, and also picturesque architecture. As long ago as 1830 he was at work upon a series of views in Venice; and four years later another series gave token of his indefatigable industry and the freshness and energy of his genius. The names of most of his works are familiar in our mouths as household words. For considerably more than a generation his varied productions have delighted all real lovers of art. His powers appeared to increase rather than decline with age; and so prolific was his genius that the mere mechanical labour of covering so great an amount of canvas with pigment must be considered, even as distinguished from the powers of conception, invention, imagination, and taste displayed, as a hard life's labour. That one man should be found to excel in branches of art so diverse as those of a Turner, a Claude, or Wilson and a Canaletti, speaks volumes for his great natural versatility, no less than his wonderful industry and application.

CORPORATION REFORM.

MR. MILL on Tuesday night submitted to the House of Commons a bill for the establishment of municipal corporations in the several districts of the metropolis coinciding with the parliamentary boundaries, which is to be followed by another measure for a central federal municipality for the whole of London. Mr. Mill disavowed any hostility to the vestries. They have done great things in making the lower grades of society familiar with public business; but the area of local administration is too small, and hole-and-corner government is always apt to engender abuses. It is of great importance that the local municipal boroughs should be of considerable extent, in order that their proceedings

may have a wide publicity, and also that the governing bodies should be composed of the highest class of men that can be obtained. The *Times*, in commenting on Mr. Mill's measure, attributes to the constitution of the municipal government of London, the fact that it is, beyond dispute, worse administered than the capitals of far less wealthy and enterprising states. There is a general indifference about its affairs, the result of which is seen in hideous public buildings, in a prevailing slovenliness and want of taste, and, sometimes, in real neglect of cleanliness. Had it not been for recent legislation, which has given some general power to various offices and boards, the evils of such a civic anarchy would be intolerable. Mr. Mill now proposes to legislate in a comprehensive manner on the subject, and certainly the objects he has in view are most desirable, and the general tenor of his proposal is reasonable. A central federal municipality for the whole metropolis would, without destroying the traditional city, extend the corporation to the whole metropolis, so that there might be one person chosen by the inhabitants of London who should be its real chief and representative, and others who might speak for the various districts in any question of general interest. The *Herald* says, if Mr. Mill can contrive to group a federal municipality around the municipality of London, his merits as a legislator will fall little below his merits as a teacher of philosophy, and his admirers will be entitled to say that the universally admired theorist has proved himself a good practical man.

Archæology.

The Annual Congress of the Royal Archæological Institute will be held at Kingston-on-Hull, under the presidency of the Archbishop of York. The meeting will commence on the 30th of July, and close on August 6.

The annual meeting of the British Archæological Association was held on the 8th inst., Mr. Planché in the chair. The following were elected officers for 1867-8:—Sir C. H. R. Boughton, Bart., president; the Earl of Effingham, Lord Boston, Lord Houghton, Sir J. Gardner Wilkinson, Thomas Close, H. Syer Cuming, G. Godwin, N. Gould, J. R Planché (Somerset Herald), and T. Wright, vice-presidents; G. M. Hills, treasurer; E. Levien and E. Roberts, secretaries; T. Wright, secretary for foreign correspondence; C. Hopper, palæographer; G. R. Wright, curator and librarian; G. F. Teniswood, draughtsman; G. G. Adams, G. Ade, W. E. Allen, T. Blashill, H. H. Burnell, J. Copland, M D., A. Goldsmid, J. O. Halliwell, J. Heywood, G. V. Irving, W. C. Marshall, Rev. S. M. Mayhew, R. N. Phillips, J. W. Previté, Rev. W. S. Simpson, C. Brent, and G. Tomline, council; J. Cato and T. Gunston, auditors. The balance-sheet shows a nett credit of £263 13s. 4d., after discharging all liabilities.

An interesting discovery, mainly due to Professor Virchow, has just been made near Daber, in Pomerania, viz., a complete Pompeii of lake dwellings. More than twenty large and as many smaller rooms or dwellings have been laid open on the western side of the Daber Lake. Each of the former is 12ft. large, 10ft. deep. The latter average from 6ft. to 4ft. and 4½ft. Between every two of the larger huts there is a distance of from 1ft. to 1¼ft.; between the smaller ones the distance is about 4ft.; while the larger and smaller ones are some 3ft. apart. It is doubtful whether the smaller buildings were meant for stables or outhouses. Many remains of bones, horns, leather, combs, needles made of bone, wooden and clay vessels, &c., were found. Similar dwellings have also been discovered near Persanzig, in the New Stettin district, which seem to have been destroyed by fire. The wood used in them, where not burnt, is still in a remarkably good state of preservation.

One of the Yorkshire tumuli, or barrows, which were recently opened near Driffield, was found to contain the skeleton of a young Briton. The right hand grasped a fine bronze dagger of the round-ended and very early type. The blade was thin and ovate-oblong in shape, the broad end having three bronze rivets, and retaining distinctly the semilunar outline of the end of the wooden handle. Upon the dagger was deposited a large flint knife, and beneath it a bronze awl or bodkin, 3in. long, square at the middle, and both ends rounded, terminating in sharp points. This is a very curious implement. Before the chest and just below the chin were five very large polished jet buttons, quite 1½in. diameter; and one button of baked clay of similar size and form, but ornamented by four lines radiating from the centre. One of these buttons had three holes at the back, the others all having two. Behind the pelvis of the skeleton was a remarkably fine bronze axe of the earliest type, evidently modelled on the plan of the old stone hatchet. The handle and sheath of the dagger had been of wood, the remains being quite evident, and the axe seems to have been enclosed in wood, the part handled being less oxidised than the rest. The whole of the bronze articles bore a very fine patina. This is the first instance, so far as is known, where a bronze battle-axe has been found with an interment in Yorkshire; and the discovery is of value on account of the association of early axe and dagger.

PARLIAMENTARY NOTES.

The subject of the pollution of rivers was brought before the House of Commons on Monday by Mr. Pollard Urquhart, who asked the Chief Secretary for Ireland whether it was the intention of the Government that the inquiries of the Royal Commissioners should be extended to the rivers of Ireland? Lord Naas said that as the Commissioners had stated it would not be possible for them to conclude their labours with regard to the rivers of England before 1868, they would have plenty of time to consider whether their labours should be extended to the rivers of Ireland. He thought it desirable that such an inquiry should take place.

In the House of Lords, Lord Lyveden asked for explanations from the Government relative to the changes which were being made in the neighbourhood of New Palace-yard. The question, he said, had excited considerable public attention, and he thought that arrangements might be effected for rendering the changes more convenient and ornamental. The present plan completely destroyed the beauty of the street from Westminster Bridge to Victoria street. Another objection was the removal of the statue of Mr. Canning, and its re-erection on a less suitable site. It had been intended when the subscription was entered into that the statue should be permanently placed immediately opposite New Palace-yard, as the available spot nearest to the scene of the struggles and triumphs of the great man whom it commemorated. It seemed now that the statue was to be placed in the small garden near Great George-street; whether or not it was private property he (Lord Lyveden) did not know. He protested against the removal of the statue from a position which it had occupied nearly forty years. The Earl of Derby replied that the arrangements which were being carried out were resolved upon by the late Government, and were sanctioned by a vote of the House of Commons last year. He did not know that any interference was designed with the approach from Westminster Bridge. As to the removal of the statue of Mr. Canning, it was proposed to form a broad footway near the statue of Mr. Canning, and immediately facing that statue it was intended to place a statue of Sir Robert Peel. He believed that the statues of both these eminent men would be placed in positions quite as conspicuous as was the site on which the statue of Mr. Canning lately stood. The alteration would conduce to the convenience of the public, and a great improvement would be shown in the appearance of the ground.

TROUBLESOME VISITORS.

As warm weather comes on, innumerable insects will wake from their winter nap, or emerge from the larva state, to enjoy their life at the expense of our comfort. The buzz of the fly will be heard on all sides, the flea will skip nimbly over the floor, and the moth and chinch will stealthily hide in the carpet or the bedstead. Scrupulous cleanliness will thwart most of them. Flies are nature's scavengers, ever ready to convert putrifying matter into innoxious substances. Keep the yard free from decaying vegetables, refuse from the kitchen and the drain of the sink, and sweeten the out-buildings with lime wash, and they will mostly emigrate to promising quarters. The flea delights in the dust and litter of the wood-house and the waggon-shed. Remove all this, sprinkle fresh lime in its place, add whitewash to the beams and boards, and the fleas will soon vanish. Take up all the carpets, beat them thoroughly and scatter pepper around the sides of the room where the edges of the carpet are to be laid. Then, once a fortnight, whip the outside breadths upon the floor with a light switch, and the remaining moths will be beaten out. The chinch or bed-bug can be routed by first washing all parts of the bedstead with cold water, and then, with a brush, applying corrosive sublimate dissolved in spirits, or an amalgam of lard and quicksilver rubbed together. Or ask your druggist for six cents worth of unguentum; mix it with lamp oil, and apply it with a brush to all joints and crevices, when the bugs will sleep, and allow you to do the same.

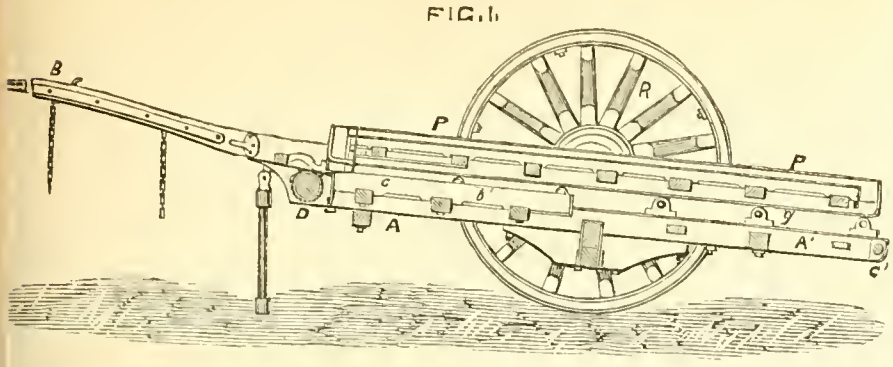
CARRIAGE OF MATERIALS.

In the transport of any material intended either to act as a component part of a structure or to constitute an entire structure in itself, there are two principal impediments to the safety of its transit. The one is its weight, the other its form or shape. Owing to the facilities at present at our command for loading and unloading heavy weights, the former obstacle is in a great measure overcome. There is not a landing-stage, wharf, or quay of any importance which does not communicate by a branch or siding with some or other main line of railway, and is furnished with powerful cranes and all modern appliances for facilitating the transport of goods and materials of almost every description. The shape of the article to be conveyed from one place to another exercises a twofold influence upon the probability of its arriving safely at its destination. If it is of an awkward, uncouth shape it becomes difficult of stowage, in fact, it does not pack well, and the pressure of contiguous objects upon it renders it liable to be fractured. Again, the danger of irregularity of shape increases according to the nature of the material. Omitting glass, slate, tiles, and some of the less important elements of construction, it may be said that cast iron and stone in this particular present considerable difficulties to safe carriage. Any sudden bends or acute angles in castings are highly objectionable for this reason as well as for others. Another point to be attended to is that there should be no extreme disproportion in the thickness or sectional area of the different parts, since the unequal contraction in cooling will bring an injurious initial strain upon the material. In illustration of the difficulty experienced in transporting large and heavy castings to even a comparatively short distance, it may be mentioned that Mr. W. Tierney Clark, in his report respecting the proposed bridge to connect Buda with Pesth, across the Danube in Hungary, remarked that were it to be built of cast-iron arches, it would be next to impracticable to obtain the safe transport of the necessary castings from England. Undoubtedly we have improved since that time, and a similar objection, judging from the large castings that have been sent to India and elsewhere, is no longer tenable. To prevent all possibility of accidents occurring to stones, they are almost universally dressed or cut upon the site of their erection, as the arrisses and chamfered parts would never stand knocking about. Where bridges are built of stone the rings, sheeting stones, and quoins are frequently dressed at the quarry, thereby saving the carting of a considerable extra weight in the shape of rough material, as the stones must be sent out of the quarry with a large surplus of substance to provide for the contingencies of cutting. Very little attention is usually paid to the description of cart for conveying the stones from the quarry to the site of the work, and numbers are broken in consequence. It is a very annoying circumstance to witness a large stone—for instance, the obtuse quoin of a skew bridge—broken clean in two just when it is ready to be put in its place, to say nothing of the delay occasioned to the work before another can be quarried and dressed. It is also a dead loss, since a broken quoin stone or ring can seldom be used for anything else but backing, especially if it be badly broken.

For some time past an excellent description of cart has been in use among the contractors for masonry work in Paris. It was invented and patented by M. Labouret, and is represented in figs. 1 and 2. The theory of its construction is based upon two principles—that of increasing the stability of a body by causing its centre of gravity to approach as nearly as possible to the sur-

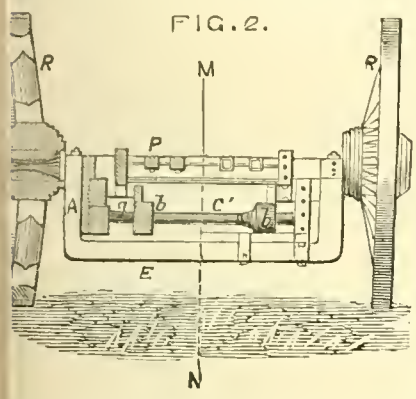
CARRIAGE OF MATERIALS.

FIG. 1.



:e upon which it moves, and that of overcoming e resistance to the motion of every vehicle by ıploying wheels of large diameter. Fig. 1 is a ıgitudinal section through the centre, and . 2 shows, to the left of the dividing line M N,

FIG. 2.



a f cross section at the centre, and to the right of ie line a half end elevation. To carry out the fir principle it is necessary to crank the axle E, an also for the purpose of having large wheels. Th shafts B are connected by wrought-iron straps to e main longitudinal pieces A, and slope upw s to a convenient height for haulage. Pa llel to the balks A are two smaller longitu- fi s b, fastened to them by the cross pieces b', wh h are themselves fastened into the front piece ee fig. 1). At the back between the two tu ers b, is an iron roller C' furnished with a ra et wheel, and a drum with similar arrange- me prevails at D, close to the junction of the sh s with the body of the cart. To receive the mo ble platform P, and facilitate its motion upon th art, the latter is provided with several little ri on rollers g, which turn freely upon pivot- bo ngs fixed at one end in the pieces b and at the th in A. Upon the platform P the stone or th substance is placed, and the whole hoisted up the cart by means of a small windlass and ru at D. During this operation the cart is in- lin l backwards with one extremity resting upon the ground. Two men are able thus to manipu- ate the heaviest load that the cart will bear. An advantage of this arrangement is that the to s may be prepared at a distance from the ui ng they are intended to afterwards or- ar at, and brought to the site with very little ıs of damage during the transit. Owing to ne nall space occupied by these carts they can e ought, together with their burden, close up t buildings, and thus got within range of the ou ng apparatus. If, on the other hand, the ar annot pass, the platform can be taken off and ar erred upon rollers wherever the stones are ed. In a work of great magnitude and im- ce, in order to employ this system of trans- or the greatest advantage there ought to be re movable platforms to each cart and they ot be thus used. Supposing the cart at e arry with the stones and the first movable at m upon it. On arriving at the site of e nstruction, this platform is removed and pty one (the second) placed upon it. h it again reaches the quarry or workshop he the stones are dressed, this second one r oved, and another loaded one (the third) if on. Having brought this to the build- s is taken off, and the first one, which has en nloaded during the interval, again raised upon it, and so on consecutively. By such a system there would be not the slightest loss of either time or labour incurred, and neither men nor horses would stand idle for a minute. The construction of these carts is simple and they could be built by any cartwright; the wood being chamfered, mortised, and bolted together in the ordinary manner. All the parts exposed to the rubbing and wearing action of the load during the time it is alternately shifting its position on and off, are protected by straps of sheet iron screwed down to the timber. The price of these carts is about £28, and a movable platform costs about £7 more, so that supposing they were to be worked upon the principle described above, a cart with its three platforms complete would cost just £50.—*Mechanics' Magazine.*

Building Intelligence.

CHURCHES AND CHAPELS.

Mr. G. G. Scott's plans for the restoration of Croydon Church have been accepted by the authorities. The exterior, so far as regards the tower and enclosing walls, will remain as they are, receiving only such repairs as may be needed. Considerable changes are proposed for the interior.

The picturesquely situated parish church of Horsmonden has been restored. The architect employed was Mr. Wyatt, and the cost, exclusive of a new organ, by Hill (the gift of Mr. J. F. Austen, of Bradford House), was £1,600.

It is said that the cathedral on the Rock of Cashel is to be restored. At a recent meeting of the dean and chapter of Cashel the matter was talked over, and elaborate plans by Messrs. Slater and Carpenter, of London, submitted. In this cathedral Divine Service was held until about the year 1752, when Archbishop Price caused the choir to be unroofed, and transferred the service to St. John's Church in the town, where the present cathedral now stands.

St. Patrick's Roman Catholic Church, Wolverhampton, was opened on Tuesday. The church, which is built in the midst of a dense Irish population, seats 700 persons on the ground floor. It has cost less than £2,700. The plan comprises chancel, nave, aisles, side chapels, and sacristy. Mr. Welby Pugin is the architect.

Batley.—The cemetery grounds and chapels here were consecrated by the Bishop of Ripon a short time ago. The ground covers an area of 12 acres, with the chapels situate in the rear centre. These are in form of the letter H, with tower in centre and chapels on each, divided from the tower by arcaded robing closets. The chapels are 21ft. by 18ft., and tower, 14ft. square and 100ft. high. The front is 110ft. long. The chapels, which are well finished, carving and ornamental decorations being freely applied, have five-light windows in each gable, with open timber roofs. The style chosen dates from the latter end of the thirteenth century, and is from the designs of Mr. Michael Sheard, architect, of Batley. The entire cost for completing the whole of the works, including purchase of land, is £15,000.

Clifton Down (Bristol).—The ceremony of laying the first stone of the new Congregational Church here was performed on Monday. The church will accommodate 800 persons, and will be in the Decorated style of Gothic. At some future time a tower will be erected, which will give completeness to the whole structure. The cost of the portion of the edifice now being proceeded with will be a little over £7,000. Mr. C. F. Hansom is the architect, and the contracts for the erection have been undertaken by the following:—Messrs. Wilkins and Sons (masons), Messrs. R. and J. Davy (carpenters), Messrs. Lewis and Sons (plasterers, &c.), Mr. Williams (smith), and Messrs. Tuckey and Son (plumbers). All the stone has been supplied from the Failand Down quarries.

Dublin.—The committee of the United Presbyterian Church have adopted a design by Mr. William Fogerty, architect, for their new church to be erected in Lower Abbey-street, Dublin, opposite the Metropolitan Hall. The plan comprises a nave 70ft. by 28ft., and two side aisles each 10ft. wide, a range of vestries at the rear, and a school-room 45ft. by 22ft., standing partly detached at one side. The style is Gothic of the Geometric type, and the building is to be carried out in granite, with dressings of freestone.

Malmesbury (Wilts).—On Thursday, the 16th inst., the memorial stone of a new Congregational Church and Schools was laid by H. O. Wills, Esq., of Bristol. The design is in the Early English style, by Mr. Stent, of Warminster; the contractors are Messrs. Light and Smith, Chippenham.

Enlargement, Building, and Repairing of Churches and Chapels.—The Incorporated Society for promoting these objects held its usual monthly meeting on Monday, at the Society's house, No. 7, Whitehall, S.W.; the Right Hon. the Earl of Romney in the chair. There were also present the Hon. and Very Rev. the Dean of York, Rev. W. Reyner Cozens, Rev. R. Tritton, Mr. John Boodle, Mr. George Cowburn, Mr. J. F. France, Mr. A. J. C. Lawrie, Rev. George Ainslie, M.A. (secretary), and Rev. C. B. Reid, M.A. (assistant secretary to the society). Grants of money amounting to £820 were made in aid of the following objects:—Building new churches at Cleadon, in the parish of Whitburn, Durham; East Leigh, in parish of South Stoneham, Southampton; and Towlaw, in the parish of Thorley, near Wolsingham, Durham. Rebuilding the churches at Childerditch, near Brentwood, Essex; Llechgynfarwy, near Bangor; Longtown, near Abergavenny; Sykehouse, near Snaith, Yorkshire; Tibberton, near Droitwich; and Whitburn, near Sunderland. Enlarging and restoring the churches at Ashton-under-Hill, near Tewkesbury; Eyke, near Woodbridge; Hardwycke, near Wellingborough; Raglan, near Monmouth; Shottisham, near Woodbridge; Tansley, near Matlock; and St. Thomas, Wells, Somerset. Rearranging the seats and restoring the churches at Burton Pidsea, near Hull; Cheverell Magna, near Devizes; Langford, near Leechdale; Michael Church, near Kington; Harwell, near Steventon, Berks; Oare, near Faversham; Pendine, near St. Clears; Reading, St. Lawrence, and Saltash, Cornwall. The grants formerly made towards rebuilding the church at Radway, near Kineton, and for restoring, &c., the Church of Great Clacton, near Colchester, were each increased. The society likewise accepted the trust of sums of money as repair funds for St. Luke's Church, Bilston, and Christ Church, Gipsy-hill, Norwood.

BUILDINGS.

A new National School has been opened at Kirby Hill. It is a Gothic structure, and has cost about £750. Messrs. Healey, of Bradford, were the architects.

Building land in the best positions is now fetching at Hayling Island from £250 to £300 an acre; at Hastings, £3,000; at Worthing, from £3,000 to £5,000; at Eastbourne, £6,000; at Southsea, from £5,000 to £8,000; and at Brighton, from £10,000 to £20,000.

The Royal Eye Infirmary, Plymouth, is being enlarged under the direction of Mr. James Hine, architect.

A new lecture hall in Molesworth-street, Dublin, has just been erected by Mr. T. N. Deane, architect. The building consists of two stories, with Gothic frontage of alternate courses of red and white brick. The entrance is in Caen-street. The hall will seat 400 persons.

A Masonic hall is about to be erected in Lame, Ireland, from designs prepared by Mr. William Kelly, C.E., Belfast.

A Transatlantic Hotel.—The gigantic Lindell House Hotel, St. Louis, which was recently destroyed by fire, is about to be rebuilt. The

Southern Hotel is the name of a similar establishment lately erected in the same city. An item or two will indicate the scale of the house. 17,000 yards of carpet were required to carpet it; 1,400 gas burners give it light. It has about 350 rooms, with over 3,000ft. of corridor; the main one on each story is 257ft., with three others crossing it at right angles, in length from about 80ft. to 200ft. The cost of "Mine Inn" was 1,250,000 dollars.

ASHTON-UNDER-LYNE.—The foundation of a new building which Mr. Hugh Mason is about to erect for the use of his workpeople at the Oxford Mills was recently laid. The workpeople have enjoyed for some time past the advantages of reading, smoking, and lecture rooms, which Mr. Mason has provided for them free of charge; and the extensive use that has been made of those rooms has induced him to erect a large building, in which there will be spacious baths and other improvements upon the original design. The existing lecture hall will seat 250 persons, and during the season of lectures and concerts it has been overcrowded. In the new room there will be accommodation for 400 persons. All the rooms will be spacious, well lighted, and lofty; and there will be large and well-arranged baths for both sexes. Messrs. Paul and Robinson, of Manchester, are the architects of the new building, which will cost about £3,000.

EDINBURGH.—The new Edinburgh University Club, from designs of Messrs. Peddie and Kinnear, architects, has just been completed. The architects have adhered to their favourite style—the Græco-Italian. The site has a frontage to Princes-street of 61ft., while it extends backwards 150ft. In the centre of the front is a bow window, which forms the most striking feature in the design. The window is two stories in height, measures 22ft. in breadth, and projects 7ft. from the front wall. It is semicircular in form, and in each story has six Corinthian columns. The building consists of two blocks, the front block containing the public rooms, morning room, library, dining-room, a number of bedrooms, &c., and the rear block billiard-rooms, smoking rooms, lavatories, &c. The front entrance is reached by a short flight of steps, and gives access to a corridor 16ft. wide, and upwards of 50ft. in length. The corridor is flanked by columns of polished Peterhead granite, bearing an entablature in Caen stone, on which the ceiling rests, and it is paved with ornamental tiles. On the left side of the corridor is the morning room, an apartment measuring 44ft. by 25ft., decorated with Corinthian columns, frieze, and panelled roof. The dining room, which measures 44ft. by 23ft., is situated behind the morning room. All the rooms upon this floor are close upon 20ft. in height. Immediately over the morning room is the library—the largest and most elegant apartment in the building. It measures 59ft. by 25ft, and is ornamented with Corinthian columns, frieze, and panelled roof. The cost of the building will be £13,000. The following are the contractors:—Mason work, Messrs. W. and D. Macgregor; carpenter work, Messrs. Watherstone and Sons; slater work, Mr. Thomas Graham; plumber work, Mr. Robert Kemp; plaster work, Mr. James Steel, Glasgow.

FROME (SOMERSET).—A building to contain a museum, library, news-rooms, and offices is being erected in this town at the cost of John Sinkins, Esq., J.P., of Wallbridge House. The design is of Italian character. The exterior will be executed chiefly in Bath stone and red Mansfield. Mr. James Hine, F.R.I.B.A., of Plymouth, is the architect. The contract has been taken at £2,100.

LANCASTER.—The contracts for the erection at Lancaster of the Royal Albert Asylum for Idiots and Imbeciles, in the north of England, has just been let. The tenders for the various descriptions of work have been taken separately, and amount together to a little over £42,000. Contracts for the execution of the whole of the work under one contract were also invited, the lowest tender for which was £43,000 by a Manchester firm, and the highest £57,000 by a Bradford firm—a difference of £14,000. Mr. C. Bayne, of Lancaster, has obtained the masonry work; Mr. Blades, Lancaster, the joiner work; Mr. Walmsley, Preston, plumbing and glazing; Mr. J. Redman, Burnley, slating; and Johnson and Brothers, Carlisle, the plasterers' work. A site for the asylum has been obtained, and the work will be proceeded with immediately, though the laying of the foundation stone will be deferred for some time.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the EDITOR, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—J. B.—R. T.—A. G. H.—C. N. B.—D. S. and Son.—E. W.P.—J. W. F.—H. O.—T. J. W., (We have for some time past thought of such a thing; we are obliged, however, for the suggestion.)—D. and Co.—G. and B.—E. J. B.—W. J.—R. C.—G. T.—J. N.—W. B.—W. E. T.—S. J. H.—A. C.

R. H.—We presume our correspondent refers to a house agent's licence, the cost of which is £2.

Correspondence.

CONCRETE BUILDINGS.

To the Editor of the BUILDING NEWS.

SIR,—I have read the various articles on concrete buildings which have from time to time appeared in the BUILDING NEWS with great interest; more particularly the letter from Mr. Tall, in this week's number, and the statements of Mr. Newton, to which Mr. Tall refers, in your issue of the 12th of April; and I cannot avoid coming to the conclusion that the matter of cheapness as compared with brickwork has been much overstated. Mr. Tall himself certainly does not allude to this further than by endorsing all that Mr. Newton had previously stated; but I have seen it asserted that the saving is from 30 to 40 per cent. Now, Mr. Newton, after employing labour at a much lower rate than it can be obtained in our large towns, says he can produce 9in. concrete walls at something less than 3s. per yard super., but he does not state the cost per yard of finishing the outside, which he ought certainly to have done in order to have enabled your readers to judge fairly of the merits of the system. Now the cheapest finish would be "render and rough-cast," worth 10d. to 1s. 2d per yard super.; but as this is hardly suitable in smoky localities, cement must be employed. This will cost in "Portland" from 2s. 6d. to 3s. per yard. Add either of these to the cost of the concrete wall and we shall then see how matters stand:—

Concrete wall 9in. thick, per yard super.	3	0
Finishing same rough cast, say . . .	1	0
Total cost yer yard super. . . .	4	0

Now, 9in. brickwork in cottages is generally done for 3s. 3d. to 3s. 9d. per yard, and, therefore, I fail to see what saving is to be effected by the concrete system, more especially in localities where rough-cast finish would be unsuitable. Perhaps, if this be deemed worth insertion in your valuable paper, some of your correspondents will kindly enlighten me on these matters.—I am, &c., F.

Chester, May 18.

CLASSIC ARCHITECTURE.

SIR,—Modern architecture is not yet in such a thriving state that the signs of life in any branch of it can be passed over without loss. To hold that Gothic is the best basis to work on, need not blind one to the merits of a design raised on a different foundation, and perhaps excelling in the very points where, for modern uses, Gothic fails. Anything like a green leaf on the Classic bough of the architectural tree is, indeed, an uncommon sight, and for that reason deserves the more attention. It is, therefore, rather surprising that the new Freemasons' Hall, with more freshness, force, and refinement than almost any recent building of the style, has received so little notice. May we hope at some time to see a view of it in the BUILDING NEWS?—I am, &c.,

JAMES CUBITT.

THE GENERAL BUILDERS' ASSOCIATION.

SIR,—In a weekly journal of the 16th inst., there is a full account of the annual meeting of the General Builders' Association, held at the Volunteer Club in this city on the 9th inst., and presided over by Mr. Alderman Neill, mayor of Manchester, who is president of the Association. His worship, in a long speech, anything but complimentary to architects generally, is reported to have said, "He believed when a good case arose and it was taken into a court of law, the builders would be able to teach the architects a lesson—to teach them for the future to be honest and do justice." Now, Sir, this appears to me to be such an unwarrantable piece of impertinence on the part of his worship, and such a gross insult to the members of the architectural profession, that it ought to be exposed and properly dealt with by the Institute of Architects and all other Architectural Societies, as also by your own and other similar journals.—I am, &c.,

WILLIAM BRUCE GINGELL, Architect.

37, Corn-street, Bristol, May 21.

Intercommunication.

QUESTIONS.

[388.]—ESTIMATES.—I gave an estimate to a gentleman to do certain work to a block of old buildings. My tender was accepted verbally, but before a witness, and I was told to proceed with the work with all speed; but just as I was about to commence I received orders that he would not have the work done, only a little patching, and that he would not give me the work, as he intended to get other estimates in for the little repairs he wanted. What I want to know is, can I compel him to pay any portion of the expense I have been put to, or what I can do under the circumstances? The materials are not of an ordinary kind and may remain on my hands a long time, and of course be a great loss to me. H. S.

[389.]—THOMPSON'S UNIVERSAL JOINER.—Can you inform me of the cost of this machine, as described in your impression of the 10th inst.? Am I right in assuming that it is worked by steam power? J. B.

[The cost of the machine is £160. It is worked by steam power.]

[390.]—TRANSPARENT PAPER.—I shall be obliged if any of your readers can inform me of any simple and expeditious way of making temporarily transparent paper for tracing? D. J.

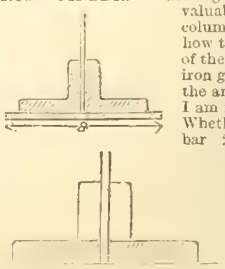
[391.]—BRIDGEWATER TILES.—Can any of your readers inform me what are the drawbacks to the more general adoption and use of the Bridgewater roofing tiles? E. H. L. B.

[392.]—TERRA COTTA.—Can any of your readers inform me what weight a terra cotta shaft 7in. in diameter will carry, and whether the interior should be filled up or left hollow? A SUBSCRIBER.

[393.]—BUILDING SOCIETIES.—I shall be obliged if you will inform me through your "Intercommunication" whether a subscriber to a Permanent Land and Building Society is liable in case of failure to be called upon for a greater amount than the shares he has taken up. In our case the shares are £40, payable by monthly subscriptions of 5s. I presume we are responsible for the £40, but I am doubtful whether that is the limit. INVESTOR.

The question raised by "Investor" is, by the managers of building societies, usually regarded as a "moot point," legal decisions having, it is said, been given both ways. With relation to terminable societies it has been advanced that even after a member may have withdrawn his deposits he may still be liable to be called upon to make up any deficiency in the nominal value of the remaining members' shares, should such deficiency arise. In permanent societies, as for example in the Temperance Permanent Land Building Society, this is not the case. Practically, however, the question of "liability" is always one of good or bad management. Building societies only deal with realised funds, and make advances on real property. They, therefore, always deal safely. But there are three conceivable ways in which they might get involved. A portion of the funds might be purloined; or property on which advances had been made might be destroyed by fire, or engulphed by an earthquake. Directors are supposed to be a sufficient guarantee against the first chance, insurance against the second, and in the supposed case of the earthquake it is probable that if the property was engulphed the members would go with it. In such a case there would be little need of further discussion as to liability. And in the case of fire liability is almost as remote. In the Temperance Permanent Land and Building Society they have in the course of fourteen years advanced £700,000 on between 4,000 and 5,000 houses, and have only had two fires with a loss covered by insurance of from £300 to £400. The conclusion is, therefore, sufficiently clear. If "Investor" is satisfied with the management of his society, he may very justifiably allow the question of liability beyond the amount of his share to remain unsolved. J. B.

[394.]—AREA OF BOTTOM FLANGE WROUGHT IRON GIRDER.—Through the medium of your valuable "Intercommunication" column I should be glad to learn how to arrive at the sectional area of the bottom flange of a wrought iron girder. I know how to find the area of the flange-plate, but I am in the dark as to the L iron. Whether the "L" is treated as bar 2½in. × 2ft. 13in. × ⅜in. according to the sketch No. 1; or that the area of the bottom part is only taken as per sketch No. 2, which is represented by being hatched—thus, 2 L iron 2½in. × ⅜in. The answer to this from one of your readers or yourself will greatly oblige A SUBSCRIBER.



REPLIES.

[384.]—LARGE RAILWAY CURVES.—The curves of railways are set off by taking off setts from a straight line. The length of the offsetts can be got from tables, or calculated. If "S. Street" will send the radius I will put him in the way of calculating the offsetts. O. S. FLINTOFF.

Middlesbro', May 22.

362.]—STAINED OAK.—The black stains in oak, ised by the rusting of ironwork, may be removed by the lowing process:—Wash over the woodwork with common drochloric acid (spirits of salts). A better result will be tained if the wood is previously washed over with a solu- n of common washing soda. The acid should not be owed to come in contact with ironwork. The cost of the d is 6d. per gallon. OBLITERATUS.

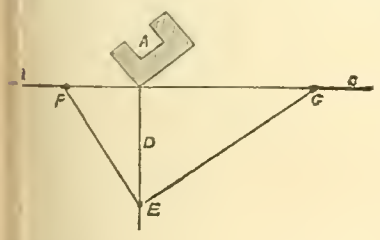
371.]—PLASTER CEILING.—I believe the correspon- nt in last week s number is well acquainted with build- ; property by the great nicety he has answered the query racked ceilings, the two things not admitted that the ceiling sts are never strutted or tied properly to withstand the ration of walking about the floors. As regards the plas- ing, the lathing ought to be double laths and butted, l the joints broke every 18in. apart, the key not less than in. The lime and hair should be two of sand to one of ne, and plenty of good hair, that should be of the best ality. The finishing coat should be two of fine washed nd to one of lime, which should be chalk. Each coat should left with a good key, and properly dry; there need then no fear of ceilings cracking.—F. F.

374.]—PURIFYING WATER.—If there be one subject re than another that deserves the serious attention of whole human family it is how to obtain pure water domestic purposes. Almost everyone knows that the ef impure water is injurious to health, yet strange to say y few adopt any means whatever for purifying it before ll. although cheap and easy methods are within the reach ll. Your correspondent, "Aqua Pura," in your last aber made a very good suggestion upon the construction house filter, and with your kind permission I will gest another way of adapting the same principle which se homely and perhaps cheaper than that of "Aqua Pa's." In the first place tie a thick piece of flannel tight nd the outlet of the water tap, then get a thick flannel about 9in. or 10in. deep and 6in. wide, put 3in. deep nall pea gravel in the bottom of the bag, then 3in. of al charcoal on the top of the gravel in pieces about the of horse beans, tie the bag over the tap and flannel iously put on; the filter is then ready for use. The tap ld be turned slowly on and a vessel placed under the to receive the water, which will be divested of all im- ties. This may be called a filter for the million. It be seen that the flannel first tied to the tap acts as the porated plate or zincing to prevent the wash of the water acing the charcoal, as recommended by "Aqua Pura." rge-sized tree pot can also be made into an excellent on the above principle. J. DUTHIE.

Peel-terrace, Preston, May 18.

36.]—BIRD'S-EYE VIEWS.—Let "S. S. S." get out lan in the ordinary way, and upon commencing his place his horizontal line so much above the ground as he may require. For instance let it be supposed that S. S." has made his plan and found the vanishing s. The building to be delineated is (say) 40ft. high; if he will place his horizontal line twice the height of ilding above the ground line, and on it his previously vanishing points, and then proceed to draw his view ordinary way, I do not think he will find any diffi- arise. He must of course bear in mind that as the of sight is so much above the building, he will see ur sides of the latter, at least as far as the roof is con- d, at once; also, that the horizontal line is by no s arbitrary as regards its position. "S. S. S." will it good practice to make a view with the horizontal elow the ground line, so as to perch the building as e on a hill. I can fully endorse your correspondent's ks with regard to your "Intercommunication," and these remarks may be of as much use to him as others been to me. W. L. B.

.]—If your correspondent "S. S. S." understands dinary system of angular perspective he has little rn to work out a bird's-eye view. It is done by sim- aising the sight or horizon line to any elevation he esire. His vanishing points will extend to the same s right and left as if he were working his drawing the sight line 5ft. or 6ft. above the base of the build- Perhaps one of the best and most simple forms of ing the correct distances of the vanishing points is llowing:—Lay down a block plan of your building ake up your mind at what distance you decide to he building at, and also the exact position you wish npy in regard to the front or side elevation of the ing. Let A be the block plan of the building fixed



angle that may be required in relation to the line which is the plane of the picture, draw a line D at ngles with B C of any length—say 100ft., 150ft., or and place on the same the distance point E, which nts the exact position in which you wish to view iding. From E draw lines to F and G parallel with e and end of the building until they reach the line od the intersection of those lines at F and G will e distance points. It will thus be seen that they ll longer or shorter to the right or the left hand as ck plan is moved at different angles from the line they will be farther apart if the object is viewed ger distance. As these are the only questions asked this explanation will suffice; but should any further ation be needed I shall be glad to afford it. W. S.

WAGES MOVEMENT.

The plasterers of Chorley are out on strike for an advance of 2s. per week. Their present wages is 26s. At present the masters object to give them what they ask.

The masons and quarrymen of Barnsley are still on strike and a settlement of the dispute is as remote as ever. Building operations, so far as the union men are concerned, are completely at a stand.

The directors of the North Staffordshire Railway, after considering a memorial addressed to them on the subject, have decided that for the future ten hours shall constitute a day's work for their engine-drivers and firemen, instead of twelve, as at present, and that in making overtime every two hours shall be considered a quarter of a day.

A correspondent of the *Times*, writing from Philadelphia, on May 10, says the labour strikes in St. Louis and Chicago for the "Eight Hours Law" have ended in the discomfiture of the working men. Those who work eight hours have been compelled to accept a proportionate reduction of pay, but in most cases the places of the strikers have been supplied by workmen from elsewhere. So many working people are now out of employment in the West that there is very little difficulty in supplying vacancies caused by strikes. Great discontent upon labour questions is, however, still reported.

BRISTOL.—Last Saturday week, with no notice, the joiners employed by Mr James Diment struck work because he refused to allow them to come (at their option) at seven in the morning—his rule being that men not at work by six should not be admitted till nine. This rule (which has been in force over twenty years) he found necessary owing to the other various branches of the building trade necessitating the engagement of a number of painters, plasterers, plumbers, &c., in the busy season. The said joiners were paid by the hour, as are all other men in Mr. Diment's employ, excepting masons who are engaged by the day. The places of these men who have struck have all been filled up by non-society men and a non-society foreman, and since these men have been at work they have constantly been subjected to annoyance from society men.

The New York correspondent of a London journal, writing of the price of labour in the United States, says—A comparison of the prices paid to mechanics in 1860 and those paid now has shown that the working men are not aggrieved by their employers. Their wages have been raised proportionately with the general rise in prices. Here are a few instances:—In 1860, carpenters were paid from 2 dollars to 2 dollars 50 cents a day; they now get from 3 dollars 50 cents to 4 dollars. Stonecutters received 2 dollars a day, whereas they are now paid 4 dollars. The general rise has been about a dollar a day, but some trades have been more fortunate. Cloakmakers (female), who in 1863 were paid 4 dollars a week, now receive 8 dollars. Cuff and collar makers now get 9 dollars a week instead of 6 dollars as formerly. The carpenters are now again out on strike, and the masters are yielding, both in this state and in New Jersey, for they have contracts on hand which must be finished by a certain date.

STRIKE AGAINST A NON-UNION MAN.—Last week twenty masons in the employ of Messrs. Wood, builders and contractors to the Midland Company at Derby, struck work in consequence of the firm having refused to discharge a non-society man. The man has worked for Messrs Wood for several years, and the character which his employers give him is that of a steady, respectable, and good workman; in fact, he has won their confidence to such an extent that they have placed him in the post of foreman. The facts of the case are as follow:—On Tuesday, May 8, two delegates from the Masons' Society went to Messrs. Wood with a request that they would discharge their foreman at once, or insist on his joining the union. Each of these proposals the firm at once rejected. On the following Saturday, a union man in the employ of the firm went to the office, and inquired of Mr. Wood, jun., what decision they had come to respecting the obnoxious man, and saying that if they still adhered to what they told the delegates all their men would be withdrawn. The firm refused to depart from their expressed determination, and when Monday morning came the men all struck, those out of the town as well as in being warned from working. The firm is now without a mason—excepting, of course, the one on whose account the turn-out has taken place—and all their works are now stopped.

STATUES, MEMORIALS, ETC.

MONUMENT TO THE LATE MARQUIS OF HUNTLY.—Last week the foundation stone of a monument in memory of Charles, tenth Marquis of Huntly, who died in 1863, was laid at Aboyne with Masonic honours. The design is a plain obelisk, 16ft. at the base and 6ft. at the top, with a pedestal of 19ft. It is built of rough blocks of granite taken from the Hill of Mortlach, on which it stands, and is surmounted by a sort of Dagmar Cross. The extreme height of the monument is 60ft. The architect is Mr. G. H. Smith, London; the builder Mr. R. Dinnie, Aboyne.

THE BROCKETT MEMORIAL.—A meeting of the committee and subscribers was held at Gateshead on Saturday to select the designs for the proposed memorial to the late Mr. W. H. Brockett, of that town. The Mayor presided. Several plans were submitted, and eventually the execution of the work was entrusted to Mr. Pearson, of the Red Barns Marble and Stone Works, Newcastle. The monument, which is to be erected over the grave of the deceased in St. Edmund's Cemetery, Gateshead, will be of Gothic character, and will be 17ft. in height.

THE LATE JOHN GIBSON.—A monument is soon to be erected to the late Mr. Gibson, in the Protestant Cemetery in Rome, the sculpture to be a simple profile head, executed by the late Mr. Spence, Gibson's most successful pupil. The epitaph has been written by Lord Lytton. The sum of £50 was all the great sculptor left for his own monument, desiring it should not be exceeded.

LEGAL INTELLIGENCE.

ACTION FOR THE LOAN OF A WINDOW.—Mr. Davenport, a chemist, of Wolverhampton, sued Mr. Edwin Turner for the sum of £10 for the use of a window on the occasion of the Queen visiting Wolverhampton. Upon the understanding that the canvas which covered the pavilion in would be taken off if the weather continued fine, the defendant engaged the room; but when Mr. Turner and his family went the canvas was not taken off, and they were unable to see the ceremony. Verdict for the defendant.

"COMPELLED BY THE UNION LAWS."—A decision of some interest in connection with trades' unions was given in the Bail Court last week. There was some time since, at Bridgewater, a strike of the carpenters in the employment of a builder named Kitch. Mr. Kitch employed a man named Jordan, who was not a member of the carpenters' union, and the strike was in effect a refusal on the part of the men to work with him. One of them, named Skinner, was deputed by the union to wait on Mr. Kitch, and he did so, handing to that individual a paper, on which was written the following:—"I am requested by the committee of carpenters and joiners to give the men in your employ notice to come out on strike against James Jordan, unless he become a member of the above society, not being any way disrespectful to you or him, but being compelled by the union laws." For serving this notice Skinner was brought before the magistrates, and charged with threatening Mr. Kitch and Jordan. He was convicted, and this was an appeal against the conviction. The judges, after hearing the arguments, held that the notice was a threat, and affirmed the conviction.

PAROCHIAL CHURCH PEWS.—A rather important case as to pew rents in parochial chapels was heard at the Liverpool County Court a few days ago. The case arose out of the following circumstances. A Mr. John Owen, who claims to be the owner of a pew in Kirkby Church, sued Margery Leech for 14s, the rent of the pew in question for two years. The pew was let to defendant about twenty years ago by plaintiff's grandfather, at the rate of 7s. a year, which, until the last two years, had been regularly paid, first to the grandfather, afterwards to the father, then to the mother, and several times to plaintiff himself. For the last two years, however, defendant had refused to pay, acting, she said, on the advice of the curate, the Rev. J. Gray. Plaintiff admitted that he had no documents relating to the reletting of the pew. It was contended for the defence that as the place had been a parish church from time immemorial there could not be, according to law, any such thing as the letting or sale of pews in a parish church. That could only be done under a special Act of Parliament, and such an Act the plaintiff had not produced. The seats in parish churches were under the control of churchwardens, who had a right to appropriate them to the use of parishioners. Judgment was given for the defendant.

General Items.

We are requested to announce that the office of the Society of Engineers, in Paris, during the Exhibition, is at 190, Rue St. Dominique, where members desirous of obtaining information can apply. Members who purpose joining the Council on the 1st of June are requested to communicate with the secretary not later than the 25th inst., at the Society's Office, 6, Westminster Chambers.

We believe that a memoir of the late Sir Robert Smirke, R.A., is being prepared by a member of his family. It will be read at an early meeting of the Royal Institute of British Architects, by Mr. Sydney Smirke, the brother of the deceased gentleman.

Mr. Tidd Pratt, in dissolving by request a friendly society at Trentham the other day, said that of the 25,000 societies enrolled in his department he could not recommend 20 as absolutely safe. The society had existed 56 years, and was reduced to insolvency by the large number of superannuated members.

The masonry of the Paris Exhibition building measured 52,000 cubic metres, of which 37,000 cubic metres were for foundations, 10,000 cubic metres for the fine art and archæological galleries, and 5,000 cubic feet for the walls forming the machinery galleries.

The current expenses connected with the National Gallery amount to an annual sum of £15,894, of which the director receives £1,000, and the keeper and secretary £750. The establishment at Trafalgar-square costs £1,523, of which £327 is given to curators and £786 to police. A sum of £621 is spent at South Kensington, £2,000 is allowed for travelling expenses, agency business, &c., and £10,000 for the purchase of pictures.

It was announced at the last meeting of the Institution of Civil Engineers, that the president's annual conversazione would be held on Tuesday evening, May 28, when the co-operation of the members and visitors was requested, in order that a collection of models of engineering construction and of works of art, worthy of the Institution, might be made.

Mr. William M'Connell, the well-known draughtsman on wood, died after a lingering illness on the 14th inst. He will be best remembered by his illustrations to Mr. Sala's "Twice Round the Clock," which were full of spirit. The death of Mr. M'Connell adds another to the long list of clever artists who have passed away within a comparatively short time, and at a very early age.—We have also to announce the death of M. Champollion-Figeac, the Nestor of French archæologists, which happened last week at Fontainebleau.

Candidates for the Pugin Travelling Studentship, in connection with the Royal Institute of British Architects, are requested to send in their applications, together with specimens of drawings, testimonials, &c., as required by the deed of trust (copies of which can be obtained on application to Mr. C. L. Eastlake, at the rooms of the Institute, 9, Conduit-street), on or before January 31, 1868.

The losses by fire in the United States were (referring to insured property alone) in 1861 about 18,000,000 dollars; in 1865, 43,000,000 dollars; and in 1866, 100,000,000. If the losses continue to increase in like proportion for three years more all the insurance companies must go by the board.

The General Council of Vice-Presidents, the Executive Committee, and the London Committee of Advice, met on Thursday last at the London offices, to consider the prospects of the National Exhibition of Works of Art at Leeds in 1868, the Earl Fitzwilliam, president, in the chair. The general progress of the exhibition was stated by Mr. W. B. Denison, chairman of the executive committee, to be very satisfactory, and the promises of support from the various private collections continued to be highly encouraging. Mr. Waring, the chief commissioner, explained the object of the exhibition in procuring works of the highest artistic excellence, and impressed upon the meeting the national importance of such an exhibition, which was not confined to Yorkshire, rich as that county was in works of art, but would represent fully the great treasures of art preserved in the private galleries of the country.

A fine wooden bridge, erected six or seven years ago over the River Boyne, contiguous to the monument to commemorate the famous battle fought there in 1690, last week gave way on the north side of the river, and half the structure fell into the water. It is proposed to erect a stone bridge in its stead.

An interesting experiment with an omnibus drawn by steam on common roads has just taken place in Paris. A small locomotive of 2½-horse power, and linked to a vehicle containing places for twenty-six persons, left the Exhibition building at about half-past two in the afternoon, and proceeded to the Quai de Billy, on the opposite side of the Seine. There Prince Napoleon, accompanied by Admiral de la Roncière le Noury, and other persons, took their seats in the omnibus, which set out along the avenue which leads to the Place du Roi de Rome, ascending without difficulty the incline. On arriving at the summit of the rise, the vehicle set off at a speed of between seven and eight miles an hour by the Avenue de l'Empereur to the Porte de la Muette, where it entered the Bois de Boulogne, passing with the greatest facility amidst the lines of carriages along the banks of the lakes at the hour most frequented, and, after describing circles within an exceedingly limited space, descended from the avenue to the Pont de l'Alma.

The Minister of Public Instruction in France has determined upon establishing a general exhibition of works of art of all kinds produced in the art schools of the State, and has devoted the terrace of his mansion to the purpose. Three galleries, which will be finished in a few days, will be appropriated as follows:—In one will be specimens of modelling, architectural works, casts in plaster, plans, linear drawings, ornaments, stereotomic models, and mathematical and philosophical instruments. The central gallery will be devoted to drawings, engravings, lithographs, and photography; and in the centre will be an exhibition of needlework, lace-making, application, embroidery, and other works produced by the pupils of the female schools. The third gallery is intended for a different purpose, namely, the exhibition of objects of value and interest, brought from Mexico by the Scientific Mission, with a systematic collection of ores and minerals made in Mexico, and a number of statuettes of divinities of past times, and other works of art.

The ordinary general half-yearly meeting of the Bath Stone Company (Limited) was held the other day, when the report of the directors was presented. The report may be accepted as a satisfactory proof of the prudence and success of the management of the company. The sales have increased upwards of £800 during the past half-year, as compared with the previous half-year, although the period over which the present accounts extend includes the winter months, during which there is always a falling off in the stone business. The accounts show a balance of £352 16s. 9d. to the credit of profit and loss, out of which the directors recommend the payment of a dividend of 6s. 3d. per share, being at the rate of 7½ per annum on the paid-up capital of the company on the 1st January, and carrying over a balance of £78 14s. 8d. The whole of the directors were re-elected; and on the motion of Mr. S. G. Mitchell, seconded by Mr. Bruce, a sum of £50 was voted to them, as an acknowledgment for their past services. It was also proposed and unanimously agreed to, "That the directors be authorised to issue 150 of the un-issued £15 shares, and to make calls up to £10 at such times as they might deem desirable."

MEETINGS FOR THE WEEK.

TUES.—Royal Institution.—"On Spectrum Analysis," by Professor Miller, 3.
Institution of Civil Engineers.—The President's Annual Conversazione, 9.

WED.—Society of Arts.—"On the Water Supply of the Metropolis, in Relation to the Conservancy of the Thames and its Tributaries and the demand of the Water Companies," by Mr. J. Bailey Denton, 8.

THURS.—Royal Institution.—"On Ethnology," by Professor Huxley, 3.

FRI.—Royal Institution.—"On the Chemistry of the Primæval World," by Mr. F. Sterry Hunt, 8.
Royal United Service Institution.—"Communications, Military and Commercial, between the Steppes of Central Asia," by Colonel R. A. Shafto Adair, 3.

SAT.—Royal Institution.—"On Ethnology," by Professor Huxley, 3.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

2734 R. HOLLINGDRAKE. CERTAIN IMPROVEMENTS IN THE CONSTRUCTION OF METALLIC PIPES OR TUBES TO BE EMPLOYED FOR THE PURPOSES OF HEATING BUILDINGS AND FOR EXTINGUISHING FIRE THEREIN. Dated October 23, 1866.

This invention relates to a novel construction of such pipes or tubes as are employed for heating rooms or buildings by steam, and is designed to obtain sufficient heat with an economy of steam, and also to render such pipes available for the extinguishing of fires occurring in the rooms. The improvements consist in dividing the pipes longitudinally down their length by means of a "midfeather" or division plate, so that the upper part of the pipe only contains steam or heated air which is sufficient to impart heat to the entire surface of the pipe. The lower part is perforated with apertures, and this part is in connection with a steam chest or boiler, and the connection is closed by a tap or valve, so that when fire occurs this valve is opened and steam is admitted into the room and the fire is thereby extinguished. *Patent completed.*

2736 G. WETHERED. IMPROVED APPARATUS FOR WASHING CLAY AND OTHER EARTHY MATTERS. Dated October 23, 1866.

The object of this invention is to facilitate the operation of washing clay and chalk for the use of brickmakers by means of a wash mill that is capable of being readily shifted to any required position. Instead of constructing the bed of the washmill with bricks or masonry, as heretofore, the inventor sinks a pit of any given length, and of a semicircular form in cross section, and over this he mounts a long horizontal shaft armed with radial blades or beaters, set helically around the shaft. This shaft he mounts in bearings carried by baulks of timber or standards placed at the ends of the pit, and by means of suitable gearing set in motion by a portable engine he gives rotary motion to the shaft. The pit he fits with supply and discharge sluices and the clay or chalk that is required to be washed is fed into the pit in regulated quantities, and water is at the same time pumped or run into the pit. The rotation of the blades or beaters will produce a thorough trituration of the clay and chalk by the time the material has reached the discharging sluice; the material having attained the consistency of cream, will then be discharged through the sluice into "backs" or reservoirs where the earthy particles will be allowed to subside. *Patent abandoned.*

Trade News.

TENDERS.

BECKENHAM.—For two shops at Beckenham for Colonel Wilson. Messrs. Haywood and Blashill, architects. Quantities by Mr. D. Cubitt Nichols:—Axford and Co., £1,996; Beeton, £1,979; Cox, £1,850; Tully, £1,797; Newman and Mann, £1,795; Russell and Breeze, £1,794; Hill and Keddell, £1,660.

DOVER.—For the new Catholic Church, Maison Dieu-road, Dover, for Right Rev. Dr. Grant. Mr. E. Welby Pugin, architect:—A. Matthews, £2,593 8s.; Elgar and Son, £2,563; J. Laundsford, £2,365 5s.; H. P. Mackenzie, £2,375 6s. 8d.; F. W. Richardson, £2,375 5s. 9d.; Ayers and Son, £2,281; W. J. Adcock, £2,261 4s.; Hodgson and Osborne, £2,255 15s.

HOLBORN VALLEY IMPROVEMENTS—FARRINGDON-ROAD BRIDGE.—The tender of Messrs. Hill and Keddell for the foundations and granite piers, under Mr. Wm. Haywood, C.E., has been accepted by the City of London Improvement Committee—£13,841.

KENTISH TOWN.—For erection of new Primitive Methodist Chapel, Grafton-road. Mr. W. A. Dixon, architect:—Mann, £1,665; Staines and Son, £1,648; Manley and Rogers, £1,627: Tarrant, £1,616; Garrud, £1,473.

KENLEY (SURREY.)—For the erection of a villa residence on the Riddlesdown Park estate. Mr. Thomas Danby, architect. Quantities supplied by Mr. Shrubsole:—Residence—Harrison and Edwards, £1,105; Perkins, £1,093; Warne, £1,075; Hazell, £1,064; Jarrett, £1,050; Garrud, £970; Rowland and Aldridge, £969; Wilcox, £959; Poxon and Smith, £955; Nightingale, £942; Tims, £905. Conservatory—Harrison and Edwards, £83 10s.; Perkins, £80 10s. 8d.; Warne, £67; Hazell, £70; Jarrett, £75; Garrud, £52 10s.; Rowland and Aldridge, £83 13s.; Wilcox, £85; Poxon and Smith, £65; Nightingale, £61; Tims, £68. Fences—Harrison and Edwards, £19 10s.; Perkins, £34; Warne, £25; Hazell, £16 17s. 6d.; Jarrett, £22; Garrud, £14 10s.; Rowland and Aldridge, £13; Wilcox, £9 10s.; Poxon and Smith, £25; Nightingale, £35; Tims, £25.

LANCASTER.—For the erection of the Royal Albert Asylum for Idiots and Imbeciles of the northern counties. Tenders for the whole of the works:—

A. Neill, Bradford	£57,873
E. Hughes, Liverpool	49,250
J. Bulmer, Darlington	47,994
C. Burkitt, Wolverhampton	46,045
G. Gradon, Durham	45,874
J. Houseman, Wolverhampton	45,513
Warburton, Bros., Manchester	44,116

Tenders for portions of the work:—

Excavating and masonry, C. Baynes, Lancaster	£23,643
Woodwork, J. Hatch, Lancaster	14,580
" J. Shaw, Lancaster	14,323
" Lauder and Mellanby, Hartlepool	13,292
" C. Blades, Lancaster	11,921
Slating, Hartley, Lancaster	3,070
" J. Redman, Burnley	2,609
Plastering, Hartley, Lancaster	3,161
" R. Ormerod, Carlisle	3,032
" Johnstone Bros., Carlisle	2,122
Plumbing and glazing, T. Dickinson, Lancaster	3,357
" " J. Walmsley, Preston	2,600

The committee accepted the following as the lowest tenders:—

Excavating and masonry, C. Baynes, Lancaster	£23,643
Woodwork, C. Blades, Lancaster	11,921
Slating, J. Redman, Burnley	2,609
Plastering, B. Johnstone Bros., Carlisle	2,122
Plumbing and glazing, J. Walmsley, Preston	2,600
Total	£42,900

MOULTON.—For restoring and reseating the parish church at Moulton, near Spalding. Mr. William Smith, John street, Adelphi, architect:—Wallis, Market Rasen, £4,527 Cave and Halliday, Greetham, £3,598 10s.; Brown, Lynn, £2,858 10s.; Bennett, Lynn (withdrawn).

MOULTON.—For a school chapel at Lea's End. Mr. W. Smith, architect:—Cave and Halliday, £838; Wallis, £765 Brown, £760; Bennett (withdrawn).

ODELL.—For new farm buildings to be erected at Odell, Beds, for the Rev. W. Hunt. Mr. John Usher, Bedford architect:—Dickens, £560; Freshwater, £455; Cunvin, £423; Robinson, £339.

PINNER (MIDDLESEX).—For the erection of a house for Mr. R. Brown. Mr. Reichel, architect:—Chappell, £2,997; Till, £2,705; Poxon and Smith, £2,195; Kemp £2,120; Lamble, £1,743.

ROCHESTER.—For cattle market. Mr. Henry Andrews city surveyor:—Contract No. 1, ironwork—Smyth and Co £896; Spencelaigh, £629; Cliff, £1,170; Norton, £788 W. Naylar, £770 (accepted); Coulson, £697; Hollingsworth £650; Hill and Smith, £805 6s.; Sollitt, £815; Colyer, £845 West, £805; Deuce, 1,325. Contract No. 2, builder's work—Smyth and Co., £1,232; W. Naylar, £499 (accepted) Coulson, £985; Sollitt, £710; West, £500.

ST. ALBAN'S.—For the erection of a house for Mr Ernest R. Raitt. Messrs. Bacon and Bell, architects:—Wilcox £1,260; Poxon and Smith, £1,125; Warne, £1,050; Webb £1,040.

STAFFORDSHIRE.—For the erection of a Methodist New Connexion Chapel at Nolstanton, Staffordshire. Mr. Ralph Dain, Burslem, architect:—Blackhurst, Burslem, £811 19s. Bennet and Brindley, Burslem, £730; Trevor, Newcast. (accepted), £745 10s.

TAFFORDSHIRE.—For alterations and additions to "The ntwoods," Staffordshire, for G. C. Adkins, Esq. Mr. ard J. Payne, F.R.I.B.A., of Bennet's-hill, architect. ntities supplied by Mr. Thomas Mansell, of Colmore-Birmingham:—Horsley Brothers, £1,612; Jeffery and ebard, £1,600; Cresswell and Son; £1,590; William thews, £1,590; James Wilson and Son, £1,550; Wm. ridge (accepted), £1,500.

PROPERTY SALES.

MAY 20.

THE MART.—By Messrs. Norton, Trist, Watney, and -Freehold plot of building land, situate on the high between Streatham and Croydon, sold for £120.

ehold plot of building land, situate as above—£170.

ehold plot of building land, situate as above, £1,200.

ehold nursery gardens, with house and premises ied, containing 2a. 0r. 8p., situate in the parish of ngdon, Berks—£650.

ehold nursery garden and meadow containing 3a. 0r. ituate as above—£660.

ehold house and close of arable land, containing 3a. p., situate as above—£660.

Messrs. Taplin and Co.—Absolute reversion to a y of £900 8s. 11d., Bank of England stock, on the of a gentleman aged 51 years—£400.

ehold house and shop, No. 9, High-street, Bow, term rs unexpired, at £40 per annum—£85.

Messrs. Cleave and Underhay.—Copyhold residence, as the "Swiss Cottage," situate at Farnham Royal, with garden grounds, orchard, and stabling, let at er annum—£2,020.

Messrs. Nash.—Freehold house, with garden, small k and orchard, stabling, and two cottages, situate in rish of Betchworth, Surrey, £915.

BATH STONE OF BEST QUALITY.

BELL and SAUNDERS, Quarrymen and Stone Mer in Bath. List of Prices at the Quarries and Depots, st for Transit to any part of the United Kingdom, ed on application to Bath Stone Office, Corsham' 16 -[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

m Bowlting, Tavistock-terrace, Portobello-road, er, June 4, at 12—John Siggers, Ricksmanworth, June 4, at 11—Francis Alfred Thornes, Harwood-Fulham, builder, June 3, at 11—George Rogers, rest-hill, contractor, June 5, at 12—Joseph Wilde, ill, house painter, June 12, at 11.

TO SURRENDER IN THE COUNTRY.

Charlesworth, jun., Tunstall, ironmonger, June 15, ohn Head, Lingfield, Surrey, blacksmith, May 30, illiam Headley, Cap Coch, near Aberdare, con- May 23, at 12—Squire Holdroyd, Cleckheaton, ay 28, at 9·45—Edward Hudson, King's Lynn, th, May 28, at 11—William Kendall, Camborne, May 29, at 12—George Place, Woodside-lane, near , Durham, mason, May 28, at 11—George Star- , Claughton, contractor, May 31, at 11—Francis eunet Thorpe, contractor, May 30, at 12—Thomas Shelf, near Halifax, stonemason, May 31, at 10— essop, Southampton, builder, June 1, at 12—James Leeds, journeyman joiner, June 7, at 12.

PARTNERSHIPS DISSOLVED.

p and Co., Bradford, Yorkshire, builders—W. and , Middlesbrough, blacksmiths—Hall and Ginger, d, builders.

DECLARATIONS OF DIVIDENDS.

andon, London-wall, builder, dividend 1s. 2d.— ntiford, Torquay, builder, dividend 1s. 5d.—J. r, Durham, joiner, dividend 1s. 2d.—J. Simpson, -on-Tyne, builder, dividend 4s. 8d.—T. P. Lewis, d, builder, dividend 10½d.

DIVIDENDS.

J. F. Dixon and W. Blenkinsop, Leeds, engineers— Chiboall, Apsley Guise, builder—June 13, T. pper Clapton, bricklayer—June 7, F. Huggett, , painter—June 18, W. Waterton, Swinton, h.

BANKRUPTCY ANNULLED.

George Edmund Child, Southwold, ironfounder.

SCOTCH SEQUESTRATION.

ler Lumsden, Coatbridge, tube and shovel maker, t 12.

ICES OF SITTINGS FOR LAST EXAMINATION.

, S. H. Coates, Turner's-road, Limehouse, builder S. W. Tadgell, Park-terrace, Balham, builder— . D. Johnstone, Duke-street, Westminster, civil -June 14, W. Williams, Plaistow, builder—June 7, nel, Bow, painter—June 12, J. T. Cooley, Wad- lumber—June 12, S. Gyer, Gordon-street, City- rth, plumber—June 12, C. Jones, Holderness- outh Lambeth, carpenter—June 14, T. Jordan Surrey, builder—June 25, R. Middleton, Nottingder—June 13, J. Willbourn, Leicester, builder— and J. Burney, Darlington, architects—June 17, Tynemouth, builder—June 7, J. Fewster, Hull, June 24, J. Briggs, Great Crosby, near Liverpool, une 3, J. Winders, Parr, bricklayer—June 11, J. alifax, mason—June 18, E. Howard, Whitfield, une 7, W. Flatt, Holbeck, painter—June 17, J. Westwoodside, joiner—J. Griffiths, Melincrythau, th, carpenter—June 10, T. Graty, Shrewe- penter—June 17, J. Hughes, Llanfairfechan,

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9	0	£10	10	Archangel, yellow ..	£11	10	£12	10
Quebec, red pine	3	0	4	10	St. Petersburg, yel..	10	10	11	0
" yellow pine..	2	15	4	0	Finland	8	0	9	0
St. John N.B. yellow	0	0	0	0	Memel.....	0	0	0	0
Quebec Oak, white..	5	5	6	0	Gothenburg, yellow	8	10	10	10
" birch.....	3	10	4	10	" white	8	0	9	0
" elm	3	10	5	0	Gefle, yellow.....	9	0	11	0
Oantzic oak	5	10	6	0	Soderhamn	9	0	10	10
" fir	2	0	3	10	Christiania, per C.,				
Memel fir	3	0	3	10	12 ft. by 3 by 9 in.				
Riga.....	3	0	3	0	yellow	16	0	22	0
Swedish	1	15	2	2	Deck Plank, Dantzic,				
Maste, Quebec red pine	6	0	7	0	per 40 ft. 3 in.	0	15	1	4
" yellow pine..	5	0	6	0	PUMICE STONE pr ton	5	0	8	0
Lathwood, Dantzic, fm	4	10	5	0	OILS, &c.				
" St. Petersburg	6	10	7	10	Seal, pale....per tun	43	0	0	0
Deals, pr C., 12 ft. by 3					Sperm body	115	0	125	0
by 9 in., duty 2s per					Cod	40	0	0	0
load, drawback 2s.					Whale, Sth. Sea, pale	44	0	0	0
Quebec, white spruce	14	10	21	10	Olive, Gallipoli.....	63	0	0	0
St. John, white spruce	13	10	15	10	Cocoanut, Cochin, ton	57	0	0	0
Yellow pine, per re-					Palm, fine	40	0	0	0
duced C.					Linseed	36	0	0	0
Canada, 1st quality.	17	0	19	10	Rapeseed, Eng. pale..	37	10	0	0
2nd do.....	12	0	13	10	Cottonseed	28		34	10

METALS.

IRON:—									
Welsh Bars in London .. ..per ton	6	15	0		0	0	0		£
Nail Rod	7	10	0		8	0	0		2
Hoops ..... do	8	15	0		9	0	0		
Sheets, Single ..... do	9	15	0		10	0	0		
Stafordshire Bars .. .. do	7	15	0		8	10	0		
Bars, in Wales ..... do	5	15	0		6	0	0		5
Rails ..... do	6	0	0		6	5	0		net
Foundry Pigs, at Glasg. No 1 .. do	2	13	6		3	7	0		
Swedish Bars ..... do	10	10	0		12	10	0		
STEEL:—									
Swedish Keg, hammered .....per ton	16	0			0	0	0		
Swedish Faggot ..... do	10	10			12	10	0		
COPPER:—									
Sheet & Sheathing, & Bolts ....per ton	85	0	0		89	0	0		
Hammered Bottoms ..... do	96	0	0		98	0	0		
Flat Bottoms, not Hammered .. do	91	0	0		93	0	0		
Cake and Tough Ingot ..... do	74	0	0		0	0	0		
Best Selected ..... do	81	0	0		83	0	0		
Fine Foreign ..... do	86	0	0		88	0	0		
Yel. Metal Sheathing & Rods ....per lb	0	0	7½		0	0	8¼		
TIN:—									
English Block .....per ton	89	0	0		0	0	0		2½
do Bar ..... do	90		0		0	0	0		
do Refined ..... do	92	0	0		0	0			
Banca ..... do	92	0	0		0	0	0		nett
Strait ..... do	87	0	0		0	0	0		
LEAD:—									
Pig, English .....per ton	22	0	0		0	0	0		2½
" Spanish Soft ..... do	19	15	0		0	0			
Shot, Patent ..... do	23	0	0		0	0			
Sheet ..... do	21	15	0		0	0	0		
White ..... do	30	0	0		31	10		0	
SPELTER:—									
On the Spot .....per ton	22	5	0		22	15	0		ne
ZINC:—									
English Sheet .....per ton	28	0	0		0	0	0		
Devaux's V. M. Roofing Zinc .... do	28	0	0		0	0	0		*
* And 5 per cent. discount if laid upon the new system.									
QUICKSILVER .....per btl	8	18	0		7	0	0		
REGULUS OF ANTIMONY.									
French .....per ton	34	0	0		0	0	0		

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THOS. GOFFEY, Clerk to the Board.

15, Lord-street, Liverpool, May 7, 1867.

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By order of the Board.

R. J. CHEESWRIGHT, Clerk.

Townhall, Croydon, May 22, 1867.

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LONDON, FRIDAY, MAY 31, 1867.

THE PARIS EXHIBITION.

THE amphitheatre of peace now stands on the field of Mars—at least, so exclaims an enthusiastic French friend with whom we approach it. The sentiment is pretty and the antithesis complete, but we have so frequently seen the antitheses of these peaceful exhibitions carried out in warlike results that we utterly abandon all sentiment in the matter. In spite of all the struggling and combating for medals and orders, both decorative and commercial, which is going on the building, or rather its contents, offers much to the thoughtful consideration of an architect. In order to extract the utmost gain from it it is our intention to issue a series of notices on those matters in which the architect is, or ought to be, deeply interested. We have deferred doing this till now, in the hope that the buildings might be completed before we commenced our review, but so much yet remains to be done that if we postpone our observations till such an indefinite period they will be of little use to our readers. We shall firstly, therefore, consider architecture as here represented, either by actual constructions or by drawings; secondly, materials useful in the construction of architecture, or in the decorative arts connected with it; and thirdly, the decorative arts themselves.

It would seem natural that we should take the architecture represented in the building itself as our starting point, and gladly should we have done so if we could have discovered it, but after minute search we have failed to do so. That it had an architect and also an engineer we are officially told, but beyond borrowing the idea of the plan from English sources, and issuing working drawings to a contractor, we do not see what functions they have fulfilled. The building is unnecessarily ugly, nor does it offer any new point in construction to compensate for this; common, ordinary, and vulgar, it is a disgrace to all connected with it; there is no one feature in it which redeems it, and not one new fact does it teach. We complained of the building for 1851, we loudly grumbled at '62; but worse beyond compare is this; and on looking back at the past from the standpoint of the present, we regard Sir Joseph Paxton's design as a thing of beauty, and begin to think that Captain Fowke's was not so very bad. We had hoped that after the influence of the first shock we received at the sight of it had passed away, more intimate acquaintance with it might discover some detail on which we could speak favourably, but our hope has been a vain one, and the more we see of it the more we dislike it and the greater mistake do we discover it to be. The very shape of the plan is an error, and those English gentlemen who fought so strenuously to obtain the affiliation of the design would now, we think, renounce their coveted bantling with disgust. No one promising feature is visible from the interior, no one main line to which the visitor can revert to guide him or indicate his position, nor does the plan offer any compensating advantage in classification to recompense for this lack of effect. Certain classes of production in certain countries overlap the limit assigned to them, or overflow in all sorts of directions, with various annexes here and there, and in wondrous isolated structures in the park. The much-be-praised systemisation of the French is at fault, and for comparative examination of the products of the various countries represented the plan is much worse than any we have before encountered. The pretence of order misleads us, and we find in unlooked-for places, detached from kingdom, country, or class, groups of objects of interest which necessitate fresh comparison and induce further and indefinite research. Even the very entrances themselves, on which a Frenchman generally lavishes his ornament, if not exhibits his taste, are miserable holes cut through the outer wall, and by no approach can anything like a dignified first impression be obtained. The state entrance is through a Chinese construction of thin woodwork and Dutch metal, rivalling a second-rate tea garden in grandeur, and the "velum" of dark green, which forms a covering some 300 yards long between it and the building, has a heavy, funereal, and catafalque-like look. Of the other approaches that of La Bourdonnaye is the only one aiming at pretence, and it is almost as good as an ordinary wooden railway station; and to crown all, by which ever way you enter the building, the first thing which greets you is the din and noise of machinery in full work. Dismissing, then, with a parting malediction the building itself, we shall confine our future remarks to its contents, and that aggregation of smaller buildings it has attracted round it.

The art of architecture is represented in the building by a very numerous collection of drawings from most European nations, the French, of course, being by far the largest exhibitors, indeed outnumbering those of all the rest; and very striking are their drawings to the English architect, who will here see the handiwork of men whose names are familiar to him in England. Viollet le Duc, Bœswillwald, Questel, and many others whose literary contributions to the history of architecture are popular amongst us, are exhibitors here, though he will regret to find chiefly as recorders of the past than as exponents of the present state of the art. The French collection of drawings divides itself into two classes, the one being drawings of existing buildings made with a view to their preservation or restoration, and the other designs for new works. The former of these classes again subdivides itself into two series, the one being drawings of buildings in France, made by well-known architects under the direction of the Government, and the other drawings of ancient buildings in Rome, Greece, and Asia Minor, made by young aspirants in the Imperial Academy at Rome as a portion of their professional education. The fact of such drawings existing is one worthy of reflection; and we see here a national interest taken in the art, not only as a matter of history in the past, but as an education for the future. How many fine monuments in our day have passed away, and no record of them retained but in the inaccessible pockets of private portfolios? Here we see careful and accurate drawings of the chief monuments of France, extending from the Roman work at Arles down to the productions of the fifteenth century. It is to the facilities afforded by such a collection as this that we owe such careful and exhaustive treatises as those of M. Viollet le Duc, and if some Minister of Public Works from England will but look at these with the same interest as does his French equivalent, he will see a way in which he can benefit his country, and win back for us a knowledge of our art history, the which, from the ready made road provided by others for the study of theirs, is rapidly being forgotten. We are proud to recollect it was the works of our countrymen, Rickman and Britton, which led the way to the study of mediæval architecture, and regret that other countries are now passing us in this direction; this, fostered by public grants, has so increased in France that we find handbooks of architecture and archæology printed for the use of schools, and a knowledge of these sciences considered as a necessary part of the education of the young Frenchman. The drawings setting forth the past architecture of France will be found on the walls of the promenade surrounding the central garden, but are not included in the catalogue; and the singular brick churches of Toulouse and peculiar Romanesque work of central France will attract strongly, by their difference from anything like what we have in England; and M. le Duc's drawings of Pierrefonds and Carcassone will, though known from his engravings, be welcome as specimens of his drawing. M. Devrez's drawings of Mont S. Michel will attract the artist and the architect; and we commend this series of drawings to the young student, not only as an archæological study, but as a wonderful exhibition of what architectural drawings may be made. For exactitude and cleanness, and for faithful representation of texture, where objects of decorative art are exhibited, they are the finest models he can study. We desire to linger longer amongst them, there is so much of beauty and history embodied in them; but we feel that our main interest, lies in the rising rather than the setting sun, and it is in the onward progress of the art and its professors that our chiefest interest lies; so we re-enter the building to examine the "Restaurations des Monuments Antique, par les Architects Pensionnaires de l'Academie Imperiale de France, à Rome."

There are a remarkable series of drawings made by young men who, having passed through the ordinary home education of an architect, are sent, by a process it would be easy to engraft on our Royal Academy, to complete their studies in Rome, and thence despatched on architectural missions to various portions of the ancient world, to examine and record those monuments which still exist; but it is even more with the feeling that we are regarding the works of the architect of the future that we look at this collection, than the interest the works themselves inspire. Here are about a dozen monuments of antiquity illustrated by drawings of great size and careful execution; they consist, generally, of a plan and elevation of the monument as it exists at present, and restored drawings from the same point of view, together with such details as have been found during the research. Many of them are of well-known works, often before illustrated, but some are the effect of individual and original research. The first of this series is a restoration of the Appian way, exhibited by M. Ancelet. It is a very careful and painstaking study, exhibiting great technical dexterity; the plan and drawings of the actual state of the remains being marvellously well drawn and coloured. Of the restoration we do not think so much—most of the work has been before illustrated; nor are we quite disposed to agree with all M. Ancelet's renderings. But in the restoration of the more than fifty tombs his drawings exhibit, there is plenty of room for the divergence of opinion. M. Boitte gives us thirteen very large and able drawings of the present condition and restored state of the Acropolis and Propylem at Athens, to which, as a work of restoration, the remarks we have before made equally apply. Very careful and painstaking has M. Boitte been, and it is a work calculated to teach the executor very much; but we think it is greatly to be regretted that, with all their beauty of colouring and power of geometrical drawing, the French architects do not pay more attention to perspective; such studies as these, illustrated by perspective views from actual points, would do more to impress upon the student and the public the actual appearance of the buildings illustrated, than numerous geometrical elevations and sections, be they never so huge, and some of these are nearly 10ft. square. M. Bonnet's drawings of the restoration of the theatre and temple in the triangular forum at Pompeii are excessively clever, and reflect great credit on him both as an architect and a draughtsman; and M. Daumet's eight drawings of the Tibertine villa are excellent, forming one of the best studies of Roman civil architecture we have seen; and some portions of his view from the Tibertine way are worthy of careful examination.

M. Louvet's restoration of the Acropolis of

Sunium is very clever, and an excellent study of the polychromatic decoration of Greek architecture. There are many other drawings of this class which deserve examination, particularly by the younger members of the profession, who, we hope, will largely visit this portion of the Exhibition. Amongst them we would particularly note M. Vaudremer's able drawings of the present state of the Castel S. Angelo, at Rome, and its restoration as the Mausoleum of Adrian. M. Thomas's fragment of the Panathenaic frieze we commend most highly, and his essays on the restoration of Khorsabad are noteworthy from their singularity. M. Guillaume's drawings of the temple of Rome and Augustus, at Ancyra, exhibit some singular details, beautifully drawn; and his restoration of the Theatre at Verona is particularly good. But of all this class of studies those which will attract the most attention are the very able ones of M. Baudry for the restoration of the ancient fortress of Træsmis, in Roumania, to which country he was sent in 1865 to study the ancient military stations on the Lower Danube. Træsmis was one of the most advanced outposts of the Roman empire on the Dacian frontier, and consequently the most frequently attacked, from which cause it might be expected that the fortifications would be those of the principle most esteemed by the Romans; and it was a wise induction to seek in this point for an example of their highest art in castrametation. M. Baudry has found great remains, and from these ably restored the fortress, taking for his point of time its condition between the rebuilding in the time of Augustus and its destruction in the fourth century. His very admirable and free drawing represents it under a state of siege, just at the point of an assault, and his military engines are disposed in the strategic positions they would naturally be employed in. The style of drawing is very unusual in France, and a bold, free, broad line takes the place of the engraver-like one usually adopted, and is in that loved by Mr. Burges in the days when he worshipped Villars de Honcourt, and before he adopted that French-like mode of drawing his beautiful ones for the Law Courts are prepared in. Of the studies of mediæval buildings and their restoration there are very few here, and M. Lisch is the only contributor of any worth. His drawings of the port of La Rochelle restored are very fine, and extremely interesting to an Englishman, as is also the restoration of the fortification of the town of Orleans to the time of its siege by the English in 1428, and its defence by Joan of Arc. These may be said to complete the archæological view of French architecture, and we reserve for our next notice our review of the more interesting aspect of it, as represented by its present condition.

MAGNESIAN LIMESTONES.

THERE are two kinds of magnesian limestones—original and metamorphic—the one description having been originally formed as a magnesian limestone, and the other being the result of agencies operating subsequently to the formation of the rock. In lithological character magnesian limestone is very variable. "It is sometimes," says Mr. J. B. Jukes, in his admirable essay on "Geology," in the "Encyclopædia Britannica," "of a powdery, earthy, and friable texture; sometimes splits into thin slabs, some of which are flexible; sometimes forms singular concretionary masses, a number of balls touching each other, either like bunches of grapes (when it is called botryoidal) or like musket balls or great piles of cannon shot. Many of these balls, on being broken open, are found to have a radiated structure. That all these curious forms have been produced subsequently to the deposition of the mass is shown by the fact of the lines of deposition or stratification proceeding through them regularly, without regard to the spherical outlines or radiated structure of the balls."

Magnesian limestones are so called because they contain a great deal of carbonite of magnesia. Professor Daniell has remarked that the nearer these limestones approach to equivalent proportions of carbonate of lime and carbonate of magnesia the more crystalline and better they are in every respect. The state of crystallisation is of the utmost importance, since the stone cannot resist attack where this is incomplete. The best varieties of this description of building stone are those in which there is at least 40 per cent. —Professor Daniell has stated 50 per cent. —of carbonate of magnesia, and 4 or 5 per cent. of silica. Magnesian limestones occur mostly in the midland and north-east portions of England. The colour of the superior descriptions is a pleasing light brown, of warm and somewhat iron-like tint. Their density is considered to be greater than that of the oolites; and, according to Professor Ansted, the labour on them is intermediate between that on the gritstones and Portland, and they can be obtained of any required size. They are also four times stronger than Portland, and in the country they are capable of resisting atmospheric influences. Indeed, the buildings erected out of London of magnesian limestones have shown signs of the utmost durableness. Koningsburgh Castle, in Yorkshire, a Norman structure, built of coarse-grained and semi-crystalline magnesian limestone from a neighbouring hill, is in such a good state of preservation that though the mortar has in many places disappeared, the edges of the joints are in a perfect condition. The same may be said of Hemingborough Church, in the same county, which was erected in the fifteenth century. It is built of a white crystalline magnesian limestone, resembling that obtained from Huddlestone, and no traces of decomposition are apparent in the structure, not even in the spire.

Bolsover stone is chiefly a carbonate of lime and carbonate of magnesia, semi-crystalline, and of a light yellowish-brown colour. Submitted to analysis it gives the following results:—Silica, 3·6; carbonate of lime, 51·1; carbonate of magnesia, 40·2; iron alumina, 1·8; water and loss, 3·3. Its weight is 151lb. 11oz. per cubic foot, and the price at Bolsover is 1s. per foot ordinary block, or 4s. 6d. (sawn) per yard, 3in. tooled flags. This was the stone employed for the Houses of Parliament, and of the result of the selection we shall have something to say further on.

Anston stone (Yorkshire) was also used for the same building, because large blocks were more easily obtained than of that of Bolsover. It is a compact, semi-crystalline rock, consisting of nearly equal proportions of carbonate of lime and carbonate of magnesia. It weighs about 150lb. to the cubic foot; and is not very costly either to obtain or work.

Huddlestone consists of about the same component parts as Bolsover magnesian limestones. Analysed it gives the following results:—Silica, 2·53; carbonate of lime, 54·19; carbonate of magnesia, 41·37; iron alumina, ·30; water and loss, 1·61. In colour it is a whitish cream. It weighs 137lb. 13oz. per cubic foot.

The stone obtained from *Roach Abbey* is also of a whitish cream colour. It is composed chiefly of carbonate of lime and carbonate of magnesia, with occasional dendritic spots of iron or manganese, and is semi-crystalline. The analysis of the 1839 Commission gives:—Silica, 0·8; carbonate of lime, 57·5; carbonate of magnesia, 39·4; iron alumina, 0·7; water and loss, 1·6. The weight per cubic foot is 139lb. 2oz.

Park Nook magnesian limestone is of a similar constitution:—Carbonate of lime, 55·7; carbonate of magnesia, 41·6; iron alumina, 0·4; water and loss, 2·3. It is of a cream colour, and has been used for sinks and tanks, but the water wastes in them. The weight per cubic foot is 137lb. 3oz.

In Bristol Cathedral, Chepstow Castle, and Spofforth Castle, there are some noteworthy contrasts between the magnesian limestones and the sandstones employed in the erection of those edifices. In each of these buildings the sandstone has considerably suffered, while the magnesian limestones have remained about as perfect as when erected. But when we come to London, with its peculiarly trying atmosphere, we find the case different. Magnesia has a great affinity for sulphur, and the sulphurous acid to be found in our London smoke has such an effect upon these and the softer limestones that they soon decay.

The history of the erection of the Palace at Westminster presents a series of mistakes which experience would not again permit to occur. In 1839, it will be remembered, a commission was appointed to inquire what was the best and most enduring stone to employ for the erection of the new buildings. The work of the commissioners was immense. They examined hundreds of buildings, old and new, inspected quarries, made careful analyses, but, as we have often pointed out in these columns, they did not extend their inquiries far enough. They were much affected in their conclusion by their admiration of Southwell Minster, which it was believed had been built of stone from Bolsover. It was subsequently found that the Minster was not erected of this stone, but of Mansfield stone.* Anston stone was adopted at the suggestion of Mr. C. H. Smith, when large blocks were required. Anston stone was used both for the Geological Museum in Jermyn-street, and for the Hall in Lincoln's Inn-fields. In the first case it stood well, but the selection was so bad in the latter building that it has shown signs of decay. Mr. T. Grissell, in a letter to a contemporary some years ago, assured the public that the stone for the Museum of Geology in Jermyn-street, and for the Houses of Parliament, came from the same quarry, and were got by the same workmen, without reference to any special selection, or for any particular building. He added:—"The situation of the two buildings not being identical may have something to do with the increased stability of one over the other. Of course in the same quarry there are some portions of the rock more dry and of closer texture than other portions, and, to use a technical term, more crystalline in its nature. But, at that time, we were not informed that to ensure perfect durability it was necessary that the stone should be perfectly crystallised." Here, indeed, was the great mistake. The Government, although admitting the desirableness of appointing a resident chemical agent at the quarries, who should examine every block of stone, refused even to pay the nominal sum of £150 to Mr. C. H. Smith for this purpose. The consequence was, that the softest stone was used, and not sufficient importance was attached to the selection of the most crystalline portions of the rock. Mr. Gilbert Scott some time ago pointed out that those parts of the building in which the magnesian limestone from Mansfield Woodhouse had been used were in high state of preservation, so that he believed that "had the same stone been used throughout, the evils since complained of would have

*Mr. Stevenson, of Nottingham, who is well acquainted with the building stones of that neighbourhood, in a communication to the Building News of September 28 last year, states that he is of opinion that Southwell Minster is not built of limestone from Mansfield, from the simple fact that the Mansfield limestone is of a very poor, small, and thin-bedded character. It is not quarried as a building stone, nor indeed is there anything to lead to the supposition that it was quarried for that purpose in ancient times. He also adds:—I have a firm conviction that the stone for Southwell Minster was procured from the limestone cliffs in Pleasley Vale, a district beyond Mansfield Woodhouse, and distant about four miles from Mansfield. In early times our forefathers would always select a cliff or escarpment from which to procure stone, as this method was preferable to delving on level land. Amongst the inhabitants of this out-of-the-way district you hear traditionally that the stone for building Southwell Minster was procured from what they call the *Long-stone Cliff*. The very name of the cliff seems to carry conviction with it.

been avoided. The structure of the stone, when examined with a magnifying glass, appears much more perfectly crystalline than some other stone, which seems to suggest a *primâ facie* probability of its being more durable." As every one knows, this is not the case with the Bolsover stone. The carvings are now almost obliterated, the upper stonework has decayed, and it is doubtful whether any portion of the ornamental details will last beyond a few more years. We have before now reported the results of our own inspections of this stone, and in our journal of May 4, 1866, gave an account of the unsuccessful processes that have been applied to prevent and stop the exfoliation of the stone. Professor Ansted declared at the Royal Institute of British Architects that he did not believe any process under heaven would prevent the powdery stones from decaying at the New Houses of Parliament; and he laid all the fault of the decay to the matter, not of the atmosphere, but of selection of material. The late Mr. C. H. Smith made a most extraordinary revelation at a meeting of the Institute with regard to the way in which the stone for the Houses of Parliament was selected. He said that the selection had been decided upon from the examination of a piece of stone, 18in. by 9in., which he (Mr. Smith) had sent up from a quarry six miles distant from that which had first been chosen as the source of supply.

It is not necessary to pursue this subject further. We have said enough to show that for external purposes in London, at least, magnesian limestone is not fitted. We only regret that Mr. Pennethorne should have employed this material for the new portion of the Record Office in Fetter-lane, which has just been completed.

THE ROYAL ACADEMY EXHIBITION.

Article III.—Sculpture.

When the "distinguished foreigner" read the declared opinions of two such distinguished authorities as the Prince of Wales and the President of the Royal Academy, as given in the report of the late annual academic feed, that Sir Edwin Landseer's lions at the foot of the Nelson pillar are the best works of sculpture in London, and afterwards chanced to see those clumsy misshapen bronze castings, he might well rub his eyes almost with incredulity, albeit already holding a very contemptuous opinion of the pretensions of the British School of Art. Could it be possible that those overgrown unintelligent masses, the haphazard amateur efforts of a man who had had no previous experience of the practice of this noble art, were to be accepted as the *ne plus ultra* of what British genius could achieve in it? The idea were too monstrous, too humiliating, to be entertained even of a poor barbarous nation of shopkeepers.

Such, we apprehend, will have been the first impression upon the mind of every man of perception and reflection when he considered the extravagant eulogy which had been sent forth from high places upon the wretched achievements of an impromptu painter-sculptor, which now stand unhappily conspicuous in the very worst of the so-called "finest site in Europe." Such were our own reflections when we made our way down to the dismal cell where the sculptor's art does penal servitude during the three months of exhibition season every year. Surely, thought we, we shall find something here to vindicate British sculpture from the opprobrium thus cast upon it by the first prince of the land and the first fashionable portrait painter of the day. Alas! no. We had reckoned without our host, and we were not long in discovering that these exalted personages, in the wild rhapsodies in which they have indulged *à propos* of the Landseer lions, were but making a sorry jest of the degraded position to which the once grand art of sculpture had descended amongst us.

Those or where the fault we will not pretend to say, but without doubt the present display in the sculpture room of the Royal Academy is a thing to be much ashamed of, and following by facile descent upon the ignominious displays of many preceding years, it leaves us much in doubt whether from some national and uncontrollable cause the art of Phidias be not altogether extinct, if, indeed, it ever lived amongst us; whether there may not be essential conditions for success in it which are impossible to us. One thing is certain, that whilst the ancient Greeks restricted their efforts in sculpture to the representation of ideal divinities, and occasionally the portraits of heroes and philosophers, whose characteristics were of world-wide renown, the chief occupation of the modern sculptor is with portraits, whole length or bust size, of dukes, lordlings, aldermen, and parvenus of all sorts—anybody, in fact, who can pay for it, with their wives and families, about whom nobody knows or cares anything, except the self-satisfied individuals themselves and their immediate following. A natural corollary to the family bust is the memorial statue, the joint result of local sycophancy and professional touting, the latter in preponderance. In the few cases in which poetic or fancy subjects are attempted the very lowest type of treatment is adopted as the surest means of touching the sympathies and the purse strings of the vulgar patron.

Descending now to particulars, we find ourselves, when arrived in the extremely ill-shapen and worse-lighted sculpture gallery, surrounded by the usual array of busts in marble, in plaster, and in terra-cotta, staring vacantly upon the desolateness around. High in the midst, as becomes the elevated rank of the originals, are fearfully lifeless effigies of the Duke of Edinburgh, the late Duke of Cambridge, and Prince Teck, the first by Mr. C. Bacon, the last two by Mr. G. G. Adams. Amongst the remaining legion of portraits we noticed only the following:—W. R. Ingram, sculptor (No. 1,032), by C. Vanden Bosch, in cap and dressing-gown, well and modestly treated; the Rev. John Henry Newman (No. 1,035), by T. Woolner, remarkable for the character of the original; Richard Cobden (No. 1,037), by J. B. Philip, by its breadth and calmness contrasts to advantage with the vulgar smirking attempt upon the same illustrious original (No. 1,057), by J. Adams. Baron Marochetti displays his power of caricature instead of character in the hard, perky twist which he gives to the good-natured countenance of Sir Edwin Landseer (No. 1,040). Lord Palmerston is represented under two aspects—the first by J. Durham (No. 1,058), "at the period of his life when he became Prime Minister," the exact authority for which we confess we do not quite recognise; the other, "a posthumous bust" (No. 1,134), by G. G. Adams, not very pleasantly suggestive, rightly or not, of a certain touting race for the first modelling of the features of the defunct minister, which was recorded in our columns at the time of the occurrence. This effort of Mr. G. G. Adams is bad enough as regards a man who is no longer in a position to defend himself; but what are we to say of Mr. C. B. Birch's cruel skit upon a living statesman, Earl Russell? Is it possible that his lordship gave sittings for its production and authority for its exhibition? If not there should be a law to protect public men, and the public eye, which delights in doing homage to the hero of the day, from being so trifled with. The same remark applies to the Duchess of Colonna Catiglione's cast of her bust of the Empress Eugenie (No. 1,180), for its fearfully exaggerated expression, albeit the authorities of Paris have sanctioned the original by admitting it in the Hotel de Ville. T. E. Boehm's bust of Colonel Loyd Lindsay, intended to be executed in bronze, may be mentioned with praise for the judicious manner in which the sash and other accessories are "kept down," so as to meet the conditions of that process. Mr. Noble's "General Garibaldi" (No. 1,138) is a spirited and truthful likeness. The Prince Sigismund, the lately deceased infant son of the Crown Prince and Princess of Prussia (No. 1,111), by Miss S. D. Duvant, is only remarkable for the elaborate revelation of a dislocated arm. In connection with the portrait bust must be classed the memorial effigy, of which we have three—too truly melancholy specimens—respectively by Mr. Sharp, Mr. Leifchild, and Mr. T. Woolner, which would be more at home in the creative stoneyards of the City-road.

Amongst the few attempts at poetic or fanciful work in the exhibition, that which is entitled to most attention is the "Europa" (No. 1,000), by Mr. C. F. Fuller. The attempt to represent a bull swimming in a sea of stone is an innovation, and a trying one, upon the prescriptions of the art; but Mr. Fuller has got over the difficulty with less of offence than we could have considered the case to admit of, the slight ripple of the water being but just indicated round the shoulder and back of the animal. The figure of Europa, which is entirely nude, is modelled with learning and skill, supposing it to be recumbent in a state of absolute repose; but whilst holding on by the neck and one of the horns of the animal, there is no indication of the strain thereby occasioned upon her delicate frame, much less of onward motion in harmony with that of her bearer. Mr. Fuller is not the first who has sunk beneath the weight of his materials.

The Academic body is but poorly represented on the present occasion. Mr. M'Dowell is content with a single specimen of his ability, entitled "The Young Mother" (No. 995), and said to be

Holding the mirror up to Nature,

whilst more literally she is holding up a veritable oval handglass to a fat, uninteresting baby. Mr. W. C. Marshall exhibits three performances, neither of which betrays the slightest indications of poetic inspiration, or even of the feeling for beauty which is sometimes of the nature of poetry. "Jael" (No. 998) is a miserably attenuated and painfully distorted figure. The heroine of "The Tryst at the Fountain" (No. 1,002) is a clumsy, half-naked woman, uncomfortably seated on the edge of a bank. "Olindo and Saphronia" (No. 1,011) is a more extensive work than either of the preceding, consisting of a group of two figures chained to a stake, as described in Tasso's "Jerusalem Delivered," but the subject is not only repulsive in itself, but utterly inappropriate for sculpturesque treatment. Turning with a shudder from Mr. Marshall, we light upon something extremely execrable in Mr. E. Davis's "Love Triumphant" (No. 1,012), execrable as an embodied libel, not only upon divinity, but upon humanity also, in the monstrous proportions and wooden build of the Venus. "Souci and sans Souci" (No. 1,014), by Mr. C. Vanden Bosch, is a sorry conceit, contrasting the woful face of a bereaved mother with the broad grin of her unconscious child—an idea probably suggested by Mr. Shultze's highly-intellectual entertainment of "Masks and Faces." Mrs. Thorneycroft attempts the difficult feat of representing a girl skipping in marble (No. 1,001), and to prove the obduracy of the dilemma in which she has involved herself places one of the feet against the stump of a tree (which the rope could not possibly pass), whilst the other reposes firmly on a cluster of vegetation. Mr. E. B. Stephens's "Lady Godiva" (No. 1,007) is another common-place nudity, of which we have too many, and might just as well have been called "Venus at the Bath," or "Susannah," or any other female celebrity known occasionally to have gone in *dishabille*.

In conclusion upon this most unsatisfactory exhibition, the falling-off displayed in it, as compared with what has been within the memory of the living age—since, for instance, the days of Baily, Westmacott, and Chantrey, not to go back to Flaxman—is patent, undeniable. Reverting to our introductory observations,

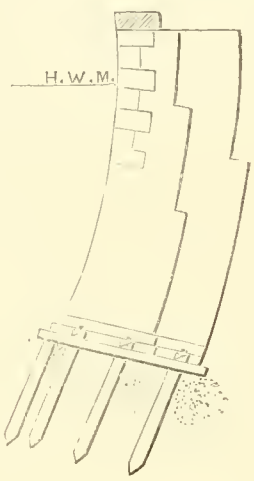
one is at a loss, at first, to account for this regrettable tendency in the destinies of a noble art; but a little reflection, strengthened by a survey of existing examples, serves to suggest that the cause lies in a condition of affairs which is the secret of weak and unsatisfactory results in so many other branches of human performance, viz., want of subject, and, consequently, want of purpose—want even of the spirit which in an educated mind should give purpose and effect to a comparatively uninteresting theme. Yes, the bust and memorial trade has swallowed up the whole thought of our workers in the plastic art, and when in the slackness of business they attempt the model of a poetic or fancy subject, in the hope of picking up a commission for it, life-size or statuette, it is done listlessly, weakly, unlearnedly, and consequently only to the deeper degradation of the producer and of his art. Above all, we notice in this, as in many previous exhibitions of sculpture, a total absence of attempt to bring the appliances of the art to bear upon the sister art of architecture, one of its most legitimate uses. This would be bad enough at any time, but at a time when every architectural design for public buildings involves the introduction of more or less sculpturesque aid, the neglect is fatuous and deplorable.

ELEMENTS OF ENGINEERING.

Docks.—No. 7.

In the examples previously given in our articles on this particular branch of engineering relating to the best form or profile to be adopted in dock walls we illustrated two different shapes, one of which experience had proved to be a complete failure; and the other, although superior to the defective form, was still not the best either theoretically or practically considered. Both of these walls were furnished with fenders or half balks of timber fixed upon their faces at intervals for the purpose of preventing the rubbing or impact of vessels against them. As their name indicates they are intended to defend and preserve the upper portion of the wall, and are consequently renewed as often as they become rotten and worn away. If a wall be built of brick a fender is absolutely indispensable, but when of stone it may be omitted, provided especial care be taken to ensure the solidity and strength of the upper part of the wall. The example given in fig. 1 is the last we shall adduce relating to wet dock walls, and it will be seen that it differs in many points from the two previously illustrated. The outside row of piles are driven first, and a wall piece bolted to it 12in. by 6in.; behind the wall sheeting piles are driven, and then the other two rows of bearing piles as shown in the figure. The curve of the wall is of the parabolic form, and the back is concentric with the face line. Upon the tops of the bearing piles transoms or sleepers of half timber are laid, and over these longitudinal balks 12in. by 4in. are bolted down through them into the heads of the piles. The whole of the timber is the best Memel, and a layer of concrete is put in under the sole pieces. An essential difference between this wall and that given in our last article is that the thickness of the latter was uniform throughout its whole height, whereas in the present instance it varies, increasing by steps or offsets towards the bottom. Both theory and practice demand that the thickness of a wall for whatever purpose it may be intended, should increase towards the base; so that when this condition is not fulfilled one of two evils must necessarily result, either the section of the wall is too slight and the thickness too small where the greatest pressure is brought upon it, or it is too strong on those parts where the pressure is but of very little amount. If the uniform thickness of the wall be sufficiently strong to resist the maximum pressure, it will, of course, be quite strong enough at any other point, but the waste of material will be very great; and at the present day, although it is always right to be on the safe side, yet such security is not allowed to be purchased, as in former times, by an enormous waste of the material employed in construction. Not only science and the advanced state of our knowledge compared with that of our predecessors, forbid anything approaching to the old "rule of thumb," but the greatly enhanced price of materials and cost of labour likewise render it imperative that all structures be built with a due regard to economy and the rules of theoretical proportion. In fact, we are rather prone to fine down the dimensions of our works too much, and sometimes design so strictly in accordance with theory that the downfall of the structure only convinces us that practice must always modify the abstract laws and principles deduced from pure mathematical or geometrical reasoning.

The wall represented in the figure is constructed of brick, although, as we have pre-



viously mentioned, stone is to be preferred when it can be procured at a reasonable cost. An excellent plan to render the upper portion of dock walls more durable when they are built of brick, is to face a portion of it for about 12ft. from the top or under side of coping with large sized stones. This arrangement is shown in the cut, where the stones are in alternate courses of headers and stretchers which bind them well into the rest of the wall. The height of the courses should not be less than 18in., nor the length of the stretchers below 3ft. Although not shown in our present example, yet a through course of stone may be introduced with advantage to the strength and binding of the wall. In all cases the coping stones should be large and well joggled or dowelled together with iron cramps. Lead dowels are very frequently used, but the preference is to be given to iron wherever large stones are concerned. They are also made of fine concrete and cement, the chief advantage of these last being that they do not stain or rust the stone as the others sometimes do, and thereby spoil its appearance in an ornamental point of view. It should be kept in mind that while some attention must be bestowed upon the appearance of the face of the wall, yet there is not the slightest necessity for carrying out fine work in the backing, which, in fact, it is much better to put in roughly, provided it be done substantially, solidly, and dry. Some years ago the late Mr. Walker, an eminent hydraulic engineer, introduced from France the use of artificial concrete, or béton as it is termed, as a substitute for the ordinary backing of dock walls; and there is very little doubt that it might be employed here not merely for backing, but also in many instances for facework, with considerable advantage and economy. It is used in enormous masses and quantities at Cherbourg in the construction of the new harbour and breakwater, and it is a common occurrence there to deposit at one operation upwards of 50 tons *en masse*. Dolphins must be provided in all docks for warping vessels in and out, and mooring posts for making them fast to during their stay in their berth. The old mooring posts were nearly universally of timber and sometimes of stone, but now they are generally of cast iron, and may be regarded in the light of a short pillar or column exposed to a severe transverse strain near its fixed end, tending to break it off short at the ground line. The amount of strain may be thus expressed. Putting P for the full of the ship's hawser, L for the length of the post, and h for the distance below the top of the post where the line of strain is supposed to act, then representing the strain by S we have

$$S = P \times (L-h).$$

This value for S is the force tending to break the post at the ground line. As they are usually of a circular form, the practical point to be determined is their diameter. Supposing the post to be solid, calling A the area in square inches, and C the safe strain per square inch to be placed upon the material, we have

$$A = \frac{S}{C}$$

but from the properties of a circle

$$A = \frac{\pi d^2}{4}$$

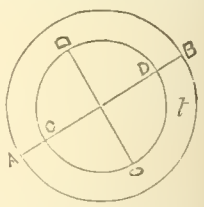
where d is the diameter and π a constant equal to 3·141592; or, briefly, 3·1416, which is quite accurate enough for practical purposes. Substituting this value for A, and the value given above for S, the equation becomes

$$\frac{\pi d^2}{4} = \frac{P \times (L-h)}{C}$$

and solving for the diameter we finally have

$$d = \sqrt{\left\{\frac{(4 \times P (L-h)}{\pi \times c}\right\}}$$

It is well known to most of our readers that hollow pillars and columns are for the same sectional area much stronger than solid ones; therefore it is evident that posts of the description under notice can be economically constructed on the former principle. The problem, therefore, that will frequently present itself is to ascertain the thickness of a post necessary to enable it to bear a given strain. Since the post is hollow, the thickness will evidently be the difference between its internal and external diameter divided by 2. Fig. 2



elucidates this. The line A B is the external diameter of circle, and C D the internal. The thickness may be mathematically expressed by the equation

$$t = \frac{(D-D')}{2}$$

where A B = D and C D = D'. The expression for the area of a hollow tube or circular pillar is

$$A = \pi \frac{(d-d')^2}{4}$$

and as from above we have

$$A = \frac{S}{C}$$

we finally obtain by substitution and elimination

$$(D-D') = \sqrt{\left\{\frac{(4 \times P (L-h)}{\pi \times C}\right\}}$$

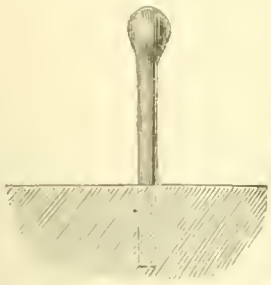
But

$$t = \frac{(D-D')}{2}$$

so substituting its value and reducing we finally find

$$t = \sqrt{\left\{\frac{(2 \times P (L-h)}{\pi \times C}\right\}}$$

Cast iron seldom has a greater strain put upon it per square inch than four tons; but in instances similar to that under notice, where the material is liable, and in fact certain, to be subjected to the action of severe jerks and sudden wrenches, we should not recommend the limit of three tons to be exceeded, particularly when it is borne in mind what a very uncertain substance cast iron is to rely upon. Of all other materials it is the least reliable in cases of abrupt shocks and concussions; and, therefore care should be taken not to tax its powers too severely. The usual method of fixing a mooring post is represented in fig. 3. It is



et in for about a third of its height into a stone bed, or it may be securely fixed into a mass of concrete. From its position being very close to the face of the wall, it is generally more convenient to secure it directly into the body of the wall. If desired, lugs can be cast upon the lower part, and bolts passed through them and let into the masonry; but they must never be depended upon for the holding power, which must reside in the resistance offered by the block of stone or concrete that surrounds the part of the post embedded in it. The two portions of the post above and below ground may be considered as two levers, and their movements about the fulcrum, which is the ground line, must be equal and opposite. Making L, as before, the length of the post, and h the height of the point where the force is applied above the ground, putting P for the strain exerted by the force tending to break it, and R for the resistance of the masonry, and h' for the length of post in the masonry, we have for the conditions of equilibrium $(P \times h) = (R \times h')$, and solving for R we have

$$R = \left(\frac{P \times h}{h'}\right)$$

We trust in time to witness wrought iron superseding cast in every example of construction, simple or compound, where the nature of the strain induced partakes of a violent or imperative character. Having laid before our readers the principal features in the actual construction of docks, we shall in our next proceed to describe the various methods for closing their entrances, and conclude this particular series of "The Elements of Engineering" with a notice of graving docks and patent slips.

OUR FUTURE ARCHITECTURE.*

It is now some twenty two years since our esteemed friend Professor Kerr amused and delighted the greater part of the architectural profession by the publication of the "New-leaf discourses." You will observe that I confine myself to the greater part, for it must be confessed that one portion of the profession was neither amused nor delighted. The reason was very obvious. Professor, (then Mr.) Kerr, had the rashness to assert that architecture was not mere construction, archæology, or knowledge of Greek, Roman, or modern detail; but was emphatically a fine art, and a very fine art indeed. At the present day the learned professor would have been understood properly, but it was different in 1845. Then some people could by no means understand that a man might have all the modern construction of a house at his fingers' ends, and might take out quantities and do surveys and dilapidations, to say nothing of valuation, and with all this yet not be an architect. Accordingly, Mr. Kerr got some severe rubs, evidently from the elder members of the profession. The papers having been collected and published in a separate form, the subject appears to have dropped.

Yet no subject can be more important to us students, who are now fighting the uphill battle of fine art architecture. To clothe Professor Kerr's thoughts in other words, the various styles are to really beautiful architecture very nearly what languages are to a poem. How seldom do we find a man who can write equally well in two languages. How often in such a case do we not find that one tongue goes to the wall, that some of the words are badly chosen, some of the sentences ungraceful, and some of the expressions sin against the idiom peculiar to the language; and yet an architect is expected to design equally well in the Mediæval and Pagan styles, which have just as many differences between them as the two languages have. But go a step further, and suppose that we had no fixed vernacular, and we were obliged to express ourselves in broken French or broken German, what sort of things would our poems turn out, in spite of any really poetic thoughts we might possess? Still the comparison holds good. We have no real vernacular in architecture. Neither of the two great styles belongs to our own days. We have to learn them painfully and imperfectly as we should learn languages. At the present time, indeed, we are seeking for an architectural language suited to our times, and we ought not to be disappointed that we do not get it in a single year. But almost every language can be traced back to a parent stock, and so with our new architecture. We have taken many points of departure, and thrown them away, one after another, until it must be confessed that we have got a little confused, and are by no means so advanced in our task as we have a right to expect considering the pains we have taken.

The last century was consistently working in the traditions of Sir Christopher Wren, when, lo! people took to measuring the Parthenon, and we had accordingly to begin almost anew, only this time with Greek art. Unfortunately, after a few years people discovered, very unwillingly it is true, that the climate of England was not precisely identical with that of Greece; that the broad surfaces and flat shallow sculpture, however well they might look beneath the sky of Athens, were different things when executed in cement and put up in London. Then we tried our national style, beginning with the latest and worst phase of it. I need scarcely tell you how from Perpendicular we went to Early English, and then to Decorated, always beginning backwards, until at last we came to what is called the Geometrical Decorated, and we were going on to all appearance very well indeed, until one day Mr. Ruskin published his "Stones of Venice," and then a rush was made for Italian Gothic in architecture, the details of which, never very fine, were nearly as unsuitable for our purpose as those of Greek architecture itself. I do not for one moment wish to deny the wonderful massiveness, beauty, and strength of the larger Italian works; on the contrary, I think them deserving of the most careful study, although they are precisely the features most difficult to introduce in these days of leasehold tenures and large fenestration; but the details of Italian-Gothic are worse than useless. For the most part they are executed in marble, which requires just as different a treatment to stone as stone does to brick; for what do we see? In marble work the work is generally shallow, and on the surface, for the material is hard. A system of rectangular panels obtained, for marble is generally supplied in thin pieces, and panels are the readiest way of showing off the peculiar colours and veinings. In stone, on the contrary, the members rely on the mouldings, carvings are often deeply undercut, and the buttresses jut out like rocks. But in brick we found them very shallow, and the iron tie-rods used to keep opposite walls in their places. The mouldings are also comparatively few, except we go to those countries where the clay, by the application of ornament and superior manipulation becomes terra cotta. In speaking of brick construction I have rather more in my mind the private houses in Belgium than the wonderful churches at Milan.

But to return to my subject. Of late years we have actually taken to tamper with the old details of the styles we employ. We chamfer things that ought never to be chamfered. We try to get an appearance of strength by using forms which were known to our ancestors, but rejected by them as being ugly. Such is the Saxon straight-sided arch—such the foliage where the leaves are square at the end instead of pointed; or we cover our buildings with notchings, an ornament most sparingly used in the thirteenth century, and even when employed generally placed at a height. We use marble in juxtaposition with stone, to the infinite injury of the latter. We cusp doorways, which are exactly the features that ought not to be cusped; and finally, we cover our drawings with such quantities of etchings that we finish by deceiving ourselves as well as our clients.

The last new invention is to use large sash windows, with of course the maximum of glass and the minimum of wood; then to put in a flat stone lintel, and over that a high pointed arch filled in with brickwork. Now a window opening demands some cutting up, if the scale of the buildings is to be preserved, and as far as I am enabled to judge, nothing is more destructive to the general effect of our modern buildings than those enormous sheets of plate-glass in the windows. A friend of mine once tried to deceive himself in this matter by saying that you have only to suppose all the lattices thrown back, but he was not sufficient of an artist to know that the sheen of the rain, or reflections of the sky, which are sure more or less to appear in any large pane of glass were sufficient to dispel any illusion of this description.

Doubtless large sheets of glass are occasionally necessary, but why should we not try and diminish the artistic evil by putting the upper part of the window in smaller panes, either of wood, or iron, or of broadish lead.

If we go to Hampton Court, we cannot fail to be struck with the very noble appearance of the window sashes in that part of the palace built by Sir Christopher Wren.

It is, in fact, our modern windows which make our common houses so hideous. A house of Queen Anne's time, although it may not have a bit more ornament than one built twenty years ago, looks ten times more cheerful, for the window-boxings project nearly to the surface of the brickwork, and when painted white, as I said before, impart an air of comfort and cheerfulness to the whole building.

I know that this mode of construction is liable to communicate fire, and is, therefore, very properly forbidden. Still I think that we might attain a somewhat similar result by other means. What appears to me as most objectionable is the thin frame, surmounted by a segmental arch, and then another immense arch above it. This, in conjunction with a high-pitched roof, some of the gables entirely hipped, and others hipped at the point only, forms, I think, one of the most distressing specimens of modern art: it is both pretentious and ugly.

Now, the question arises, what form is our architecture of the future likely to take? I have, as far as I have been able, advocated two means for its advancement, viz., a most careful study of early French art, and the study of the human figure.

As to early French art, I believe it to be more suited to the requirements of the present day than any other phase of Mediæval architecture. We live under different conditions to our ancestors. They delighted in small pretty buildings with delicate details, which would be out of place in our smoky atmosphere. In French art everything is upon a larger scale, and it is usually suited for our large warehouses and for high houses, such as are being sown broadcast in old London. It is a curious thing, but there is little doubt of the London houses in the thirteenth century being very low as compared with those of Paris; for Mathew Paris, describing the visit of Henry III. to St. Louis, represents the English court being amazed at the loftiness of the houses of Paris as compared with those of the English capital.

It would be a work of supererogation for me at the present time to go deeply into the merits of the French architecture of the thirteenth century, and the various reasons for, to a certain degree, preferring it to that left us by our ancestors. I can only say that our whole habits of life and our external circumstances having altered from what they were in those ages, we should use our common sense, and adopt that style of architecture most suited to us, at the same time bringing into use all modern improvements which can actually be proved to be such, and decorating the building with sculpture and painting, relating quite as much to our own times as to those gone by; for sculptured buildings are

* Read by Mr. Burges at the Architectural Association, May 24, 1867.

but stone books, and why should the last chapters be left out?

There is a window in Westminster Abbey which illustrates this; it is in the nave aisle, and to the memory of a civil engineer. I pass by its artistic merits or demerits, and come to the iconography. The series of stones begins with the Tower of Babel, and ends with the Menai Bridge. I should state that the latter was pointed out to me as a sort of practical joke on the part of the stained glass designer; but I confess I see no joke at all in it. The designer only did what has been done in every age of the world, and who knows?—perhaps the fragile piece of glass may be designed to outlast the iron of the bridge. There are some people who view every application of Mediæval art to modern life as a joke, and, in nine cases out of ten, to be discouraged. They consider Mediæval art as eminently ecclesiastical, and therefore something profoundly serious and to be approached with caution, forgetting that mankind has been very much the same in every age, and that our ancestors joked and laughed just as much as we do. It is true that a very great part of our ancient domestic buildings have perished, and even of those which have been spared by time or man, none possess their original decorations. Consequently, these people above mentioned almost refuse to believe in any scheme of secular painting and decoration of the thirteenth century, still less what they consider as the reprehensible interchange of secular and religious subjects, such as the series of Scripture history in the King's Chamber (probably answering to our drawing-room) at Westminster, or the secular series of the labours of the year, and the signs of the Zodiac in ecclesiastical buildings, as at Salisbury, &c.

The fact is, that with our ancestors religion was not simply a mere matter of private devotion, or of an attendance at church once in seven days—they said their prayers in their churches, and therefore had their churches made as beautiful as they could afford. A great cathedral must have been an encyclopædia of all the knowledge of the time; indeed, M. Didron tries to prove that this was literally the case with regard to the sculptures of the cathedral of Chartres. It is only by acting in a similar manner that we shall ever progress and have an art of our own, and I am the more disposed to reiterate this upon the present occasion when I have the honour of addressing my younger fellow students; for, alas! we are all students now, and there are no masters in Israel. Whether there ever will be, must depend upon the zeal and earnestness of purpose with which you take up that banner which is about to fall into your hands. If you do not draw the figure better, if you do not study more deeply, and if you do not take due advantage of the art-discoveries and labours of those who have been a little longer in the profession, it will, indeed, be a bad thing for our future art.

Some men may do more and some may do less, but everyone can do something. Of course, a great deal depends upon the circumstances in which you may be placed, and over which you may have no control; but I very much doubt whether any circumstances ever hindered the ultimate advance of anyone who had a real and lasting love of art.

Various circumstances may hinder various men: thus one may have to work for his living immediately after finishing his apprenticeship; another may marry early, and may have to go to quantities for his livelihood; a third, seeing how very hard is the struggle for an art man with no connection may go into dilapidations, and light and air cases; a fourth may get into practice too early, either through his connection or through accident; but all may do something to advance our future art and architecture. Of course it cannot be expected that they can do so much as the man who thoroughly devotes himself to it, and who is neither married nor obliged to work for his bare living; but they can do something—they can afford employment to good artists in their buildings; they have their annual holiday, during which they can study more or less, and their more lucrative practice enables them to purchase art for their own houses.

Now during this time the art man, as your President very truly said upon a former occasion, finds that he gets comparatively nothing to do, and indeed he may think himself comparatively lucky if he does when he is tolerably past the middle of his life. But these fallow years are exactly those which are the most valuable to him; it is in them that he applies the knowledge gained by wandering to and fro over the surface of the earth. That knowledge may have but a small area to work upon; it may, perhaps, be a piece of goldsmith's work or ivory carving, for which he is almost ashamed to charge a fee at all, but which, with the design and the constant superintendence of the workman, takes him as much time as would suffice to enable his late fellow-student, who does the light and air, to make much gold; but then, on his side, he will have added another new and beautiful thing to the world, and he will have done something towards solving the problem of our future art.

I hope you will not suppose for one moment that I wish to detract from the merits of the gentleman who goes in for quantities, light and air, and dilapidations; on the contrary, the world could not do without him; and there is no doubt but that he does the most useful as well as the most lucrative part of the profession; and if he has not the opportunity of becoming an artist, it is simply an application of the great law of compensation, which ordains that one man shall not have everything.

I confess that the most, by far the most, interesting series of drawings in this room are those of the sketching class. I should have liked them to have been more numerous, and to have come down to a later date. When one is a pupil, one often marches quickly, so that the drawing of 1865 may give a very different idea of a man's progress to what drawings a year later might themselves give. The only defect in the sketching class appears to me that, when done, the sketches should be sent to some competent person to give a written opinion upon them in the same way that a barrister might be asked to give an opinion; that that opinion should be paid for in the same manner that a barrister's opinion would be paid for, for this is the only way by which advice is ever attended to. Before leaving these sketches I must not omit one of a design for the polychromy of a chancel arch, where the figures are very well done indeed, and where the colour is exceedingly good.

In conclusion, let me ask you to devote some time to the drawings of Mr. Thompson, of Glasgow. They represent buildings in Greek architecture, but certainly the best modern Greek architecture it has ever been my lot to see. Whether some of the edifices are exactly suited to the climate of Edinburgh is another question: but the most curious thing is that many of them, by a very few touches, could be most easily translated into thirteenth-century French art. There is one little drawing of a villa that might almost be taken for a copy of some little fortalice in the south of France; in fact, there are actually two rows of these features, called machicolations, lately so rabidly proscribed by writers.

Gentlemen, I am sure that our art future will be safe in your hands; and although it is neither to be expected, or even desired, that all of you should devote yourselves exclusively to the fine art branch of the profession, as I said before, you can all do something towards our future architecture, and Mr. Thompson's excellent designs suggest to me a question which we might all ask ourselves whenever we turn out a design, viz., what would the Greeks have thought of it? If answered unsatisfactorily, or in the negative, would it not be better for us to try again?

W. Burges.

DESIGN FOR THE NEW LAW COURTS.

We this week give as our principal illustration, Mr. Raphael Brandon's proposed design for the new Law Courts—Strand view. Mr. Brandon's design was criticised at length in the Building News of March 29, and in our number of March 15, we gave another double page view of the same design.

BRISTOL ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.

A meeting of this society was held on Tuesday, Mr. C. F. Hansom, F.R.I.B.A., one of the vice-presidents, occupying the chair. Mr. C. J. Phipps, the honorary secretary and treasurer, presented the annual report of the council, which stated that since the last report fourteen gentlemen and fourteen ladies had been elected as subscribing members. The society has to regret the loss by death of its life member, Dr. Scandret Harford, and Mr. Harrington, one of the student members. At the close of the year the society consisted of seventy-four subscribing members, six honorary members, and the artist members of the Academy of Fine Arts. The following officers were elected for the present year:—The Earl of Limerick, president; Mr. Hansom and Mr. Ponton, vice-presidents; Mr. C. J. Phipps, honorary secretary and treasurer; Messrs. Underwood, Godwin, Fripp, Masters, W. H. Wills, and the Reverend W. Barclay, council.

The Council of the Royal Institution of British Architects having invited the co-operation of this society in their endeavour to promote the satisfactory representation of British architecture at the Paris Universal Exhibition, the council appointed Mr. E. W. Godwin and Mr. C. J. Phipps, as their representatives upon the Institute Committee. A preliminary exhibition of architectural drawings was held at South Kensington, and a selection made, which are now being exhibited at Paris. The balance sheet of the finances is presented herewith, showing receipts to the amount of £40 7s., and expenditure £34 8s. 8d.; leaving a balance to the credit of the society of £5 18s. 4d.

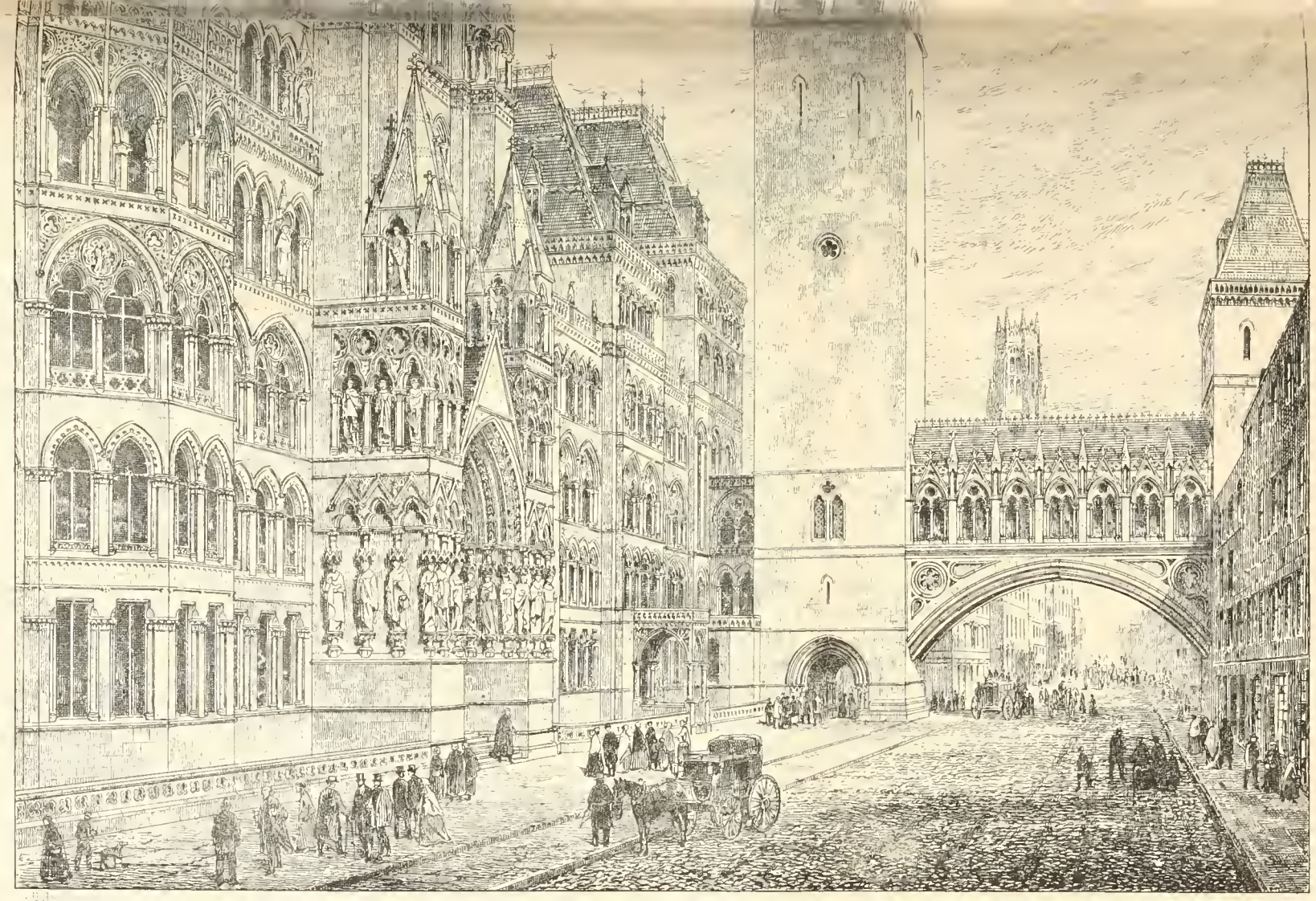
THE ENLARGEMENT OF CHURCHES.

The annual meeting of the incorporated society for promoting the above objects was held on Friday at the offices, 7, Whitehall; the Archbishop of Canterbury, the president, occupied the chair. From the forty-ninth annual report it appeared that the receipts during the year had been £7,720. The total amount now held by the society in trust for the repairs of churches was £38,524 14s. 3d. In March, 1866, it was £31,280 7s. 1d. The past year had been one of great financial distress in the country, and the income of the society had been injuriously affected thereby. But great exertions continued to be made, and with considerable success in many parts of the country, with the same object as that for which this society had so long laboured. The number of applications entertained during the past year was 133, and the total amount granted was £7,560, being £1,410 more than in 1865-66. And this sum would have supplemented local and other resources to the estimated amount of £270,321 towards works providing increased church accommodation for 27,597 persons, inclusive of children. During the forty-nine years of the society's existence it had voted a sum of £747,788 towards an estimated total expenditure of upwards of £6,000,000 amongst more than 5,000 parishes and districts; the result being to provide additional sittings to the number of more than 1,250,000, of which upwards of 1,000,000 were for the free use of the poorer inhabitants. These additional sittings had been obtained by the building of upwards of 1,400 new, and the enlargement or re arrangement of more than 3,700 old churches. The report was adopted, and the routine business having been transacted the proceedings terminated.

OBITUARY.

It is with deep regret that we learn of the death of Sir Thomas Phillips, Q.C., chairman of the Society of Arts, which occurred at his residence Gloucester-place, on Sunday. Sir Thomas was in his 66th year.

Mr. E. H. Baily, R.A., the eminent sculptor, died on the 22nd inst., at the venerable age of 80. He was a native of Bristol, the son of a ship-carver and very early gave indications of ability in the profession in which he has won so high a reputation. He became a pupil of Flaxman, and his progress to fame was exceedingly rapid. He was specially renowned for his beautiful and graceful delineation of the female figure; and his best work perhaps, are "Eve Listening to the Voice," a companion to his "Eve at the Fountain;" "The Graces," "The Fatigued Huntsman," "The Sleeping Nymph," and a colossal statue of Sir Robert Peel for Manchester. Amongst his other works are—"Hercules casting Lycus into the Sea," "Apollo Discharging his Arrows," and "Maternal Love," as well as statues of Lord Egremont, Sir Astley Cooper, Earl Grey (at Newcastle), the Duke of Sussex (for Freemasons' Hall), and a monument to Lord Holland, in Westminster Abbey, with many others. The statue of Nelson, which surmounts the lofty column in Trafalgar-square, is also one of his works. Mr. Baily was elected A.R.A. in 1817, and an R.A. in 1821.



Proposed Design for the New Law Courts, Strand View.—RAPHAEL BRANDON, ARCHT.

OUR WATER SUPPLY—A NEW IDEA.

It will readily be admitted that we cannot have too many new ideas on a question of such vital importance as the water supply of the population, provided always that the ideas are worth anything as a means of answering it. The question is one that presses more and more on public attention every year. Last summer and autumn—an unusually hot season, with cholera epidemic threatening—it will be remembered that something approaching to alarm existed among us owing to the frightfully polluted state of the drinking water of the metropolis. Numbers of the public wells were condemned as being totally unfit for use, after their poisonous draughts had in several instances produced disease and death. Great was the outcry and numerous were the suggestions made to remedy a state of things which on all hands was felt to be very serious, and might become still more so. Chemists issued the result of their analyses, which enjoined on us to filter every drop of water before using it, doctors prescribed gratuitously for the public through the newspapers, and local boards of health could hardly have been more active than they were in disseminating sanatory knowledge among the people. Then came no end of proposals from eminent engineers touching the necessity of a better supply of water for the metropolis. All this was very good and useful in its way. But has any real result followed? The cold season arrived bringing with it purer water as well as purer air, fever and diarrhœa disappeared, and "the subject dropped." Now that the dog days are again at hand it would be well to consider whether, after all our talk and experience, we are enjoying more wholesome water in 1867 than in 1866, or whether we are not in exactly the same position that we were. Within the last few years there have been no fewer than eight or nine different schemes suggested for giving London pure drinkable water. In 1850, Mr. S. C. Homersham proposed to water the metropolis from the deep springs of the chalk. The estimated cost of his plan was £350,000, and the amount of supply 8,000,000 gallons of water. During the last two years we have had Mr. H. H. Fulton's scheme of a supply from the River Severn, but with no details as to cost or extent of service. Mr. J. F. Bateman suggests North Wales; Mr. G. W. Hemans, the lake district of Cumberland; Mr. C. F. Gower, Guildford. Mr. Telford Macneill's plan, again, is to bring the supply from the Thames, filtering through Bagshot Sands; Mr. Baily Denton prefers the higher tributaries of the Thames—a scheme which met with the approval of Sir John Rennie; while Mr. George Remington would go to the rivers Dove, Wye, and Derwent. The estimated supply from these various sources ranges from 15,000,000 gallons to 250,000,000 gallons of water, and the cost from £4,500,000 to £25,000,000. We come now to the latest scheme proposed—that of Mr. Arthur Sydney Ormsby, C.E. This gentleman has recently published, in the form of a shilling pamphlet,* a remarkably able letter, addressed to the Secretary of the Royal Commission on Water Supply, tendering a solution of the difficulty. In this letter Mr. Ormsby shows the impossibility of getting pure water from any of the various sources we have named, and propounds a plan of his own which he calls a new idea, though it is really but a new application of an old idea. Mr. Ormsby proposes to deal with one portion of our water service only—the water we use for drinking and for culinary purposes. And there is really no pressing need for more. London is plentifully supplied with water. What we lack, and lack sadly, is not quantity but quality. We want the pure element. Now chemical science abundantly proves that it is by contact with the earth that water contracts those impurities which are injurious to health. Under the best conditions a river is more or less polluted. Recent inquiries have shown what are the conditions of the Thames, the Tyne, the Lea, the Ware, the Dee, and other rivers. It is a fact equally well established that the mechanical operation of filtering can never make unwholesome water wholesome. "Thick sewage water can be filtered so as to appear pure and bright, but, nevertheless, it still retains all its pernicious ingredients." For these reasons Mr. Ormsby discards all the schemes hitherto proposed for supplying the metropolis with pure water. He states his conclusions thus:—

1st. That it is practically impossible to obtain a sufficiency of water absolutely pure and fit for drinking and cooking from the earth.

2ndly. That it is therefore necessary to separate the sources of supply, and the classes of water to be supplied.

3rdly. That by a more perfect conservation of the Thames, New River, &c., it is quite possible to obtain an ample supply of water for all purposes, except drinking and cooking.

4thly. That by collecting rain water before it falls upon the earth, and using the proper means for its purification and storage, it can be distributed in an almost perfect state of purity for human consumption.

In order to carry out his plan he proposes to construct at eight points around London—as much as possible out of the influence of any atmosphere that may be charged with smoke or other impurities—"artificial collecting grounds or surfaces, covered over with a light and ornamental iron glass roof, so designed that all the water falling upon it may immediately flow off into a receiving reservoir, and pass from thence into a settling, filtering, storage, and distributing reservoir with which the main supply pipes would be connected. The space underneath this roof would be made available for market, fruit, and flower garden, and for a winter garden or sanatorium if required. The writer calculates that from £50 to £200 per acre per annum might be obtained by letting-off the ground for these purposes, which would no doubt materially lessen the expenses of Mr. Ormsby's proposed company in carrying out the project—that is, if the ground could be let at the figure, which we much doubt. There are many places on the continent and abroad—Brussels, Venice, Buenos Ayres, and British Guiana, among others—supplied with water in this manner. It is collected on the roofs of the houses, and preserved in cisterns, and it is proved that the water is always pure, well-tasted, and cool. One very great complaint against our drinking water arises from the impurity to which it is exposed between the distributing reservoirs and the house cistern—from the water pipes coming in contact with either the gas-pipes, or the hydro-sulphuretted substratum of the streets, and another is the impurity to which it is subject in the cistern itself. The statement would be incredible were it made on less undoubted authority than that of the engineer of the company itself—namely, that "instances have occurred where lights being applied to the water-pipes of the New River Company the gas has ignited as if the pipe were a gas-pipe." Is it not absurd, therefore, exclaims Mr. Ormsby, "to have health officers, inspectors, &c., employed to attend to the sanatory condition of London, if the very water that we drink is to remain in such a poisonous state as that?" The only remedy for the evil is of course a total separation between gas pipes and water pipes. This separation Mr. Ormsby proposes should be effected under the direct sanction of the Legislature, and at the expense of the gas and water companies. He gives several sketches to show how this separation may be accomplished by means of arched subways. He would remedy the second complaint by the adoption of water cisterns made of a non-decomposing material. Apart altogether from the other and perhaps more important portion of Mr. Ormsby's plan, there is no reason, except the old one of vested interests, why we should not reap the advantages of so great an improvement as is here suggested. Touching the major part of his scheme Mr. Ormsby leaves us without any particulars as to cost of construction and the like. His reason is that the size of the collecting surface will depend upon the numbers to be supplied, the quantity of water per head per diem, and the amount of rainfall, all of which must be given before even an approximate estimate can be arrived at. If we may judge, however, from the plans he has given, and the calculations he has entered into, the scheme is simple, and would be inexpensive as compared with other schemes. He assures us, moreover, that a sufficient water supply for London might be obtained by his method in fifteen months from the date of commencement, none of the other water companies being interfered with, while all the other plans that have been put forward may require from six to ten years before a drop of water can come into London, and may seriously interfere with existing water companies. Mr. Ormsby, who is evidently an enthusiastic believer in his own project, concludes his letter in the following pleasant and hopeful style:—"In all other schemes the engineering difficulties—the tunnels, bridges, aqueducts, retaining walls, reservoirs, collecting grounds, catch-water drains, weirs, overfalls, sluice gates, pumps, siphons, and steam engines—render any estimate purely imaginary, and are absolutely enough to frighten the financial world out of its wits; while the useful and though ornamental, still unpretending roof that I propose has in it nothing to alarm the capitalist, and possesses attractions to make it extremely popular as the water, vegetable, fruit, and flower garden of the nation."

* Metchim and Son, 20, Parliament-street.

A CHAPTER ON PLASTERERS' LATHS AND PLASTERING.

From our former chapter on "Floors and Flooring Boards," we turn to the subject of Plasterers' Laths and Plastering. From the age of willow twigs we move by slow degrees to that of riven laths from heart of oak, and the more ordinary material, reeds, which in their turn represent a distinct period of history. Oak, as a material for lath splitting, long and deservedly held its sway, and it was only economy which led to the more frequent use of reeds; but even then we find reeds held in position by the identical laths they strove to supplant. With the drainage of the waste lands of Lincolnshire and other fenny districts reed growing naturally declined, and the harvesting of that material gradually proved unprofitable in the face of the application of foreign wood to the purpose of lath riving. By a series of changes which almost every branch of trade is subject to, we find that reeds have become more scarce and costly, and that laths from foreign wood have become more plentiful and reasonable in price. At the present day, if we except some out-of-the-way country districts where only old usages are allowed to exist, reeds as a material in the hands of the plasterer are wholly unknown. Fifty years ago lath splitting may be said to have been in its infancy compared with what it is now. They were split on the eastern side of the country from Baltic lath wood or timber, and on the western side from the log pine of Canada and the hemlock spruce. The average cost per bundle of 300ft. run of lath was eighteenpence. With little change, further than adding an additional 60ft. run of lath to each bundle and reducing the cost both of material and production, we are introduced to the present day. Those who are versed in the use of laths know well the growing perfection, if I may use the term, of the trade of lath riving, and the tendency they possess to mere splinters. The standard size was 1in. wide and 1¼in. thick, but now we have them ½in. or ¾in. wide and little

stronger than ⅛in. Nor is this the only evil: we find the interior of the bundles are made up of short laths and splinters. Laths of this description are made in the coast towns at from 7d. to 7¼d. per bundle, and in the inland towns from 8d. to 8¼d. Not content with these measures, there are many makers who, to meet the growing demands of competition, only supply 320ft. run of lath to a bundle instead of 360ft. When we consider these little matters it is strange that price should have so much to do with the question. A bundle of laths split to ⅞in. and purchased at 7d. per bundle is dearer than a bundle purchased at 9d. where the laths are 1in. broad. Not only do the narrow laths cover less space per bundle when in work, but they require more labour per yard than wider laths, which is a serious consideration in the face of the present cost of labour. Nor does the evil end at this stage. With narrow light laths the work is not so good as with strong broad laths. With inferior laths the plasterer is bound to nail them close together or they would not carry the weight of the rendering; and here we lose one of the most essential elements to a good ceiling, viz., the key of the plaster. A strong lath fixed ⅞in. or ½in. apart will make better work in every respect, and will necessitate on the part of the plasterer the use of good plastic material. Knowing, as most practised architects do, the growing use of these inferior laths, they have to counteract their introduction by specifying the use of lath-and-half, which, of course, are of a stronger character, and in a great measure represent the original form of English made lath before these days of feverish competition.

Taking these matters into consideration we are naturally led to ask, "What is the reason assigned for this tendency to make cheap laths?" Certainly when the question is properly considered they are the dearest article in the end, and we are brought back in an indirect manner to the natural cost of production—viz., 8d. or 8¼d. in the coast towns, and 9d. or 9¼d. in the inland towns, and we must come to this point before an answer can be given to the question. Some years ago the lath makers of this country were surprised at the introduction of foreign-made laths from the Baltic ports. These were made by men.

The Baltic split laths, as might be expected, were clumsy articles when submitted to the refined eyes of English builders, and an outcry was at the time raised against the importers. This was conveyed to the foreign makers, and in their anxiety to accommodate the English market laths were made which excelled our own in point of fine splitting, and then went forth the complaint that foreign made laths were rubbish. Having worked out the two extremes, the medium of perfection was yet to be sought. With a few years of careful training foreign makers have been able to surmount these difficulties, and the foreign laths are now an article of settled commerce, and the manufacture of them gives employment to hundreds of people who formerly were out of employment during the long and dreary northern winters. As might naturally be expected, the price of the foreign laths is low, and it is the useless attempt to counteract their introduction that has led to the common custom of making cheap English laths. What shall we say of their cost? It is certain, from the expenses of freight, &c., that they must be produced for 4d. or 4½d. per bundle in Sweden; they can be retailed to buyers in Hull at 7d. per bundle, and to wholesale buyers at 6¾d., and when we consider they contain the full measure of 360ft., and are broad, strong laths, what shall we say at the refined and comparatively worthless make of the English cheap laths, further than "the making of them must be discontinued?" If the cheap make of English laths are driven from the market, the tide of competition will set in between the foreign laths at a cost of 6¾d. or 7d., and the good make of English laths at 8d. or 8½d. per bundle; or in other words, it will be a struggle for supremacy between the English and the foreign laths, the one having a clear advantage over the other of 15 per cent. Let us next consider the two articles on their various merits. Lath wood as imported into this country is of the best quality from the most northern ports, St. Petersburg rating the highest per standard fathom. As we approach the southern parts of the Baltic, lath wood is somewhat inferior in quality; being more open grown, it is consequently cheaper, and less costly in freight. With the English made laths it is simply a question of cost of wood in the first instance. If laths are split from St. Petersburg or even Riga wood, they are superior to the foreign made laths, which are split from Gottenburg wood. Then, again, the English laths are cleaner to the hands of the builder than those which have been stowed in the hold of a vessel. In some instances the Swedish laths are found to have taken a green or mouldy coating on the outside, which is a minute vegetable fungi engendered by such a mass of newly split wood lying closely packed together. The English laths are reputed to have another advantage, which though some people would smile at, still it is a cause why the sale of English laths is kept up; it is that they are tied up with string, whilst the foreign laths are bound up with twigs of the Norway spruce. The builder who is anxious to introduce the foreign laths finds this a real difficulty. The architect, or the proprietor of the works, will detect such laths, and the builder is bound to admit they are foreign made. The words "foreign made" have a grating sound upon the English ear, but why it should be so is somewhat of a mystery, as we are great importers to foreign markets. If we except the question of the quality of the wood, the minor objections of colour and the mode of binding are narrow prejudices, which, we think, are destined to die away. As laths are a thing of almost constant and universal use, it is natural that the genius of invention should be turned to their production. As far as we have followed the subject, hand labour is the agent in their production, and it has long been said that laths can never be made by the aid of machinery. We have a few words to say on this subject:—Contemporaneous with the growing trade of lath riving in Sweden, an attempt has been made to produce sawn laths, cut from the edge of 1in. boards, and they have been submitted to the merchants of this country. They are truly a beautiful lath, the roughness caused by the saw greatly aiding the adhesive qualities of the plaster. They are more level in work when suspended from joist to joist of a ceiling, the key space is more regular, and they require less material to coat them over, or, to use a plasterer's phrase, "to cover them." The objections are that they cannot be produced at the same cost as the riven laths, that they are liable to be crossgrained, an evil which would cause the ends to split in nailing—not up the centre as with riven laths, but across the corner, rendering the lath worthless. They are also subject to being crossgrained in their length, which would render them unable to carry the weight of the ceiling. They have been tried in Yorkshire by a large builder and found wanting. There are, however, some large contracts made with the English merchants for their importation this season, but they are generally looked upon as comparatively worthless. Following in the line of invention and the application of machinery, we have what is termed the "chopped or cut lath," which is allowed by many competent persons to be the acme of perfection. Their manufacture has been commenced in Stockholm, and the process is as follows:—1in. boards are prepared to suitable lengths and steamed to a proper consistency, to enable laths to be shaved or cut off the edges without tearing or breaking the grain; they are thus produced in a rapid manner by the aid of powerful machinery. Before being tied up in the ordinary way they are laid out on heated floors to dry, the process of previously steaming the wood rendering this step necessary. The cost of production by this new principle is said to be considerably less than by the old system of hand riving, and the makers will be able to undersell the cheapest make of foreign or English laths, and thus lay claim to a large share of the present trade of hand-made plasterers' laths. W. S.

FAILURES IN CONSTRUCTION.*

CRUSHING.

MUCH might be added under the head of crushing in respect of careless or unskilful masonry in freestone, which is often made too good-looking to be good at heart, although a fair face is not to be despised. The bed and the bond of the stone is seldom thoroughly what it ought to be, and when these are neglected a soft stone bearing a great weight is apt very readily to show its distress. Squareness of bed (I do not mean smoothness) is an essential quality in freestone masonry, for if the bed be tapering, and wedged up to bring the face to its proper place, no dependence can be put upon such work; the outer edges, too, should be slightly eased off, instead of being worked close to make an extremely fine joint; but there is no space here for minute masonic details.

There is abundant evidence in both ancient and modern works of the defective mode in which the materials of walls are put together, and though this may be of comparatively slight importance when the walls have not much duty beyond that of being the enclosures of buildings, yet when they have to sustain great weights or thrusts it becomes of paramount importance that their materials be well applied and united, and this fact seems scarcely to have been fully appreciated since the best days of the Greeks and Romans. The crushing of the piers carrying the dome of the Pantheon at Paris is a most instructive warning under this head, and, while deploring the occurrence, we cannot but admire the remarkable mechanical talent displayed by Rondelet in the restoration of them, and the book that was published on the subject is well worthy of study, but the chief defect that I wish to allude to is the absence of that uniformity in the horizontal strata of walls which the word homogeneous most expressively indicates, and of which defect the tambour wall under the dome of St. Peter at Rome is a notable example. In a rapid age like the present it is not likely that this homogeneity or similarity of material through the whole thickness of the wall will be thoroughly attended to. I will note a small matter that is slightly connected with the point, namely, that in buildings even of considerable excellence the water tables of buttresses often break away from the body of the buttress, especially when the bulk of the work is of rough stone, as in the sketch; this irregular settlement shows that the dressed stone, being more compactly laid than the rough stone, the two do not harmoniously blend, and that a more thorough bonding is needful, by using longer alternate stones than is customary, and it also suggests the idea that buttresses may have too great a projection, inasmuch as the outer part may not catch the due influence of the weight.

The power of materials to resist crushing can only be ascertained by experiment, but in all experiments the results have been so various that we must take care to use the safe side of the results. We have heard of 40 tons and even greater pressure being put upon a stock brick of special quality, but these extreme cases must not be allowed to mislead us. A trustworthy experimentalist, Mr. Thomas Cubitt, stated 13 tons as being about the power of a stock brick to resist crushing, which is far more likely; but my belief is that something like 12 tons per superficial foot of brickwork, not per brick, is the greatest weight permissible in ordinary practice.

Some valuable experiments were made on Bath stone in 1864 by Messrs. Poole and Son, for our Fellow, Mr. Pearson, and the results were, I believe, circulated amongst our members, for which information we ought to be grateful. The crushing weight upon a foot super of bed varied from 185 tons to 54 tons; and what was called the first damage appeared with weights varying from 10 tons to 46 tons. Detailed calculations of weight and bearing power are not often needed in the usual building operations, but to neglect them altogether is a most dangerous habit. I will here state my belief that a large number of buildings

* Continued from page 358.

stones, especially those of the calcareous kind, have a greater bearing power when their natural bed is placed perpendicularly than when it is placed horizontally; nevertheless it will not do to use them in that manner in parts that are subject to atmospheric influences, which is perhaps almost tantamount to saying that they should not be used so at all.

TOWER STAIRS.

One of the points connected with crushing is the position of the stairs in church towers, for when one side of the tower is open to the interior of the church it is important so to place its staircase that the tower shall not be improperly weakened by the hollow space which the stairs occasion. In a lofty tower that was built according to the plan shown, you will observe that one side is open to the church, and here there was a lofty arch, springing at 24ft. above the church floor. On the side next the stairs a crushing commenced, and alarmingly increased after the roof was on, but the whole was saved by immediately bricking up the stairs solidly from bottom to top, showing that greater bulk was needed in that part. The stairs ought to have been put at one of the outer angles of the tower, or have been kept much farther from the inside of the wall.

STONE STAIRS.

It may appear to be strange to state, and yet it is a fact, that it is not very uncommon to see solid stone stairs, with open well hole and exposed soffit, put up with each step merely lapped over the other and pinned into wall at one end. Architects well know that this is seldom enough for such stairs, but that to be safe, each step must be notched upon the one below it, and that they often fail when otherwise executed. It is all-important with stairs of this kind that the bottom step stand on a thoroughly firm foundation, and that the lower front edge and the upper back edge of each step be well notched the one to the other; the best form of notch, when the steps are triangular, being that with which you are all familiar, but for rectangles a square notch is preferable. Stairs are very strong when thus properly notched, but many faulty stairs exist even in good buildings from insufficient attention to the point. I suppose that what I state should be vouched for by an instance, therefore let me name the Railway Station at Sydenham, where the stone steps were not notched, and where they got out of place, but being observed in time, a queer remedy was applied by putting timber beams under them, and wood strings housed on, with wood rails and balusters, instead of the former of iron, and to the lower portion a wall was built under the ends.

The stairs of the Shire Hall, Chelmsford, fell in 1856, breaking off, and leaving the ends in the wall; that accident was attributed to the landing failing first, yet this could scarcely have occurred if proper construction had been attended to. It is quite as necessary for the landing as for the steps to be notched on, and the landings should be joggled together, and in many cases it is wise to put an iron beam, but never a wooden one on account of its shrinkage, which, however slight, would slack the bearing.

In Professor Lewis's most valuable paper on fire-proof materials and construction, read in this room in 1865, there is an account of the fall of stone stairs during a fire, from the rush of cold water upon heated stone, which was evidently the case; but as the detail of the construction of the steps is not fully stated, and as wood landings which did not fall down are named, I may be permitted to entertain some doubt as to the notching of those stairs, and as to the junction of the upper steps with the wood landings, for I am of opinion that open stone stairs should never finish against wood landings unless there be also an independent and unshrinking support for the upper step, such as a stone or iron bearer, for it must be evident that, if all is to be firm, it must be impossible for the top step, as for the bottom one, to slip in the slightest degree, the top fixing being the very keystone of the system.

As I have alluded to joggles, let me name certain law proceedings that took place in 1844, relative to a large extent of landings at Westminster Cemetery, when very contradictory evidence was given as to what a joggle is; and as it is important that architects should agree in the names of things, I will observe that the only true joggle is that in which a groove midway along the edge of one stone, receives a corresponding projection worked along the edge of another stone. The double groove joint, whether it has a plug, or be only run with lead or cement, is not a joggle.

CORNICES.

Enormous cornices to buildings should not be used unless there be an easy mode of giving them a natural balance—any mode of tying down a cornice, which, without tying down, would topple over, is vicious in the extreme. There have been many instances in which large cornices have failed to keep their place. One near Vauxhall Bridge fell in 1851, and killed several men; one in the New-road, in 1854, with severe injuries to workmen; one in Wood-street, Cheapside, in 1855, killing one man. In 1856, one man was killed and others were injured by a fall of cornice from the Wellington Barracks near Buckingham Gate; in 1865 a cornice in Winchester-street.

BRICK FLOOR ARCHES.

A very large number of failures have occurred in brick arches used to form fireproof floors, and in very many instances the fall has arisen from injury by rain or frost, when they have been turned during a wet period of the year; such was the case with those of the prison at Northleach, which fell in November, 1844; with those of houses in Bloomsbury, which fell in January, 1850; with those of the Liverpool Corn Exchange in 1852, and the fall of the latter appears to have been accelerated by some sleeper walls, for flooring, being built upon the arches longitudinally instead of transversely; but the main cause is stated to have been saturation by rain, and the injudicious removal of the centreings while the mortar remained unset; another mishap of like kind occurred with floor arches in Victoria-street, Westminster, in January, 1853. It is well known that arches of this and other kinds frequently fail, from the centreing being struck too early, and sometimes from the centreing being too flimsily constructed. Amongst mishaps from this cause may be named the arches over Brixton Waterworks, which fell in 1855, killing several men; a bridge near Darlington, in 1856; a bridge on the Forest of Dean Railway, which fell in 1861.

FIREPROOF FLOORS.

As to fireproof floors, as they are called, when formed of iron bearers and brick arches, they have been almost conclusively shown to be not fireproof by Professor Lewis, in his admirable paper before mentioned; and he clearly explains that brick piers as well as brick arches are necessary, if fireproof work is to be accomplished; nevertheless, iron and brick floors have been and are still so much used, that it will be interesting to make a few remarks on the ironwork connected with them.

CAST-IRON BEAMS.

Besides the falling of the cast-iron roof of the Brunswick Theatre in 1828, killing eighty persons, there have been other startling accidents from the breakage of cast iron beams carrying floors; such as the fall of a factory at Salford, in 1824, killing eighteen persons; but the destruction of twenty persons by the fall of a Cotton Mill at Oldham, in 1844, raised an alarm as to the general safety of cast-iron beams, which were then in very extensive use for bearing purposes, and it became the turning point in favour of wrought iron for heavy weights or wide bearings. It was Mr. Thomas Cubitt who, with great ability, when reporting on this case, urged that attempts should be made to use wrought in place of cast iron; his idea was that of rolled iron beams—the boilerplate beams, now so universal, having then scarcely come into use for buildings, and only to a moderate extent for ships. Ten years after this date, Mr. Fairbairn published his book on the application of cast and wrought iron, and in it he advocated a greater use of wrought in place of cast, and remarked that "for some time after 1844 we had little or no knowledge of the superior resisting powers of wrought iron in the shape of beams."

The Oldham Mill was one of several floors on the fireproof principle, with cast-iron columns and cast-iron girders, carrying brick arches; a part of the upper floor fell, and caused the floors below it to fall also, so that the whole suddenly became a ruin. The evidence went to show that the beams were slight,—that their section was not good,—that the tie-rods which united them were placed too high up, and moreover that some of the castings were removed from the sand while red hot, and this last defect was, no doubt, a most serious one; and it is surprising that any manufacturer should do this, although it effects a saving to him, for it is not necessary to be an ironfounder to perceive the folly of suddenly cooling any hard material, be it iron, glass, or pottery, in which, and such like materials, it has from time immemorial been known that an annealing process is absolutely needful if toughness instead of brittleness is to be obtained; yet, while architects are subject to the neglects of manufacturers, how perilous is their position, the only protection, and that a very imperfect one, being the testing system, by which some little, and only a little, security is gained, it being impossible to apply a severe test without doing injury to the beam. I believe it would be well for architects to stipulate not only the proving force to be applied to each girder, but also the number of hours that are to elapse between the time of moulding and the time of removing from the mould, though it may be difficult to ensure the observance of the stipulation. The smallest things should remain in the sand (say) twelve hours, and larger castings double or treble that, or longer, to suit the case. It will be seen by the drawing that the section of the Oldham beam was not of the form most approved in the present day for strength, namely, the wide inverted ⊥ of a certain proportion, its bottom flange was not wide enough, and the metal was not of equal thickness all over, a point which is important during the period of cooling, in order that crystallisation may go on at an equal speed in all parts.

A few out of the many other instances of failure in cast-iron beams may be named—the Caledonian Distillery, at Edinburgh, in 1857, where four stories with fireproof floors in course of erection suddenly fell down; a fireproof floor to a building at Wolverhampton, where the girders were A shaped, tied by rods, and carrying brick arches and stone paving—the evidence was that the girders were too weak, and were badly made, having cold-shuts in them. A sugar refinery at Leith, a heavy structure of eight stories, and entirely of iron and brick fell in 1865, killing four persons and injuring others, but it seemed probable that the foundation yielded in this instance, and so strained the iron work; an iron and brick floor of the Chartered Gas Company's Works, at Westminster, in 1865.

BOILER-PLATE GIRDERS.

I believe it possible to put too much faith in the boiler-plate girders now in vogue, for it is doubtful whether all the joints and all the rivets do their duty; and moreover, if the rivets be subjected to jar, they may in certain positions fail, as in some railway bridges. Nevertheless a more valuable invention has never been acquired, and we see the great capabilities of it in that monstrosity near London Bridge, which, in an æsthetic aspect, degrades the age in which we live.

I believe the fact is not very generally entertained that wrought iron subjected to continuous concussion becomes crystalline, and proportionately loses its toughness. I have had no practical experience of this, but it is a not unimportant phenomenon, and should be understood. Looking at it theoretically it might be expected that any substance whose nature it is to be crystalline would endeavour to return to its natural condition out of the unnatural state that it has been made to assume by artificial operations, such as those that have been brought to bear in the manufacture of wrought iron, whereby a fibrous structure has been enforced, and that the encouraging process of shaking by continuous concussion may assist the going back to the normal crystalline habit of the material. There seems, also, to be some connection of this phenomenon with the polarization of iron by concussion. At all events, as there does appear to be some possibility of wrought iron losing a portion of its toughness after it has been used in construction, the item of possible failure becomes thus introduced.*

ORGANIC AND INORGANIC SUBSTANCES IN WATER.

AT a meeting of the Institution of Civil Engineers, held on the 21st inst., Mr. John Fowler, the president, in the chair, Mr. Edward Byrne, M. Inst. C.E., read a paper on "Experiments on the Removal of Organic and Inorganic Substances in Water," of which the following is an abstract:—It was premised that the objects of these experiments was to try how far the statements generally made with regard to the action of charcoal in purifying water might be depended

* To be continued.

on. They were not undertaken to support any theory, but rather to satisfy the author himself, who observed every precaution to obtain trustworthy results. It was stated that many substances were spoken of as having a purifying effect on water, but of all, charcoal (especially animal charcoal) had been considered the most efficacious. Though in works which treated on spring and river waters, the assertion was constantly made that both vegetable and animal charcoal (particularly the latter) removed the organic and inorganic substances found in waters, yet no experiments were given by which to judge to what extent these statements were true. With a view to ascertain whether water, uncontaminated by either decomposing animal or sewage matter, but containing dissolved vegetable matter, would contain any nitrogenous bodies, some bog-water was procured from a locality that precluded the possibility of its containing any animal or sewage matter, the experiments on which served to prove that, in bog water at least, vegetable nitrogenous matter was present. After some observations to the effect that nitrogenous organic matter might exist in water in an innocuous state, and that as putrefactive nitrogenous matter was the most hurtful of all substances that could exist in water, the author remarked how much it was to be regretted that by chemical means no distinction could be made between the nitrogenous organic matter which existed in a putrefactive, and that which existed in a non-putrefactive state. The details of four sets of experiments were given, the first on animal charcoal, of which nearly 5lb. new, and freshly burned, and of the degree of fineness used in sugar refineries, were packed in an ordinary stoneware filter. The water employed (of which a complete analysis was given) contained, in the gallon, organic matter, 10·80 grains; inorganic matter, 88·30 grains. The hardness of the water before boiling was found to be 50·50 deg., and after boiling, 33 deg.; and the oxygen required to oxidise the organic matter contained in one gallon amounted to 0·0116 grain. Several gallons of the water were allowed to percolate slowly through this charcoal, and, upon examination afterwards, it was found that, of the inorganic matter which had originally existed, 52·60 grains were removed from the first gallon; but from each succeeding gallon less and less; so that, from the twelfth gallon of water that passed through the charcoal, only 8·80 grains of inorganic matter were removed. Of the organic matter 4·80 grains were removed from the first gallon; but, with a gradual decrease, the charcoal ceased to remove any organic matter after the sixth gallon. In fact, immediately afterwards, it commenced to give back a portion of the organic matter removed in the first instance, the quantity returned to the twelfth gallon amounting to 1·55 grain. Thus, of the 13·54 grains of organic matter removed by the charcoal from the first six gallons of water, as much as 4·98 grains were given back to the next six gallons; from which the author concluded that, had this set of experiments been carried a little further, all the organic matter removed at first by the charcoal would have been given back again. The second and third series of experiments were with wood and peat charcoal, which, however, were still less satisfactory than those with animal charcoal. The fourth set of experiments was on animal charcoal, with water previously treated with permanganate of potash slightly in excess. After remarking that the water in its passage through the charcoal was found to contain organic matter, apparently in the same quantity as before treating it with the permanganate, attention was drawn to a comparison between the first and fourth sets of experiments, to show how closely they agreed to contradict the general statements made as to the removing power of charcoal, and to demonstrate how very little indeed could be done by this filtering material, even on a small scale, towards the purification of water. The author then said that as the epidemic which had so recently left these shores might return again before the adoption of any scheme to supply the metropolis with an abundance of pure water, he thought it would be well, if only to check its ravages in ever so slight a degree, to experiment on various materials which were believed to possess the power of removing organic matter; but to obviate false conclusions and to render such experiments practically useful they must be systematic. In conclusion, he gave it as his opinion that, as by chemical agency bad water could be purified to a very limited extent only, the public mind should more than ever be given to the great question of supply: and, as people valued their lives, they should, above all things, in their choice of a source, not be too much influenced by distance, but be willing to undergo the necessary expense of securing the object of their search, not only in abundance, but in the greatest purity.

ARTIFICIAL STONE IN INDIA.

Mr. WALTER M. DUCAT, R.E., Executive Engineer for Reclamations, Bombay, has been conducting some experiments in making artificial stone by Ransome's Patent process, apparently with highly satisfactory results. In a letter dated March 29, and addressed to the editor of the *Bombay Builder*, Mr. Ducat gives an account of these results, and his method of working, a short description of which will interest our readers. Having, as he says, on more than one occasion heard failures attributed to the want of lime in some form or other in the composition of Ransome's patent stone, the writer first draws attention to the fact that some of his specimens are entirely devoid of chalk or lime. The idea, he thinks, originated from Mr. Ransome having recommended the admixture of chalk, on account of its whiteness, with the sand in the composition of fine stone. Mr. Ducat forwards three specimens of stone—1, stone made of six parts of sand, one part of chalk: 2, made of five parts of sand, one part of chalk, and one part brickdust; 3, made of six parts sand, and two parts white moorum or clay. The manipulation in each case is very much the same; the material, when perfectly dry, is mixed with silicate of soda, in the proportion of one gallon of silicate to one cubic foot of material. This, after being mixed in Ransome's mill for ten minutes, is moulded into the form required, and then immersed in chloride of calcium. Mr. Ducat finds that the best stone is obtained by allowing the solution of calcium when cold to penetrate the mass, which takes from twelve to forty hours, or more, according to the size of the stone operated on, and then heating the bath up to boiling point, or a little below, say 200 deg., and keeping the stone in it at this temperature for about four hours, and then gradually cooling it. If the casting is immersed in heated calcium at first, the outer surface hardens so rapidly that the centre is not properly acted on, and the strength of the stone is not uniform. When the newly-made stone has cooled down it requires to be washed for three days and three nights, in running water, to remove the salt, which is formed in it by the chemical action. The time here given as being necessary to allow for the chemical action, viz., forty hours in the cold bath of calcium, and four hours more in the hot bath, may not in all cases be required, and is much larger than Mr. Ransome himself allows; but the chemicals which Mr. Ducat has been using have been lying by in Bombay for upwards of three years, and he supposes they may during that time have slightly deteriorated, which would perhaps account for their slower action. As the exact amount of immersion which is necessary for each stone must necessarily depend upon the size of the stone, the manufacturer must here exercise his own discretion. As the sand, chalk, moorum, or other ingredients which may be used are merely required to be absorbent, and have no part to perform in the chemical action which takes place in the formation of the stone, it is clear, says the writer, that by the introduction of the natural earth colours, such as red and yellow ochres, &c., we can produce any variety and depth of colour that we like, and this alone will make artificial stone highly prized for ornamental and string courses, &c., in these days of polychromatic architecture. His experiment being as yet incomplete, Mr. Ducat has not been able to report on the cost of construction, crushing, or strength of the stone. His attempts at moulding, he tells us, are far from being crowned with success as yet, but he has succeeded so far as to produce a good hard even-grained sandstone, composed of the cheapest and commonest materials in Bombay, viz., sea-sand and moorum. The manipulation is neither difficult nor uncertain, and the results to be anticipated, in a pecuniary point of view, are highly satisfactory, wherever much dressing and fine jointing are required. In a note appended to Mr. Ducat's communication, the *Bombay Builder* says: "The specimens of stone which we have before us exhibit a hard, even-grained stone, equal, if not superior, to most of our natural sandstones, and the moulding, if not as clean-cut and hard in all its outlines as Mr. Ducat himself seems to wish and expect, is nevertheless sufficiently sharp to show what may be done with a little more practice and experience in such ductile material."

Archæology.

A Roman villa was unearthed last week near Andover. Mr. Lockhart and Mr. Kell were the lucky finders of this treasure, in a field on Andover Down Farm, heretofore known as Castlefield. Fragments of stone and pottery had frequently been found on the spot before Messrs. Lockhart and Kell began their labours. The villa which they have found is oblong, 65ft. long and 41ft. broad, having a portico on its western side. Six or eight massive pillars support the roof; and numbers of roofing tiles, of an hexagonal form, were found. Two fireplaces were discovered, but no hypocaust or bath; and instead of a tesselated pavement, only a pavement of flints embedded in mortar was observed. The walls were 2ft. thick, regularly built of flint stones and mortar. The wall of the portico was 3ft. thick. Roman coins and fragments of Roman glass and pottery were picked up, with some curious relics of iron and other metal-workmanship. The discovery helps to support Hoare's suggestion, that Vindonum lay on this side of the present Andover.

Another of the numerous Saxon graves so frequently met with at Melton Mowbray has recently been explored in the brickyard belonging to Mr. Fetch. The antiquities discovered are very interesting. In this grave no skeleton was found, but it contained a Saxon bucket of very large dimensions, a two-edged sword 3ft. 3in. long, with a considerable portion of its wooden sheath still adhering to the corroded iron, the boss or umbo of a shield, two spear heads, and a fragment of pottery. Unfortunately none of these relics could be obtained entire, notwithstanding the utmost care and perseverance, the soil being unusually damp, and the iron thoroughly corroded. The bucket, which is the most interesting relic, is in a sadly fragmentary state; enough, however, remains to form a tolerably correct idea of its general appearance, and also to exhibit the wonderful skill of our Saxon forefathers in the manufacture of metals. The two upper rims are of bronze, and have been highly polished on the outer side; one of them is beaded by turning the bronze over an iron wire, similar to the tin ware now in use. The plain one is 2in., and the beaded one 1½in. broad. Towards the bottom of the bucket are four iron rims, ¾in. wide and 1½in. apart, of a very elegant moulded pattern, and excellent workmanship. Instead of the usual handle, this bucket has been carried by two stout iron rings, nearly 5in. in diameter, suspended from iron uprights fastened on either side by three iron rivets, the heads of which are plated with bronze, and are exactly the size of the small florin now in circulation. Eight similar rivets have served as ornaments on the plain woodwork betwixt the bronze and iron rims. This vessel is of very large size, averaging about 1ft. 8in. in diameter, and would contain from four to five gallons. To construct a similar vessel in the present day without the aid of machinery, would require all the appliances of the modern forge and workshop, and a skilled workman into the bargain. The use of these wonderful vessels, as described by the Saxon chronicler Beowulf, was intended to convey wine to the festive hoards of the great and powerful.

A very gratifying compliment has recently been paid to Mr. S. C. Hall, F.S.A., the projector and editor of the *Art Journal*. A number of the principal manufacturers and other inhabitants of Birmingham have presented him with an elegant dessert service (by Elkington and Co.) in the Pompeiian style of ornament, the whole carefully chased, parcel gilt with figures in oxidised silver the dishes of crystal, flashed with ruby, elaborately engraved and cut. The centre piece stands on a circular plateau bearing an inscription which states that the testimonial is made in testimony of Mr. Hall's unceasing labours for the advancement of art in connection with manufactures, extending over a period of thirty years. To Mrs. S. C. Hall was presented at the same time a beautiful cameo brooch mounted in gold, set with rubies and pendant chain, the work of Messrs. Randalls. An illuminated and bound address signed by the Mayor of Birmingham on behalf of the subscribers accompanied the testimonial.

Building Intelligence.

CHURCHES AND CHAPELS.

The parish church of St. Andrew, Carlton (a chapelry of Market Bosworth), having undergone thorough restoration, was reopened last week. The work has been carried out under the superintendence of Messrs. Goddard and Son, architects, Leicester.

The Primitive Methodists have erected a new chapel at Malton at a cost of nearly £2,000. The architect is Mr. John Gibson of that town.

A new Catholic Church (All Saints) has just been opened at Thirsk. It is built in the Early English style, and consists of nave and apsidal chancel. The material is brick with stone facings. The church, which will accommodate about 250 persons, has cost £1,600, the architect being Mr. W. A. Bourne, of Thirsk.

The foundation stone of a new chapel on the Milbourne estate, Northumberland, was laid last week. It will be in the Early Geometrical style and is intended to seat 100 persons. Mr. Robert Johnson is the architect, Mr. John Donkin the builder.

The restoration of Blurton Church has just been completed by Mr Barlow, from designs by Mr. Lynam, architect, of Stoke.

Mr. Gilbert Scott arrived in Aberdeen on Monday, for the purpose of making a professional survey of Oldmachar Cathedral. Mr. Scott is accompanied in his inspection by Mr. James Mathews, architect, Aberdeen, who is employed by the local heritors in designing the repairs which fall to be borne by them.

LEICESTER.—A new church dedicated to St. Matthew has recently been consecrated here. The edifice is from the designs of Mr. George Gilbert Scott, R.A., is built in the Early English style of architecture, prevalent in this country in the thirteenth century. The materials used are granite from Mountsorrel, with brick and freestone for the dressings. The ground plan shows a nave with aisles, and a chancel with north and south chapels. The aisles are divided from the nave by arcades of six arches on each side, supported alternately by cylindrical stone columns, and clustered columns composed of brick surrounded by stone shafts; the arches above are of stone and moulded red brick. The roofs of the church are of stained deal; that of the nave being very high pitched and open timbered, those of the side aisle having tie beams carrying kingposts; the plaster shown between the timber is stencilled. The roof of the chancel is also high pitched, of stained deal and panelled.

NEWCASTLE-ON-TYNE.—The ceremony of laying the foundation stone of a Methodist New Connexion Chapel here, was performed on Monday, the 27th inst. The chapel will be 58ft. 8in. by 26ft. 3in. and 23ft. in height internally, and will accommodate about 350 persons. Mr. S. Oswald is the architect, and the contracts for the erection have been undertaken by the following:—Mr. Robert Ridley (mason) and Mr. Robert Mattison (carpenter). The cost of the erection of the chapel with vestry and keeper's rooms attached, will be about £700. The walls are to be of stone. The style is that of Early English Gothic.

BUILDINGS.

The opening of the new schoolhouse in connection with St. Paul's Congregational Chapel, Tindal-street, Newcastle, took place last week. The building, which will accommodate 500 children, has been carried out from designs by Mr. Douglass, builder, at a cost of £1,100.

Mr. Wardlaugh, the proprietor of the Alma Theatre, Longton, Staffordshire, has commenced the erection of a new brick and stone building to supersede the present wood erection. Mr. Spicer is the contractor.

The tender of Messrs. Simms and Marten (£9,888) for the erection of the Royal Hospital for Incurables, Putney-heath, has been accepted, and the works are commenced. The corner stone will be laid with all due ceremony early in July.

NANTWICH (STAFFORDSHIRE).—The sanction of the Secretary of State to borrow the money requisite for carrying out the new set of plans adopted by the Local Board of Health for a Market Hall, has been received during the week, as also his approval of the plan of proposed increased water supply. The first-named work is estimated to cost £2,500, and the latter £1,500. A proposition is also on foot for substituting blue brick footpaths for the existing stone pavements which formed so marked a peculiarity of this and many other ancient towns.

SALFORD.—The foundation stone of a new school in connection with Hope Chapel, Liverpool-street, was laid last week. The new building will be of brick, with the facings of pressed brick, relieved by some stone work, and blue bricks in the stringcourses and arches. The site is rectangular, measuring 81ft. by 72ft.; and the plans, which are by Messrs. Paull and Robinson, of Salford, provide for an assembly room, class rooms in two floors, and a third story at the front corners, in which other classrooms are provided. The total number of classrooms is seventeen, varying in size from 19ft. by 15ft. to 14ft. by 9ft. and none less than 11ft. high. These with the existing infant and other classrooms, will afford accommodation for 1,000 scholars. There will also be separate rooms for the superintendent and the library. Provision is made for supplying warm fresh air to every apartment, and for extracting foul air. The cost of the building will be about £6,000.

STAFFORD.—The new Manchester and Liverpool District Bank has been completed. It is the most elaborate piece of architecture in the town. The building is of red brick with Hollington stone dressings, and the shafts which support the capitals in the windows and doorways are of red Mansfield stone. The style is Gothic, treated with considerable freedom, and an almost profuse employment of carving and other ornamentation. The front is divided into three gables, terminating with finials. The whole width is 44ft. All the door and window openings inside and outside have shafts of red Mansfield stone, supporting carved capitals. The upper portion of the windows are of solid stonework, pierced with circular openings of various sizes. The main entrance doorway in the centre is lofty, wide, and deeply recessed. Double shafts surmounted by richly carved capitals, support the arch, which is elaborately moulded. An inner arch, forming half a quatrefoil, is filled with a very graceful piece of floriated ironwork. The spandrels are pierced, and this doorway is perhaps the best feature in the elevation. The bank itself is 40ft. 6in. long, by 23ft. wide. The room is very lofty, the glass ceiling being 29ft. above the floor. The architect is Mr. Robert Griffiths, county surveyor; and the work has been carried out by Mr. H. Lovatt, contractor, of Wolverhampton.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the EDITOR, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—C. F. and Sons.—W. O. C.—W. H. D.—B. and Sons.—E. E. E.—J. N.—R. W. E.—W. S.—J. W. B.—H. and P.—J. H.—B and P.—J. H. C.—J. K. C.—S. and G.—W. B.—R. W. E.—T. F. (not in our line.)—J. J. W.

J. H. (Torquay).—The drawing has been returned.

"An American" is informed that the American scientific newspapers live to a great extent on English papers; and very frequently articles are reproduced in English papers from American papers, which in the first place were taken without acknowledgment from English papers.

ALPHA.—You should have sent stamps in order to secure the insertion of the advertisement.

A CONSTANT SUBSCRIBER ought to be the best judge of what he should charge. Certainly 5 per cent. is not much.

G. T.—The agreement is not valid without a stamp.

Correspondence.

CONCRETE BUILDINGS.

To the Editor of the BUILDING NEWS.

SIR,—I have read with some interest the correspondence and articles that have appeared from time to time in yours and other journals in reference to concrete buildings, and although my name has been pretty freely used, I should scarcely have ventured to take part in the controversy had not one of your correspondents disputed my figures, or, to speak more correctly, made such additions to and explanations of my statements as would make it appear that there really is no advantage whatever in the use of concrete for building walls. Now, I have no interest whatever in Mr. Tall's patent, or any other patent relating to concrete buildings in this country, but as I apprehend your desire is to elicit the truth, I hope you will permit me to reply to some of the observations of "F.," from Chester. "F." does not dispute that I can produce concrete walls 9in. thick at less than 3s. per yard super, but wants to add on 1s. 2d. per yard for rough cast, and from 2s. 6d. to 3s. per yard for Portland cement stucco, and then "fails to see what saving is to be effected." I can only say that if satisfied with rough cast I need not be at any expense whatever for facing the walls, as they already have the appearance of rough cast. As, however, I prefer a neat Portland cement face, I generally put on a skin of stucco, for which at Norwood (not by any means a cheap place for labour) I paid last week something under 2d. per yard super. As I find it as well to be accurate, I may say that I paid 3s. 4d. for labour on 24 yards super of Portland cement stuccoing, finished with drawn joints. I gauge the stucco 4 parts of sand to 1 part of cement, and it is put on less than the thickness of a penny piece. Now sand at 5s. per yard, and Portland cement at 1s. 10d. per bushel, will give me the materials at less than 2d. per yard super. As I am certainly over the mark in putting the price of 9in. concrete work at 3s. per yard, I may take the stucco at 3d., and say the walls can be built and finished in Portland cement stucco at 3s. 3d. per yard super. What on earth "F." means by saying that stuccoing in Portland cement will cost 3s. per yard is more than I can understand. "F." is equally unfortunate about his brickwork. He puts this down at 3s. 6d. per yard of 9in. work. Now there are 100 bricks in a yard of 9in. work; take these at only 30s. per thousand, and you have 3s. for your bricks, leaving only 6d. for mortar, labour, scaffolding, &c. Now "Laxton's Price Book" gives me over 2s. per yard of 9in. work for labour and mortar, thereby bringing the price to 5s. per yard, even with bricks at 30s. per thousand. If "F." will only undertake to do me a lot of work at 3s. 6d. per yard I will give him as much as he can do, and will abandon concrete altogether, although I have spent some thousands of pounds in carrying it out in this and foreign countries.—I am, &c., W. E. NEWTON, C.E.

66, Chancery-lane, May 28.

SIR,—Your correspondent "F.," on the subject of concrete buildings, seems to have forgotten that the surfaces of a wall properly erected in that material are quite level and smooth, and only require about ¼in. thick of cement and sand plastering to give them a perfect finish. This would be done for about 6d. per yard super, and for the same reason fully half the cost of internal plastering is saved. I think he has also understated the cost of brickwork, as it cannot be done here under 20s. per cube yard, and that without any pointing or other finish. The result of my experience, from a few experiments tried with concrete, is that good wall can be erected for 11s. per cube yard, or 2s. 9d. per yard super for 9in. work, and that taking the cost of Portland cement at 3s. per bushel, which is nearly 50 per cent. over the London price. The proportions used were one cement to eight of sand for the concrete, with about an equal bulk of small flat stones or broken bricks filled into the mould, care being observed in doing so to keep each piece separate and about half an inch from the surface. This plan effects a considerable saving of cement, and as far as I can see does not diminish the strength of the wall. I should tell you that the cost of the sand and broken stones was 2s. 6d. per cubic yard.—I am, &c., J. F. C.

Dublin, May 28.

PENNY WISE AND POUND FOOLISH.

SIR,—An instance has just occurred at Wellingborough, which fully verifies the truth of the above well-known adage. A church, the designs for which were furnished by a London architect but handed over to a local gentleman of the profession to superintend and carry out, has been for some weeks in course of erection. Those interested in the proposed new building thought, no doubt, that by employing a local architect to inspect the work occasionally, they might thereby save the (what appears to some unnecessary) expense of a clerk of the works. What is the result? Simply this, the church is falling down, although a very small portion of the roof timbers are yet put on, the defect being, of course, where it generally does occur, viz., in the foundations,

where we are sure the strongest and most substantial work ought to be put. The stone bases (upon which the pillars intended to carry the roof were set) and which were some 3ft. square and deep, were composed of small rubble stone, many of the pieces being not larger than a goose egg, and put together with common mortar; in fact, they were built like a common rubble wall. One would fain ask the question, Where was the inspector while this was being done? Consequently, when the weight came on, the work began gradually to sink, and the stonework split and broke in all possible directions, and the whole structure presents a most deplorable wreck. I forward you this brief account of the above, hoping that should any of your numerous readers be interested in any proposed large or public buildings, they will see that the salary of a clerk of the works is not, as many people foolishly think, money thrown away.—I am, &c.,

OBSERVER.

POPLAR DISTRICT BOARD OF WORKS.—ELECTION OF ASSISTANT SURVEYOR, AND COMPETITION FOR NEW OFFICE DESIGN.

SIR,—I beg to enclose you a report from a local newspaper touching this election, which will speak for itself:—"The Board pleasantly occupied more than two hours in the examination of plans, testimonials, &c., of the various candidates. This was a proceeding scarcely worth the time, considering that it had been resolved by a majority of the members to elect Mr. Chatterton, who has been assisting the assistant surveyor for some time past." Perhaps you will allow me to ask the members of the Poplar Board, through your columns, whether the competition is to be decided in the same manner, as I hear that the present assistant surveyor, assisted by the past assistant surveyor, is likely to be a competitor, and now, likely enough, we shall find the future assistant surveyor has a finger in the pie. If the members have determined to uphold, at all risks, their association of past, present, and future assistant surveyors, why ask for other designs.—I am, &c.,

B.

"BLIND BUILDERS" NO LONGER.

SIR,—The below being the whole of the tenders received are sufficiently singular in their unanimity to merit notice, all being exactly to a halfpenny the same.

Shrewsbury, May 23. S. POUNTNEY SMITH.

Tenders received for the erection of Parsonage, Atterbury, Salop. Mr. S. Pountney Smith, architect:—Messrs. Bowdler and Darlington, Shrewsbury, £1,300; Messrs Everall, Shrewsbury, £1,300; Mr. Evans, Yockleton, £1,300.

BEBINGTON CEMETERY CHAPELS, &c.

SIR,—I shall feel obliged if any of your readers can give any information respecting the above competition as to the number of competitors, and also when it is likely that the selection from the designs will be made. If anyone has any remarks to offer on the drawings that have been sent in, as to merits or demerits, for the good of others, they will confer a great favour on me as well as other architects. It is to be hoped that there will be no hole-and-corner work in this competition, as has been the case with others of late, but that the motto system may be carried out in a fair and honourable manner.—I am, &c.,

A CONSTANT SUBSCRIBER.

Intercommunication.

QUESTIONS.

[395.]—HOW TO DESTROY FLEAS.—I have a house infested with fleas; they are chiefly underneath the floor. Could you or any of your readers inform me of the best remedy to get rid of them I should feel greatly obliged.

W. KING.

[396.]—GREEN COATING ON STONEWORK.—Can any of your readers inform me of a good plan to remove the green coating from stonework? I wish to do it without in any way injuring the surface of the stone. A. W.

[397.] — CRUSHING WEIGHT OF COLUMNS.—Have the kindness through the medium of your "Intercommunication" to give me the formulæ for ascertaining the crushing weight of a cast-iron column; also be kind enough to inform me how many times the calculated load (of buildings) it is the practice to provide for, both in the case of a cast-iron column and a wrought-iron girder.

CHARLES CLARKE.

[398.]—OAK WINDOWS.—I am about to erect a building in the Early English style, and the large casement windows are to be made of oak. Would any of your numerous readers kindly inform me what kind of oak would be best to use for the purpose, both as regards "standing" properties and durability? W. R. T.

[399.]—F.R.S.—Would you kindly inform me what are the necessary qualifications for F.R.S., and whether any Academical degree is required? E. P.

[A candidate for admission into the Royal Society must in the first place be the author of some scientific work or paper read before the Society, and be must be nominated by at least six fellows of the Society. The entrance fee is £10, and the annual subscription is £4. There are at present, we believe, about sixty candidates waiting for admission, but the Society elects only fifteen fellows annually.]

[400.]—CYCLOIDAL CURVE.—Can you or any of your geometrical readers explain to me the peculiarities of the cycloidal curve? There is something so paradoxical in what is said of it that I cannot understand it. My own notion has always been that the nearest way from one point to another is by a straight line; but there are plenty of people who say no, that is not so, and that descending bodies pass rapidly from point to point through a cycloidal curve! The assertion seems to me to need further proof, if it be true; hence my application. SIMPSON, JUN.

[401.] — IRIDISCENCE. — What is the cause of iridiscence—that singularly beautiful appearance which is presented by mother-of-pearl, and which makes that substance so very useful in ornamental art? I have seen the like peculiarities on the surfaces of soap bubbles, &c. Would it be possible to produce similarly charming effects on metals, as gold, &c.? Are the chameleon-like changes of colour to which I refer due to chemical or mechanical causes, or both? It seems to me that the natural beauties of mother-of-pearl might be imitated artificially on other substances of a cheaper and more plentiful kind, and that decorations might thus be effected which would be very good for a variety of purposes, and not so costly as the one named. GRAINER.

REPLIES.

[369.]—SQUARING DIMENSIONS.—There is no shorter method of squaring dimensions than those mentioned by W. Carter; and it is owing to our unfortunate metrical system that we are compelled to use twice as many figures than what would be required in the same calculation if made in accordance with the French decimal system. I myself always use feet and decimals instead of feet and inches in my own calculations which shortens the labour, but is open to the objection that they cannot well be checked by others not used to that plan of calculating. It may, however, be said that the use of the decimal parts of a foot instead of inches is coming into general favour, although it will be a long time before it becomes a rule.

APPRENTICE.

[381.]—ARCHITECTS' CHARGES.—In answer to "Inquirer," I beg to say the usual commission for an architect is 5 per cent. upon the sum expended upon all work under his direction and in accordance with his drawings and specification. Whether old or new materials are used in the construction of the work concerns the builder, but not the architect. If plans which have been prepared by order, are not required and the work is not done, the charge is at the rate of 2½ per cent. upon the estimated cost of the contract. Travelling expenses are always allowed, and the salary of the clerk of the works, and occasionally other expenses by special agreement. A. X.

[382.]—GAS METERS.—A wet meter by all means; dry ones are troublesome to keep in order, and there is an improved description of the former which obviates all objections. GAS ENGINEER.

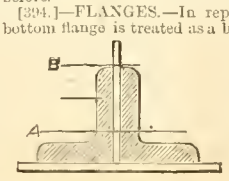
[384.]—LARGE RAILWAY CURVES.—"J. Street" will hardly accomplish his purpose by trying to strike his curves with a radius. The method I have used in getting templates cut to bend rails to the proper curve, is to get a few points in the curve by offsetts, draw lines joining them, and the carpenter can manage the rest. In the cut let

A B C D be a batten 10ft. or 12ft. long; find the centre E F, and take the point E as the starting point of the curve, which will be identical upon both sides, therefore the offsetts will be equal along E A and E B. To obtain the first point in the curve 1_1 1_1 let D be the distance E 1, and R the radius, of the required curve, then putting O for the length of the offsett 1_1 1_1 we have $O = \frac{D^2}{2R}$. By taking equal distances along the batten, that is making E 1 = 1, 2, = 2_1 3, &c., the length of the second offsett 2_1 2_1 will be four times that of the first; the length of the third nine times, and so on as the square of the numbers 1_1 2, 3, 4, &c. ENGINEER.

[388.]—ESTIMATES.—If "H. S." has been induced, by the acceptance of his tender and the instructions he received "to proceed with the work with all speed," to lay out any money in providing materials specially to carry out the particular order for repairs, or has otherwise incurred expense about the matter, he can recover the amount of his outlay; and the County Court will probably furnish the most expeditious means to that end. A BARRISTER.

[390.]—TRANSPARENT PAPER.—Your correspondent "D. J." will find that when a sheet of white paper is moistened with benzole it becomes temporarily transparent, and any lines may be traced through it. In a few hours the benzole evaporates, and the paper becomes opaque as before. J. HALL.

[394.]—FLANGES.—In reply to 394 the L iron in the bottom flange is treated as a bar of area equal to the entire section, but allowance should be made for the different leverage at which the section from A to B acts; and ⅛in. round the rivet holes should be deducted besides the area of the holes to allow for the effects of punching the bottom flange.



O. S. F.

WAGES MOVEMENT.

The carpenters' strike at Cardiff is at an end.

The strike in the building trade at Worcester may now be said to be at an end. The operatives, with the exception of the masons, resumed work on Thursday last, and, pending the settlement of dispute by arbitration, are to continue to work on the same terms as previous to the strike.

LEEDS.—The strike in the building trade continues. A meeting of masters has been recently held, at which it was unanimously resolved not to make any further concessions. The men appear equally determined to hold out. Some of the masters have succeeded in procuring a number of bricklayers from Thorne, but several of them have been induced to give up work and return to their homes; whilst the others have been so annoyed that the aid of the police has been sought in several instances to preserve order.

COMPENSATION.

At the Lord Mayor's Court on Saturday, before the Recorder and a special jury, the case of "the Governors of Bridewell and Bethlehem Hospital v. the Metropolitan Railway Company" was heard. The question was in respect to some freehold property in Liverpool-street and its adjacent parts required by the railway for their Tower-hill extension line. The jury went to make a personal inspection of the property, and soon afterwards the counsel and other parties consulted together. Mr. Hawkins informed the jury that they had settled the matter, and they would only have to give a verdict for £40,000. The learned Recorder presumed the jury would have no objection to such a termination of the case. The jury had no possible objection and gave a verdict for £40,000, which was entered upon the proceedings.

At the Lord Mayor's Court on Monday was heard the case of Walton v. the Corporation of London. The claimant was Mr. Charles Walton, wine merchant, in the Farringdon road, whose premises were required for the Holborn-valley improvements. The claim, as appeared from the precept, was just over £42,000, and was made up of various items. The jury went to view the property, and on their return the case was opened by the Solicitor General, who called witnesses in support of the claim. Mr. Hawkins addressed the jury on behalf of the Corporation, suggesting that about £21,000 would satisfy the justice of the case. The Common Serjeant went through the evidence, and left the question of compensation to the jury. After an absence of half an hour they gave a verdict for £28,069.

STATUES, MEMORIALS, ETC.

Mr. William Brodie R.S.A., has completed a statuette in marble of the late Mr. John Philip, R.A., and also the model of a life size bust. The statuette represents the artist leaning in an easy attitude with his right hand upon a pedestal, on which lie a palette and brushes. The likeness in both statuette and bust is said to be perfect.

Preparations have been made for the erection of a magnificent mausoleum over the grave of the late Baroness Ferdinand de Rothschild in the Jewish cemetry at East Ham. The mausoleum is also intended as the last resting place of other members of the family.

A monument has been erected at Clun in memory of the Austrians who fell at the battle of Königgratz. It is of iron, and consists of a colossal cross on a Gothic pedestal and bears an appropriate inscription.

LEGAL INTELLIGENCE.

THE LAW OF CONTRACTS.—The judge at the Rotherham County Court on Saturday decided a case of considerable importance to artists and designers. Mr. C. H. Whittaker, the plaintiff in the action, is a designer and modeller at Birmingham, and sought to recover from the defendants (Messrs. Wright and Chambers), who are iron manufacturers at Rotherham, the sum of £50, the price of a design and model flower stand. In November last the plaintiff received an order from the defendants to furnish a design for an ornamental flower-stand, and in February the defendants wrote a letter to the plaintiff complaining of the non-delivery of the model by the end of January, as agreed upon, and stating that if it did not come to hand at once it would arrive too late for the spring season. The chased pattern was forwarded immediately, and the receipt of it was acknowledged by the defendants in a letter dated March 8, in which they expressed their fears that it had arrived too late for the season, and stated that it was much heavier than had been previously represented by the plaintiff; the letter concluding with a request to forward the invoice. Some further correspondence took place, and in a letter dated March 11, in acknowledgment of the receipt of the invoice, the defendants complained of the "enormous price" charged for the design, and, after repeating their former complaints as to the late delivery and the excessive weight, ask the plaintiff if they may return it, or transfer it to some other manufacturer. The plaintiff replies the next day, and refuses to take back the stand;

vhereupon the defendants, writing on March 13, nsist upon their right to rescind the contract. Whether the defendants had a right to do this vas, the judge said, the first question he had to ry. The defendants said they had the right, on he ground that the contract was a special one, ontaining three conditions, which had been roken by the plaintiff. These conditions, which he plaintiff denied, were that the model was to be elivered by the end of January; that it was to be inexpensive," and that it was to be only one-hird the weight of another stand then in de-endants' possession; whereas the defendants ntended that the model was not delivered until Iarch 8, the price was "enormous," and the eight of the stand was two-thirds greater than hat of the old stand. As to the condition refer-ng to the time of delivery, the judge thought hat the defendants had been too late in insisting pon it, and he considered the word "inex-ensive" was too vague a term for him to ecide upon, and that a maximum sum should ave been fixed. In reference to weight, he hought there had been no definite agreement on hat point; but even if there was, the defendants ould not, on that account, rescind the contract, it would only be entitled to some reduction in e price as was clearly laid down in "Chitty on ontracts." He, therefore, came to the conclusion at on March 13 the defendants were not entitled rescind the contract, nor to claim any reduc-n from the price. His Honour gave judgment the plaintiff for the full amount claimed.

Master Builders and the Union.—An action s heard at Birmingham the other day which, hough involving a sum of only 1s. 3d., is of nsiderable importance to the operatives of the ilding trade. The defendant (Surman), who is a ster builder in Great Colmore street, was sued the plaintiff (Waldron) for a quarter of a day's ges, in lieu of the same period of notice. The intiff, in examination, said that he was "taken ' without any contract being made or proposed either side; but he urged that the defendant l practically adopted the rule of the "Union," paying 6½d. an hour, and by ceasing work on Saturday afternoon. He declined, however, give him the two hours and a half notice; hence action.—The judgment was that according he plaintiff's own showing there was no agree-nt between the parties as to the terms of the agement, and therefore no claim could lie nst the defendant.—Mr. Cutler, for the defen-t, said his client, being an employer of about men, resisted the claim on principle. There an association of master builders who agreed he rules of the "union," but Mr. Surman was one of that association, and he repudiated the ion" altogether.—The plaintiff said it was rally understood that the defendant had ed to abide by the rules in question.—The ge said they did not deal with "understand-" in courts of law; and that, as there had no contract, a nonsuit would be entered.

General Items.

vo gentlemen in Kidderminster are said to invented a process for the destruction of ex-ve gases in coal and other mines, so as to ren-them safe for miners to enter.

the steeple of a church was being pointed re-y, the attention of a little girl was attracted he scaffolding put about it. She appeared le to comprehend it; but finally, after a mo-'s reflection, she said "It's the crinoline."

e International Society of Fine Arts ited) has just opened its exhibition of pic-, at 25, New Bond-street. There are a great pictures, principally from foreign artists, rious degrees of merit, and many of which orthy of the attention of British artists and isseurs.

loured glass when heated so as to be lumi-emits the same light which, at ordinary eratures, it absorbs; thus, red glass gives r radiates, when heated, a greenish light, and glass a red light. This phenomenon is due long known principle that the radiating of different substances is directly propor-e to their absorptive, and inverse to their ive power.

Alum and plaster of Paris, well mixed in water and used in the liquid state, forms a hard compo-sition, and is a useful cement.

The celebrated Prussian archæologist, Dr. Gerhard, is dead.

The Wiltshire papers announce the death at Heytesbury, in that county, of Mr. John Parker, a well-known antiquarian, at the age of 87.

As a sign of the times, it is worthy of note that builders in some parts of the country are now in-serting in their tenders, a proviso exempting them from forfeit in case they are prevented from completing their work by strikes.

We may mention as one of the minor events that the Poplar Recreation Grounds, situate between the High-street and the East India Dock-road, were formally opened on Monday last by Sir J. Thwaites. The grounds occupy about five acres in extent, and were purchased at a cost of £12,000, towards which the Metropolitan Board of Works contributed £6,000, and £1,500 has been realised by the sale of old materials. The remainder is borrowed, and twenty years allowed for its repay-ment.

It is reported that the fortifications and other works completed and in progress at the Isle of Grain for commanding the approaches to the Thames and Medway at the confluence of the rivers have been so imperfectly constructed that they are falling to pieces. The original estimate for the cost of the defences in the Isle of Grain was £100,000, but already a much larger amount has been expended on the works.

Mr. H. R. Cotton says:—In your notice of my plan for the proposed workhouse for the parish of St. Martin-in-the-Fields, you say, "the beds must either be placed under the windows or about a foot apart, in pairs." This is not so, the spaces I have allowed being 1ft. 10in. and 3ft. alternately, the 3ft. space being at the windows and no beds being placed under them.

The drainage of that part of Geddington, Nor-thamptonshire, lying on the south side of the river is about to be commenced at once. Plans embracing a complete system of sewers with pro-visions for an extension of the main and filtering beds at a distance from the town, have been pre-pared by Mr. R. W. Johnson, architect, Melton and Leicester, and the contract for the first portion of the works has been taken by Mr. Patrick, builder, of Geddington.

We have reason to believe that the Commis-sioners of Woods have determined upon connect-ing the coal basin in the Forest of Dean with the Great Western line. This extra communication will enable the coal-owners of the district to compete in the London market with the pro-duce from the North, as it will effect a saving of 2s. per ton in the cost of transit and deterio-ration. Hitherto the bitumen coal of the Forest of Dean has only been obtainable as far east-ward as Reading, in consequence of the want of a connecting link with the Great Western from the mouth of the pits.

A portion of the public park at Southampton has just been officially dedicated to the free use of the population as a cricket ground. Only a few years ago this land and the park generally were cultivated as potatoe and cabbage fields, belong-ing during the summer six months to private in-dividuals. These private rights the Corporation some years ago bought up from the proceeds of a building estate known as the "Marsh;" and the public have now not only an ornamentally planted pleasure ground but a capital match ground. Mr. Guillaume, surveyor to the Marsh estate and the park, and Mr. Lemon, the Borough surveyor, have successfully carried into effect this desirable work.

It would appear that a representation has been made to the Royal Commissioners who are con-ducting the Trades' Union Inquiry, to the effect that in allowing the evidence to be published they are not pursuing the usual course followed under Royal Commissions, of first reporting and sub-mitting copies of the evidence taken to her Majesty, and, under her direction, to Parliament. We are, therefore, not in a position to give more of this evidence this week.

The British Association of Gas Managers in-tends to hold its annual general meeting at Not-tingham on the 11th, 12th, and 13th of June next. Mr. Thomas Hawksley, president of the Associa-tion, will take the chair. Besides a lecture by Dr. Letheby "On the Utilisation of the Residual Pro-ducts of Coal Gas," the following list of papers and communications will be submitted to the meeting:—"On the Practical Working of the Liquor System of Purification," being a statement of results in continuation of the paper of last year on "An Im-proved Method of Purifying Coal Gas," by Mr. George T. Livesey, South Metropolitan Gas Works, London; "On the Purification of Gas from Ammonia, and the Utilisation of the Pro-duct," by Mr. George Anderson, London; "Notes on the Manufacture of Sulphate of Ammonia," by Mr. W. Esson, Gasworks, Cheltenham; "On the Application of Liquid Hydrocarbons, as a Substitute for Cannel, in the Manufacture of Gas of high illuminating power," by Mr. E. Goddard, Gasworks, Ipswich; "Some Remarks on the Explosive Properties of Fire Damp and Coal Gas, with Particulars of Experiments made in Light-ing portions of the Oaks Colliery with Pit Gas," by Mr. J. Hutchinson, Gasworks, Barnsley; "On Leakage from Gas Mains," by Mr. E. S. Cathels, Gasworks, Crystal Palace District; "On the Valves of Gas Purifiers," by Mr. W. J. Warner, Gasworks, South Shields.

MEETINGS FOR THE WEEK.

Mon.—Royal United Service Institution.—"Further Particulars regarding Moncrieff's Protected Barbette System," by Captain A. Moncrieff, 8.30.

Wed.—Geological Society, 8.

Thurs.—Chemical Society, 8.

Fri.—Architectural Association.—Nomination of Officers—A Paper will be read by Rev. E. L. Cutts, 7.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

2758 D. M'DERMID. Improvements in Machinery or Apparatus for Pasting Wall-papers. Dated October 25, 1866.

The patentee in carrying out this invention constructs a box, vessel, or receptacle to contain the paste; the upper portion of the box is provided with bearings for the recep-tion of two rollers, one above the other, the lower roller dipping slightly into the paste; the paper is then intro-duced between the two rollers and drawn completely through, whereby the revolution of the rollers by friction of the paper will cause a layer of paste to be applied to the paper, when it is ready to be attached to the wall. Or the paper may be wound on a core or roller, and set in bearings on the box, and may then be drawn off over a lower roller dipping into the paste, or between two in-dependent rollers, as in the first instance. *Patent com-pleted.*

2797 J. HUNTER. Improvements in Machinery or Apparatus to be used for Excavating and Mining. Dated October 30, 1866.

This invention relates to a certain arrangement of parts of apparatus by which a very effective movement is ob-tained for actuating a pick or picks or hammers used for excavating and mining, and consists as follows:—A fixed piston is employed which fits into or between the annular space of a cylindrical segment, being closed around the sides of the piston, sufficient freedom for motion, how-ever, being left that when steam or compressed air is admitted from a central valve to one or the other side of the piston, the cylindrical segment is caused to revolve or vibrate upon the fixed piston as the steam is alternately admitted on its opposite sides from the two ports in the central valve through one of which the steam from the full side of the cylindrical segment is exhausted whilst fresh steam is being admitted through the other port to the other side of the segment, the ports being opened and closed by the rotation of the segment over the central valve. From what has been described it is obvious that a very rapid oscillating action of the segment is ob-tained, and to adapt this for the cutting or dislodgement of material in excavating or mining, one or more picks are fixed into the periphery of the segment. The apparatus is mounted on a carriage to facilitate transport and move-ment as the work is going on. *Patent completed.*

Trade News.

TENDERS.

Crouch End.—For Mr. Isaac Frost's villa residence at Crouch End. Mr. W. P. Griffith, architect:—Patman, £1,985; Dimsdale, £1,870 (£150 less for burnt clay for ballast); Webb and Sons, £1,445 (£100 less for burnt clay for ballast).

Duddeston (Birmingham).—For erection of new church for the parish of St. Matthew, Duddeston. Mr. J. Chat-win, architect:—Wilson, £3,200; Jones (accepted), £,3199.

DEVONSHIRE.—For erecting a new church at Ellacombe, Torquay, Devon, for A. F. Halburton, Esq. Messrs. E. Habershon, Brock, and Webb, architects:—Manley and Rogers, £4,474; Simpson, £4,434; Hervey, £3,950; Jackman, £3,920; Call and Pethick, £3,694.

KENT.—For alterations and additions to a house, and for partly erecting a pair of semi-detached houses, at Bexley, Kent, for H. E. Marsh, Esq. Mr. Herbert Ford, architect. Quantities supplied by Mr. J. W. Dennison:—W. Brass, £3,381; Browne and Robinson, £3,306; Turner and Sons, £3,305; Piper and Wheeler, £3,256; G. S. Pritchard, £3,206; Crabb and Vaughan, £3,157; R. Mann, £3,077; W. Henshaw, £3,037.

KETTERING.—For additions to school buildings, Kettering. Mr. R. W. Johnson, Melton and Leicester, architect:—Margetts, £228; Hawthorn, £215; Wilson, £214.

KETTERING.—For additions to premises at Kettering. Mr. R. W. Johnson, Melton and Leicester, architect:—Margetts, £398; G. Henson, £388; Wilson, £379 16s.; Sharman, £374 10s.

LEEDS.—For works in additions to Becca Hall, near Leeds. Mr. R. W. Johnson, Melton and Leicester, architect:—Backhouse, £665.

MARYLEBONE.—For new chronic wards at St. Marylebone Workhouse. Mr. H. Saxon Snell, architect. Quantities supplied:—Stephens and Watson, £6,450; J. Henrle, £6,287; J. Martin, £6,264; Kelley, Brothers, £6,085; George Shaw, £6,077; G. C. Rigby, £6,072; David King and Sons, £6,060; Godden and Webb, £6,000; E. Brown, £6,000; B. E. Nightingale, £5,785; W. Henshaw, £5,716; Crabb and Vaughan, £5,598; J. Chappell, £5,567; W. C. Wills, £5,396; Robert Mann, £5,345; Nutt and Co., £5,343; Manley and Rogers (accepted), £5,120.

NORTHAMPTONSHIRE.—For alterations and additions to Kelmarsh Hall. Mr. James K. Colling, architect:—Myers and Sons, £2,749; Watkin and Son, Northampton, £2,175; Stanyon and Son, Market Harborough, £1,922; Winkles and Kellett, Leicester, £1,869 7s. 6d.

PECKHAM.—For building two houses at Rye Hill, Peckham Rye, Surrey, for Mr. Preece. Mr. Henry Jarvis, architect:—Tarrant, £1,597; Henshaw, £1,524; Thompson, £1,468; Deavin, £1,400.

WHITECHAPEL.—For repairs and alterations to German Protestant Church, Hooper-square, Whitechapel. Mr. John W. Morris, architect:—Peters, £210 15s.; Stevens, £160; Salt, £155; W. and D. Brown (accepted), £137.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET

Thomas Cracknell, jun., Maida-vale, builder, June 12, at 12—Jonathan Neve Elsey, Battersea, lime merchant, June 6, at 2—William Faulkner, late of Spencer-road, Hornsey, ironmonger, June 17, at 11—Charles Garrett, Banstead, railway contractor, June 10, at 11—Richard Jewell, Roman-road, Barnsbury, builder, June 11, at 11—William Everitt, Poplar, builder, June 17, at 11—Charles Thorp, Riley-street, Bermondsey, paper hanging manufacturer, June 11, at 12.

TO SURRENDER IN THE COUNTRY.

James Biden, jun., Southsea, builder, June 17, at noon—Abraham Fletcher, Bradford, Yorkshire, quarryman, June 7, at 9 45—Thomas Smith Greenway, Wolverhampton, carpenter, June 5, at 12—John Hacche, Swansea, cabinetmaker, June 5, at 2—Edward Heathcote, Manchester, plumber, June 4, at 9.30—John Hopper, Newcastle-upon-Tyne, ship carpenter, June 5, at 11.30—John Morley Pearson, Saltburn-by-the-Sea, builder, June 6, at 11—David Moor Randles, Beestonhill, near Leeds, plasterer, June 7, at 12—John Howard Robinson, Hulme, asphalter, June 8, at 9.30—Frederick Mussel Rodwell, Thorrington, Essex, blacksmith, June 15, at 11.30—William Spring, Great Grimsby, joiner, June 7, at 11—Samuel Clinton, Wednesbury, gastitting maker, June 22, at 12—William Thomas Harries, Woodside, near Saundersfoot, iron and brass founder, June 7, at 10—Charles Hibberd, Sutton Mandeville, stonemason, June 11, at 12—John Jones, Briton Ferry, builder, June 7, at 11—Philip Presant, Norwich, bricklayer, June 11, at 11—George Turner, Stockton, painter, June 15, at 11.

PARTNERSHIPS DISSOLVED.

Sheldon and Hill, Smethwick, machinists—W. and T. West, Silverstone, Northamptonshire, timber merchants—A. S., W., and P. Dart, Totnes, cabinetmakers—T. and J. Hopkinson, Bradford, Yorkshire, bellfounders—Wotton and Castle, Tavistock-mews, builders—Fidell and Co., Gainsborough, timber merchants—J. and G. Overend, Nottingham, builders—R. and W. Gardner, Liverpool, plumbers—Creighton and Johnson, Newcastle-upon-Tyne, decorators.

DIVIDENDS.

June 12, W. Langley, Liverpool, builder—June 7, D. Sykes, Castleford, builder—June 17, J. Bailey and J. Geldard, Leeds, builders—June 17, W. Barker, Leeds, builder—June 10, J. P. Kay, Rainton, Yorkshire, builder—June 7, J. Asldey, Eriswell, Suffolk, blacksmith.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

June 28, W. Larkins, Dod-street, Limehouse, carpenter—June 19, J. Heatley, Whitchaven, plumber—June 1, A. Rose, Hollington, Sussex, builder—June 7, R. Griffin, Hull, painter—June 11, T. Fleet, Newick, Sussex, blacksmith—June 6, A. Jeffrey, Harlow Hill, near Harrogate, blacksmith—June 21, J. Swire, Haslingden, builder—June 26, J. Turner, Cheetham Hill, builder—June 27, H. Bendall, Freshwater, painter—June 27, C. Salter, Newport, mason—June 11, J. Burnicle, Middlesborough, joiner—July 24, W. Dixon, Codicote, builder—June 12, W. Hedley, Capcoch, Glamorganshire, contractor—June 13, J. W. Magness, Ashperton, Herefordshire, blacksmith.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9	0	£10	10	Archangel, yellow ..	£11	10	£12	10
Quebec, red pine	3	0	4	10	St. Petersburg, yel...	10	10	11	0
" yellow pine..	2	15	4	0	Finland	8	0	9	0
St. John N.B. yellow	0	0	0	0	Memel.....	0	0	0	0
Quebec Oak, white..	5	5	6	0	Gothenburg, yellow	8	10	10	10
" birch.....	3	10	4	10	" white	8	0	9	0
" elm	3	10	5	0	Gefle, yellow.....	9	0	11	0
Dantzic oak	3	10	6	0	Soderhamn	9	0	10	10
" fir	2	0	3	0	Christiania, per C.,				
Memel fir	3	0	3	10	12 ft. by 3 by 9 in.				
Riga.....	3	0	3	5	yellow	16	0	22	0
Swedish	1	15	2	2	Deck Plank, Dantzic,				
Masts, Quebec red pine	6	0	7	0	per 40 ft. 3 in.	0	15	1	4
" yellow pine..	5	0	6	0	PUMICE STONE pr ton	5	0	8	0
Lath wood, Dantzic, fm	4	10	5	0	OILS, &c.				
" St. Petersburg	6	10	7	10	Seal, pale....per tun	42	0	0	0
Deals, pr C., 12 ft. by 3					Sperm body	110	0	0	0
by 9 in., duty 2s per					Cod	40	0	0	0
load, drawback 2s.					Whale, Sth. Sea, pale	43	0	0	0
Quebec, white spruce	14	10	21	10	Olive, Gallipoli.....	62	0	0	0
St. John, white spruce	13	10	15	10	Cocoanut, Cochin, ton	59	0	0	0
Yellow pine, per reduced C.					Palm, fine	34	10	40	0
					Linseed	38	0	0	0
Canada, 1st quality.	17	0	19	10	Rapeseed, Eng. pale..	37	10	38	0
2nd do.....	12	0	13	10	Cottonseed.....	23	0	34	10

METALS.

IRON:—								
Welsh Bars in London .. ..per ton	6	15	0	0	0	0	3	
Nail Rod	7	10	0	8	0	0	2	
Hoops ..... do	8	15	0	9	0	0		
Sheets, Single ..... do	9	15	0	10	0	0		
Staffordshire Bars ..... do	7	15	0	8	10	0		
Bars, in Wales ..... do	5	15	0	6	0	0	3	
Rails ..... do	6	0	0	6	5	0	net	
Foundry Pigs, at Glasg. No 1 .. do	2	13	6	3	7	0		
Swedish Bars ..... do	10	10	0	12	10	0		
STEEL:—								
Swedish Keg, hammered .....per ton	16	0		0	0	0		
Swedish Faggot ..... do	10	10		12	10	0		
COPPER:—								
Sheet & Sheathing, & Bolts ....per ton	85	0	0	89	0	0		
Hammered Bottoms ..... do	96	0	0	98	0	0		
Flat Bottoms, not Hammered .. do	91	0	0	93	0	0		
Cake and Tough Ingot ..... do	74	0	0	0	0	0		
Best Selected ..... do	81	0	0	83	0	0		
Fine Foreign ..... do	86	0	0	88	0	0		
Yel. Metal Sheathing & Rods ....per lb	0	0	7½	0	0	8¼		
TIN:—								
English Block .....per ton	89	0	0	0	0	0	2½	
do Bar ..... do	90		0	0	0	0		
do Refined ..... do	92	0	0	0	0			
Banca ..... do	92	0	0	0	0	0	nett	
Strait ..... do	87	0	0	0	0	0		
LEAD:—								
Pig, English .....per ton	22	0	0	0	0	0	2½	
" Spanish Soft ..... do	19	15	0	0	0			
Shot, Patent ..... do	23	0	0	0	0			
Sheet ..... do	21	15	0	0	0	0		
White ..... do	30	0	0	31	10	0		
SPELTER:—								
On the Spot .....per ton	22	5	0	22	15	0	net	
ZINC:—								
English Sheet .....per ton	28	0	0	0	0	0		
Devaux's V. M. Roofing Zinc .... do	28	0	0	0	0	0	*	
* And 5 per cent. discount if laid upon the new system.								
QUICKSILVER .....per btl	6	18	0	7	0	0		
REGULUS OF ANTIMONY.								
French .....per ton	34	0	0	0	0	0		

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THE BUILDING NEWS.

LONDON, FRIDAY, JUNE 7, 1867.

THE PARIS EXHIBITION.

ARCHITECTURE.—SECOND NOTICE.

FROM archæological researches we turn to the architecture of the present, and its condition in France at this time. Of the drawings submitted there are two classes, the one appealing solely to the imagination, being studies in composition by young men for academy purposes, the other for buildings either actually executed or prepared with the intention of being built. Of the former, it is noticeable that, with one very brilliant exception, they all affect the Renaissance school, and only one seizes upon a Mediæval mode of expressing his thoughts. Far deeper in thought and far higher in imagination than any others of this class is M. Lameire's project for the decoration of a church; it is a study full of symbolism and conventionality, yet a most successful attempt to apply these in a manner which, though reminiscent of the past, is not discordant with the present. M. Lameire evidently believes that bad drawing and harsh incongruous colouring are not essential to Mediæval expression, and his drawings give us very great pleasure to look upon—there are nine of them, and all good. The subject is the decoration of a church dedicated to St. John, and his *motif* is drawn from the Apocalypse. His church itself is noteworthy in many ways; it is cruciform, apsidal in the chancel, and having nave and aisles, with a quaint triforium and a clerestory. On the large vault over the apse rises Christ the conqueror, whilst before and around him the sea of glass and the whole Apocalyptic imagery spreads itself out; this, too, all carefully and well considered, with a severity of treatment equal to Mosaic work, and a beauty of drawing equal to fresco, exhibiting M. Lameire's great power as a draughtsman, as well as his great knowledge of Christian iconography. Nor is it only by the mystic light of past symbolism that this design has been produced, but the present finds its place in it, and a long procession of historic types links our day with the future and the past; for a long chain of Merovingians and Carlovingrians, of the houses of Capet and of Valois, and lastly of Bourbons and Napoleons, leads up the French nation to one great end. In this frieze, M. Lameire adheres to actual costume, and the cleverness with which he has grouped these seemingly incompatible elements in his composition is praiseworthy. Unfortunately, he cannot draw a horse; all else is admirable, but his horses are quadrupeds, and have only that quality in common with the rest of their species. The altar and its cihorium are clever and good, and the summit of his porch is a volume of thought and symbolism in itself. M. Lameire's interior perspectives are the best we have seen from any French architect, and we commend to serious study this series of drawings, both for imaginative quality and technical expression.

M. Pascal treats us to some wonderfully impossible things. His Hospice in the mountains looks like a young New Jerusalem, excepting that it has a preposterous temple in its midst. Both this and his "Design for the Staircase for a Royal Palace" are ill-considered; they are very large in drawing, but very small in value, and lack everything which belongs to true architecture.

M. Picq contributes two designs—the one "A Hall of Fêtes," which is grim and dark, and much more like a hall of mystery. It is in the worst style of Lepautre, and has not either in design or drawing anything commendable, nor is his "Monument to Don Pedro IV., at Lisbon," much better.

These academy studies are very disheartening, and are not nearly equal to our own, and it is a matter of some surprise to us that so much good training should produce such small result. In reproduction it seems to work admirably, but creative invention seems to be deadened, and some change in the curriculum of study is evidently needed. We scarcely know how to class M. Boileau's "Design for a Cathedral on a Pyramidal Principle," for we are almost in doubt if M. Boileau considers it as a serious attempt for present practical purposes, or throws it out as a spark of genius to inspire the future. It is an octagon building, or rather erection, of iron columns and girders, each series, as it approaches the centre, becoming higher than its outside neighbours, and this is all. A cathedral it is not, and cannot be, at any rate for Catholic usage, as it possesses neither altar nor choir, neither organ nor chapels, nor ritualistic arrangement of any kind, and for Protestant purposes it would be equally useless, as mortal man could never be heard preach in it; in fact, it is neither a house of prayer nor preaching, and as a matter of engineering it is bad. That M. Boileau is serious in propounding this attempt we are led to believe from the fact that we have seen elsewhere similar misfortunes emanating from him, and to which we shall hereafter revert. M. Louis Charles Boileau, who is, we presume, a son of the preceding, submits a "Design for a Church at Rambouillet," in which the hereditary taint comes out rather strongly. He says the design is of a new character of construction; it simply consists of a very badly mutilated thirteenth century exterior, with very ordinary engineering inside. M. Boileau, senior, is, we presume, too old to learn, but to M. Louis Charles we would recommend careful perusal and consideration of M. Le Duc's admirable "Entretiens," and after that course of study we shall be glad to see him try again. M. Deperthes sends a design for this same church at Rambouillet, which is far superior to that of M. Boileau, jun., and has much to commend it, though we think his junction of his tower and spire bad, and would be worse in actuality than in drawing, and, although he has placed the spire with its angles to the centre of the square faces of the tower, it would have an ugly effect when seen diagonally, whilst his nave and chancel, being of the same height, prevents any variety of line in his east end. His "Design for the Church of Sainte Anne d'Auray," is a poor example of the worst style of French fifteenth century work, and neither in outline nor detail has any redeeming quality. Nor is M. Truchy's "Restoration of the Abbey Church of St. Jean des Vignes, at Soissons," much better; not knowing the church, we cannot tell how much blame attaches to M. Truchy.

It is very pleasant to turn to the really excellent works of M. Questel, where there is much to admire and more to learn. The Clinical Asylum for Lunatics, just erected at Paris, is a model of its kind, and its plan is well considered—in fact, it furnishes a basis for all future arrangement of this class of building. And we may here contrast the almost lavish disposition of space in all buildings of this kind in France with the contracted and restricted ground plan of similar edifices in England. In this design of M. Questel, the arrangement has been considered to be of primary importance, and appearance a secondary consideration, yet the latter has not been neglected, and a simple but pleasing effect is obtained by the management of the masses of his construction rather than by detail. His smaller Hospice at Gisors presents a similarly well-considered plan, and we would especially draw attention to the interior of his chapel, and leave the result of the contrast it affords to the whitewashed room devoted to that purpose with us to work its own effect without our comment. These two designs show M. Questel's great ability in planning. His skill as an artist is shown in his very excellent Hôtel de la Prefecture at Grenoble, also just completed. It is a very able Renaissance treatment, with much dignity and grace. His drawings are exquisite, and it is pleasant to see in all these how lovingly the French architect sticks to his building to the very last. The decoration and furniture of all the rooms are considered in his design, and no profanities of the upholsterer and dealer in Edgware-road ware are allowed to intrude. We much prefer this design to that of M. Questel for the Library and Museum in the same town; there is a want of unity in this latter as a design. Nor do we consider the arrangement of the plan so good as the other essays of M. Questel. Beautifully executed are all the geometric drawings which illustrate these designs, but a pupil at the end of his articles would be ashamed to turn out such perspectives. Poor, tame, and vapid, they do not reveal the character of the building as much as they caricature it. M. Anger's Hôtel de Ville at Elbeuf, in course of erection, is a large and important building, but of no very marked merit or demerit; but far away across the park, amongst bricks and water-closets, is another Hôtel de Ville—that of Arras, which we sincerely hope is not in course of erection. It is a wonderfully over-ornamented design, and full of every kind and description of carving. It consists of a central composition in each lateral façade, piled up with figures and pediments, and things it is impossible to give a name to, with wing buildings cut into two by columns, and having two dormers outvying their roof—all this in something worse than the most wretched Flemish work of the sixteenth century. M. Esquié sends some interesting drawings of old churches at Valcabrère and Vénerque, both in the Haut Garrone, which he is about to restore, but we take more interest in his Lunatic Asylum in the same Department. His plan is very well arranged, and his chapel, with its division for the sexes, is singular. This division is marked externally by large arches, from between which springs a bellcote not very happily conceived; but there is very much that is good in M. Esquié's design, and it is well worthy of attention. M. Huot has also a very well planned Lunatic Asylum at Aix, and we may here remark that almost all the designs submitted are accompanied by their plans, and as a rule all French plans are worthy of study. In his chapel M. Huot has shown the influence of local tradition, and his chapel is designed in the style of Provence. We, in England, should endeavour to impress this idea on the general building, and the effect would be greatly improved thereby, nor need the cost be increased. His school of design for the same town has much merit. Turning from the eminently practical to the highly decorative portion of the profession, we would point out the drawings of M. Chauvin and M. Normand; the former contributes his drawings for the decoration of the Concert Hall of the Conservatoire Imperial du Musique, executed in 1865 by command of the Minister of the Imperial Household; and the latter, his designs for the Pompeian House for Prince Napoleon. Both are in the Pompeian style, but M. Chauvin adapts, whilst M. Normand simply adopts it. The decoration of the concert hall is a very fine composition in colour—intensely deep red with black forms the groundwork, and the fine treatment of the lower part of the orchestra, admirably adapted to bring the performers into full relief, and his re-introduction of black in his frieze, are both bold and successful, whilst the treatment of his "balcon" fronts in the hall is extremely good. We do not admire the strawberry and cream colour he has used in his ceiling; it weakens all the other reds and is not in unity of style; minor harmonies in colour are rare in Pompeian work, minor contrasts frequent, and we should have much preferred the latter here. M. Norman's Pompeian house is probably well known to most of our readers, but to those who have not seen it we may tell them that for a franc they can now do so, as it has

been found so unsuited to modern habits and requirements that it has ceased to be a residence and has subsided into a show. It is well worthy of a visit, and however wrong may have been the original conception, its detail is marvellously carried out. M. Normand's drawings are beautifully executed and show a great power of drawing and exquisite finish; as archæological studies they demand much consideration.

M. Normand's house at Liancourt is not worthy of him, and the strange mixture of all sorts of feelings and styles produces a harsh and disagreeable effect; his heavy Louis XIII. ornament above and his thin ornament below, his label moulds and quoins, do not mix well, and his drawing makes us regret our having seen it. We have reserved until last M. Hénard's very interesting series of thirty drawings; twenty of them are devoted to the illustration of domestic architecture, and the remaining ten illustrate the public monuments intended to be erected in Paris. There is very much in M. Hénard's work which will be both new and pleasing to the English architect; and though the stringency of the building regulations of Paris prevents much individuality in general composition, and sacrifices the unit to the effect of the total, yet M. Hénard has managed by his exquisite detail to impress on his work a stamp of originality. His house for Baron Solomon Rothschild at Surennes we like the least of all his contributions, but even here his detail wins our admiration—the verandah and parapet of cornice are very good. His large details of an "Hotel in Paris," built, we believe, near the Parc Monceaux, are very exquisite and full of grace, and as specimens of detail drawing we have rarely seen anything to equal them. His monument to commemorate the defence of Paris in 1814 has not and probably never will be built, but it is a very fine and imposing design, and the arrangement of the sedant figures at the base and the pedestal which supports the bust of Maréchal Moncy are particularly good. We think that exaggerated wreathing of immortelles French architects are so fond of introducing is a great mistake; it is exceedingly ugly in form and presents no beauty in detail—the idea might be expressed with much more refinement. Of a totally opposite character is M. Hénard's other design—instead of commemorating fire and sword, it sets forth the myrtle and the olive, and is dedicated to the Alliance of all Nations. Perhaps in that good time coming when the fact is realised some such record of it may be erected; till then we fear it would be premature. The idea is based on that of the Choragic Monument of Lycicrates at Athens, but the arrangement of the base and its sculpture redeem it

Rob the commonplace appearance which
Musse able hands, have resulted from
11.30—William of so well-known a type. M.
—Samuel Clinton,

from William Thomas we cannot praise too
would, in less brass founder, attention of English
the re-treatment ville, stonema
Hénard's drawings builder, Jun. Other drawings
highly, and we call the at 11 not of suffi-
architects especially to them. larisation;
there are of minor note, though will be
cient interest to demand partic ministers farm
but amongst the machinery there
found a series of illustrations of the Em-
buildings on the private estates of the
peror, to which we would draw attention, as
there is much to be learned from them, and,
by that strange perversion of systematisation
which is confusion worse confounded, here
too will be found a very interesting set of
drawings illustrating baths and washhouses at
St. Etienne, from the design of Louis Mazerat,
the roof of which is excellent, and the photo-
graphs of the various markets, and the model
of one of them, erected by M. M. Joly from
the designs of M. Victor Baltard and M.
Dubois, will amply repay examination.

SALON, PALAIS DES BEAUX ARTS.

Before quitting the French school of architecture, it will, we think, be well to take a short review of the drawings exhibited in this year's "Salon" in the Palais des Beaux Arts, on the Champs Elysees, as in many instances the same artists are represented in both places, and many who find no home in the galleries of the Exhibition place their works before us here, and give us a more extended view of our subject.

Of the fifty-eight exhibitors in the *salon*, twelve of them are those of whose works we have already spoken, and with many of them we are glad to make further acquaintance, as in some instances these exhibits are better than those we have already reviewed. M. Boileau, sen., sends two of his extraordinary churches, one of them quite as bad as his cathedral, but the other much better in arrangement, though still on the same absurd engineering principle, and his son's works of a decorative character here exhibited are of much better quality than his architectural ones. They are designs for decoration of two chapels—one, that of St. Joseph, in a church in the Jura, and the other for that of the Blessed Virgin, at Gentilly. M. Boitte we are pleased to meet again, and a charming little sketch of the Parthenon, at Athens helps us to realise still further that accuracy of his geometrical drawing we before noticed. M. Desperthe's "Theatre at Reims" does not enhance his reputation, but M. Hénard shows that all his best things were not sent to the Champ de Mars; his "Design for a Chateau in the South of France" is thoroughly equal to his other productions, and his plan excellent. M. Huot's project for "A Monument Commemorative of the Emperor's Visit to Algeria" is more remarkable for its size than its quality, and in outline is a poor and exaggerated travestie on M. Hénard's one to commemorate the defence of Paris. M. Joyau, whose drawings of Heliopolis we have noticed, here exhibits four very clever sketches, two of them being Athenian subjects—the Temple of Minerva Polias, and the Parthenon—and the others, which are even of a higher quality, sketches in Cairo. M. Picq goes in for more festive halls, with almost as melancholy a result. M. Sedille, whose contribution to the other exhibition we did not think sufficiently important to notice, here comes out more strongly; his several drawings for a sideboard are exquisitely good, and his detail admirable. Of all the sketches of Athenian remains, we have seen none to equal those of M. Thierry. They are truth itself; the glorious sky, and the rich ochre yellow of the masonry, with its quaint brown stains, are rendered with more than photographic accuracy. M. Thierry is even a more able colourist than his restoration of the Temple of Hercules, at Tivoli, led us to suppose; and, lastly, M. Vaudremer treats us to a charming little study from that mysterious-looking Capella Palatina, at Palermo, with its chatoyant lustre of Mosaic, and its Saracenic architecture, all of which are here beautifully expressed. Two small sketches from Pisa and St. Francis d'Assisi complete the works of those whose acquaintance we have already made, and, as a rule, increase our respect for them. Of those whom we are now for the first time making the acquaintance, we certainly admire most the production of M. Hoyeau, whose "Project for a Museum and a Public Promenade" is full of great originality and quaint detail. It is one of the most hopeful designs we have seen, and should lead to some influence; it is by such studies as these that art progresses, and though it has many faults from over-exuberance of fancy, yet with judicious pruning, it would be very fruitful. M. Hedin's odd Spanish-looking Hotel de Ville, at Foix, has much merit, and is a very pleasing composition. Very good and simple is M. Douillard's "School of Albert le Grand, at Arcueil;" it has great dignity, and is a relief after the weary array of both heavy-laden designs we see so many designs for and at home. Here are several to have a theatre at Rheims, which seems tion, but a largely responded to competi-
merit, are of them have any extraordinary
whole lot the only new idea we find in the
boxes an ather clever arrangement of the
lcons in M. Lenoir's design.

The best restoration of a French church we have yet seen is that of Larchant (Seine et Marne) by M. Baraban; and even out-stepping, on the road to folly, M. Boileau's productions, is the extraordinary "Projet d'un Temple Protestant," by Hûgelin, which is a strange mixture of Brahminism and Mahommedanism in design, and we rather fear M. Hûgelin has meant to be satirical. His design is really so bad that we can't even laugh at it. Much else is there we should like to notice, but the absorption of the Great Exhibition is so great that we cannot devote longer time to this little one; though we advise every architect who visits Paris to go and see the beautiful drawings of the Pallazzo Vecchio and the Podesta, at Florence, by M. Rohault de Fleury, and M. Tomaszkiewicz's wonderful transcript of Raphael's decoration, and the many other drawings of this class he will find. All who are not architects will be sure to find their way to the picture galleries, and if not *blasé* from all they have undergone at the Exhibition, will find great delight therein.

We purpose reviewing the architectural productions of other nations in our next, and have thus digressed in order to place before our readers the largest range of architectural art in France they have ever had the opportunity of beholding, and the like of which may not be again afforded for many years to come.

PROGRESS IN THE MECHANICS OF BUILDING.

Building is one of those arts which ever has been, and which so long as bricks and mortar are used will continue to be, performed in the main by manual labour. Mechanical appliances there certainly are for aiding man's hand and arm both in shaping and mixing building materials, and in helping him to place them in position. But man is *the* builder, and he has not yet invented a machine to take his place absolutely in the art of construction. But we must tread warily and write charily, for who knows what a day may bring forth? This is an inventive age, and who knows how soon we may have small houses moulded and turned out by the thousand, as bricks are? And if small ones, why not large ones? It is but increasing the size or multiplying the power of the machine. Indeed, we have the germ of the idea, if not the idea itself, in Mr. Tall's system of building houses, which we described in the Building News for the 17th May last. But, pending the advent of the new patent house-moulding machine, let us glance around us at the recent progress in those labour-saving machines which are adapted to the requirements of various departments of the building art. And this we are enabled to do from an instructive visit to the conversazione of the Institution of Civil Engineers, which was lately held under the auspices of Mr. John Fowler, C.E., the President of the Institute. Here we found several matters well worthy the attention of our readers, both in a building and a civil engineering point of view. The most important of these was the stone-cutting and dressing machinery of Messrs. Hunter and Fothergill Cooke. This machine depends for its efficacy upon the peculiar forms of the cutting tools, which are simply movable teeth. They are attached to holders or sockets, which are fixed in the edges of the blade, instead of the blade forming the cutting edge. For surfacing, the cutting tools are fixed on the circumference of cylinders. The movable tools are steel bolts, the heads of which are made of trumpet form and hardened. They are simply slipped into a socket in a cutting disc, and wedged in with a piece of paper or shaving. There are other forms of tools, flat, concave, &c., all adapted to the same holders, and which are used for giving ornamental and apparently hand-tooled surfaces to ashlars, quoins, sills, and the like.

The machine in which the work is done

by these tools consists of a table moving on V grooves, and upon which the block of stone to be operated on is clamped, or, in the case of large blocks, chained. A self-acting screw, worked from the main shaft, causes the table to advance with the stone block upon the cutting blades. The speed varies from 3in. to 6in. per minute, according to the nature of the stone and the work to be done. The cutting blades are fixed by means of collars to a shaft over the table, the shaft being connected to machinery which causes it to revolve. In the collars of the cutters are screws, by which the cutters are adjusted to their work according to the width of the stone. For sawing, the trumpet-shaped cutters are used, being placed on the edge of a metal disc, as previously described; the disc being mounted on the revolving shaft over the table. By this machine window-sills, door-posts, coping-stones, and a variety of other building details are made out of rough blocks of slate, which were formerly thrown away as useless for want of means to work them up. By slightly altering the construction of the machine it is adapted for cutting stone out of the rock in the quarry. The cutting tools, instead of being placed in a single row around the rim of a thin disc or blade, are fixed in rows across the margin of a broad disc, so as to clear away a wide space. It can be applied to cut both vertically and horizontally, the machinery being perfectly portable, and attached to a carriage running upon rails. The sawing and cutting machines are exceedingly effective, and are gradually coming into general use. A large circular saw, with blades 13ft. in diameter, is now being erected near Newcastle for the Tyne Navigation Commissioners. From the successful and economic working of the machine we inspected, we may hope to see our buildings improved by the use of stone instead of bricks and cement.

Mr. Messent's concrete mixer is another important step in the right direction, as it not only facilitates the process of building, but thoroughly mixes the ingredients of which the concrete is formed. The peculiar value of the apparatus lies in the form of the mixing vessel, which is such that when half-filled four turns or changes are imparted to the enclosed material for every revolution of the vessel. The machine consists mainly of the mixer and a supply waggon, which when in operation are supported on two balks of timber over the space to be filled in with concrete. Two men on the waggon fill a hopper with the materials in the same time that four men are mixing a charge. This hopper is a measure of the dry material, and adjoining it is a water tank, which is filled from a flexible hose. After a charge has been shot from the mixer, it is turned with the opening upwards, and the contents of the hopper and of the water tank are transferred to it. Cement, previously measured into bags, is also added, and the door is tightly closed by a wedge fastening. The mixing of the charge is then effectively accomplished in seven revolutions of the mixing vessel, when it is stopped with the opening downwards, and the contents are discharged almost instantaneously. The mixer is then turned door upwards, and the filling and mixing proceed as before. With the two men to fill, and four to mix, and a boy to attend to the water, half a cubic yard of concrete is turned out every six minutes. We should add that the practical value of this machine has been fully proved at the Tyne Pier Works, for filling in the concrete hearting between the masonry walls and other parts.

In sinking the foundations for the piers of the Clyde Railway bridge now in course of construction at Glasgow, a very ingenious contrivance has been introduced for removing the soil from within the cylinders. It is a dredger, or rather a digger, which has been invented by Mr. Milroy, and is highly spoken of by Mr. Blair, the engineer of the works. It consists of an outer octagonal frame of cast iron, to which are hinged the spades or diggers, which taper towards the digging edge. They have raised sides, and are so shaped that when they are drawn together to the centre of the frame—which is connected to the outer frame by radial arms—the whole forms an octagonal tray. The apparatus is lowered from a staging down to the bottom of the cylinder, the spades hanging vertically from the frame. By one set of chains the spades are forced into the soil, and by another set of chains, attached to the cutting ends of the spades, they are drawn to the centre of the frame. They bring the soil with them, and the apparatus is then raised bodily to the staging, and run over a trolly or mud waggon. The spade chains are then released, the soil falls into the mud waggon, and the dredger is lowered for another charge. All the operations are conducted from the staging above, and the chains, whether for lowering, for gripping the earth, or for raising, are easily worked. As skilled workmen are not required to attend this dredger, the expenses attending its working are comparatively trifling. It may be used with equal ease in deep as in shallow operations, and without any sensible increase in the cost of working. On the Clyde Bridge works, cylinders 8ft. 4in. in diameter were sunk by Mr. Milroy's apparatus at the rate of 4ft. per hour, until the solid foundation was reached, at a depth of 80ft. below low water level. The cylinders are simply weighted and guided by piles, and no divergence of the cylinder from the vertical has ever taken place during excavation. The rate of sinking cylinders and of excavating, as seen from the above statement, is therefore higher than has yet been attained by any other method. In fact, Mr. Blair has informed us that he found it effected a great economy both in time and labour. Floating dry docks of iron are coming into use, especially for foreign stations.

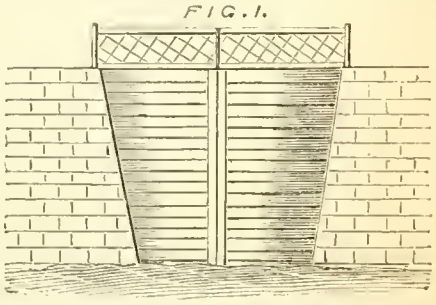
Messrs. Brotherhood sent to the conversazione a model of an ingenious machine for making bricks out of dry earth, and another of a capstan for turning down screw piles and cylinders in hard ground. A new method of ascending steep gradients was shown by Messrs. Fowler, of Leeds, who were represented by a model of a locomotive working on a railway on the rope system. Fowler's well-known clip drum is placed vertically in the centre of the locomotive, the boiler of which is double-barrelled or divided longitudinally. The rope, which is of steel wire, is fixed at each end of the railway, and is gripped by the clip drum around which it is coiled. By this simple means Messrs. Fowler reasonably hope to supersede the present complicated and expensive system of climbing locomotives as at present adopted on the Mont Cenis and other railways having steeper gradients than an ordinary locomotive can overcome. In conclusion, we would notice some elegant and correct models of churches, &c., which were exhibited by Mr. Thwaite, of Craven-street. Although these do not come exactly under the head of the mechanics of building, yet they are so closely related to the building art in its higher branches that they are not out of place here. We noticed especially models of the church of St. James the Less, in Garden-street, Westminster, and of Bowden parish church, near Manchester. These models are well worthy of examination, as they are most carefully and delicately executed, every detail being brought out with sharpness and precision. The materials of the buildings are represented in their various colours, which enables the beholder to fully realise the building itself. We also noticed numerous models of windows, ancient and modern, the tracery of which was rendered with fidelity and effect. The whole of Mr. Thwaite's models are produced from cardboard with a knife, and are at once examples of architectural and modelling art.

ELEMENTS OF ENGINEERING.

DOCKS.—*Concluding Article.*

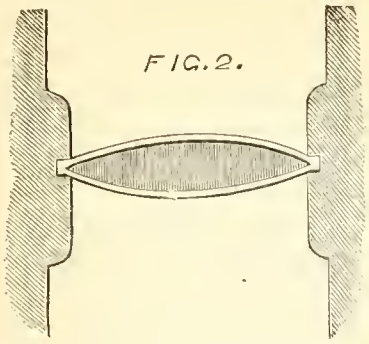
THE whole of the different methods, and the secondary varieties included under them, of closing the entrances to docks whether dry or wet, may be classed under the two chief heads of gates permanently attached to the side walls of the entrance and those which are floated in and out as required, alternately opening or closing up the passage into the dock. Of the many kinds of gates belonging to the first head, those on the swing principle are, taking all points into consideration, the most convenient, the most easily worked, and the readiest kept in repair. The general arrangement of this description of gate is shown in elevation in fig. 1. They

FIG. 1.



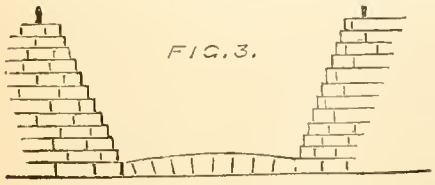
meet at an angle in the centre, and when open lie perfectly flat against the outer sides of the side walls, a recess in the masonry being purposely left for them to fit into. It is hardly necessary to remark that until recently all dock gates were made of timber, and a great many of them are constructed of that material at present. The posts and uprights of the framing must be of the best timber that can be procured; and in this particular example of construction no expense must be spared to ensure the soundest material, as any of inferior character will rot to pieces in an incredibly short period. All the workmanship, especially of the iron forgings for straps, bolts, gudgeons, and other works required to put the gates together, must be finished with great accuracy and care, and the adjustment of surface of the sole piece and the bottom of the gates must be sufficiently nice to prevent the occurrence of any leakage. Too much attention cannot be bestowed upon the hanging and the manner of fixing the gudgeons upon which the gates swing. They should be let into the solid masonry and securely fixed to a depth sufficient to obviate any chance of the gates canting forwards, the effect of which would be that, although they would fit tight enough at the top, there would be a leakage at the bottom. As rollers are always provided for the gates to turn on, if they be properly balanced, they are easily opened and shut by the aid of a small winch or capstan fixed upon each side wall. Besides fulfilling the main duty of closing the dock, the gates also serve the subsidiary purpose of forming a means of communication between the opposite sides of the harbour. A foot bridge is always constructed upon them (see fig. 1), which opens in the centre, to allow of each half accompanying the corresponding half of the gate when it is opened and shut. Iron swing gates have in measure begun to supersede their wooden predecessors, but except for durability their superiority is not yet fully established. They are considerably more expensive, and do not appear to have afforded that entire freedom from leakage which was expected of them. In all gates sluices must be made to allow of scouring out the docks, as the mud accumulates on the average about one inch in a year.

The second classification of dock gates includes all those capable of being floated in and out of their place at the entrance, and are usually termed floating dams or caissons. A plan of one is shown in fig. 2, and their shape is very analogous to that of a canoe—sharp at both ends. The operation of closing



the entrance with them is very simple, and certainly less troublesome and laborious than that attending the manipulation of swing gates. They are floated at high tide into the recess shown in fig. 2, and by letting in water inside them, they sink in the grooves cut for their extremities, and in which they fit quite watertight. Similarly to open the passage, the water is either pumped out altogether or run out at low tide to a certain depth, and the caisson rises and is disengaged from the grooves and easily towed away. The lower part of the caisson is made somewhat narrower than the upper part, in order to facilitate the removal out of the grooves of the masonry into which they fit. They also carry bridges on their tops similar to the swing gates. These caissons are undoubtedly cheaper in construction than the gates already described, take up much less space, and, moreover, by building the masonry of the entrances of different docks to the same gauge, one caisson would be available for closing any of them, so that if it were not required for one dock it would answer for another. Some iron caissons on a very large scale have been constructed for the docks at Chatham, where they have given perfect satisfaction. The first application of floating caissons in England was made at the entrance to the new basin at Portsmouth Dockyard, and since that time the Government authorities have viewed them with a good deal of favour. Their great utility may, however, be regarded to consist in their application in an extensive system; for small docks, and where the water space is limited and the approaches are of contracted and narrow proportions, they might be found inconvenient, and the use of the swing gates would be preferable. Caissons are, in fact, nothing more than small vessels very deep in proportion to their length and breadth; they have a strong iron keel, which fits into a groove at the bottom of the recess, and the framing and ribs of the iron are precisely similar to those of an ordinary vessel. The keel of those made for the Chatham Dockyard is of solid wrought iron, 1½in. in thickness, and the framing is composed of heavy tee, angle, and channel irons, strengthened by numerous stiffeners, both longitudinally and transversely. Their cost varies from £3,000 to £4,000.

The particulars of construction we have entered into in the present and preceding articles apply to dry as well as to wet docks, and we shall now notice the distinguishing feature of the former description. Briefly a dry or graving dock is for the purpose of repairing and constructing vessels in, and the object is naturally to keep the water out. Fig. 3 represents a section, from which it is



evident that it partakes somewhat of the shape of the vessel it is destined to receive. Wet docks do not require to have the same degree of attention bestowed upon their watertight walls as graving docks, for a little leakage on the former, provided it does not imperil the security of the work, is of no consequence. The case is very different in the latter, for, as the ship is laid up high and dry, and the carpenters have to be about her continually until she is fit to go to sea, the effects of any leakage and any accumulation of water in the interior of the dock would be attended with a great deal of loss, trouble, and inconvenience. If the inside of the dock were wet it would be impossible to keep the vessel in it dry; and, moreover, the men employed upon her would suffer severely by having to work continually in the wet, and in all probability would be unable to stand it. To ensure the absence of all damp, not only are the walls well protected by three or four feet thickness of puddle at the back, but the whole of the interior of the dock is lined with solid masonry, every stone of which is accurately squared and finished, so that a perfectly close-fitting joint may be obtained. A graving dock when completed, just before it is opened for use, presents a very handsome appearance, and reminds one forcibly of some of the massive constructions of solid masonry common in the olden times, but rarely seen now. If there is one part of a dry dock that requires more attention than another it is the foundations. They must be got in with the greatest care, whether piles, concrete, or any other system of founding them is employed, and the building of the requisite drains and culverts to carry off any water that may accumulate is an important part of the undertaking. Granite is the stone *par excellence* to employ in the building of docks when it can be procured at a reasonable expense. The granite dry dock at New York is famous for its size and the perfection of its construction. Among others of importance are those of Toulon, Havre, and Brest. The docks at Liverpool are built of blue freestone, but the quoins, coping, and other parts exposed to wear and tear are of hard Scotch grey granite. Dry docks have been made double, that is, to contain two ships at a time, but they are generally made to hold only one; manifestly the latter plan is the more convenient, for unless the two ships could come in during the same tide, whatever operations had been commenced upon the one berthed would have to be suspended to allow the second to be floated in, which would be a source of much annoyance and loss of time and labour. Floating dry docks of iron are coming into use especially for foreign stations.

We shall close this series of our "Elements of Engineering" with a short description of the method sometimes adopted for obviating the great expense attendant upon the building of a graving or dry dock, and which in very bad ground would reach to an enormous proportion. We allude to what are termed slip docks, or simply slips; and numerous patents have been taken out at different times for improvements in their plan of construction. A slip in its rudest and most elementary form is nothing more than a piece of sloping beach, upon which small vessels can be hauled up either for the purposes of repair or to shelter them from the violence of tempestuous seasons. Ships averaging from 50 to 200 tons have been frequently hauled up in this manner, and the practice is general in all our small fishing ports. The cost of a slip in comparison with a dry dock is trifling, and it has the further advantage of occupying less space, and can be built almost anywhere, whether the shore is steep or flat, which is not the case with graving docks. Moreover, ships can be hauled up during any state of the tide, whereas it is only at certain tides that a ship can be docked and undocked. The slips at Cronstadt are the most remarkable for their size and the excellence of all the arrangements.

"The work of a thousand men for four years," is the inscription upon the great railway bridge across the Susquehanna River at Havre de Grace, Maryland, U.S.

FAILURES IN CONSTRUCTION.*

WOOD BEAMS.

THE breaking down of beams in wood floors has sometimes occurred, and we had an instance of this in 1865, when a school floor at Westminster fell during a fête, killing two persons and injuring ninety more. The bearing of the beam that broke was stated to be 20ft., and its scantling 13in. square, and the distance from the next beam 8ft. It was of Baltic fir.

From these data we gather that the area of floor appertaining to the beam was nearly 182ft.; thus, at 160lb. per foot (a full allowance) and adding the weight of the timber, the whole weight to be borne was 31,325lb., and taking this, with the given length and depth of the beam, let us see what the breadth should have been for carrying this weight without destroying the resilience, using the recognised formula:—

$$\frac{L \times W}{510 \times D^2} = B \quad \frac{\overset{\text{Feet}}{20} \times \overset{\text{lbs.}}{31{,}325}}{510 \times 13^2} = 7\tfrac{1}{4}\text{in.}$$

Therefore supposing the beam to be die square and not cut into, the breadth of 7¼in. would have been suitable for the load; but it was 13in. broad, and the mortising for the joists certainly would not have weakened it to the extent of the difference; in fact, the beam was larger than required by the rule for stiffness, yet the beam broke, and the evidence of those who were called in to inspect seems to have been that the timber was somewhat poor and knotty, and had been heated and dried by gas jets underneath it, whereby its tenacity had become lessened. Now we observe no circumstance that may not occur any day in any building; and it is really a sort of accident not easily guarded against. If the timber had been found to be rotten inside it would have been a good illustration of the advisability of cutting whole timber in half, turning it inside out, and bolting it together, by which means you see better what you are about, though you get a more expensive beam, and one that is not stronger. Confidence in formulæ becomes a little shaken by these occurrences, not in their theoretical accuracy, but in their practical applicability.

FLITCH GIRDERS.

Flitch girders will bear a remark or two. Cast-iron flitches have, I suppose, been nearly discontinued; yet I know of a warehouse in the City in which they have been recently used, and where one of the number failed, although it had not so great a weight upon it as the others that remained sound. But whether the flitches be cast or wrought, the proper theory to be observed in constructing these beams is to treat the wood as the bearing material, and the iron as an assistant only to the wood; they cannot both be masters. Then, admitting this, what must be done? If you make the iron and the wood of equal depth, all three pieces of material bear upon the wall, which is contrary to the above principle, and, moreover, it has this bad effect, namely, that after the girder has been some time in the building the wood is likely to shrink, and to become of less depth than the iron, with the sure result that all the bearing must be thrown upon the edge of the iron flitch, however slight the shrinkage of the wood, and however tightly the iron may be bound to the wood, and the iron is likely thus to become distressed and perhaps to break, and perhaps to crack the template on which it bears. It seems, then, that the flitch should always be of less depth than the wood by (say) an inch, and if the sides of the flitch could be roughed so as to have a surface like the teeth of a very coarse file, the adhesion to the timber would be improved. I, however, consider that even the simplest complex beams, such as these, have their disadvantages; the bolts seldom keep thoroughly up to their work, and the flitch may be always on the move, according to the temperature, and therefore may not comfortably dwell within its wooden bands, and I have no doubt that if old flitch girders were examined many would be found to be very like three independent girders, side by side, rather than like one solidly bound and uniformly acting mass.

SUSPENSION GIRDERS.

Girders trussed on the suspension principle are sometimes used. One at a flour mill, at Shadwell, failed from the suspension rod having square-wormed screws, the thread having been stripped off by the weight, which most likely would not have happened if the thread had been of the pyra-

* Concluded from page 381.

midal form, which is very far stronger for resisting tensile force.

HARD WOOD.

The combination of hard wood, such as oak, with soft wood, such as fir, is often needful for making good work, there being cases in which the ends of timbers, acting against the sides of other timbers, are apt unduly to compress and indent the parallel fibres, whereby a truss may become crippled. It is common to interpose a piece of metal, but this is not always what is wanted; for instance, the trussed girder in the diagram was executed wholly in fir, and it settled more than was agreeable, and it ought to have had the head of the wall bracket of oak, there being very considerable pressure upon the point of the diagonal, where the ends of the fibres might indent themselves into so soft a wood as fir. The heads and sills to wood posts in warehouses should be of oak, as they sometimes become too much compressed when of fir.

BREASTSUMMERS.

Perhaps it is needless to allude to the insufficient manner in which breastsummers are frequently carried to support the fronts of many houses, because the fact is evident to everyone here. Yet builders of the common sort are so reckless in this respect that it is painful to observe their confidence, and we ought to check the folly if we can; they seem to think that their brick fronts are airy things, and that if the breastsummer touches a few inches on the wall at each end, all must be right. A corner house, open on both sides for a shop, is a most perilous looking thing, as commonly constructed, and I imagine that, when many of these buildings become a little aged, they will give ready evidence of their deficiency in ligature and muscle. The principle in this paper being to illustrate by facts, I must quote one instance out of very many. In 1863 two houses fell at Penge and killed two men, the fall being occasioned by the weakness and bad fixing of the breastsummers, combined with wet foundations and rapid building.

CHIMNEY STACKS.

Chimney stacks for factories require some care. It is important that they should stand independently of the surrounding buildings, both on account of their greater weight, and on account of there being always some degree of rock in them from the force of the wind, whereby it might happen (as indeed has happened) that a process of jerking against other brickwork may eventually bring the stack down. It is also desirable that they should be built during the summer season. Several stacks have fallen soon after being erected. This was so with one at the Counterslip Sugar Works at Bristol in 1849, at Joynson's Paper Works, at St. Mary Cray, several years ago, and at many other places, and generally from careless design or bad workmanship, both of which are quite inadmissible in such tall structures. Good authorities have stated that their height should never be more than ten or twelve times the width of base above ground, and the top not wider than two-thirds of the said base, and you will not find that this gives a very sturdy proportion. Of course, near the bottom there should be a good spread, and a general form, something like that of the Eddystone Lighthouse, would be far preferable to many of the shapes that are seen, such as the absurd one of a great undercut torus, intended as an attempt to make a chimney look like a Doric column. Depth of foundation is, in these buildings, particularly needful, and the fire-proof lining must never be considered as part of the structure.

Chimneys that have got out of the upright have sometimes been got back to the perpendicular by very clever treatment. There is one now standing near the canal, between London and New Cross, which leaned over soon after it was built, but it was got back to its place by boring holes in the mortar joints near the base on the contrary side to the lean, and, being done with much caution, it gradually assumed its perpendicularity. Another, and large one, in Yorkshire, which had a very great lean and was likely to fall, had part of a course of bricks cut out from the bottom, slowly and carefully, and filling in the cavity, as the operation went on, with new lime and earth, and, when the cut was thus complete, the chimney gradually lost its lean, squeezing out the lime and earth as it came over. Other cases might be cited, but the above suffice.

UNDERPINNING.

Underpinning is really an important subject under the head of failures; and when we see that accidents under this head may cause verdicts of manslaughter to be recorded against architects, as was the case against Mr. Abraham, after the noted fall of a house in the Strand, in 1853, we must be awakened to the necessity of so arranging the business part of such operations that the architect shall not be made responsible for details he cannot control. It is often a sort of work that requires intelligent watching during every moment of its progress—and this is not the architect's business; and if this view be not recognised by courts of law, it behoves us to define the responsibility in a written document between architect and builder before commencing the work. A very good letter on the subject was written by Professor Kerr at the time of that accident.

The underpinning of lofty and ponderous buildings by the aid of gigantic shoring is not only too large a subject for this paper, but it has been too ably treated of by others to need remarks now. The works of Rondelet, at the church of St. Geneviève, at Paris, and of Flachat, at Bayeux Cathedral, are notable examples, besides the works at Hereford, Chichester, and other buildings, of which no publication has yet been made. The underpinning at the Custom House was also an extraordinary work.

FALL OF OLD BUILDINGS.

The fall of old buildings scarcely comes within the scope of this paper, because the failure often arises from the mere decay of age, yet sometimes it may have been from an original defect in the structure, and that defect, if it becomes revealed to us by the fall, teaches us something. The records of failures in the middle ages, rather indulge in religious than in practical explanations of the causes, and so we do not gain much practical knowledge from these examples, such as the fall of the towers of Winchester Cathedral, in the twelfth century; of Gloucester Cathedral, in 1160; of Worcester Cathedral, in 1175; of Evesham, in 1215; of Dunstable Priory, in 1221; the smaller towers of Worcester Cathedral, in 1222; the tower of Lincoln, in 1244; of Ely Cathedral, in 1322; of Norwich Cathedral, in 1361; and the west front of Hereford Cathedral, in 1786, and the central tower would have fallen had not its impending ruin been observed and remedied a few years ago. The old tower of Thurston Church, Suffolk, fell in 1860. Then we had the Chichester tower in 1861. The above small list of towers awakens the thought that special care is needed for all structures that are carried upon piers, instead of upon continuous walls. But the description that has been clearly given by Professor Willis, and by Mr. Burnell and others, of the cause of failure in the Chichester tower, would, I imagine, have been very applicable to many of the other cases. The lesson derived from the Chichester fall seems to be, that rubble masonry should never be used in piers carrying towers or other heavy work; it is a masonry suitable where bulk and weight are main objects, but it is inadmissible where unyielding vigour of pier is to be attained; it also suggests that in any such case a soft kind of stone is scarcely safe, even if it be of a sound nature; and the stone forming the facing at Chichester, though in some respects a good stone, was not suitable for a position where a crushing force was the chief force in action. It was from near Binstead, in the Isle of Wight, and it is (I am pretty sure) the only tertiary building stone in England; but if we want a thoroughly good freestone, we must get it out of the secondary beds.

The stone in the piers of the French Pantheon was of rather weak quality, but I am uncertain as to whether the *pierre d'Arcueil* and the *pierre de Mont Souris* with which they are built, are secondary or tertiary stone, but that with which the inner and intermediate domes were formed was tertiary, from the quarries of Conflans, about eighteen miles from Paris, and for which latter purpose it is particularly suitable. This stone has recently been used in England at a new house erected in Kent for an eminent geologist.

TRADES' UNIONS' COMMISSION.

AMONG the witnesses examined before the Commission last week was Mr. Hewitt, an ironmaster, of New Jersey, United States. He said he had come over to this country partly on business, and partly to inquire into the state of the iron trade in England, and its effect upon American industry. He employed 4,000 men. The puddlers' wages were about 17s. per day; they were now on strike for 21s. per day. Trade unions in America had very little effect upon the trade of the country, not being so powerful as the unions in this country. The working day of ironworkers was about ten hours. The wages in America can never fall so low as in England, owing to the fact of the great abundance of fertile land, by which, if a puddler, or any other workman, is dissatisfied with his rate of wages, he can, under the Homestead Act, obtain possession of 160 acres of land upon the sole condition of cultivating it. Without a high tariff it would be impossible for America to compete with English ironmasters, owing to the cheap rate of labour in this country. During his recent inspection of ironworks in this country he was astonished to find that in large ironworks in Wales women were employed at 1s. and 1s. 3d. per day, for which labour men in America were paid 6s. and 7s. per day; and at Swindon and in Staffordshire, where women are not employed, men are receiving 3s. and 3s. 6d. per day for the same kind of labour. Such a thing would not be tolerated in America, as there both masters and men are agreed that labour shall not be degraded. He then went on to describe the educational system in America, and the efforts which were being made by large employers of labour there to instruct their workmen in the principles of political and social economy. At the Cooper's Institute, in New York, there are 2,000 workmen availing themselves of the opportunity thus afforded to them. Temperance is also much on the increase amongst the better class of workmen in the United States. The real necessaries of life, with the exception of clothing and house rent, are about at the same rate as in England, so that the chief expenditure of the American artisan is upon articles of dress or luxury. Labourers' wives generally wear a silk dress for their best dress. He described the efforts now being made in the States to bring about the eight-hour system; in two of the states, Illinois and Wisconsin, it is now the law; while in New York State the law had passed the Legislature, but it was vetoed by the Governor. His own opinion was that the eight-hour movement would fail, and that the old ten hours per day would again be resorted to. Being asked with regard to the law of contract between master and workman, he said there was no Master and Workmen's Act in America. His own workmen were employed under a fortnight's notice on either side, and if a workman left without such notice he forfeited his wages due, a week's pay being usually kept in hand, which by law the master was entitled to. No inconvenience arose from this to the employers. Such a thing as imprisoning a man for debt or breach of contract between master and workmen was quite unknown in America. Piecework was not objected to by the men, but there were restrictions by the unions in regard to apprentices. There was no law to enable masters to divide profits with the workmen, as in this country, but at Troy the ironmoulders had established a foundry on the co-operative principle, which did not appear to be making any great progress, the wages paid not being equal to those paid by private firms

HOLBORN VALLEY IMPROVEMENT.

THE corner stone of the Holborn Viaduct was laid on Monday by Mr. Deputy Fry, Chairman of the City Improvements Committee. Considering the great public importance of the work the ceremony was a very quiet and unimposing affair. We have more than once had occasion to describe the nature and extent of this work, which, when completed, will be one of the most splendid improvements ever effected in the metropolis, and refer to it again only briefly. The viaduct will support a roadway extending from the corner of Hatton Garden to the corner of the Old Bailey. The roadway will be 80ft. in width, and will take in part of St. Sepulchre's Churchyard at one end and part of St. Andrew's Churchyard at the other. Side streets will be formed connecting the roadway of the viaduct with the lower level of Farringdon-street. Practically, the viaduct will be level; technically, the steepest gradient will be 1 in 143. The most important part of the work will obviously be that section intended to cross Farringdon street. This bridge will be on three spans, supported on piers, which, as well as the abutments, will be of polished granite. The height of the bridge from the footways of Farringdon-street will be 16ft., and from the roadway 21ft. Flights of steps at each corner of the bridge will yield communication between the upper and the lower levels, and these steps will be enclosed in stonework, forming foun-

dations for ornamental continuations above the level of the viaduct, these structures being appropriated for shops and warehouses. Shoe-lane at its northern end will have its width doubled, and a girder bridge will span the thoroughfare, which will be projected northward to a junction with Farringdon-road, so as to form a direct line of communication to the north-east of London, and especially to the new dead meat market at Smithfield, the first stone of which was laid on Wednesday. A similar approach street will be carried from Farringdon-road in a curve eastward joining the viaduct at St. Sepulchre's Church. Several streets will necessarily have their levels altered. Beneath the footways of the viaduct vaults will be formed for the accommodation of the houses to be built on each side, and besides these vaults will be subways for gas and water pipes and telegraph wires. The roadway will be borne on a series of arches. The subways will average 11½ft. in height and 7ft. in width, being constructed of brickwork, except where they will cross the Chatham and Dover Railway, at which point iron will be extensively used. Vertical shafts will connect the pipes in the subways with those on the lower levels. Below the subways will be sewers draining the houses by the side of the viaduct, and the construction of all the subways and sewers will enable repairs to be effected at any time without breaking the surface. Messrs. Hill and Keddell are the contractors for the whole structure, which, it is hoped, may be available for the purposes of traffic within two years. The foundations have been laid from 20ft. to 30ft. below the surface. This depth has been rendered necessary by the nature of the ground in the bed of the old Fleet River, but all such difficulties have been overcome, and there is nothing now to prevent the prosecution of the work with the utmost rapidity.

DESIGN FOR THE NEW LAW COURTS.

OUR lithographic illustration this week represents the north-east angle of Mr. G. E. Street's proposed design for the new Law Courts. We were not backward some time since in pointing out in detail some of the defects of this noble design, neither were we chary in attributing to it many splendid qualifications.

WHAT CONSTITUTES A ROYAL RESIDENCE?

A VERY curious and interesting case was decided on Tuesday by the Barons of the Exchequer. Hampton Court Palace is no longer an actual royal residence, but is partitioned off into seventy dwellings, which are bestowed by her Majesty upon impoverished members of the nobility. Some time ago the Sheriff of Middlesex executed a writ of *fieri facias* against the goods of Lord Henry Gordon, one of the inmates of the Palace, and this proceeding being deemed a violation of the privileges of the palace, a special case was agreed to for the decision of the higher Court. Barons Bramwell and Martin held that her Majesty having ceased to reside in Hampton Court all immunities ceased also. In delivering his judgment Baron Martin said, he was disposed to give the privilege which protected the person, residence, and property of the Crown the widest possible application, and he would extend it not only to Buckingham Palace, Windsor Castle, Osborne (and Balmoral, if it were in England), but to every place where the Queen actually resided, or what was ordinarily understood to be her dwelling place. But when a palace formerly occupied by the Crown ceases to be entirely a Royal residence, and when there was no probability of the Queen ever going to live there—and this was so in the case of Hampton Court—in his judgment no privilege attached to it. Her Majesty had thought fit to appropriate the palace to an entirely different purpose from that of a Royal residence. The Lord Chief Baron differed. In a very elaborate judgment, he said he was of opinion that the immunity of a Royal palace from the execution of a civil process was not lost because it had ceased to be a Royal residence for a considerable time if the Sovereign had not abandoned possession of it. He thought this privilege still existed at Hampton Court, and at every Royal palace in which the Sovereigns of this kingdom had once resided, and might come to reside again, and which was actually in the occupation of and kept up and maintained at the expense of her Majesty. On that ground he thought the intrusion of the defendant was unlawful, and that judgment would be for the Crown; but, as his learned brethren were of a different opinion, judgment would be for the defendants. The result of this decision is, that residents at Hampton Court are no longer exempt from the execution of civil process.

Hampton Court Palace, or a considerable portion of it, was built by Cardinal Wolsey as a residence for himself. In the year 1526 the Cardinal presented it to Henry VIII., and was in turn rewarded by the gift of the palace at Richmond. Since that period Hampton Court has constituted part of the Royal demesnes appurtenant to the Crown of England. King George II. was the last English monarch who ever occupied it, and since his death, embracing a period of upward a century, it has ceased to be a place of the actual personal residence of the Sovereign. The Palace, as well as the gardens which surround it, are maintained by the Crown.

BUILDERS' BENEVOLENT INSTITUTION.

A GENERAL meeting of the friends and subscribers to the above charitable institution was held on the 30th ult. at Willis's Rooms. The object of the meeting was for the election of three pensioners on the funds, two males and one female. Mr. Benjamin Hannen, president, took the chair. The following gentlemen were present:—Messrs. Joseph Bird, James Simpson, B. D. Dove, Henry Dove, Thomas Cozens, John Thorn, Thomas Stirling, M. Hall, J. Chapman, T. Lambert, Richard Head, T. G. Smith, J. E. Lawford, C. S. Murray, R. Richardson, T. Abbott, &c.

The chairman, in opening the proceedings, said he found that the list contained the names of nine candidates, four men and five women, and he thought it a matter of congratulation that the state of the funds and present circumstances permitted them to elect one-third of the number who had put themselves forward for election, instead of having a very long list from which only a few could be successful. They were anxious on all occasions to elect as many as possible, and at the present time he could say that if the funds continued in the same position of prosperity there would be another election in November next, when those who were unsuccessful that day might have the gratification of obtaining a successful result.

The poll was then proceeded with, and the following were announced as the successful candidates:—George Hunt (1,459 votes), aged 67, of 1, Eton-street, Gloucester-road, Regent's Park. He was formerly a subscriber to the institution, and had been a carpenter and joiner for forty years. Owing to general debility and defective sight he was not able to earn on an average more than 8s. a week. Charles Gravett (1,292 votes), aged 76, of 17, William-street, Islington. He had been a carpenter and builder for fifty years, but now unable to work from the infirmities of old age, and was, therefore, solely dependent on his children. Ann Walker (4,307 votes), aged 67, widow of the late Mark Walker, mason and builder, of Monk Bretton, Yorkshire. Her distress was caused by the entire failure of an annuity left her by her husband, which rendered her dependent on the bounty of kind friends. The others were:—G. N. Lambert, 165 votes; R. Burdett, 81 votes; Mrs. M. Unwin, 1,807 votes; Mrs. Lawrence, 3,493 votes; Mrs. Ware, 1,417 votes; Mrs. Martin, 237 votes.

Mr. Bird said that in looking over the lists he believed that 300 of their supporters had not been canvassed or asked for their votes, and impressed upon the unsuccessful candidates the necessity of increased exertions. He concluded by proposing a vote of thanks to the scrutineers for the performance of their arduous task. The motion having been seconded was duly carried.

The usual vote of thanks to the chairman concluded the proceedings.

IMPROVEMENTS IN THE CITY OF LONDON.

THE COMMISSIONERS OF SEWERS REPORT.

WE have before us the report of works executed by the Commissioners of Sewers of the City of London during the past year, by Mr. William Haywood, engineer and surveyor to the Commission. From the report it appears that the total length of sewer constructed during the year was 810ft., of which 524ft. was on the line of old sewers; the total number of premises drained was 226. A large number of improvements in the way of widening streets, setting back frontages, &c., we observe have been made, while other improvements are pending. We are glad to see that the house known as No. 1, St. Paul's Churchyard, and situated at the eastern end of Ludgate Hill, has been purchased by the Commission with the view of widening that over-crowded thoroughfare; and we further learn that negotiations have been commenced for the purpose of allowing the railings of St. Paul's Cathedral on its western front to be lifted and set back from the street. This would be an immense improvement, and we trust the Commission will be able to obtain the necessary power to carry it out. The Post-office authorities having purchased the three houses in Newgate-street, between Bath-street and St. Martin's-le-Grand, which project beyond the general line of improvement in that street, the Commission is now negotiating for the ground required to complete the improvement at that spot. The Commission, having at the request of the Corporation, undertaken to carry out a line of improvement in Mansion House street, notices were served upon the Union Bank of London, in respect of ground upon which they were about to build in that street, and arrangements were ultimately made by which it will be thrown into the public way. The largest portion of the ground needed for widening the street is included in that agreed to be purchased of the Bank. The contracts for scavenging and dusting were let for £22,620, which was an increase of £6,840 over the previous year. The increase is explained by the extra exertions made by the contractors to obtain cleanliness. The cost of gas lighting for the year was reduced £1,500, as compared with previous years. The report states that the illuminating power and the chemical purity of the gas supplied were throughout the year subjected to the constant investigation of Dr. Letheby, gas analyst. The price of the gas supplied to private consumers, which for some years previously had been 4s. 6d. per 1,000 cubic feet, was reduced on January 1, 1866, to 4s. per 1,000 cubic feet. The handsomest drinking fountain in the city was erected during the year in the churchyard of St. Lawrence, Jewry, at the expense of the parish. We regret to notice that the practice of selling diseased meat is becoming more and more common in the city. Inspectors of slaughter-houses, who are at the same time inspectors of meat, had occasion to condemn larger quantities of meat than in any previous year. There were no fewer than twenty convictions before the magistrates, and in one instance the vendor was imprisoned. These facts cannot be too widely known.

CONTRACTS.

THE contract for the new factory or warehouse for Mr. Wm. Windley, has been let to Mr. Arthur Haw, builder, of Nottingham, for the sum of £5,060, exclusive of foundations and the fire-proof floors (Dennett's patent).

The contract for the new rectory house at Gedling, from designs prepared by Mr. H. Goddard of Lincoln, has been let to Mr. E. J. Thompson of Derby.

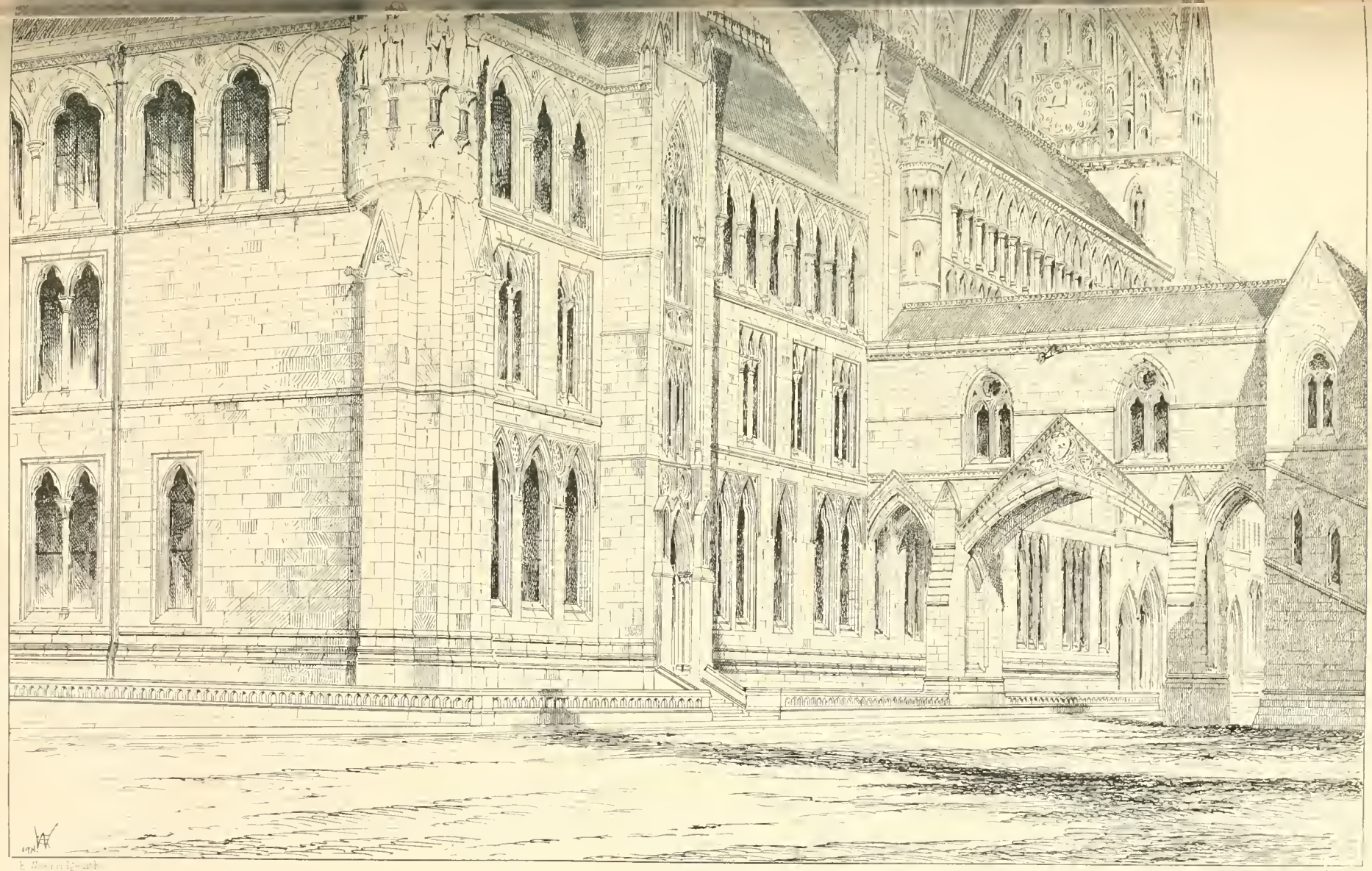
The council of the Liverpool Architectural Society has appointed three architects as a deputation to meet a similar number of master builders to confer together with the view of furthering the settlement of the contract question it is expected that the first meeting will be held this week.

ORGANS.

A SPECIAL-service was held in the new church Stockton-road, Sunderland, on the occasion of the opening of the new organ. The instrument cost £450, and was built by Messrs. Forster and Andrews, of Hull. The design of the organ is chaste and simple, the front pipes being of the best (spotted) metal, and diapered in keeping with the church. The instrument, which is built on the principles adopted by Schultz, the great German builder, embraces all recent improvements.

A new organ has been placed in Queen street Congregational Church, Wolverhampton. The instrument has been built by Messrs. Bevington of London, and cost £450.

It is proposed to decorate the interior of the Flaxman Hall, in University College, Gower street, and Mr. W. Cave Thomas has been invited to furnish a design for the work.



North · East · Angle · of · Propose · New · Law · Courts G. E. Street A.R.A Architect

THE LONDON UNIVERSITY BUILDING.

A SHORT time since we called attention to the designs for the London University Building, when we pointed out their unfitness for the intended purpose. On Friday last, on the vote of supply for £20,000 for erecting the new building, Mr. Layard moved that it was not desirable that the proposed building should be built according to either of the designs exhibited in the library; whereupon Lord John Manners, the Chief Commissioner of Works, defended in a spirited manner what the Government had done. He deprecated interference on the part of the London University, or "any body external to themselves"—meaning, we suppose, the BUILDING NEWS—"to call for the stoppage of works that were in progress." He also stated that £9,000 had been expended upon the building, that £6,000 more had been contracted for, and that the materials were on the spot. Now this building is for public purposes, and the public have a right to expect that those in authority shall exercise such care in the selection of the design as shall ensure a handsome as well as a commodious structure. The First Commissioner appears to court the responsibility of the selection, but upon what grounds we are at a loss to imagine. Mr. Tite observed "it is to be regretted that Mr. Pennethorne should have departed from the style of Somerset House and Burlington House, and taken a fancy to a new style, to which the general feeling of the House was opposed." With Mr. Tite's regrets we mingle our own, but cannot help inquiring upon what grounds an accomplished designer in the Classical style should have been selected to carry out a building of the Italian Gothic type. It is no disgrace to Mr. Pennethorne that he should not be a master of all styles, but there appears in this instance to have been an unusual want of discretion on the part of those in authority; and it is not too much to say that but for Mr. Layard's motion a building would have sprung up which would have caused lasting annoyance to no one more than the architect himself. As the drawings have disappeared from the library of the House they will, in all probability, never see the light again, and a brief description of the objectionable façade may, therefore, be interesting. The building consists of a central portion and two wings. The central portion has an arcade of five arches, a small clock tower in the centre, and a very large buttress at each end, surmounted by a canopy containing a statue. The wings are divided into three bays by means of buttresses, with statues in the place of pinnacles, and have at the angles a canopied buttress of less ambitious character than those of the central portion. The parapet is pierced in a very ordinary manner, and the roof is much ornamented by slates of different colours. The best general description that can be given of the composition is that it is unsatisfactory, weak in some parts, heavy in others, elegant in none. With regard to the use of statues as pinnacles opinions vary. Mr. Scott has used them largely in his design for the new Law Courts; but when statues are employed they should be of one size, and it is improper to seek to give importance to the central portion of a building by making the statues half as large again as those in the wings. We cannot imagine how Mr. Pennethorne could have fallen into such an error, and trust that when the design is amended it may be rectified, together with several others of almost equal importance. As to the style selected, we well know that the First Commissioner of Works has a partiality for the Italian Gothic, but it may be questioned whether a Palladian building would not be preferable for this locality. For our own part we cannot understand how it is possible to erect a building in a florid style of Italian Gothic without being out of harmony with its neighbours, and we are not reassured by Mr. Hope's *naive* remark, that "nobody without the wings of a dove would fly away and see the two separate fronts of two distinct buildings at one and the same time." To us it seems that the feat could be about as difficult with the wings as without them. On the division of the committee a majority of six members supported Mr. Layard's amendment which was, "Provided that no part of such sum shall be applied to the erection of any building according to either of the designs now exhibited in the library." The designs are accordingly in Mr. Pennethorne's hands for amendment, and we sincerely wish him better success in his next effort.

THE EARLY DAYS OF CLARKSON STANFIELD, R.A.

ALTHOUGH the decease of this remarkable man and distinguished painter has already been noticed in the columns of the BUILDING NEWS, we have no hesitation in furnishing its readers with some further and more minute particulars of Stanfield's early life. Many of the literary journals have fallen into error in respect of the first part of the great artist's career, and none of them seem to have been acquainted with several of the following facts:—Clarkson Stanfield was born at Sunderland in 1793. His father, James Field Stanfield, was a member of a respectable family of the Roman Catholic faith, and who in early life—whether heaven directed or not we cannot say—had gone the way in which many others have preceded and succeeded him, namely, to a Provincial theatre and to poverty. As an actor the elder Stanfield did not succeed in obtaining either fame or fortune, and he lapsed into the humble, but useful position of a stage prompter. He was not destitute of education, and he dabbled in literature to some extent. His greatest success in this direction was the production of a warlike and patriotic song of the Dibdin class, which attained some popularity. The mother of Clarkson dying prematurely, and the second marriage of his father rendering their poor home less comfortable than before, the youth, after officiating as call-boy and taking lessons in dancing from the ballet-master at the Sunderland Theatre, determined to go to sea. This resolution, in company of his elder brother, he speedily put in force. The maritime propensities of Clarkson Stanfield were not of a belligerent character, and he did not, as has been said, join the Royal Navy, where in those days fighting was a reality. He served for a considerable time on board an Indiaman, where he was entrusted with the care of the ship's signal flags. His brother became the mate of a collier. It would be unjust to the memory of Clarkson's father to omit stating that to his encouragement the world is considerably indebted for the development of his son's early displayed talent for drawing and sketching. During the absence of the latter at sea interchanges of letters took place whenever practicable. Those from the parent teemed with urgent advice to the son to draw and paint, and to suffer no circumstances, however depressing, to interfere with his studies. These persistent and affectionate counsels had their due weight, and specimens of Clarkson's handiwork while at sea, or ashore after voyages, frequently reached the home and gratified the heart of the "poor player." Hence the germ of that tree which subsequently took root, and grew and blossomed so luxuriantly. The young sailor was by this time (1814) nearly disenchanted of a maritime life, and perhaps this result was expedited by a fall from the rigging of the vessel in which he served, and his narrow escape from a violent death in consequence.

In the winter of 1814-15 a young man, rueful in countenance, wobegone in manner, and lean as Shakspeare's apothecary, engaged a modest lodging at Stepney—then as now a maritime quarter of the metropolis, and the parish by right of British subjects born at sea. The apartment he tenanted was in the house of a Mr. John Young, at the time an officer in H.M. Customs, but who, singularly enough, had been previously one of the *corps de ballet* at the old Royalty Theatre, Wells-street, St. George's-in-the-East. The melancholy-looking lodger was Clarkson Stanfield, and he communicated the painful fact to Mr. Young that his purse was rapidly becoming as attenuated as his person, and that remunerative employment was not only a want with him but an absolute necessity. He revealed his history to the erst-while dancer of the Royalty Theatre, and exhibited before him his own proficiency in the same line. He also gave him proofs of his skill as a painter. It was now, therefore, a question whether Stanfield should trust to his legs or his arms for a livelihood. His destiny vibrated between the stage and the painting room, but fortunately for the world of art the latter prevailed. His generous landlord introduced the dancer-sailor-artist to Mr. Vickers, jun., then a partner with his father in the management of the old Royalty Theatre.* The introduction led to an engagement in the scenic and decorative department of the establishment, and Stanfield with a guinea a week was comparatively a happy man. His happiness, however, was shortlived, for he had to endure first the contempt and subsequently the bitter enmity of the regular scene-painter of the theatre. This individual, whose name, on the old principle *de mortuis nil*, &c., shall not be mentioned, was much more devoted to the dram than the drama, and when he saw that the young aspirant for fame was by his well-regulated deportment and ungrudging exertions gaining the marked respect of his employers, he took to drinking harder than ever. The usual result followed—he was dismissed. Soon after Stanfield was promoted to the vacant post, and its duties he performed with vigilance and fidelity. Quite irrespective of short pay and long hours, his motto was Work, work, work. In short, it may be said that his engagement at the Royalty Theatre was the "tide" in his affairs which led "on to fortune." As his circumstances improved he appears to have become impressed by the force of the very ancient maxim, that "it is not good for man to be alone." He demonstrated the strength of his conviction by marrying (1817) Miss Hutchinson, a very young and pretty, though not a very talented, actress of the Royalty Theatre.

From the Royalty, Stanfield migrated to the Coburg Theatre, then in the zenith of its melo-dramatic fame, and where he met the afterwards not less celebrated David Roberts, R.A. In company of Mr. Davidge, Clarkson Stanfield went (about 1819) to Edinburgh to fulfil an engagement in a minor theatre there. In that city he found his father and his half-brother William steeped to the lips in poverty. At this period his own salary, if he could have got it, which he could not in consequence of the failure of the manager, would have been barely sufficient for the maintenance of himself and wife. He nevertheless, with filial and fraternal affection, which cannot be too much commended, took both his unfortunate relatives under his protection. With him they came to London, and his father, who subsequently became afflicted with blindness, was kindly lodged and cared for so long as he lived in his own humble cottage, Mount's-gardens, Westminster Bridge-road. To his half-brother he was equally kind, and many other relatives had to thank him in his upward course for generously extended aid.

Of Stanfield's subsequent engagement at Drury-lane Theatre, his contributions to the Royal Academy, and of the great works which have made his fame not only national but European, the public know enough. We have only endeavoured to string together some episodes of his early history, which have not been elsewhere recorded.

* The site of this establishment was formerly occupied by a Methodist chapel; this was removed to make way for the Royalty Theatre, which being burnt down was succeeded by the Brunswick Theatre, which fell down, and the Sailors' Home at present covers it

THE RIVER LEA.

THE Royal Commissioners appointed to report as to the pollution of rivers—Mr. Rawlinson, Mr. Harrison, and Mr. Way—have just presented a report on the state of the River Lea, which was selected for early examination because it chiefly supplies with water the East London district, in which there was an outbreak of cholera last summer. It appears that some unfiltered water was at that time used, but it is not now delivered in that state, and there were several local conditions calculated to produce cholera. The report states that the River Lea has been navigable from time immemorial; King Alfred is known to have visited Ware by water. The area of the watershed is about 500 square miles, the greater portion of it a natural filter, but in dry weather the flow is for the most part spring water. This river supplies about half the population of London with water, and the limit of supply, without the construction of extensive storage reservoirs, has been fully reached. Pollution of the waters of the Lea by sewage is general throughout its course. At Luton, three miles from its source, the depravation begins, and it goes on increasing until, when the river reaches Ponder's-end, it becomes in a great degree like an open common sewer, and in the latter part of its course runs through a nuisance district, the seat of trades expelled beyond the limits of the better parts of the metropolis. The Commissioners admit that it may not be possible to raise the quality of the water of the lower Lea to the standard of the New River water, which is to a great extent derived from springs flowing direct from the chalk, and is most jealously guarded from pollution in its course along an aqueduct devoted to no other purpose than that of a water carrier; but if proper measures be adopted to protect the Lea from avoidable pollution, a great improvement in its purity will be secured. Large expenses have been incurred for improving the water taken for domestic supply, and a fair wholesome water is obtained at Ponder's-end by the East London Waterworks Company. The question whether a navigation should be allowed to continue a conduit for water destined for the supply of the metropolis is one which, say the Commissioners, deserves serious consideration. Dealing with the matter as they find practicable, they recommend the protection of the water of the Lea on the system inaugurated by the Act of last Session relating to the Thames. They propose the appointment of a good working conservancy board, on which the Government should be represented as well as the water companies and the navigation and trading interests and the city corporation; and the prohibition, after a certain period allowed for alteration of existing arrangements, of the casting into the Lea or its tributaries of any sewage or injurious refuse, unless it has been purified by passing over land. The conservancy board should be furnished with complete powers, and be responsible for keeping the river a fit carrier of pure water, and seeing to the observancy of statutory prohibitions against the pollution of water which can reach the river, superintending also works of arterial drainage in the watershed. If the present income prove insufficient, it should be supplemented by a charge upon the water companies, not exceeding a certain maximum—a course to which the companies will not object; and if necessary a loan from the Public Works Loan Commissioners might be obtained. Lastly, the Commissioners do not fail to recommend that it be rendered compulsory upon the companies (New River and East London) to supply water upon the "constant system" throughout their districts, and upon owners of houses to furnish their houses with proper arrangements to receive such supply.

OBITUARY.

THE Birmingham papers announce the death of Mr. John Hardman, the head of the well-known firm of Hardman and Co., of that town. His father, says the Birmingham *Daily Post*, was one of the oldest manufacturers engaged in button making. Mr. Hardman succeeded to the business, then carried on in Paradise-street, and conducted it for some years; but he is better known as the reviver of the art of metal working and glass painting, according to true principles. An accidental interview, in the year 1837, with the late Mr. A. W. Pugin, at that time Professor of Architecture at Oscott College, resulted in Mr. Hardman's entering into the views entertained by the distinguished architect, and a friendship began which terminated only with the life of Mr. Pugin. Imbued with a kindred spirit of enthusiasm to that which animated his famous associate, Mr. Hardman entered thoroughly into the views of Pugin, and was the medium by which the magnificent conceptions of the latter were realised. With Mr. Hardman it was a labour of love—he spared neither time nor money in effecting the end he so earnestly desired to achieve. For that purpose he collected together, taught, and trained skilful workers in gold, silver, iron, and brass; he experimented on all the mediæval processes of metal work—saw-piercing, beating up, enamelling, stone-setting, and niello—all of them arts which were practically obsolete at the period when he commenced his labours. After many difficulties, patiently encountered, though at great cost of time and money, Mr. Hardman by the perfection of his workmanship, realised the fondest dreams of his friend and associate, Mr. Pugin. In stained glass Mr. Hardman was equally successful, achieving a high degree of excellence in works in that material, which realised all the solemnity and harmony of colour, peculiarity of design, form, and expression, which distinguish the glass of the best mediæval artists. In doing this he gave our town a new trade; and he did more—he showed the world that Birmingham, stigmatised for the production of things false, was, at the bidding of an earnest man, capable of producing things honest, truthful, noble, and precious. It was in 1845 that Mr. Hardman commenced his establishment for the manufacture of metal work and stained glass in accordance with true principles, and from this undertaking has emanated the many similar works now so widely distributed in the metropolis and elsewhere. When he commenced his labours in his peculiar field he found everything false as regards principle, and tinsel as regards ornament; for the false he substituted the true, for the tinsel he substituted the real. There are few cathedrals, churches, or public buildings built according to the true principles of revived Gothic architecture, in which are not enshrined some examples of his manufacture. His works shone resplendent in the local exhibition of 1849, and in the Mediæval Court of the great Exhibition of 1851. They also form interesting features in the Palace of Westminster, and his monumental brasses (singularly appropriate in character, and excellent in execution) are to be found widely distributed. Mr. Hardman was fifty-five years of age.

The death is announced of Mr. Alexander Brodie, the Scottish sculptor. He was fast rising to a high place in his profession. Several of his works are well known—the latest and one of the best is a statue of the Queen recently erected in Aberdeen. The deceased gentleman, who was only thirty-six years of age, was brother to Mr. W. Brodie, the Edinburgh sculptor.

Building Intelligence.

CHURCHES AND CHAPELS.

The foundation stone of a Chapel of Ease has been laid at Eddington, Hungerford. The architect is Mr. Blomfield, of London; the contractor, Mr. Wooldridge, of Hungerford. The chapel will be 83ft. in length, and built in the Decorated style with brick and Bath stone dressings. It will accommodate 275 persons, and all the sittings will be free and unappropriated. The cost is estimated at about £2,300.

The foundation-stone of a new chapel, to be erected in Hood-street, Monkwearmouth, for the use of the United Methodist Free Church denomination, was laid last week. Mr. John Tillman is the architect, Mr. John Hodgson having the contract for the masonry and bricklaying, and Messrs. Elliott and Hudson for the joiner-work. The structure will be of white brick, with red brick arches and stone facings, and will accommodate 350 persons, with a schoolroom added to hold 150, the school being so arranged that it can be made available for the chapel. Total cost about £900.

The restoration of the exterior of the south transept of Gloucester Cathedral is now being carried out under the direction of Mr. G. G. Scott. Mr. Gambier Parry has been engaged for many months in painting the chapel of St. Andrew—the first chapel east of the south transept—and the whole of this superb edifice is being restored by Mr. T. Marling, of Gloucester, as a memorial of his wife.

ALFORD (LINCOLNSHIRE).—The parish church here (a fine specimen of the architecture of the time of Edward III.), having been for a long time in a very dilapidated state, it is intended to enlarge and restore it. The cost of the works is estimated at £4,000. They will be carried out under the direction of Mr. G. Gilbert Scott. Messrs. Hasnip and White, builders, Alford, have commenced the work.

CHURCH ASTON.—A new church erected upon the site of the old church was opened last week. The architect is Mr. Street, of London, and the contractors are Messrs. Treasure, of Shrewsbury. The style is Gothic, of the Decorated period. The building is rectangular in form, and consists of nave, north aisle, chancel, and chancel aisle, with bell turret. The material is red sandstone, from a quarry belonging to Mr. R. M. Leeke, not far distant. The dressings, the low wall which divides the nave from the chancel, the font, and the pulpit, are all of white Grinshill stone. The roof of the nave is open, exposing the beams and the ceiling; that of the chancel is covered by circular boarding of stained wood. The church is estimated to seat about 350 persons.

CROXTON KENIAL (LEICESTERSHIRE).—The complete restoration of the interesting church in this parish is now fully commenced, under the superintendence of Mr. G. G. Scott, R.A. The work comprises a thorough restoration of the defective stonework generally, and new roofs throughout, which, together with all the elaborately carved stalls and benches, are being done in English oak. This church is especially rich in ancient architectural remains of historical importance, being the reputed burial-place of one of England's kings. Mr. J. Fast, of Melton Mowbray, is the contractor, and Mr. Yeomans is the clerk of works.

KINTBURY.—The consecration of Christ Church, Kintbury, Berks, took place on Tuesday week last by the Bishop of Oxford. The style of architecture is Decorated or of the Second Pointed period. The material used in the construction of the walls is brick, as it is obtainable in the locality, but all the windows, doorways, weatherings, copings, stringcourses, and plinths are executed in Bath stone. The plan consists of a tower entrance, a nave, chancel, and vestry. The nave is 26ft. wide and 66ft. long, and will hold 250 adults; the seats are of deal, stained and varnished. The chancel is 29ft. long and 20ft. wide. The church has cost upwards of £3,000. The architect is Mr. Talbot Bury, of Welbeck-street. The stonework was entrusted to Mr. Keats, of Newbury; the brickwork and plastering to Mr. Cumner, of Kintbury; and the woodwork to Mr. Cruise, of the same place.

TOPSHAM.—A new Wesleyan Chapel was opened at Topsham, Devon, last week. It is built in the French Gothic style, from designs by Mr. T. R. Orwell, architect, North Shields, and has cost about £3,000. Mr. Perriam, of Topsham, is the builder.

UPPER CLAPTON.—In noticing the design for a new church which is shortly to be erected at Upper Clapton, at a cost of from £10,000 to £12,000, the *Ecclesiologist* says:—"From the photographs which we have before us, it will, we fear, be only another addition to the unsatisfactory churches which have been erected in the parishes of Hackney. There is some merit about parts, especially the proportion of the tower and spire, which remind one of some of the Lincolnshire examples; but there is a striking want of originality in every part. The upper lights of the tower are in the style of the thirteenth century, as are also the piers of the nave, whereas the rest of the detail is fourteenth century. The church consists of nave, aisles, with gabled roofs, timbers open to ridge; tower and spire at the end of the south aisle; the east end facing the road. We particularly dislike the semihexagonal apse with each side gabled and crocketed. The whole is just such a church as any architect's assistant, of fair ability, might design. It is not to such buildings as this that we are to look for progress in our future architecture."

WOLSTANTON.—A Methodist New Connexion Chapel is being erected here at a cost of about £900. The style is Italian, and the exterior front elevation will be faced with white pressed bricks, and Hollington stone dressings for doorways, windows, cornices, &c. The church will seat about 350 persons. The architect is Mr. Ralph Dain, of Burslem, and the builder, Mr. Trevor, of Newcastle.

BUILDINGS.

The foundation stone of the new Metropolitan Meat and Poultry Market—which we have more than once described—was laid on Wednesday by Mr. H. L. Taylor, chairman of the Markets Improvements Committee of the Corporation of London. The Corporation have been empowered by act of Parliament to raise for the construction of the market a sum of £235,900, and an additional sum of £70,000 for making a new street connecting the market with Victoria-street. With a view to the gradual liquidation of those sums, they have been authorised to impose a light toll of a farthing for every 21lb. on all meat conveyed to market by rail or otherwise. The architect of the new market is Mr. Horace Jones, the City architect; the contractors are Messrs. Browne and Robinson.

DAWLEY.—A new market hall has been erected at Dawley, in Shropshire, which has frontage to the High-street of 80ft. by an equal depth, and is roofed over in three spans, the centre being of narrower span than that of the two sides. The outside is of red brick, with stone facings. The contractors were Messrs. Nevitt, of Ironbridge, who have carried out the work for £2,140, from the plans and under the superintendence of the architect, Mr. Bidlake, of Wolverhampton.

LEEDS.—Messrs. Beckett and Co.'s new banking premises, Park-row, which have been upwards of three years erecting, are now completed. The building is designed in the Early Pointed Gothic style, is constructed of red brick, and the outside facing bricks have been procured from Mr. Robert Bond, of Thirsk, who made them expressly to the dimensions decided upon by the architects. These bricks are very thin, of a peculiar and pleasant red colour, and smooth faced. They have the appearance of being polished, and are laid in dark coloured mortar, carefully jointed, which gives a richness to the face of the building not generally found in ordinary brick buildings. The string mouldings, base course, capitals to the shafts of the windows and doors, a portion of the parapet, and other parts of the building have been executed in stone, the major part of which has been procured from Mr. Walker's quarry, Mount St. Michael, about ten miles beyond Halifax. The building has been designed and erected under the superintendence of Mr. Gilbert Scott, R.A., and Messrs. Perkin and Son, architects. The mason, brick, carpenter, and joiners' work was executed by Mr. Thomas Whiteley. Mr. John Kaberry was clerk of the works.

WHITLEY.—The foundation stone of the Prudhoe Convalescent Home was laid on Tuesday last at Whitley, on the Northumberland coast, by Lord Warkworth, grandson of the Duke of Northumberland. The building is dedicated to the memory of his great uncle, the late Duke of Northumberland, and will be connected with the Newcastle Infirmary. The building will accommodate fifty patients, thirty men and twenty women, and it will be so arranged as to be capable of extension at any future time. The ground, containing 6¾ acres, was bought for £1,500, and the building will cost £12,746, exclusive of the engineering work, which is estimated at £3,000 more.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the EDITOR, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—T. D.—P. T.—J. F.—E. V. M.—J. P. S.—[illegible] and C. B.—J. G.—A. G. H.—R. L.—H. O.—J. W. B.—[illegible] J.—H. and P.—J. N.

N. H. T.—The case is rather complicated. Consult a lawyer.

W. R. (Southampton.)—See reply [249] in Intercommunication.

T. B.—Ask some architectural bookseller for a catalogue.

J. T.—Most of the facts in your letter appeared in Mr. Newton's letter last week.

L. F.—There are some good points in your answer to Mr. Burges's paper, but it is marred and weakened by sneers, and, therefore, inadmissible.

W. R.—It is our intention to give all the designs for the new Law Courts, with one or perhaps two exceptions. Next week Mr. Barry's design will appear.

J. R. T. (Manchester.)—Write Mr. Jos. Newton, President, Association of Foremen Engineers, London Coffee-house, Ludgate-street, London.

Correspondence.

OUR WATER SUPPLY.

To the Editor of the BUILDING NEWS.

SIR,—Your journal of last Friday, May 31, contains an article on the above subject, having especial reference to Mr. Ormsby's scheme for supplying the metropolis with pure water, and our object in addressing you is to call attention to the following statement contained in it:—"It is a fact well established that the mechanical operation of filtering can never make unwholesome water wholesome. Thick sewage water can be filtered so as to appear pure and bright, but nevertheless it still retains all its pernicious ingredients."

Now, if, as you state, these are the only reasons for which "Mr. Ormsby discards all schemes hitherto proposed for supplying the metropolis with pure water," we think we are justified in saying that he argues upon false premises. The organic matter, which is the principal cause of the unwholesomeness of water in large towns, may be almost entirely removed by the simple process of filtration, and sewage water treated in this way, so far from retaining all its pernicious ingredients, is found to be entirely deprived of them and rendered sufficiently wholesome and sweet for either drinking or culinary purposes. The Commission lately appointed by the *Lancet* for inquiring into the subject of water filters, adopted perhaps the most severe test which could have been devised for determining the capabilities of various filters in removing organic impurities, viz., that of passing through them a quantity of water mixed with milk. The reason for adopting this test was that chymically milk is a representative of all animal matters usually found in drinking waters, and if a filter can be found which will remove this, it may fairly be inferred that it will remove all organic impurities. This result was obtained by the Silicated Carbon Filter, which delivered the water perfectly free from the slightest trace of any of the constituents of the milk. By adapting a filter of this description to the main service supply pipe, as is now done at the General Post Office, the London Hospital, and other large buildings, water may be purified to any extent, not only from visible impurities but from organic substances dissolved in it.—We are, &c.,

THE SILICATED CARBON FILTER COMPANY.

Works, Church-road, Battersea, June 30.

CONCRETE BUILDINGS.

SIR,—It appears to me that the experience of Mr. W. E. Newton, C.E., must have been confined to a very limited area, or he would not have shown himself so unacquainted with the cost of building materials and labour as his letter in your issue of the 31st ult. proves him to be. With your kind permission I will reply as briefly as possible to a few of his statements, and then take leave of him and this subject, fully satisfied that Portland cement concrete, however suitable it may be in London or Paris, is not the cheapest building material for provincial towns and rural districts. Mr. Newton considers me unfortunate in the prices I quoted for brickwork; let us look into the matter. I can purchase the bricks used for cottage building in this and other localities which I can name at 20s. (not 30s.) per thousand; and 1,000 of these bricks will build eleven yards of 9in. wall, whilst lime and sand can be had at similarly reasonable prices. Mr. Newton can make his own calculations from these data if he pleases. Now to the concrete. In the discussion on improved dwellings for the working classes, reported in the BUILDING NEWS of April 12, Mr. Newton instanced some houses which he was building in Paris and at Norwood, in which he calculated the cost to be less than half what it would have been in brick or stone; he employed unskilled labour in Paris at 2½f. (2s. 1d.) per day; he burnt the ballast himself for less than 2s. per cubic yard, and the result was, he built his 9in. wall slightly under 3s. per yard super, his cement costing only 1s. 10d. per bushel. Now, if he could build for no less than that, with labour at so low a rate, what would be the case had he to pay 3s. or 3s. 6d. per day for it, and 13s. or 14s. per barrel for his cement, which is the price it is sold at here—rather more than 3s. I suspect? In his letter last week he says that he paid but 3s. 4d. for labour on twenty-four yards of Portland cement facing to the outside of his building, the stucco being composed of four parts of sand to one of cement (rather lean stuff for the job) and laid on thinner than a penny piece. Mr. Newton must permit me to doubt both these statements; it will take a more than ordinary workman to lay fifty yards of cement finishing coat on a previously floated wall in a day; the wages of a plasterer and labourer for a day will be very low at 8s., to say nothing of profit to an employer; and I have had rather too much practice in building not to know that a coat of cement so thin and so weak cannot be laid on a floated wall, much less an unprepared one. I now quit the subject; I thank Mr. Newton for his information and his kind offer of employment, but am not in want of any at present; though, if he will send his brickwork to Chester, I will find him men who will do any amount of it at the price I quoted.—I am, &c.,

Chester, June 4. F.

OUR FUTURE ARCHITECTURE.

SIR,—It appears to me that Mr. Burges has quite mistaken his vocation when he places himself before the public as a lecturer upon art. That he is a man of talent and acquirements few persons will venture to deny, but that he possesses those qualities which are necessary for a public teacher, I think but very few men would willingly assert. He lacks ballast. Like Bottom, the weaver, he wants to play the lion and "roar as gently as any sucking dove," and, like the Athenian mechanic he, gets laughed at for his pains. The lecture or paper in question is professedly upon our future architecture, an all-important and serious subject, which is scarcely hinted at, and, contains but little matter beyond an ill-natured, though covert, sneer at those members of the profession who have not led a similar life and, taken up with the same pursuits as Mr. Burges. Why an indirect shaft is hurled at those persons who are necessitated, or who prefer to get their living by following the more practically useful but not more agreeable branches of the profession, and seeking, perhaps at an early age, to render themselves independent of their friends (if they have any), I am at a loss to conceive. If the "Art Man" knows and cares nothing about "light and air," surveying, "modern construction," and such little matters, in the name of common sense let him leave those alone who do, and confine himself to the subject he undertakes, without unnecessary digressions and a constant harping upon the almost worn out strings of thirteenth century French art and figure drawing. We have had rather more than enough of this for the last fifteen years, and if gentlemen will talk about our future art they ought to give us something new, or at least stick to their subject.

When Mr. G. A. Sala produces one of his charming papers, professedly upon the "Streets of the World," but really upon any subject that happens to be floating through his mind at the time, we forgive him his digression, and indeed like it on account of its brilliance, but writers like Mr. Burges are but heavy hands at this sort of work, and give us all the rigmarole without any of the wit.

Architecture is, after all, more of a science than a fine art. If the science is not backed by art it is bad, but, on the other hand, if the fine art is not accompanied by science, even including the paltry one of "modern construction," it becomes but of little use in the hands of its possessor, and, to quote the quoted words of the lecturer "he finds that he gets comparatively nothing to do, and indeed, he may think himself comparatively lucky if he does when he is tolerably past the middle of his life."—I am, &c., NEMO.

For some time past the Knightsbridge Barracks have been condemned by many people as a nuisance, and on Monday evening last the question was talked over in the House of Lords, and, as we might have expected, found defenders there. One noble lord thought that the barracks are of much more importance than the new Hall of Arts and Science is soon likely to be. One objection frequently urged against these barracks is, that a considerable portion of the soldiers' rooms are over stables. "What of that," said Lord Redesdale, "do not many of their lordships' servants live over stables without making any complaint?" Truly; but two blacks won't make a white. Because "their lordships' servants" live in unhealthy situations is certainly no reason why soldiers should also do so.

Trade News.

TENDERS.

BAGSHOT.—For Royal Albert Orphan Asylum, Collingswood Court. Mr. Edward Ellis, architect:—Ashby and Horner, £3,270; Perry and Co., £3,091; Wheeler, £3,008; Higgs, 2,843.

BROMLEY.—For erecting eight houses in Palace-road, Bromley, Kent, for Mr. C. Gordon. Mr. Samuel H. Hope, of Penge, architect. Quantities supplied:—Keys, £3,515; Staines and Son, £3,264; Wallis, £3,053; Walker, £2,960; Deards, £2,768; Lawrence, £2,585; Farthing, £2,524; Harrison and Edwards, £2,515; Hazell, £2,500; Lennerton, £1,820.

CLAPTON.—For roads and sewers on an estate at Clapton, for the London and Suburban Land and Building Company (Limited). Messrs. Hammack and Lambert, surveyors:—Reddin, £13,940; Pound, £11,714; Potter, £11,260; Porter, £7,025.

DALSTON.—For building new music hall at Dalston. Mr. Lovegrove, architect. Quantities supplied:—Scrivener and White, £764; Maeers, £750; Blackmore and Morley, £742; Webb and Sons, £731; Crocket, £728; Shurman, £718; Eaton and Chapman, £710; Wood Brothers, £698; Nutt and Coy, £698; Garraud, £695; Grover, £694; Staines and Son, £688; Nightingale, £687; Crabb and Vaughan, £647; John High (accepted), £645 10s.

HAMPTON.—For alterations to the Vicarage, Hampton, S.W. Mr. W. Wigginton, Cornhill, E.C., architect:—Dearle, £1,159; W. N. Johnson, £1,025; Tims, £984; Harrison and Edwards (too late), £872 17s.; Warne, £779 16s.

LINCOLN.—For rebuilding Harlaston Rectory, Lincolnshire. Messrs. Goddard and Son, Lincoln, architects:—W. Huddleston, Lincoln, £1,650; Hobson and Taylor, Hogsthorpe, £1,473; Messrs. Pattinson, Ruskington, £1,240; architect's estimate, £1,250.

LINCOLN.—For Saint Martin's Parochial Schools, Lincoln. Messrs. Goddard and Son, Lincoln, architects:—R. Young, £998; Kent and Otter, £996 10s.; William Huddleston, £914; J. Chambers, £843; Barnes and Wright, £838 10s.; Otter and Elsey, £823; Close and Goodbarn (accepted), £773; Fotherby and Taylor, £728.

LONDON.—For alterations and new fronts to the Tippling Philosopher, for Mr. Wm. Owston. Mr. S. Brookes, architect:—Chutter, £418; Langmead and Way (accepted), £345.

NOTTS.—For alterations and additions to Gedling Rectory, Notts. Messrs. Goddard and Son, Lincoln, architects:—J. Barker, Nottingham, £993; S. and W. Pattinson, Ruskington, £955; William Key, Coulton, £950; J. W. Thompson, Derby, £940; architect's estimate, £950.

NOTTING HILL.—For rebuilding the Elgin Arms, Notting Hill, for Mr. Norden. Messrs. Hammack and Lambert, architects:—Newman and Mann, £4,345; Williams and Son, £4,297; Eunor, £4,119; Gibson, Brothers, £4,070; Dew, £3,850.

POPLAR.—For Fire Brigade station, at Poplar, for the Metropolitan Board of Works:—Piper, £2,382; Chappell, £2,370; Nixon, £2,344; Abraham, £2,297; Wood, £2,293; Wilcox, £2,260; Nutt, £2,194; Henshaw, £2,165; Lathey, £2,162; Mann, £2,120; Howard, £2,047.

PADDINGTON.—For repairs to St. Mary's Hospital, Paddington, W. Mr. W. Wigginton, Cornhill, E.C., architect:—Rigby, £2,411 5s.; Warne, 2,074 12s.; Roper, £2,041; Steel and Leggett, £1,937; Welch, £1,695; Norton, £1,691; W. W. Johnson, £1,645; Nightingale, £1,641.

PADDINGTON.—For rebuilding the King and Queen Tavern at Paddington Green. Mr. John Blore, architect:—J. and C. I'Anson, £2,990; Ebbs and Son, £2,985; Stimpson, £2,945; Attkins, £2,817 14s.; Green, £2,740; Brown, £2,700; Martin (accepted), 2,687.

PUTNEY HEATH.—Royal Hospital for Incurables.—The tender of Simms and Marten for £9,888 has been accepted, and the works have been commenced. The corner-stone will be laid early in July.

SOUTHAMPTON.—For the erection of a mansion on the Westland's Estate, Bassett, Southampton, exclusive of offices, stables, and lodges. Messrs. Guillaume, Parmenter, and Guillaume, Southampton, architects:—C. Collier, £4,250; John Richards, £3,511; John Lewis, £3,102; H. J. Sanders, £3,025; Wm. Gambling, £2,990; Thomas Philps, £2,978; Bull and Sons, £2,972; architect's protecting estimate, £2,900.

TORQUAY.—For erecting a new church at Ellacombe, Torquay, Devon, for Mr. A. F. Haliburton. Messrs. E. Habershon, Brock, and Webb, architects:—Manley and Rogers, £4,474; Simpson, £4,434; Hervey, £3,950; Jackman, £3,920; Call and Pethick, £3,694.

WATFORD.—For a pair of villas at Watford for Messrs. Margetts and Wallis. Mr. Frank Thicke, Rosendale, Dulwich, architect:—Messrs. Waterman, £878 (including boundary wall, &c.)

WINDSOR.—For erecting malthouse, ale stores, barley and malt stores at Windsor, for Messrs. Burge and Co. Mr. H. Walker, architect. Quantities supplied by Mr. Henry Wm. Broadbridge:—Keys, £2,097; Whittle, £1,989; Hollis, £1,950; Fish, £1,910; Sykes, £1,790; Wills, £1,786; Reavell, £1,775 10s.; Sawyer, £1,753; Jarrett, £1,745; Myers and Son (accepted), £1,679.

PROPERTY SALES.

JUNE 4.

AT THE MART.—By Messrs. Edgley and Aylett.—Leasehold residence, No. 13, Fulham-place, Paddington, annual value, £65, term 92 years from 1846, at £12 10s. per annum—sold for £495.

By Mr. J. Scott.—Leasehold house, No. 2, Westbourne-grove North, Bayswater, underlet at £29 per annum, term 98 years from 1847, at £6 per annum—£460.

By Messrs. Debenham, Tewson, and Farmer.—An annuity of £100 per annum for about 11 years, secured upon Manor House, Chelsea—£650.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham' Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET

Stephen Gates, Crawley, builder, June 11, at 2—Robert Pearson, Stratford, gasfitter, June 13, at 1—William Henry Samuel, Bow, builder, June 19, at 12—George S. Tapsell, Knockholt, Kent, builder, June 17, at 2—Henry Churchill, Deddington, Oxfordshire, carpenter, June 20, at 1—Thomas Curtis, Aylesbury, plumber, June 20, at 12—William Rolfe Golder, Folkestone, boatbuilder, June 20, at 1—Frederick George Hall, Chester-street, Kennington, timber dealer, June 19, at 2—George Higgs, Alma terrace, Stepney, ornamental mason, June 20, at 11—Henry Thomas Johnson, Spencer-street, Battersea, surveyor's assistant, June 17, at 11—Evan Jones, Tottenham, carpenter, June 20, at 1—John Littlechild, Northall, near Barnet, builder, June 19, at 1.

TO SURRENDER IN THE COUNTRY.

William Francis Bubbings, Hull, wheelwright, June 14, at 11—Thomas Cook, Northam, builder, June 12, at 2—Ambrose Hartley, Seaforth, near Liverpool, builder, June 13, at 11—Joseph Kesterton, Erdington, Warwickshire, carpenter, June 21, at 10—Henry James Ledger, Hulme, builder, June 18, at 12—Thomas Owen, Birmingham, journeyman brassfounder, June 21, at 10—Benjamin Robertshaw, Burnley, iron and tinplate worker, June 21, at 12—William Anthony, Litchurch, moulder, June 19, at 11—William Bryning, Eastbourne, Sussex, decorative artist, June 19, at 11—Joseph Jackson, Litchurch, foundryman, June 19, at 12—Isaiah Kendrick, Walsall, iron dealer, June 21, at 12—Thomas Straker Lawson, Newcastle-upon-Tyne, joiner, June 18, at 12—Samuel Moss, Presteigne, blacksmith, June 18, at 12—Thomas Noble, South Stockton, joiner, June 17, at 11—James O'Connor, Sunderland, ironmonger, June 17, at 12—John Patterson, Hull, engineer, June 26, at 12—William Williams, Pontypridd, contractor, June 14, at 11.

PARTNERSHIPS DISSOLVED.

Suckling and Leach, America-square, marine surveyors—Penn and Matthew, Deptford, engineers—Holmes and Grainge, Bradford, Yorkshire, brick makers—T. and J. Jackson, Sheffield, builders—Attkins and Carrington, Salford, engineers—Temple and Emmerson, Scarborough, builders—R. and J. R. Cook, Wigan, plumbers—Bonser and Cocker, Sheffield, brassfounders—G. and H. Illingworth, Bradford, Yorkshire, joiners—Ramsbottom and Co., Blackburn, engineers—Crossley and Dawson, Newsome, Yorkshire, builders—Wells and Robins, Blechynden-street, Kensington, builders.

DIVIDENDS.

June 27, W. S. Parfitt, J. Barnard, and A. Harvey, Devizes, engineers.

DECLARATIONS OF DIVIDENDS.

G. Gardner, Sunderland, shipbuilder, div. 2s. 6d.—J. and C. W. Todd, Milner-street, Brompton, builders, div. 3½d.—J. N. Pierce, Bristol, painter, div. 8d.—W. Williams, Pentyn, iron merchants, div. 1-19th of a penny.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

June 21, T. Trenholme, R. Brook, G. Stansfield, and W. Davies, Langfield, near Todmorden, builders—June 26, A. Middlemist, Hull, sewing machine maker—June 19, T. Hay, Bishop Wearmouth, builder—June 29, A. Mawson, Bradford Moor, stone leader—June 29, S. Holroyd, Cleckheaton, joiner—June 26, D. S. M'Laren, North Audley-street, mechanical engineer—June 26, R. Buckingham, Tavistock-terrace, house decorator—June 28, D. G. Ward, Jerusalem Coffee-house, boilermaker—June 28, J. Mears, Wandsworth, brickmaker—July 1, E. Myers, Paris, gas-meter manufacturer—June 25, W. Faber, Mount-street, Shoreditch, plasterer—June 17, J. Howe, Hillington Heath, builder—June 27, J. Jarvis, Arthur-terrace, Dalston, builder—June 25, J. Briggs, Great Crosby, near Liverpool, joiner—June 25, G. Starbuck, Claughton, Cheshire, railway carriage builder—June 22, R. Hallam, East Ardsley, Yorkshire, contractor—July 17. J. Jenkins, Tredegar, builder—July 3, W. Silver, Wantage, coach builder—June 24, G. Jessop, Southampton, builder—June 20, J. Harris, Buckfastleigh, timber merchant.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9	0	£10 10	Archangel, yellow ..	£11	10	£12 10
Quebec, red pine	3	0	4 10	St. Petersburg, yel...	10	10	11 0
" yellow pine..	2	15	4 0	Finland	8	0	9 0
St. John N.B. yellow	0	0	0 0	Memel.....	0	0	0 0
Quebec Oak, white ..	6	6	6 0	Oothenburg, yellow	8	10	10 10
" birch.....	3	10	4 10	" white	8	0	9 0
" elm	3	10	6 0	Gefle, yellow.....	9	0	11 0
Dantzic oak	3	10	6 0	Soderhamn	9	0	10 10
" fir	2	0	3 0	Christiania, per C.,			
Memel fir	3	0	3 10	12 ft. by 3 by 9 in.			
Riga.....	3	0	3 6	yellow	16	0	22 0
Swedish	1	15	2 2	Deck Plank, Dantzic,			
Masts, Quebec red pine	6	0	7 0	per 40 ft. 3 in.	0	15	1 4
" yellow pine..	5	0	6 0	PUMICE STONE pr ton	5	0	8 0
Lathwood, Dantzic, fm	4	10	5 0	OILS, &c.			
" St. Petersburg	6	10	7 10	Seal, pale....per tun	42	0	0 0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.				Sperm body	110	0	0 0
				Cod	40	0	0 0
				Whale, Sth. Sea, pale	43	0	0 0
Quebec, white spruce	14	10	21 10	Olive, Gallipoli.....	62	0	0 0
St. John, white spruce	13	10	15 10	Cocoanut, Cochin, ton	59	0	0 0
Yellow pine, per reduced C.				Palm, fine	34	10	49 0
				Linseed	38	0	0 0
Canada, 1st quality.	17	0	19 10	Rapeseed, Eng. pale..	37	10	38 0
2nd do.....	12	0	13 10	Cottonseed.....	23	0	34 10

METALS.

IRON:—						
Welsh Bars in London .. ..per ton	6	15	0	0	0	0 3
Nail Rod	7	10	0	8	0	0 2
Hoops ..... do	8	15	0	9	0	0
Sheets, Single ..... do	9	15	0	10	0	0
Staffordshire Bars ..... do	7	15	0	8	10	0
Bars, in Wales ..... do	6	15	0	6	0	0 3
Rails ..... do	6	0	0	6	0	0 net
Foundry Pigs, at Glasg. No 1 .. do	2	13	6	3	7	0
Swedish Bars ..... do	10	10	0	12	10	0
STEEL:—						
Swedish Keg, hammered .....per ton	16	0		0	0	0
Swedish Faggot ..... do	10	10		12	10	0
COPPER:—						
Sheet & Sheathing, & Bolts ....per ton	85	0	0	89	0	0
Hammered Bottoms ..... do	96	0	0	98	0	0
Flat Bottoms, not Hammered .. do	91	0	0	93	0	0
Cake and Tough Ingot ..... do	74	0	0	0	0	0
Best Selected ..... do	81	0	0	83	0	0
Fine Foreign ..... do	86	0	0	88	0	0
Yel. Metal Sheathing & Rods ....per lb	0	0	7½	0	0	8¼
TIN:—						
English Block .....per ton	89	0	0	0	0	0 2¼
do Bar ..... do	90	0		0	0	0
do Refined ..... do	92	0	0	0	0	0
Banca ..... do	92	0	0	0	0	0 nett
Strait ..... do	87	0	0	0	0	0
LEAD:—						
Pig, English .....per ton	22	0	0	0	0	0 2¼
" Spanish Soft ..... do	19	15	0	0	0	
Shot, Patent ..... do	23	0	0	0	0	
Sheet ..... do	21	15	0	0	0	0
White ..... do	30	0	0	31	10	0
SPELTER:—						
On the Spot .....per ton	22	5	0	22	15	0 net
ZINC:—						
English Sheet .....per ton	28	0	0	0	0	0
Devaux's V. M. Roofing Zinc .... do	28	0	0	0	0	0 *
* And 5 per cent. discount if laid upon the new system.						
QUICKSILVER .....per btl	8	18	0	7	0	0
REGULUS OF ANTIMONY.						
French .....per ton	34	0	0	0	0	0

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THE BUILDING NEWS.

LONDON, FRIDAY, JUNE 14, 1867.

THE PARIS EXHIBITION.

ARCHITECTURE.—THIRD NOTICE.

IN resuming our notice of the architecture exhibited in Paris, we shall follow the order in which the countries recur in the official catalogue, commencing with that of France's one prosperous colony.

ALGERIA unfortunately sends us no record of the many new buildings and important works her prosperity is creating, but represents herself to us only through the past. Her chief architectural contribution is a model of the so-called Tomb of the Christian, a mausoleum of her ancient Mauritanian kings, situate some sixty miles west of Algiers. It is a fine circular tomb, of a type common in Asia Minor and Etruria, and of which that of the Emperor Adrian may be looked upon as the culminating example. This one is about 200ft. in diameter, and consists of an Ionic engaged columnar wall, crowned with a graduated pyramidal covering. No trace of the mode in which the apex was terminated seems to have been discovered, and in the well-executed model which sets forth its restoration this is left plain.

From the NETHERLANDS we find but three architects stepping forward to represent the profession, and of these two may be considered to be, in all things but by the accident of birth, French. M. Cuypers, who may thus be said to be the sole representative of his nation, contributes his King William Museum at Amsterdam, and three churches. His representations of the former are very puzzling, for the geometric drawing shows us a plain building in the Flemish style of the seventeenth century, and his perspective view a Gothic translation of the same design. In both of these the weakest point is the treatment of the large flat space between the windows of the ground floor and the sills of the large dormers which light its principal story. So obvious a position for sculpture is most unaccountably neglected, and the small escutcheon of arms pinned up in the centre of each of these huge spaces seems more to demonstrate the weakness of this part of the design than to cover it. The most interesting portion of this series of drawings are the details of the roofing, which are worthy of study. Of M. Cuypers' three designs for churches, decidedly the best is that of his restoration of Onze Bieve Vrowe Munsterkirke, at Roermund, of which, however, we are not quite sure how much belongs to M. Cuypers and how much is original, than which, perhaps, we could scarcely say anything more complimentary. It is a very fine church, of that Romanesque character peculiar to Germany, and either as an old building or a restoration is very interesting. The proposed new church at Amsterdam is very ambitious, and its failure is quite as great as its intended success; it is be-pinnacled, crocketed, and cusped beyond endurance, and has nothing but labour to recommend it. His church of S. Domenic, at Nymengen, is very poor, much worse than we have seen for years in England, and is at least thirty years behind our standard. The fine opportunity presented by the angle of the street is cruelly wasted, and has only a wretched little octagon turret for its principal element of composition.

M. Bouwens, who was a pupil of M. Labrouste, and resides in Paris, sends drawings of a house erected in the Parc Monceaux, and can therefore be scarcely said to represent the architecture of the Netherlands. His contribution is thoroughly French, and not particularly good of its kind. M. Van Soolen sends a very well considered brick and stone church, based on the models of those of the central district of France built in the thirteenth century. It has low nave arches and a high triforium converted into a gallery, and is worthy of examination. Like most of its cogeners, the transepts, choir, and nave are all of the same height, a[illegible] outline is therefore very heavy. This we [illegible]o must refuse to consider as a production of [illegible]e Pays-Bas, for we find that M. Van Soolen is "Architecte agréé de la préfecture du Haut Rhin," and resides in Paris. Being born in Amsterdam may make him a Netherlander, but he is a French architect, and his works should have been exhibited in that section.

The architecture, and, indeed, the beaux arts generally, of BELGIUM find no place in the hitherto published official catalogue, and if in our remarks we should misname any buildings or architect we must plead the extreme difficulty of deciphering the spider-like and involved signatures and writing on some of the drawings and the great height at which they are placed as our excuse. The largest exponent of Belgian architecture is M. Suys, who contributes many large drawings, the first series of which are illustrative of a design for a palace for the fine arts at Brussels, and it is singular to remark, in this instance as in our own National Gallery competition, how utterly incompetent the fine arts seem to provide a decent home for themselves. M. Suys' endeavour to house them is a remarkably unfortunate one. He presents us with an ill-arranged, overladen design, where curved pediments flank a huge semicircular aperture in the centre of the composition, and a similar arrangement, but kindly varied by making the pediments angular, at each end. All the rest is made up of the usual materials of Renaissance treatment, stuck together anyhow and anywhere. Nor is his Bourse at Brussels any better, and in his projected Memorial to King Leopold he piles up the agony of ornament to an excess fearful to behold, till the effigy of the commemorated king is quite lost beneath the folly of his loving subject. That M. Suys is capable of doing better when he restrains the exuberance of his fancy is visible from his new baths at Spa, which are very good. Plain and simple in general conception, and, as their enlarged detail shows, very good and pure in accessory ornamentation, they are very creditable to M. Suys, and we hope, both for the interests of art and his own position in it, M. Suys will learn the lesson which seems to be inculcated by the fact that of all his designs exhibited this is the only one executed. M. Hoste sends a church, which is simply—nay, we err—it is elaborately horrible; and we turn with even an excess of pleasure to M. Charpentier's two very welcome designs for churches. The first of these is that of SS. Peter and Paul, at Chatelet (Belgium), which is very quiet and refined. It is cruciform in plan, and has a tower at the crossing and two smaller ones at the west end, all three slated, and very simply treated, producing an effect of much dignity. We regret that the three windows at the west end have their sill line broken, and should have much preferred two here to three, or, even if three, to have had their sill line continuous. The church of SS. John and Nicholas, at Brussels, is more ambitious, but equally good. If not yet built we would urge M. Charpentier to reconsider the lantern portion of his central spire; the reduplication of windows over one another at this point not only looks but is weak, and a greater amount of mass at the angles would be both a structural and æsthetic improvement. M. Charpentier shows himself to be so able an artist that we feel sure he will value our remarks, and we congratulate Belgium on possessing that very rare continental treasure—an able and a truthful exponent of Mediæval architecture. M. Vanhouteyhem sends a very good specimen of a Belgian château, with those odd looking round towers having pointed roofs at the angle, only found with us in Scotland. This is much better than many of the like kind we have seen, and in this instance the towers are made large enough to be useful. In the stationary cou[illegible] Belgium will be found seven drawings illustr[illegible]ng a church at Argenteuil, which is worthy of a visit from those who urge the introduction of iron largely into our ecclesiastical architecture. It is a horrible abortion in cast iron in the very worst style of poor Rickman, and, strange to say, it has only just been erected. We had thought that such things no longer existed, but hope that this may be the very last of its kind. MM. Carlier and Son have a position, for they sign themselves Architects to the Town of Nivelles, and we earnestly hope if they should ever be guilty of such another attempt they may be deposed from that exalted position. Nor are they the only offenders, for with a most portentous flourish of trumpets comes to us M. Charles Vincent, Architecte provinciale du Hainault, Membre Correspondant de la Commission Royale des Monuments, Lauréat de l'Exposition des Beaux arts de Mons, &c., &c., and, with all this fanfaronade, brings the very worst things in the whole Exhibition. His communal hall for Hainault and his proposed restoration of the clock tower at Mons are the most wretched things we have seen for many years, and if so incompetent a person can gain so much honour there we recommend a few of our young men to emigrate to a land where brains are scarce and laurels plentiful. Altogether the state of architecture in Belginm, as represented by these exponents, is not hopeful, and is very much worse than we had expected to have seen. Many English architects have already done good works there, and these ought to have incited its native professors to outstrip us, but they seem, with the exception of M. Charpentier, to have no one able or willing to take up the gage. We cannot leave the Belgian court without passing a very high eulogium on M. Guffer's very exquisite cartoons. His figure drawing and drapery are admirable, and we wonld recommend all students to pay particular attention to them.

From PRUSSIA we have several contributions, the most important of which is the new Townhall at Berlin, by M. Waesemann. This is illustrated by a large plaster model of the front, and many drawings. It is a brick construction, having only the tracery of its windows in stone, and even these may be of terra-cotta. There is much that is good in M. Waesemann's design, and yet there is much which is very harsh and discordant, and if Mr. Scott is to be the happy man whom his country delights to honour with the commission for our new Law Courts, we sincerely trust he will carefully study this design and will there see the unpleasant effect of disguised roof he is so anxious to import, for here the roofs are invisible, being, like those of Mr. Scott's design, masked behind a parapet, only M. Waesemann is the more consistent of the two, as he adopts the same principle throughout. In the centre of the façade rises a lofty tower, somewhat on the principle of design of those at Laon, but, in consequence of the retiring of each successive stage, has too telescopic an effect to be pleasing; these defects, and the exaggerated projection of the balcony which runs round the first floor of the building, mar a design of much general merit. We cannot applaud M. Waesemann's mode of treating the different parts of the building internally in such very opposite manners. Thus the principal entrance is in the style of that of the fourteenth century work of Germany; the Great Hall, fifteenth century of Italy; and the Municipal Council Chamber in that of Francis I. of France. Unity of idea is the first element of grandeur in art, and we regret to see it wilfully ignored.

M. Orth sends a model and many drawings of his Zion's Church, now in course of erection at Berlin. This is an edifice of Renaissance proportions and outline, served up with details of Romanesque, and the mixture is not good to take, and the only good feature in it is his treatment of the interior gallery. This is a fixed structure of stone on segmental arches, which support it only, not treating it as

a triforium, and therefore having no piers above it to obstruct the light and sound. Unfortunately, this gallery runs quite round the church, even round the choir, so that many of its occupants must be wrongly placed.

From M. Schmitz we have some very beautiful drawings, quite models of line drawing, and nothing in the Exhibition excels, in technical execution, his design for a church in the German Gothic style—a style not finding much favour in our eyes, but of course, from a German point of view, bearing a different aspect. His spire is, we think, marred by the balcony which surrounds it, like the gallery of a minaret, about half-way up. M. Schmitz's details of portions of this are wonderfully drawn, and his front elevation of Cologne Cathedral and drawings of several of its parts are wonderful in execution, and deserving of patient and careful examination.

The little kingdom of Wurtemburg sends a drawing of a small bathing establishment on the Lake of Constance, of ordinary character, and a model of a monument to the memory of Uhland, by M. Oppel, of Stuttgard. This latter is composed of modillions and cantilevers in every variety of contortion, and the projection of its cornice counterchanges the plan of its base in a most unpleasant manner. In the catalogue are several other contributions from this small State, but we have searched in vain to find them, looking for them even in the mouth of Krupp's monster cannon, which seems likely enough to swallow up the present and the future of these stray little bits of Europe.

From Bavaria we have but one drawing, but that a remarkably fine one of the restoration of Ratisbonn Cathedral. This will be found in the Annexe in the Parc, which contains the other exhibits of the Beaux Arts of that kingdom. From the middle of the sixteenth century until 1859 the cathedral remained incomplete, and a well-intentioned endeavour was then made to complete it from the design of M. Denzinger, the Cathedral architect, who shows himself quite worthy of his honourable post, and his drawing is everything which could be desired. We sincerely hope that the present troublous times will not prevent the conclusion of his labours. Of course it has open-work spires—everything in Germany seems to need those anomalous terminations; but these are very good of their kind, and it is one of the most successful restorations and completions exhibited, thoroughly harmonising with the old work, and seeking only to do so.

Austria has, next to France, the most important collection of architectural drawings in the Exhibition, and surprises us by the very high standard of excellency maintained throughout the whole of them. M. Hansen sends a very careful restoration of the Choragic Monument of Lysicrates, with the tripod and supporting figures of its roof terminal very pleasingly and probably restored, and two designs for the Houses of Parliament at Vienna, the Lower House being particularly well composed. His Upper House is too columnar to have much variety, and is not equal to the other. But M. Hansen's chief works must be sought for elsewhere, and amongst the munitions of war in the Machinery Gallery we find some very fine photographs and drawings of his great Arsenal at Vienna, a work well worth examination and study, combining, as it does, the idea of a military edifice with the practical utility of its purpose. There is much that is very strange to our eyes in this work of M. Hansen's, but we cannot fail to recognise great thought and ability in it. Further illustrations of this building will be found in the stall of M. Drasche, the terra-cotta manufacturer, and the biggest brickmaker in the world. This is in the park, and is well worthy of a visit, not only for its immediate contents, but to examine the portfolio of drawings of buildings executed with his materials. To these we shall at present confine our attention, reserving our notice of his manufacture till a future occasion. The Arsenal is a building of bricks and terra-cotta, supplied by M. Drasche, and is an excellent illustration of the use of such materials, all the details being well and carefully considered with reference to this material. M. Hansen has executed many other buildings in Vienna and its neighbourhood in this material, the drawings of which will be found here, and we advise English architects to examine particularly the palace of M. Drasche himself. It is a very noble design, and the details are in exquisite taste, and of Renaissance character. Very strange to English eyes does M. Hansen's Synagogue at Pesth look, with its odd Eastern—almost Russian—character; and his quaint Greek Church at Vienna shows that there is great versatility in him as a designer. But perhaps the most charming of all his contributions here is a small villa at Maun, in which he has been associated with M. Föster, and the details of which are most remarkably elegant and good. There are other works of both these gentlemen here, as well as those of others, but we return to the Gallery of the Exposition, and will examine the contributions of M. Fesrtl. The best of these is decidedly his design for the Hungarian Academy at Pesth—a design, we fear, not likely to be realised. It is a very successful study of Mediæval character, based upon the Hotel de Ville type of Belgium, but not slavishly following the model, and his adjunctive buildings are very picturesquely grouped. His votive church, now in course of erection at Vienna, is much too overladen with ornament, and is far from being equal to his other work. Very excellent indeed is his drawing of the Castle of the Gross Skal, in Bohemia, and wonderfully picturesque. This and his drawing for a royal shooting-box we strongly recommend to the notice of our younger readers as models of representation. To turn from these and examine his design for a Parliament house is very painful. It is in the worst Palladian character, and M. Fesrtl ought to have known better than to have exhibited it. M. Henszlmann, of Pesth, gives us a very plausible restoration of that architectural *crux*, the Church of S. Bénigne at Dijon, on which so many antiquaries have tried their hands and been baffled to make the description accord in any way with the remains. Dr. Henszlmann has succeeded in a greater measure than any others we have seen, but without plans it would not be possible to show in what manner. In conjunction with MM. Gerster and Frey he also exhibits a design for the same Hungarian Academy we have before noticed. This is of a much plainer character than that of M. Fesrtl, and is of a very simple early French character, and well-considered in plan. MM. Gerster and Frey send also a design for a bazaar at Pesth, which is of ordinary Italian character.

M. Rösner gives us very beautiful drawings, and a very good design for a cathedral at Diakover, of quaint Lombardic character, well worthy of notice. M. Hlavka contributes designs for a bishop's palace and a theological institute at Czernowitz, which look quite as strange as their name and his, and we recommend them to the sensationalists as a new basis for eccentricities. With a little more thought these might have been fine designs, but there is a great want of unity in them, and the subdivided work in the gables has no relationship with the stories beneath them; still there is much that is pleasing in the designs, and the arrangement of the dome and its seating on to the square in the theological college and the interior of the hall in the bishop's palace are very good.

M. Hasenauer presents to us a very fine design for the western front of the Cathedral at Florence. There are several other designs for this work, and M. Hasenauer's is in our opinion undoubtedly the best. We believe this design secured the second prize, and it is very worthy of its position; the whole arrangement of the detail is excellent and carries out fully the peculiar character of Sta. Maria del Fiore. We confess we do not like his gables to the lean-to roofs of the aisles, although he has precedents for these at Orvieto and elsewhere, and has filled them in with mosaic in the like fashion; yet none of the other designs have overcome this difficulty in so pleasing a manner. We do not think M. Hasenauer has been happy in attempting to finish Giotto's glorious campanile; the general form is too heavy for so elegant a substructure, and had Giotto finished his work we feel that his delicate and loving handiwork would have blossomed into exquisite beauty here. There is a perceptible German tendency in M. Hasenauer's work, which rather mars it for this style, and his crockets and minor details partake of its hard angular outline instead of the flowing lines of those used in the detail of the building itself, and we are convinced that a further study of the building would persuade M. Hasenauer to our opinion. By the same architect are many studies for small villas too much in the "suburban style" to be good and with too manifest a striving to suit customers of all tastes to be genuine work; as drawings they are very cleverly executed and are worth looking at, but hung so badly and so high that it requires a powerful glass to see them. His Adel's Casino is not good, but M. Hasenauer has had a very narrow escape from being a good architect. M. Schmidt is worthy of the position he holds, and when we say that we are saying something, for is he not a Chevalier of the order of Francis Joseph, of that of St. Gregory, of the Red Eagle of the first class, of Albert of Saxe, and of the House of Hohenzollern? and is he not a member of the academies of Milan, Munich, and of Urbino? and does he not hold the honourable position of being the chief architect to the Cathedral of St. Stephen at Vienna, fills the chair of the president of the Society of Architects and Engineers, and the professorship at the Academy of Fine Arts at Vienna? and in saying that he is worthy of all this we give him honest praise. His contributions are numerous, and amongst his best are his church in the Wiesgarten at Vienna, the eastern end of which is excellent, but the hexagonal tower at the west end is rather too "dodgy" to please us. A further illustration of this church will be found in M. Drasche's pavilion in the park, and where also will be seen two other churches by him, that of St. Vincent de Paul being particularly good. These churches are further illustrations of the great use made of terra cotta in Vienna, for the walls are all of brick, and the decorative portion of the building, as pinnacles, canopies, tracery, &c., is all manufactured at M. Drasche's works. M. Schmidt's church at Funfhaus, near Vienna, pleases us the least of his productions, and there is in it much that is questionable, and the plan is more suitable for anything else than a church—it is a mediæval study based on the Pantheon and is bad. His House of Lords is a very eccentrically planned building, being radial, with the chamber in the middle, and has much worth noting in it; and his Castle of Leichtenstein particularly good. M. Ernst sends us two perspective views of the Castle of Grafenegg, which is a very strange-looking building, restored by him, or rather, we think, altered from its olden purpose to a modern residence; but it is so unlike anything we have ever seen before that we are at a loss to know what portion is original and what not; it seems to us that the defensive works have been pierced and formed into peaceful galleries. M. Ziteck gives us a plan for a national theatre at Prague which has very great merit, as has his other contribution. M. Tietz shows us in what manner the Viennese delight to have their houses decorated, and a very excellent manner it is; his drawings for these are particularly good. We prefer his decorative designs to those of his more structural portion of the art, and though his hotel at Volnau is by no means bad yet there is a great tendency to commonplace in his works. M. Jobst's beautiful Indian ink drawing of a fifteenth century altar, with its

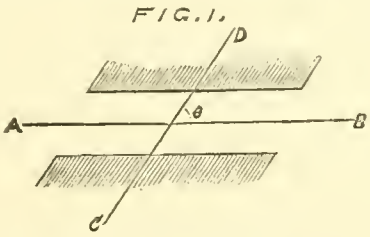
retable and tryptich is very commendable, and still more so as drawings are those of MM. Banko and Willermans. These and some of a similar character we have before noticed are especially worthy the attention of the architectural draughtsman; the broad well-drawn lines and clearness of detailisation are deserving of all praise. Altogether, we consider the contributions of Austria a most valuable illustration of the history of modern architecture, and one from which there is very much to be learned. Before quitting this court we must call the attention of all who visit it to the very exquisite illuminations to a missal which is being prepared at the instance of the Emperor as a gift to the Pope. Only a selection from its eighty-two folios is exhibited, but amongst these we find as their illustrators the names of Christian Ruben, Furich, Blaas, Trenkwald, Mayer, and a host of other names well known in the revival of Christian art. Very beautiful and full of thought are Furich's illustrations to the Festival of the Nativity. Geiger's illustration to the Epiphany is a wonderful miniature painting, and Carl Blaas's folio of the Purification exquisite. Emler's Corpus Christi is a poem of deep import, and, in fact, to point out all the beauties of this exquisite series would be to describe each one. The ornament by Gruner, and the very beautiful small drawings which illustrate some of the Initials by Madjera, are very worthy of notice; and it is with a desire to linger longer amidst this interesting record of art life in Austria that we tear ourselves away, and must reserve till our next issue the notice of the other countries who thus expose their strength or weakness to our view.

THE ART OF CONSTRUCTING OBLIQUE ARCHES WITH SPIRAL COURSES.*

SOME readers prefer a purely theoretical treatise upon any particular subject, others one solely practical, and others, again, give the preference to a work of a mixed description, where the principles enunciated in theory are illustrated by practical examples. To the first of these three classes belongs the little volume before us, and those who are partial to that particular style and mode of treating a subject will find the contents well worthy of a perusal. For our own part we prefer the mixed style, and, moreover, consider it more likely to be of use to the student. That the author has given a series of formulæ more or less complicated for determining the different data necessary for calculating all the proportions required in a skew bridge there is not a doubt, but at the same time we completely differ with him respecting their real practical utility. There are numerous designs, especially in ironwork, where calculation and mathematical formulæ may supersede with great advantage, both with regard to time and labour, the somewhat more usual process of geometrical methods, and ascertaining the various dimensions of the parts by scale. But if there is one class of engineering design more than another that demands imperatively the aid of the draughtsman, and of a skilled draughtsman too, it is that of skew bridges. For a beginner to derive any clear idea of what a skew bridge is, and what knowledge is really demanded in its construction, he should at the commencement lay aside all calculation, both arithmetical, algebraic, and trigonometrical, and take his tee-square, drawing-board, pencil and scale, and work out in detail all the projecting lines, templates, and curves necessary for working the stones to. He should make these working drawings to as large a scale as possible, and should mark out the templates either in wood or zinc, or some other suitable material, himself, so as to be certain that he thoroughly understands every successive step of the construction of the bridge. If a tyro works out certain dimensions by a given formula or equation, he never really sees it; but if he draws them on paper to a good large scale he sees the thing at once, and what is more, does not forget it. The scale for such drawings should not be less than that of one inch to a foot. It may, of course, be as much larger as is convenient, but upon a smaller one it is not possible to accurately show the sizes of the stones that will be required, the best way of arranging the joints, and many other particulars equally necessary and important.

In mentioning the data required for the calculations of a skew bridge, the author remarks:—"The data are the direct span, the angle of obliquity, the versed sine of the arch, and the width of the pathway." The practical way of writing the above would be, "The data are the 'span on the square,'" the "'angle of skew' (which is not the angle of obliquity)," the rise of the arch and width of roadway on the square. The term "direct bridges," as used further on, would be incomprehensible to a working mason. The two kinds of bridges are correctly distinguished as "bridges on the square" and "bridges on the skew," the latter being sometimes termed oblique bridges. Again, the angle of obliquity is not the angle practically required, but its complement, which is what is usually called the angle of skew, and is the acute angle between the directions of the roads over and under the bridge. In fig. 1 let the lines

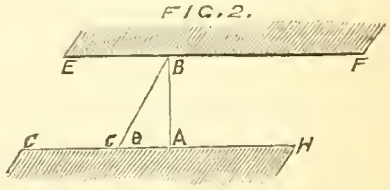
FIG. 1.



A B C D represent the directions of the roads under and over the bridge, then the angle of skew is θ, and the angle of obliquity $(90° - \theta)$; the former being the really valuable datum, as from it and the span on the square, the skew span and other dimensions can be calculated.

There is no absolute necessity for taking an uneven number of voussoirs in dividing the heading spiral, unless a keystone be put in. We have built many skew railway bridges in stone with no keystone, and unless it be intended to put in a handsome one, it is certainly a loss of time to readjust the dimensions for the mere sake of having an uneven number of rings in the face of the bridge. We fail to perceive the utility of the elaborate calculation entered into for the purpose of determining the value of the angle of obliquity, which, as we have before stated, is equal to $(90° - \theta)$. The angle of skew θ is fixed by the plan of the locality where the bridge is to be erected, and cannot, as our author appears to imagine, be varied at pleasure. For instance, suppose a line of railway laid out, and on its route it crosses obliquely a road or river at a certain angle; provided that route be adhered to, the angle is determined, and may either be measured with a protractor upon the plan, or more accurately obtained by actual observation on the ground. Deducting it from 90 deg. we can get the angle of obliquity, if desired, without employing an abstruse formula for the purpose. Chapter II., on the stability of oblique bridges, is of no practical utility whatever, being simply a mass of intricate mathematical formula and formidable algebraic equations, the result of which it would be impossible to reduce to any comprehensible form. They remind us strongly of a similarly numbered chapter in Mr. Bashforth's work on the same subject. All the terms chosen by our author are unfortunately so worded that it is scarcely possible for a practical man to understand their meaning. It was some time before we ourselves divined that the "radius of soffit cylinder" really meant "radius of intrados," that the "length of springing" meant "length of impost," and to this moment we are not quite certain that what he calls "angle of skew-back of facial screw line" is identical with the "angle of intrados," which is the foundation of nearly all the calculations for the templates and developments. Heading joints, coursing joints, angle of twist, twisting rules, and a variety of other terms commonly used and understood by engineers and masons, either find no parallel in the treatise in question, or are replaced by names conveying no intelligible meaning. Although a treatise may not be intended to have any practical value, yet there is little or no use in giving theoretical information, if, after making a calculation according to a given formula, one does not know to what it applies. Previously to commencing the drawings and calculations of a skew bridge, four data are determined by the nature of the locality, and other circumstances, *à priori* to all after calculations. They are the angle of skew, as already explained, the span on the square, the rise of the arch, and the width between parapets, or simply the width of the bridge on the square, bearing in mind that the width of the bridge is not to be confounded with the square span. The span is measured under the arch; the width on top of it, and is always at right angles to the skew span or face line of the bridge. In fig. 2 is represented the plan of a skew bridge, and

FIG. 2.



A B is the span on the square, C B the span on the skew, and θ the angle of skew. Of these three, two, viz., the angle of skew θ, and the square span A B, are known; and to find C B, the skew span, we may use the simple formula $C\ B = \frac{A\ B}{\sin.\ \theta}$. The width of the bridge will be measured square to the line C B, and will be equal to E F or G H on the square, minus twice the thickness of the parapet walls, measured also on the square. The rise is determined in some degree by the span, and is fixed independently of any calculation. From these four data all others can be determined by simple trigonometrical and algebraical means, which should always be used as a check upon the accuracy of the drawings, and the dimensions of the templates and stones obtained by geometrical methods. As a purely mathematical treatise, Mr. Donaldson's work is deserving of merit, and may be classed in the same category as that of Mr. Bashforth; but the young architect and engineer will find Mr. Buck's work the only one likely to afford him that practical and theoretical information necessary to enable him to construct a skew bridge. He may also peruse with advantage the concise, but exceedingly practical instructions respecting skew bridges given in "Masonry and Stonecutting," in one of Weale's Rudimentary Series.

* "The Art of Constructing Oblique Bridges with Spiral Courses." By WILLIAM DONALDSON, M.A. London: E. and F. N. Spon, 48, Charing Cross. 1867.

A NEW VIEW OF AN ARCHITECT'S DUTIES.

AMONG "things not generally known" it may be as well to record this thing—to wit, that the Right Honourable the Lords Commissioners of Her Majesty's Treasury, in the plenitude of their collective wisdom, have decided that the measuring of work is the duty of the architect, and that his established remuneration of 5 per cent. covers this duty and other extras usually thought to belong to the surveyor. We have come to the knowledge of this precious piece of information

from the perusal of a correspondence which has just been published, between the Office of Works and Mr. E. M. Barry, having reference to that gentleman's professional remuneration as the architect employed at the New Palace at Westminster. It may be worth while to tell our readers by what strange process of reasoning the Lords Commissioners have managed to arrive at their unheard-of decision. The correspondence opens with a letter, dated June 5, 1860, from the Secretary of the Board of Works, requesting Mr. Barry to superintend the completion of the works at the New Palace—"The rates of your remuneration being the same as those paid to your late lamented father." In accepting the appointment Mr. Barry informs the Chief Commissioner of Works that he is unwilling to enter into the question of remuneration, assuring the Commissioner that he would gladly have rendered his services gratuitously if necessary for the satisfaction of knowing that the views of his late father respecting the great work upon which his reputation will principally rest were likely to be carried out in their integrity. At the same time, Mr. Barry says he feels bound on public grounds, and in justice both to himself and to the architectural profession, to call the attention of the Chief Commissioner to the fact that the remuneration "forced" upon his father's acceptance—"against the injustice of which he always protested"—was (1) less than is customary with architects of standing, and less than was adequate in the case of the New Palace; (2) less than was then being paid to architects employed by the Government on other works; and (3) less than was offered by the Government to architects of all nations in the public competition for the new Government Offices. Mr. Barry, however, repeats that he has no wish in any way to introduce pecuniary considerations, and that he readily accepts the proposition conveyed to him by the Board of Works. The next letter, dated November 14, 1863, is addressed by Mr. Barry to the First Commissioner, and refers to settling up. The architect forwards his account, made out at the rate of 4 per cent. on the expenditure. Mr. Barry, however, reminds the Commissioner that the arrangement agreed upon between them was limited to the works which had at the date of appointment received the sanction of the Board, and for which Parliament had then made grants of money. But a further grant of upwards of £20,000 had been necessary to complete the work. This was an unforeseen necessity; and in consequence of it Mr. Barry, as he states, had been called upon to prepare quantities for lump-sum contracts, as well as to settle extras and omissions upon them; and also to furnish the Board with detailed measurements of work that would have been done by M. Szerelmey had his engagement continued; but which, in consequence of the termination of his contract, had never been executed, and upon which no commission had subsequently been charged. He acquaints the Commissioner that, while his expenditure of time, money, and labour in superintendence during the three years and a half had been, owing to the circumstances stated, much larger than is usually the case with architects, his remuneration (after deducting the expense of measurement) had been little more, and as to some parts of the work even less, than half the customary amount. But, treating the completion of his father's work in an exceptional light, he says he has no intention of making any claim against the Government, and leaves the whole matter in the hands of the Chief Commissioner, desiring it to be understood, however, that his acceptance of an inadequate remuneration should not be referred to as a precedent in the profession. Whereupon Mr. Cowper writes a letter to the Lords Commissioners, enclosing Mr. Barry's communication, and puts it to their Lordships whether, looking at all the circumstances of the case, Mr. Barry be not fairly entitled to the usual commission of 5 per cent. on the expenditure voted during the three years. Their Lordships don't quite see it just yet, and request "some more detailed information regarding the lump contracts." This Mr. Barry furnishes, and goes over the old ground, stating his reasons for accepting, and the conditions on which he accepted the offer of the Board originally. Another appeal to their lordships from Mr. Cowper follows, and at length the matter is settled—Mr. Barry, in his letter of acknowledgment expressing "his best thanks to the First Commissioner for the fair and liberal manner in which he has approached this question." The date of the letter closing this part of the transaction is March 29, 1864. The correspondence again opens in October, 1866, relative to certain proposed alterations in the Ladies' Gallery of the House of Commons. In answer to a communication from the First Commissioner, in which it is stated that the Board is of opinion that the duty of measuring the work devolves upon the architect, as his commission of 5 per cent. on the outlay covers any expense he may incur in preparing and making out the accounts, Mr. Barry writes that he cannot concur in the opinion of the Board, appeals to the rules of the Royal Institute of British Architects, a copy of which he encloses, and urges that the system of taking out quantities has been repeatedly recognised by the Board, and architects employed in Government works have received their full commission of 5 per cent. for their services, exclusive of taking out quantities. The question as regards the Ladies' Gallery is of so trifling a character that Mr. Barry would gladly have waived it altogether had it not, as he truly says, involved a question of principle, to abandon which would expose him to the charge of unprofessional conduct on the part of his brother architects. This letter remains unanswered until March last, when the contractors having applied to the architect to have the work done measured and paid for, Mr. Barry addresses a note to the Board of Works soliciting a reply to his former letter. The First Commissioner reiterates his opinion on the disputed point of measuring, and informs Mr. Barry that when he was appointed architect to the New Palace it was upon the understanding that he was to be remunerated at the same rate as Sir C. Barry—namely, 4 per cent. commission, "including the measuring." Mr. Barry reiterates in turn, and informs the Commissioner that he has felt it his duty to lay the matter before the Institute of British Architects. Then comes a communication, dated March 26, from the aforesaid Institute, enclosing copy of a resolution passed by the council to the effect that the council do not feel called upon to express an opinion as to whether any private arrangement may justily Mr. Barry in acceding to such a mode of remuneration on the present occasion, but they state distinctly that such an arrangement is contrary to the practice of the profession, and they protest against its being drawn into a precedent on future occasions. "The rules for the remuneration of architects laid down by the Institute have been generally accepted by the public, and are considered binding on the profession, and the council feel sure that the Board of Works would not wish to adopt a scale of remuneration lower than that accepted by private individuals." The communication is politely acknowledged, and after four days' due deliberation and consideration, Mr. Barry receives a reply from Lord John Manners. This is what his lordship's secretary says:—"I am directed by," &c., "to acknowledge the receipt of your letter of the 25th ult., in which you state that you are prepared to abide by his lordship's decision as far as it relates to the present case of the works that have lately been completed in the Ladies' Gallery of the House of Commons, and I am at the same time to acquaint you that, in order to prevent any future misunderstanding, your remuneration for all works entrusted to your superintendence by this department, whether at the Palace at Westminster, or elsewhere, will be calculated by the Board at a commission of 5 per cent. on the outlay, which commission is, according to the practice of this department, to cover all expenses of measuring and superintendence, except the charge for the clerk of the works." This is certainly very cool and very diplomatic. So far, Lord Manners has the best of it. The whole sum in dispute does not amount to £10; that, however, is not the question, which is one of principle. Where the principle in this instance lies we leave our readers to judge for themselves. We must say, after reviewing the whole correspondence, that had Mr. Barry insisted a little more strongly on the principle of the thing than he seems to have done in his letters, and been somewhat less anxious to "abide by his lordship's decision," probably he would have carried his point. It is needless to say that our sympathies are entirely with the architect, who is undoubtedly in the right. Perhaps the mistake was in not having a specific agreement at the outset. The Board of Works has gained the day by a quibble. But architects, we protest, ought not to be subjected to this sort of dictation and treatment. Neither should they submit to it.

MEETING OF ARCHITECTURAL SOCIETIES AT KETTERING.

A GENERAL meeting of the Architectural Societies of the archdeaconry of Northampton, the county of Leicester, and the county of Bedford was held at Kettering last week. The members of the various associated societies after visiting the church held a meeting in the Corn Exchange. The Rev. W. L. Collins, vicar of Kilsby, read a paper on Dr. White Kennett, who was Bishop of Peterborough some 150 years ago, and who was also a zealous antiquarian.

After the meeting a short excursion in carriages was made to Rushton and Geddington. The first place visited was Rushton Hall, the seat of Captain Clarke Thornhill. From the hall the excursionists went through the park to the

TRIANGULAR LODGE,

a building of a somewhat marvellous character, and upon the peculiarities of which the Rev. H. Ward delivered a short paper. Mr. Ward stated that although there were no traces of its history left behind, it was clear that the lodge had stood there (Rushton Park) for nearly two and a half centuries. It was built by Sir Thomas Tressham, a man of very peculiar temperament and taste, and was supposed by many to have been used as a place of meeting for the gunpowder plot conspirators, but this he was not inclined to credit, as he believed from the mysterious emblems on the building that it was erected as a retreat for private devotion. The form of it was singular, or, more properly, unusual, for they had at Geddington the cross of the same triangular form, and some of the company might know Lord Radnor's triangular house at Longford, near Salisbury. That was said to be built after a Danish model, but why the Dane chose that form he did not know. This building was evidently so built as intended to symbolise "the Trinity," as Liveden, from its form and carvings, &c., was "the Passion." The indications of such an intention in the case of this building were numerous. Almost every feature bore on the number three. The form was triangular, as denoting the three persons and in reference to the equality of the Godhead in the Trinity. All the triangles were equilateral. Next, each side of the building measured 33ft. 3in.; then the height of the parapet (28ft. 7in.) was exactly that which the apex of a triangle would reach with equal sides of 33ft. 3in. He had little doubt also, if he could have ascertained the height of the centre pinnacle, that it would just be comprised within a triangle of exactly the same size if lines were drawn from the corners of the building to it. Again, the building was of three stories, and there were three windows in each story on each of three sides, and each of these windows had divisions or compartments of threes. The shields of arms were arranged on each side in twice three couplets in three lines. Another point he stumbled on was that each of the long Latin inscription consisted of thirty-three letters, and the single words below them were three sets of two letters on each face of the building. The very name of Tressham (or as he believed it should be pro-

nounced Tressam) had a sound of three about it. The arms were made up of trefoils arranged in threes. It was very probable that his name and arms might have given to such a strange mind as that of Sir Thomas a bias in favour of this doctrine, but that his purpose in the building was that which he had ascribed to him might be proved, he thought, by his adoption of the Latin text over the door, "There are three that bear witness."

After paying a visit to Rushton Church the excursionists proceeded to

GEDDINGTON,

a village a few miles off, where one of Queen Eleanor's crosses was erected. This was described by Archdeacon Trollope, who, referring to the cross at Geddington, said there were two similar monuments erected to Queen Eleanor by Edward I., one at Waltham and the other at Northampton. Some people thought that the one at Geddington, from its triangular character and lightness of decoration, was the most elegant of the three, but he thought the one at Waltham was more complete in its form. It was a little straight at the base, but it was elegant above. The three statues in the niches of the cross (Geddington) were representations of the Queen, and they were very gracefully executed. On each side of the base of the monument, intermingled with diaper work, were shields with the arms of Castille and Leon with that of Clare, and the royal arms of England with that of Clare. The monument which was recently erected at Charing Cross, not on the site of the old cross, but in front of the Charing Cross Railway Hotel, was a very besutiful work of art.

The company then entered the Geddington church, for a description of which they were indebted to the Rev. G. A. Poole. He said as they went round the exterior they had ample evidence that it was built during the transition period between the Norman and Early English. The arcade was Norman, and it was quite evident that the nave was longer when it was a Norman one than it was now. There was at least one arch more. It seemed that about the close of the twelfth century, the time of the transition into the Gothic style, some part of the nave was taken down and these arches were built, and, as far as he could judge, the arcade was made as long as the Norman one. When the nave was shortened the chancel was lengthened; but why the nave was shortened he could not say. The tower and sedilia were also of the transition period. Above the Norman arcade of the south aisle were the remains of a Saxon arcade, which showed that there was a church on this spot long before the time of the Conquest. A remarkable fact connected with this church was that it was the first church that had pews erected in it in England.

Archdeacon Trollope said, with reference to the peculiarity of the arcade, that he believed the Norman clerestory was built on the Saxon arcade to escape re-consecration of the church, the fees for which were exceedingly heavy in those days. If so, it was a very expensive and very dangerous experiment.

On Wednesday morning an excursion took place to Barton Seagrave, Burton Latimer, Irthlingborough, Ringstead, Finedon, Higham Ferrers, Stanwick, Raunds, Woodford, and Crauford, which concluded one of the most successful meetings the joint societies have held.

NATIONAL PORTRAIT GALLERY.

THE tenth annual report of the trustees of the National Portrait Gallery to the Lords of the Treasury has just been published. It contains one or two items of general interest. We note, in the first place, that Earl Dudley and Lord Elcho have ceased to be trustees, in accordance with a bye-law to the effect that any trustee who shall not have attended any meeting of the Board for the space of two years without assigning any cause, "either of illness or of absence from the United Kingdom," shall be held to have resigned his trusteeship—a rule which the most sensitive must deem fair and reasonable. In September last, Mr. Beresford Hope, M.P., and Sir Coutts Lindsay, Bart., were elected trustees. The value and importance of this national collection have been largely enhanced by the number of handsome donations received since the last report, and also by the numerous valuable purchases made by the trustees themselves. The Gallery now contains seventy-two donations, nine of which were received since July last year. A marble bust of Richard Cobden, by Mr. Woolner, was presented by the widow of the great Free-trader. Mr. W. Smith, F.S.A., Deputy-chairman of the Trustees, presented a portrait of Cardinal Pole (1500-1558), painter unknown; Mr. W. Jones Lloyd, a portrait of the Right Hon. Henry Pelham (1696-1754), painted by William Hoare; Mr. J. W. Everett Green, a portrait, by Opie, of F. Bartolozzi, R.A., the engraver (1730-1813); Sir W. C. Trevelyan, a portrait of Thomas Hobbes (1588-1679), by Joseph Michael Wright, the artist; a portrait of Thomas Clarkson, by De Breda, R.A., and one of Walter Savage Landor, painted by W. Fisher, were bequests by the late Mr. Henry Crabb Robinson, F.S.A. A portrait of J. H. Mortimer, R.A., by himself, is the gift of Miss Twining; and in April last her Majesty, in compliance with an application addressed to her by the trustees, presented a full-length portrait of the Prince Consort. This, we believe, is a *replica*, by M. Winterhalter, of the last portrait which that artist painted from life of his Royal Highness. It is understood that the Queen will, at some future time, present to the Gallery a companion portrait of herself. Nearly £600 have been expended in additions to the collection during the year. The following are among the more noteworthy of these:—A portrait of Catherine Hyde, Duchess of Queensberry (Jervas), £120; William, Duke of Cumberland (school of Sir Joshua Reynolds), £70; Nell Gwynn (school of Sir Peter Lely), £68 5s.; Queen Henrietta Maria (school of Van Dyck), £56; Patrick Fraser Tytler, the historian (Mrs. Carpenter), £42; a marble bust of the Duke of Wellington (J. Francis), £52 10s.; also, portraits of Queen Anne, Simon, Lord Lovat (Hogarth), George III. (Allan Ramsay), Sir Robert Walpole, John Gibson, the sculptor, and others. We notice as a matter of regret that it has been found necessary to place some of the most valuable pictures in the Gallery, —including the Chandos portrait of Shakspeare, and portraits of Sir David Wilkie and Sir Joshua Reynolds—in airtight cases with glass fronts for their protection. One of the most satisfactory features of the report relates to the evident interest which the public, and more particularly the Easter Monday visitors, take in the exhibition. On this point, Mr. Scharf, the secretary and keeper, makes the following favourable remarks:—"Nothing could exceed their decorum and the attention which they manifested towards the pictures themselves. They studied the printed lists, which were freely circulated gratuitously, as before, and in several instances I ascertained that they had brought with them the lists which they had taken away the year before. It is gratifying to see the interest which parents take in pointing out to their children the great celebrities and the best characters of past times, and I was much pleased to observe the large proportion of intelligent lads, apparently from printing and large warehousing establishments." The number of visitors to the Gallery during the year 1866 was 24,666, being an increase of 3,024 over the previous year. The conclusion that the report leads us to is this: were our national portraits decently housed they would be visited by a much larger number, and confer correspondingly greater benefits. As it is, this attractive and important collection, like nearly all our national collections of a like kind, literally hasn't room to breathe in.

ON ENCAUSTIC PAINTING.

THE nature and durability of colours and the various materials used in painting form a subject of great importance at this time. We have already pointed out the tendency to decay of English pictures which have been executed without chemical knowledge on the part of the artists employed at the Houses of Parliament. Many of the English pictures at Kensington have long been a source of great concern to connoisseurs, owing to their ill condition. Hardly a master of our own country is known to have troubled himself about the materials in which he worked. Pope speaks of painting as a means of conferring immortality on the frail flower-beauty; and some painters have mixed their colours in a way that rendered them tolerably permanent. These, however, form the exceptions. The rule with English painters is the reverse. Under these circumstances, whoever has the knowledge and the ability to throw light upon the best methods employed by the more distinguished old painters whose paintings have lived through centuries and retained their splendour to the last, will confer a benefit on art and on the rising generation of artists. On Thursday last week, Mr. Cave Thomas delivered a lecture before the Society for the Encouragement of the Fine Arts, at Conduit-street, "On Encaustic Painting." He observed that paintings executed with vehicles in which wax is combined in certain proportions rank next to frescoes in architectonic propriety of effect. They possess in a great measure the same freedom from gloss, and can be seen in any position; moreover, they powerfully resist the action of acids, atmospheric corrosion, and damp. The ancients, it would appear, had three methods of encaustic painting. Pliny enumerates and distinguishes them thus:—1st, that in which they used a stylus and painted on ivory or polished wood, previously coated with a wax preparation. The stylus or stigma served to draw the outlines, and its spatula or blade end to clear off the filaments which it ploughed up in the prepared ground. 2nd, that in which colours were mixed with wax and spread over the pictures with a metal spatula, the various colours being previously prepared and formed into small cylinders for use. By the side of the painters stood a brazier, which was used to heat the spatula with which the colours were smoothly spread after the outlines were completed, and thus the picture was proceeded with and finished. 3rd, that in which painting was performed by dipping a brush into wax liquified by fire. By this method the colours attained considerable hardness, and could not be damaged either by the heat of the sun or the deleterious effects of sea water. It was thus that they painted their ships with emblems, which decorations were finally smoothed and polished. This kind of encaustic, therefore, was styled "ship painting." Other passages in Pliny were also examined, and the experiment instituted by Count Caylus towards the end of the last century detailed. Mr. Thomas also described several other methods of encaustic invented at various times by artists and amateurs, and concluded by expressing a belief that whatever may be the process of encaustic painting ultimately adopted, it will probably be preferred to fresco in this country, promising as it does a somewhat richer range of effect, and to be the more simple process of the two.

GREECE REVIVING.

A CORRESPONDENT of the *Times* gives some very interesting information relative to the present condition and future prospects of Greece. The following will interest our readers:—Greece, says this writer, has effected much towards obtaining a fair position in the scale of civilisation, contending all the while with many disadvantages, disadvantages wholly unappreciable in this quarter of the globe. After the war which gave to Greece her independence, the whole country was literally strewn with the ruins of towns. The few that escaped the almost universal destruction were the following:—In the Peloponnese—Nauplia, Navarino, Modon, and Coron; in Eubœa—Chalsis and Charysto; in continental Greece—Vostizo and Lepanto. The towns destroyed were the following:—In the Peloponnese—Tripolitza, Argos, Corinth, Ægina, Kalavryta, Patras, Pyrgos, Kyparissia, Nissi, Calamata, and Gythium; in continental Greece—Missolonghi, Carvassara, Carpenissi, Agrinium, Amphisse, Galaxidion, Atalante, Levadia, Thebes, Megares, and Athens; in Eubœa—Xerokhori. These towns were burnt, demolished, and sacked principally by Ibrahim Pasha, who also destroyed the fruit of the land—the vine and the olive. Not only have all these towns been rebuilt, but with the following additions:—1. At Patras the higher town has been restored, and a new and larger one built on the seashore. 2. A new Sparta on the supposed site of ancient Sparta. 3. A new Megalopolis. 4. Between Calamata and Coron on the seashore a new town called Petalidi. 5. At the Piræus the town, the harbour, and the quays. 6. Syra and its harbour, of daily increasing importance. 7. At the southern extremity of Eubœa a new town and harbour in process of construction, called Othonopolis. 8. A little town called at first Amaliapolis, now Pelagia, on the harbour of Volo. 9. A new town called Adamas, in the island of Milos, founded by the Sphakiotes, inhabitants of the white mountains of Crete. 10. Corinth has been twice rebuilt, once after the war, and again after the earthquake in 1858, at the east of the ancient harbour of Leché. Twenty-three ancient towns have been rebuilt and ten new ones, including Athens, have been founded. Athens alone contains more than 5,000 houses, and is increasing. Very different from the Athens described

in Chateaubriand's *Itinerary*—"squalid, tottering, and tortuous, its wretched roofs the haunt of storks, its State degraded, its population debased." To these towns must be added villages, some of which, from local causes, have grown into small towns, such as Philiatra, Dimitzara, Leonidion, Cranidion, Cume, Astacos, and others. Taking as a starting point the actual population of the 33 towns rebuilt at 180,000 inhabitants, that of the same towns restored at 25,000, that of the villages grown into small towns at 33,000, we have a population of 238,000. Granting a proportion of eight inhabitants per house, we find about 30,000 houses rebuilt since the year 1833, which, calculated at a minimum of 7,000 drachmas per house, represents a capital of 210 millions. This sum has been earned by persevering efforts on sea and land, and by the influx of the corn trade, as well as by the export of national produce.

VILLA—WORCESTER PARK ESTATE.

OUR illustration represents one of a number of villas now being erected by the South-Western Villa Residence Company, from the designs and under the superintendence of their architect, Mr. John Giles, of 28, Craven-street, Charing Cross. They are erected on the summit of the hill some five minutes' walk from Worcester Park Station, one of the most charming spots in Surrey, with views of Epsom Downs, Sydenham, and the hills which skirt the county on all sides. The villa illustrated is built of yellow malm facings with red bands and slate roofs, no cement being used, but a few Bath stone dressings for chimney caps, &c., where required. It contains eleven bed rooms and a bath room on the upper floors, and the usual living rooms and offices. The cost is under £2,500, including "fittings" and every expense, there being no extras of any kind in the contract. The builder is Mr. Thomas Dobbs, of Hackney Wick.

THE INFLUENCE OF CONTEMPORARY WRITERS ON THE ARCHITECTURE OF THE DAY.

SIR WALTER C. JAMES, Bart., gave an able and interesting lecture on "The Influence of Contemporary Writers on the Architecture of the Day," at the rooms of the Architectural Exhibition Society, on Tuesday evening. Mr. M. Digby Wyatt, F.S.A., occupied the chair. The lecturer dwelt upon the various influences which different writers had had upon the revival of Gothic architecture in England, and especially referred to the writings of the elder Pugin and Mr. Ruskin. For the genius of both men he had the highest respect, though he accepted Pugin as the truer teacher. Ruskin was a great critic, but his great fault was overweening self-confidence. Alluding to Sir Walter Scott, he remarked that though he was not a good churchman he knew more of architecture and had a finer feeling for the beautiful in art than many professed writers on the subject. The lecturer quoted Scott's well-known lines on Melrose Abbey, and remarked that the writings of the Wizard of the North had contributed in a great measure to the wide popularity to which the study of archæology had attained in his time. Sir Walter James thought that much of the art criticism which appeared nowadays was of a very ephemeral and valueless character as compared with the works of the elder writers on the subject. But the fact was, we had no time to write treatises; we live in the hurry and hustle of an age of railroads, and are content to record only hasty impressions. If we have not time to write treatises—which were the labours of years and perhaps of a whole life time—as our forefathers did, let us at all events, said Sir Walter, take time to read what they wrote. The lecture was interspersed with many excellent hints to students and young architects, particularly on the subject of the use of ornament in architecture.

Mr. Digby Wyatt, on rising to move a vote of thanks to the lecturer, said he agreed with much that had fallen from Sir Walter James, particularly as regarded current criticisms, a great deal of which was of the most flimsy and superficial kind, and h[illegible]d had very little influence indeed on [illegible] of the day. He remarked [illegible]t admiration for Pugin, v[illegible]f keen observatic[illegible]tures to enunciate the great principles of architecture. For Ruskin his admiration was much less. Pugin was Ruskin's idol; but though he was his idol, he was always finding fault with him. In his treatment of Pugin, Ruskin reminded him of a child who would one minute fondle and decorate its doll, and the next would dash its head against the bedpost. What was good in Ruskin was Pugin's, and what was not Pugin's was Ruskin's own—wrong and false, and sometimes nonsense. The chairman concluded by proposing a vote of thanks to the lecturer which was unanimously carried.

FRENCH ROOFS.

FRENCH roofs may be divided into two general kinds—the pointed and the flat. The former are prominent in the northern climate, where they are essential to prevent the snow collecting in great quantities. The latter are especially used in the southern parts for the accommodation of the inmates of the houses. From a practical point of view, the pointed roofs are undesireable; their construction is no cheaper than that of vertical brick walls, and the apartment they cover is narrow and uncomfortable. This arises from the oblique sides, which take away the best part of the room, and give by no means a favourable impression. There is, however, this advantage, one additional floor is obtained beyond the number which the laws for building houses in a city permit, because the roof floor is not counted in these laws. Looking at these roofs from an æsthetic point of view they can certainly be defended. They give a favourable appearance to high houses in narrow streets, as well as to houses having a richly ornamented front. This especially applies to houses of a light colour, in which the eye finds an agreeable relief in the dark roof. On villas or summer residences standing alone, so as to be visible from all sides, the French roof lacks in taste and appearance, if it is not positively ugly. As a rule roofs in general contribute but little to the style and good looks of a structure, those which are the least visible will generally be the best. The only exception to this rule is the dome, which being an ornament of itself, enhances the appearance of a building on which it is judiciously placed.

HOUSE DECORATIONS OF POMPEII.

IN some things the walls of Pompeii read us lessons which we should be the better for learning. We agree with a recent reviewer that the sight of any house which has been allowed to go out of repair in an English town is pitiable enough. The crumbling mortar defiles everything, and the walls exhibit wretched strips of paper with the colours faded and the patterns blotted out. After centuries have passed away on centuries the walls of Pompeian houses are scarcely less firm and beautiful than when their owners lived and moved within them, unconscious of the mischief about to be done by the long slumbering fires of Vesuvius. It will probably take many a year yet to convince Englishmen that the paperhanger is not the most fit person to make a home seemly or beautiful, or that a genuine artistic ornamentation of walls may be within the reach of other than the wealthiest classes. The Pompeians, generally, were not wealthy; and some examples of the purest taste are found in the houses of men whose means were manifestly not great. The beautiful effect produced by their treatment of wall surfaces is disputed by none; that we should still have but an imperfect knowledge of the means employed to obtain it is much to be regretted. The receipt for making the stucco used by the masons of Pompeii would be a boon to thousands in this country, who long to escape from the dominance of fashions which are none the less absurd because they are old.

EDINBURGH ARCHITECTURAL ASSOCIATION.

AT the usual fortnightly meeting of the Edinburgh Architectural Association Mr. W. Beattie, the president, in the chair, a paper was read by Mr. Thomas Henderson, entitled "The Gothic Revival—its Causes and Effects." In introducing the subject, Mr. Henderson referred to the late distribution of medals at the Paris Exhibition, alluding to the fact that, out of eight medals, four had been awarded to France, and none to Britain, and asking if, looking at this result, we have any right to call ourselves a fine art people? He then proceeded to show that, whatever might be the causes conducing to this result, when we looked back to our cathedrals and other old works of art, we did possess such a right. He then proceeded to investigate the causes which had led to the revival of the style of these old masterpieces in preference to the Classic styles which had been exclusively used since the decay of Gothic art. The causes of decline were stated to be principally the reformation, the revolution, the unsettled state of society, and the wars abroad. The symptoms of revival were indicated in the literature of the country—in the poetry of Byron and Wordsworth, and the novels of Sir Walter Scott. The effects of this revival in art are, among others, the return to Gothic models, the resuscitation of many forgotten arts, and the discovery of some new ones. It might be allowed that we know more about architecture, as we certainly write and talk more about it than any people ever did before us.

THE NEW SOUTH KENSINGTON MUSEUM.

THE erection of these proposed buildings has been delayed in its progress by the death of Captain Fowke, and possibly to some extent by that of one of his most able assistants, the late Godfrey Sykes, who was more particularly engaged in the designs of the details of the work. By the courtesy of the authorities we have been favoured with an inspection of the building in its present stage, and will make a few remarks thereon. An impression has prevailed that the building would, to a great extent, partake of the boiler character, intermixed with something of the Exhibition of 1862. It is time this delusion should be dissipated. The only decorative portion complete is the interior of a quadrangle. But this one effort is a fine specimen of what will be the effect of the whole edifice when completed. The materials seem to be calculated, as far as possible, to resist the deteriorating properties of our climate. They are red brick, terra-cotta, and stone, blended in the most charming and harmonious manner. Although the surfaces are everywhere decorated, and even the smallest ornament is a study, yet the *tout ensemble* does not present the slightest appearance of crowding or confusion. The general features of the architecture consist of red brick pilasters resting on a substantial plinth, and rising the height of two stories, supporting a decorated cornice and entablature. Between each pilaster are coupled windows, square headed on the ground floor and semicircular-headed above, connected together by balconies, with what may be called Venetian columns as balusters. The façades are finished with a third story of corresponding character with the others, crowned with a richly decorated cornice. The principal façade of the quadrangle has a highly decorated raised centre, in which an extremely picturesque effect of light and shade is produced by a row of three arches on columns, three of which, in rear of each other, support the arcade above, the soffits of which are profusely panelled and ornamented.

The architraves, friezes, cornices, balustrades of balconies, &c., throughout the whole of the work, are enriched in an elaborate manner in terra-cotta, from designs made by the late Godfrey Sykes, who modelled every portion himself. The designs are of the most original character, and bear the stamp of a masterly hand. We have an impression on our minds that in this museum building we shall have the nearest approach to a new style of architecture, and a style of a character which is not composed of all sorts of crooked corners, out-of-the-way spikes of roofs, odd windows and doors for the main features, nor of all sorts of chamfers and stoppings, notchings and choppings, and the most awkward and deformed decorations, for its details, but a style which, while rich in decoration, both of colour and form, is neither gaudy nor crowded; where each, even the most minute part, though a thing of beauty in itself, and able to bear the closest inspection, has in that character only to perform a subordinate part, its chief purpose, and one which in every instance in the case before us it fully carries out, being to do its share in contributing to the realisation of a great and harmonious whole. H. AND P.

Mr. Ruskin on Friday evening delivered a lecture at the Royal Institution "On the present state of Modern Art, with reference to the advisable arrangements of a National Gallery."

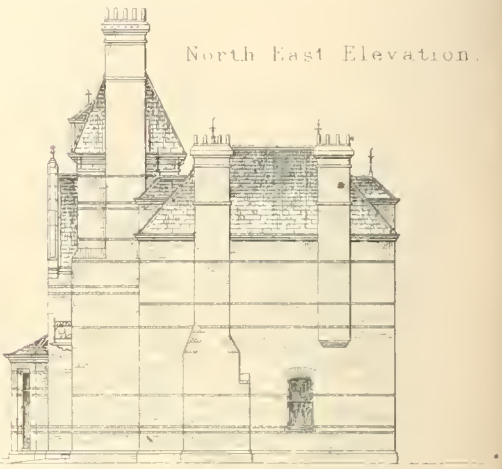
VILLA FOR PLOT No 1.

South East Elevation

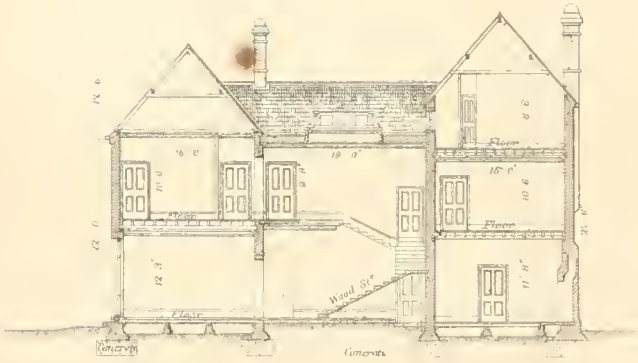
South West Elevation

Back Elevation

North East Elevation.

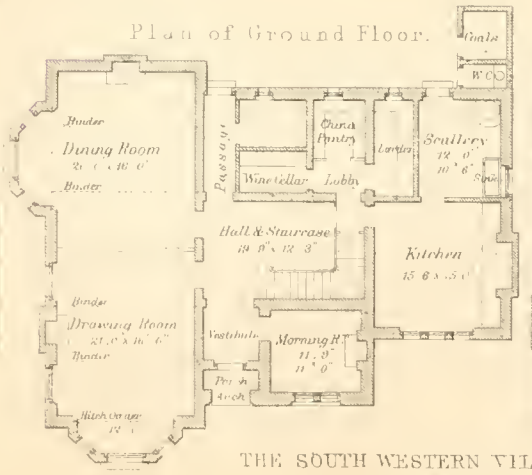


Longitudinal Section.

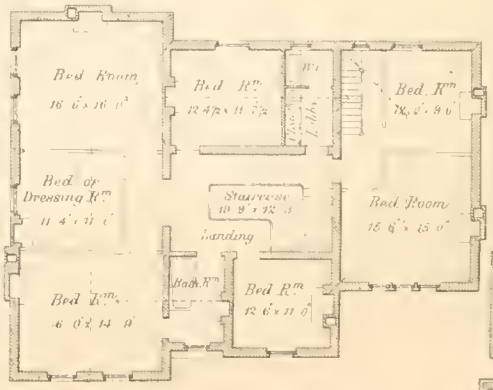


Transverse Section

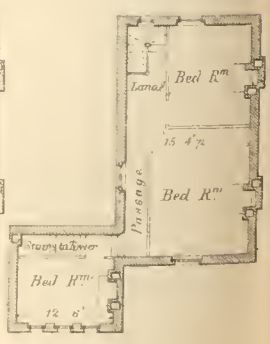
Plan of Ground Floor.



First Floor Plan



Plan of Second Floor.



THE SOUTH WESTERN VILLA RESIDENCES COMPANY (LIMITED)
WORCESTER PARK ESTATE.

JOHN GILES, ARCHITECT

SCALE 24 FEET TO AN INCH.

Plan of Room in Tower

J. Abbott Lith.

Design for New Law Courts. _ Strand View. _ E. M. BARRY, ARCHT

THE COURTS OF JUSTICE COMPETITION.

WE promised our readers to complete our criticisms on this great national competition by a notice of some of the reviews which have appeared in the more important newspapers and periodicals. We proposed this somewhat singular course because it is only upon these rare occasions, when the country is about to expend a million or so of money, that the non-professional journals honour architecture and architects with their opinions concerning it and them, and it is, to say the least, edifying to note the nature of these opinions and the way in which they are expressed.

As a rule the reviews in the periodicals (under which term we include the weekly papers) show a greater knowledge of the subject than the criticisms in the daily papers. Some of these latter are very curious. There is one in the *Globe* which begins with perhaps the most enormous flourish of drums and trumpets anywhere to be found. Synopsis and tabulation are the watchwords of this exhaustive critic. He paraphrases the architects' reports and supplements them by the architects' answers to questions which he in all the dignity of his office, swelled by synopsis and robed with tabulations, has evidently issued, so to speak, *ex cathedra*. Of course alarums and excursions on such a scale could not fail but come to grief; and the history of this reviewer was cut short in the flower of his youth. In a word, the law courts exhausted him before he began even to criticise. A very different plan is that of the art critic of the *Times*. He devotes something less than two columns to the whole subject. About half of it is criticism, such as it is, and the other half is what may be called popular introduction, with here and there an offhand remark on the different natures of Italian and Gothic architecture, which would be regarded as flippant in a journal of less mark. Here, for instance, is a dictum uttered with a gravity which is very amusing:—"The Italian style of architecture because more symmetrical [than the Gothic] is less manageable, less easily twisted and pulled about, while to succeed in its ornamentation a very rare degree of genius is required." Then, speaking of the great building in question, the writer, as might have been expected, goes in strongly for the tailoring view of architecture, which assumes the arrangement of rooms to be the one difficult problem, and the fine art a mere cloak which is easily thrown over it, and which one architect can cut out just as well as another. He says, "the question of its beauty shrinks into a corner beside that of its convenience." And, again, "the enormous difficulty of the undertaking lies, not in the invention of a beautiful, but in that of a fitting edifice." These are no doubt very fine-sounding phrases, but unfortunately they possess nothing else but sound, save the unmistakable evidence of appropriation, for they are really only weak reiterations of Mr. Williams's fallacious anti-art argument which we dwelt on in a former article. When, however, we come to the reviewer's notes on the "artistic effect" of the several designs, our amusement turns to pain. Of Mr. Seddon's great hall, he says, "it is sustained by colossal pillars, pillars of such enormous proportions that elephants and tigers not far from life-size can disport in their capitals." Now the whole height of the largest capitals in Mr. Seddon's design is certainly not higher than an elephant's leg; and as the animals only occupy a portion of the total height of the smaller capitals, we may confidently assert that the animals are not larger in proportion than many of those to be found in old buildings over which the *Times* reviewer, if he has any sense of art at all, would utter big words of praise. After this piece of detailed "criticism," we are naturally prepared for anything, and we are, therefore, not astonished to find Mr. Lockwood's overloaded design described as simple, compact, and light; nor are we surprised that the writer, having gone out of his way to abuse Mr. Seddon's work for what it can be mathematically proved it does not possess, should again turn aside and "feel that the leading ornaments" of Mr. Lockwood's design "are not overdone." We cannot, however, part with the *Times* without giving one more extract:—"Mr. Garling's design is one of the most symmetrical in the room—after Mr. Lockwood's perhaps the most compact. But the very attempt to produce compactness of design and simplicity of outline in so vast a building must tend to reduce its façade to the monotony of the side of a street. Mr. Garling has not been afraid of that monotony; and he has produced a design which is in every way creditable to him, although he must permit us to say that when the façade of a palace assumes in any degree the look of a street it is apt to be flat and heavy." We only hope Mr. Garling appreciates this, and will rest satisfied in having been able to produce a monotonous, flat, and heavy design, seeing that "it is in every way creditable to him."

As the *Times* article appeared on February 11, it of course named Mr. Waterhouse, the then popular favourite, as the least objectionable. But—and this was the shrewdest part of the article—as people, or what Spenser would call the "rascal many," were even then beginning to delight in Mr. Lockwood's fossil fireworks on the one hand, and were beginning to be mindful of all that Mr. Scott had done for art on the other hand, the writer in the *Times* did not forget to pat the backs of these two champions, and raise them so close to Mr. Waterhouse that in the event of one of these becoming the favourite it might be doubtful how far the architectural prophet of the *Times* had given the right tip.

Of far more importance than any of the articles in the daily papers are those which appeared in the *Athenæum*. The writer in that journal has evidently taken considerable trouble over his work, and has devoted very much space to the consideration of what ought certainly to result in the greatest art work of the age. The *Athenæum* rejects at starting six of the eleven designs. Of the remaining five the art-critic says, that any one "is equal to the occasion in its serviceable as well as in its artistic aspect: these are the works of Messrs. Street, Seddon, Burges, Waterhouse, and Scott." Then, like many other modern writers on architecture who have had no positive architectural education, the critic suddenly becomes amusing. Mr. Burges's design is described in very florid lines, and as we cast our eyes down them we become aware of such words as "picturesque effects," "exquisite," "graceful," "deliciously piquant," "noble," "superbly imagined;" and then we have, "none of Mr. Burges's rivals has surpassed him in strength of design."

So far so good; but the ink of these words could scarcely have been dry before our critic thus writes of this same design:—"Less masculine than Messrs. Street and Seddon, there is more of unlicensed freedom in his ideas than in theirs." What in the name of common sense does this mean? We suspect the critic himself does not know. A certain design is stronger than, or at any rate as strong as, any others, and yet is less masculine than two which happen to be the most delicate—we might almost say the most effeminate, certainly the least "masculine"—of the eleven. Another instance of that loose writing which seems to infect critics whenever the subject matter is architecture is illustrated in the *Athenæum's* notice of Mr. Scott's design:—"On the plan the courts form a line exterior to that of the ambulatories, and are placed on an 'accommodated' floor; that is, level with the bench." That is to say, the floor of the courts is so "accommodated" as to be level with the bench. We hope such a truly unique accommodation will meet with the reward it deserves. Of course, neither Mr. Scott nor anyone else has been guilty of any such egregious folly. But whilst noticing these drawbacks we cannot fail to recognise very considerable acumen in the summing up of the merits and demerits of some of the designs with which the *Athenæum* favours us. Of Mr. Scott, it says, "We should think Mr. Allom, who was Mr. Scott's draughtsman, could single-handed design as fine a building as this, which already owes so much to him." Again, "Our verdict is decidedly adverse to the claims of Mr. Waterhouse's designs for a high place in art; generally speaking, they are the best examples of drawing-room Gothic we have seen." And of Mr. Burges, "We commend his learned, comprehensive, and very original plans to the attention of all architects and lovers of art."

Another of those amateur criticisms which show such a lamentable ignorance of architecture as a constructive art is that in the April number of the *Ecclesiologist*. The writer almost begins with a note of exclamation, or admiration, or whatever! stands for. Here is the sentence: "The mere criticism of even the plainest and best considered of these designs is simply bewildering. How much thought and trouble, what hours of labour and brainwork, must have been expended even upon the worst!" Of course, if this is intended for satire we have no fault to find, but if the writer earnestly thinks that there has been "thought" or "brainwork" expended on the worst sufficient to warrant a note of admiration, then we cannot give him much credit for his perception, and must hold the article as the work of a very doubtful authority. We should have been inclined to put it down for satire for the sake of some passages of really good criticism which occur now and then; but unfortunately directly we turn the page we read, "There is not one design in the whole series that does not exhibit much earnestness and some degree of success." A dozen lines lower down we find this criticism of Mr. Abraham's design:—"The whole is clumsily heavy, and with details of the poorest possible description." And yet this we are asked to believe shows "*some degree of success*." Clumsy heaviness and the worst possible detail are, we are told, the fruit of "*much earnestness*." What is the editor of the *Ecclesiologist* doing that he allows such utter nonsense as this to be printed? Anyone can in a moment see the mistaken kindheartedness and the desire to speak truthfully which lie at the bottom of this nonsense. We can see the writer *wishes* to be gentle to everyone, but finds, when he comes to take up his parable, that blessing must for truth's sake turn to cursing. Some of this adverse criticism is remarkably good. Mr. Lockwood's design is considered "almost the worst of the whole lot." Mr. Garling's "would have been considered fair twenty years ago." "Mr. Barry seems to have been unable to get the idea of St. Paul's out of his head." Mr. Deane everywhere shows "a want of power and real feeling." On the other hand, Mr. Seddon is audacious, marvellous, powerful, and bold. How architecture that is full of power, or how a marvel of art can be said to be audacious, is a question for the solution of which we must look to the heart rather than to the head of the critic. Mr. Brandon and Mr. Street, from whose designs there is very much to be learnt, come in for a large share of what the *Ecclesiologist* might call "discipline; whilst in very powerful contrast to these gentlemen Mr. Burges is exalted to a pedestal where all is "exquisite and pure." And even his undoubted weakness for excessive machicolation is defended in the style almost of a special pleader. We doubt very much whether such blind criticism does not do the architect more harm than good, and that in more ways than one. As to whether Mr. Scott designed his elevation or plan first, or whether they were thought out simultaneously, matters little to us now. Mr. Scott, and all who talk

like him about *clothing a plan in a fitting garment*, are talking nonsense if plan, and section, and elevation grow up in their minds simultaneously and together. We take it they mean what they say, and accept the architecture offered us for what *the clothes* are worth. So far the reviews we have mentioned are manifestly the work of amateurs; when, however, we come to the smart writing in the *Westminster Gazette*, we recognise another style of thing altogether, for the reviews in that periodical are evidently either written or inspired by an architect whose name there would be little difficulty in setting down aright, did we care to turn our articles into advertising mediums. The writer in the *Gazette* has given us not a few trenchant criticisms, but they are spoilt by the general character of the articles, which is distinguished, and markedly so, by an unwholesome degree of acerbity. We can quite understand the critic's demand for an extended competition. We have said from the commencement that *the selection* of architects was a mistake which was sure to culminate in an injustice to the public and the profession. The majority of the competitors must know, as all their brethren know, that by some means or other they were chosen, to the exclusion of *better* architects than themselves. But justice to the public is quite another thing. The public cannot be sure of getting the best article for their money with such a competition as this, whilst extending the number of architects from the first chosen few to a dozen was by the selection rendered a mere farce, and was eminently characteristic of the British House of Commons. But, whilst we say this, and desire to say it as emphatically as we can, whilst we have no hesitation in asserting that several of the competitors have no earthly right to be in this competition, we cannot go so far as to endorse the language used by the critic in the review under notice. A few specimens of the language will suffice. Thus, of Mr. Barry's design, one feature is singled out and likened to a "bunion on a foot," it "damns it at once." Of Mr. Scott's everything save the portico is "really detestably bad;" some things are "simply appalling;" others "weakness made visible," whatever that may mean; some are "unconstructional expedients;" and in the windows reigns "dreary monotony." The assistance the late Mr. Pugin rendered the late Sir Charles Barry in designing the Houses of Parliament is dovetailed into the review, and this, taken with the reviewer's extravagant laudation of the present Mr. Pugin in his correspondence with "Philocalus" in the *Standard*, reveals pretty clearly the partisanship of the writer. Now we have mentioned "Philocalus," we may as well tell him that we think his unqualified praise, not to say puff, of Mr. Burges's design—a work which though possessing many merits has also not a few crudities, if not positive errors—is not calculated to do good either to art in general or to the architect in particular; and that the fight between these two partisans of two rival houses was, to say the least, undignified. Neither Montague nor Capulet in this case are distinguished for an excess of modesty, and we never need be afraid that either one or the other will let his light shine under a bushel.

Mr. Fergusson—we mention his name with profound respect for his earnest thought and long labour—has honoured this competition with a few remarks, the gist of which, so far as we can understand them, seems to be that he can find no originality in any of the designs. His suggestion that originality might have had a chance had the Pointed arch been excluded from the competition is very weak, and most unworthy of the author of the "Handbook of Architecture." Can Mr. Fergusson be labouring under the delusion that a plain or one-centred arch is more original than a two, three, or four centred arch? If we did not know Mr. Fergusson to be one of the most amiable of men, we should regard such an attack as this is upon the Pointed arch as the ebullition of some blind fury grounded in disappointment or rooted in despair at the strong position which Gothic art has taken through the earnest labour of the best men in the profession, supported by the great literary power of the greatest art critic of the age.

We come now to the best reviews which have appeared on these designs for our Law Courts. The *Chronicle* and the *Saturday Review* may be congratulated for articles which exhibit an intimate knowledge of the subject, without exhibiting anything to warrant the suspicion that the writers had been "coached" by an interested and professional hand. Both reviews agree with us in placing Mr. Burges's design first. And from men who *really* understand *architecture as represented in architectural drawings*, we have heard but one opinion, and that not given grudgingly—viz., that Mr. Burges has produced by far the greatest work in this competition. It is worth notice, however, that even our best critics are so dazzled by a fairly thought out design as to become blind to its faults. Mr. Burges's work, as we have pointed out in a former article, has its demerits—demerits in proportion of parts—in other words, in excesses of power, which show, it is true, a certain force, but it is the force which leads to coarseness, and may if unchecked develope into a barbarity. The great merits for which Mr. Burges deserves praise are those without which we cannot grasp the idea of a large building—we mean simplicity, scale, and rhythm; but when we come to speak of separate parts—of piers in relation to arches, of scale of sculpture, small full-length statues at the top, and half-length figures of larger scale at the bottom—we feel that the architect himself would be the very first to say that he was mistaken. These things we should not have troubled our readers by reiterating, had not the reviews under notice been as unqualified in their praise of one as they are unqualified in their blame of others. Mr. Seddon, for instance, has been most unjustly treated even in the best reviews. "A grotesque jumble of spires and gables," as the *Chronicle* calls his design, it most unquestionably is not. We have never thought very highly of it; but it stands amongst the very few which are worth thinking about at all.

We conclude these notes with an extract from the *Solicitors' Journal*, which shows how the *Fine Arts* are regarded by one of the organs of that learned profession for whose special benefit the concentration of our law courts has been devised. The consideration of professional convenience "seems to us of such supreme importance that no question whatever ought to be allowed to come, even in the slightest degree, into competition with it;"—"The Registrars of the Court of Chancery have with one dissentient determined to recommend Mr. Brandon's design."

Vox et præterea nihil.

MR. BARRY'S DESIGN FOR THE NEW LAW COURTS.

We give on another page an illustration of the Strand view of Mr. Barry's design for the new Law Courts. Though we were free in our criticisms on all the designs, we intended from the first to give perspective views of all of them, so that our readers might judge for themselves.

HARBOUR BUILDING IN FRANCE.

The substitution of artificial composite blocks for quarry-hewn stones has met with much greater favour, and is much more extensively employed, in France and on the continent than in England. The French have always been addicted to the use of concrete, béton, and pierre perdue, to a much greater extent than ourselves—in fact, these materials form a very important item in the construction of all their harbour and marine works. Recently, says the *Mechanics' Magazine*, at the works of the new harbour at Brest, denominated "Port Napoléon," these artificial blocks have been manufactured on a stupendous scale, containing individually over 50 cube yards of materials, and weighing above 120 tons. They are constructed upon timber platforms covered with a thin coating or layer of clean sand. The first specimens were provided with external grooves for the purpose of raising them by the aid of chains, but this method involved so much trouble and risk that it was speedily abandoned, and another plan adopted. It consists in bedding four rectangular pieces of timber, about 2ft. square and 4in. thick, within the block near the corners, and placing them at a depth of 1ft. above the bottom, that is, the under surface of the timber is 1ft. from the lower external surface of the block. When this latter is completed, four vertical holes or slits, 5in. by 1ft. 4in., are bored down from the top to the timber and continued through it for the purpose of inserting iron suspension pivots to which iron lifting rods are attached. One great advantage of this plan of raising is, that, when necessary, as it sometimes is, the blocks can be taken up again after they have been actually placed in position, an operation impossible to accomplish with the lifting chains. The blocks are composed of rubble stone, Portland cement, and sand, the proportions of the two latter being nearly four to one. Great care and attention is bestowed upon the manufacture, and the quoins are dressed and chamfered in order to ensure close joints and a good fit between the contiguous blocks when deposited. A large number of blocks were put together upon the open strand by tidal work, as it is called, but so great a loss of time and material was incurred by this troublesome and intermittent process of manufacture that it became evident it would be more economical to construct them altogether out of the reach of the water and its destructive influence. Accordingly, a slip 375ft. in length was prepared, with an inclination of 1 in 16, upon which were placed the movable platforms carrying the artificial blocks. These latter being completed, the platforms are drawn down the slip by an endless chain arrangement, set in motion by steam power. So soon as the block has descended to the required depth it is seized by a crane; the platform, relieved of the weight, immediately floats upon the surface of the water, and is easily drawn up again upon the slip. About thirty blocks, with their separate platforms, can be accommodated at the same time upon the slip.

Archæology.

A bi-monthly meeting of the Leicestershire Architectural and Archæological Society was held in the Guildhall, Leicester, last week, the Rev. J. H. Hill in the chair. The following among other antiquities were exhibited:—By Mr. Henry Goddard, architect.—A collection of Roman antiquities, found in the Friars, Leicester, in the year 1866, about 5ft. below the surface. The collection comprised a bronze needle and pin, four bronze styli, three bronze pins (one with ornamental head), portion of bronze fibula and a coin (bronze) of Vespasianus. Also from the same locality two large boar's tusks, each measuring 8in. in length. Mr. Goddard further showed a mediæval salt cellar, made of white metal, found in Cart's-lane, Leicester, 8ft. below the surface. Mr. W. Johnson, Saddington, produced drawings of some further antiquities recently found in the Anglo-Saxon Cemetery at Melton Mowbray. Mr. North explained that during the unbareing of a portion of the earth for the purpose of working the clay for the making of bricks additional discoveries of interest had been made, which he hoped to explain at a future meeting. Spears, a sword, and the fragments of a bucket with small pieces of pottery had been brought to light, and Mr. Johnson had very kindly made drawings of the two latter objects, which he then exhibited. Mr. North produced a massive gold finger ring, weighing more than 12 dwt., lately found in Leicester. On the bezel is borne a female bust surrounded by an inscription undecipherable. On the shoulders of the ring is the French motto, in old English letters, *ells me pleit*—she pleaseth me—round which are borders of forget-me-nots. On the inside of the hoop is the "posy" or "reason," also in old English letters "god be my help at nede." The forget-me-nots, and probably the bust, have been handsomely

enamelled, fragments of which still remain. This interesting and valuable ring (which is apparently of the fifteenth century) is the property of Mr. Loseby, Hotel-street. The Rev. J. Fisher communicated some notes upon the destruction of Heralds' College in the Great Fire of London, and the preservation of its contents.

ARBITRATION IN THE BUILDING TRADE AT WALSALL.

A CODE of rules has just been adopted by the master builders and the operative carpenters and joiners of Walsall, for the regulation of these branches of the building trade. The main features of the arrangement are as follows:—The operatives desired that the hours of labour should be 55½ hours per week, work ceasing at one o'clock on Saturday; and that the wages of average workmen should be 27s. per week, the wages of superior or inferior workmen to be decided by the foreman or employer. The employers proposed that average workmen should be paid at the rate of 5½d. per hour, and that work should cease at four o'clock on Saturday, walking time to be allowed on that day to men working at a greater distance than four miles from the shop. The arbitrator has fixed the rate of wages at 27s. 6d. per week, in consideration of work being continued until four o'clock on Saturdays. After May 1, 1868, however, the work was to cease at one o'clock on Saturday, and the rate of wages will be reduced to 27s. per week. With reference to overtime, the operatives desired that the first two hours should be reckoned as a quarter of a day; that all overtime between 7.30 p.m. and 6 0 a.m., should be paid for at the rate of time and a half; and that Sundays, Good Fridays, and Christmas Days should be reckoned as double time. The employers desired the first 2½ hours to be reckoned as a quarter of a day, from half-past five until a quarter to six being allowed for tea time, and all further overtime to be paid for by special arrangement. The arbitrator decides "that no workman be bound to work overtime, but if he should agree to do so, the first 2½ hours shall be counted as a quarter of a day, and every subsequent two hours shall be counted as a further quarter of a day, and such overtime shall be paid for accordingly." As to payment of wages, the operatives desired that it should be commenced at the works, or office, not later than ten minutes past one o'clock. The employers proposed that it should be commenced not later than half-past four o'clock, and in no instance at a public-house. The arbitrator sanctions the proposition as to wages not being paid at a public-house, and decides that payment must be commenced within ten minutes after the hour fixed for closing on Saturdays. With reference to proceeding to work, the operatives proposed to start to any job not exceeding three miles distance from the Bridge at six o'clock, the hour fixed for the commencement of work, and to walk back in their own time, except on Saturdays; but on all jobs more than three miles distant, lodgings and railway fare to be paid by the employer. The employers proposed that the men should walk the first mile from the shop in their own time, and be allowed for every subsequent mile at the rate of three miles per hour, returning in their own time; and that jobs at a greater distance should be subject to special arrangement. The arbitrator approved the first part of the masters' proposition as to starting to and returning from work, adding that "on Saturdays each workman shall leave work at such a time as will enable him to be at the paytable at 4.15 p.m. For all distances exceeding four miles, a sufficient sum for lodgings, time, and travelling expenses to and from the place of work, shall be paid by the masters to the workmen." As to notice the arbitrator decides that one week must be given, but in case of drunkenness or neglect of work, any workman may be discharged without notice. Notice of any contemplated change in the rules is to be given in January, and shall expire on May 1 following.

Building Intelligence.

CHURCHES AND CHAPELS.

Mr. F. R. N. Boswell, of North Shields, is the architect of the new chapel at Topsham, and not Mr. Orwell, as stated in our last.

The parish church of Sutton in-Ashfield, near Nottingham, is about to be restored, from designs prepared by Mr. C. Neale, of Mansfield, at the estimated cost of £1,100.

BRAYWOOD.—The Bishop of Oxford on Saturday consecrated All Saints' Church here, an edifice erected by his Excellency the Belgian Minister and Madame Van de Weyer, as a memorial to the late Mr. Bates, the father of Madame Van de Weyer. The church, which, with its commodious parsonage, cost nearly £15,000, stands within the parish of Bray, on the border of Windsor Forest. The style of architecture is Gothic, of the transition period between the Early English and the Decorated. The structure is in the form of a cross, having chancel, nave, and transepts, and adjoining the south transept is a lofty tower, which at one angle is surmounted by a turret containing the termination of a winding staircase. The nave and transepts have open timber roofs; the chancel has an oak wainscot ceiling. The pulpit is of white marble, elaborately carved. The altar rails, the sedilia, the lectern, &c., are supported by brasswork of Gothic design. In the north transept there is an organ, built by Messrs. Bevington. It is intended that there shall be a peal of five bells in the tower; at present only one of them, cast by Messrs. Mears, has been hung. The architect is Mr. T. Talbot Bury, of Welbeck-street, who was the architect of New Lodge, the palatial residence built for his Excellency some nine years ago; the builders are Messrs. Dove, Brothers.

CHRIST CHURCH, GIPSY HILL, UPPER NORWOOD.—This church was consecrated on Saturday last by the Bishop of Winchester. The Bishop referred in very flattering terms to the structure, and said he had never seen its superior. The building accommodates 1,200 persons, without galleries. It is built of Kentish rag with Bath stone dressings. The internal columns throughout are of red and grey polished granite, and the five windows of the chancel, which is apsidal in form, are already filled with stained glass memorial windows. The builders' contract was under £7,500, including 40ft. of the tower; the remainder and the spire have yet to be completed. The architect is Mr. John Giles, of Craven-street, Charing Cross. Eleven months only have elapsed since the foundation stone of the church was laid.

LOW MOOR.—The corner stone of a new church (St. Paul's) for this hamlet was laid on Monday. The building is designed in the thirteenth century Gothic. It is to be built of limestone, with dressings of freestone. The aisles are divided from the nave by an arcade of four arches, with circular columns and moulded capitals and bases. These, together with all the interior stone work, will be executed in stone from the neighbourhood. The roof is to be of deal stained and varnished. There are open seats throughout, and accommodation is provided for 600 people, all in the body of the church. The seats throughout will be free and unappropriated. The cost of the church will be about £3,500. Messrs. Stevens and Robinson, of Derby, are the architects.

ROSS.—A new Wesleyan Chapel has been opened at Ross, Hereford. It is in the Gothic style, and will accommodate about 300 persons. The architects are Messrs. Pearson and Son, of Ross, the builders Messrs. Smith and Son, of Weston. The cost is about £1,100.

RUSSELL TOWN.—The corner stone of a new Congregational Church, at Russell Town, Bristol, was laid last week. The style is Gothic. The front gable will be surmounted by a turret of stonework supported on eight pillars, with carved capitals. The roof is to be of open timber work supported on pillars with octagonal shafts and massive timber ribs and arches, the whole covered with a ceiling of wrought and chamfered diagonal boarding, stained and varnished. The church will seat 800 persons. The present cost is estimated at £3,000, the whole of which will be defrayed by Mr. William Sommerville. The designs for the church were prepared by Mr. W. J. Green, architect, of Portman-street, London; and the general contractors for its erection are Messrs. Harding and Vowles, of Castle Green.

BUILDINGS.

Mr. Smith Child, of Stallington Hall, Stone, has given £800 for the erection of a block of cottages for convalescents and incurables in connection with the North Staffordshire New Infirmary.

A limited liability joint stock company has been formed at Bideford for the erection of a large room for use on public occasions, the present room at the Mansion House being extremely small and inconvenient.

Mr. Charles Burkitt, of Wolverhampton, has commenced Dromore Castle, for the Earl of Limerick. An illustration of the building appeared in the BUILDING NEWS of March 29.

The new Promenade Pier at New Brighton, which was commenced about six months ago, is now nearly half completed. It runs parallel with the ferry pier on the north side, at a distance of 20ft., and will be 550ft. long, and from 70ft. to 130ft. wide. It is built of iron columns and girders, the columns being sunk in the rocks. The engineer is Mr. E. Birch, of London, and the contractor is Mr. J. E. Dowson, also of London.

BRIGHTON.—The site of ground between West-street and Middle-street, proposed for an arcade, is to be appropriated for the building of a large concert hall, capable of holding 3,000 persons. It is now in course of erection, Mr. Horatio N. Goulty being the architect. The size of the hall is to be 200ft. long by 46ft. wide. There will be restaurant, billiard rooms, &c., attached, and extensive wine vaults. Independently of accommodating 3,000 persons, there is to be an orchestra for 400 performers and an organ.

COLDBATH FIELDS PRISON.—The county magistrates of Middlesex continue the rebuilding of Coldbath Filds Prison, on the radiating cellular plan. Another new wing has just been finished, having been built by Mr. Lovatt, of Wolverhampton, and when tenanted a further one will be begun. The great garden and drive up to the gates have been taken in, and a new governor's house has been built right forward to the street frontage.

FAIRWATER.—The erection of the new Independent College, at Fairwater, near Taunton, has been begun. The building is estimated to cost £10,500, the land and other extras making a total of about £20,000. It will be in the Tudor-Gothic style, 220ft. in length, with two wings, and a tower 106ft. in height. The chief schoolroom and diningroom will be 65ft. by 20ft., and will accommodate 200 boys. Dormitories will be erected in the first instance for 150 boys. Mr. Joseph James, London, is the architect; Mr. Davis, Taunton, the builder; and Mr. Salmon the clerk of the works.

HALIFAX.—The Parish Church New Schools were opened on Monday. The building is in the Perpendicular style. The architects are Messrs. Mallinson and Barber, Halifax. The schools are built of stone, and have cost £5,000. They form three sides of a square. Within the square is an open paved yard. Internally the school-room is 130ft. long by 28ft. wide and 26ft. high, and altogether will accommodate close upon 700 children.

LONGRIDGE.—On Saturday afternoon the foundation stone of two Roman Catholic schools was laid at Longridge, Preston, by the Rev. H. Browne, of Ribchester. The schools, which are to be built one over the other, are each 60ft. long by 25ft. wide, with class rooms 16ft. long by 14ft. wide. The style adopted is the free treatment of Early English. The whole is to be built of stone with brick backing (which latter have been made on the spot). Mr. R. W. Hughes, of Preston, is the architect, and the present contractor is Mr. W. Gorst, of Longridge.

NEW RESTAURANT. — A new and handsome restaurant will soon be added to the number in the neighbourhood of Regent-street. It is in Glasshouse-street, two or three doors from Regent-street, and £10,000 has just been expended in decorating and altering it. Evidently no money had been spared in any part, and some of the ornamentation is very tasteful. The outside is plain, the only thing worthy of remark being the pilasters of the ground floor, which have incised ornaments on the face richly gilt. About 6in. space is left between the wood frames of the large windows on this floor, and the stone lintel, which being filled up with open ironwork forms a capital ventilator, and one worthy of more general adoption in shop windows, &c. The bar on this floor, and the dining-rooms on the floor above, are profusely decorated with looking-glasses and paintings, in a light airy style, and the walls of the billiard and smoking-rooms are covered with tiles in rich pattern to the ceiling. The billiard-room is at the top of the house. The kitchen department is fitted up with every modern convenience. We may say, in passing, we think either architect or builder has made a mistake here in making the centre table of heart of oak, which bids fair to split in every direction. Lifts are provided throughout the establishment.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the EDITOR, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—E. W. G.—G. E. W.—F. B. R.—C. B.—A. B. C.—R. C.—G. S.—T. M.—J. G.—H. E. R.—T. K. M.—T. K. M.—G. W.—E. W. P.—J. H.—J. W. D.—J. G.—J. T. B.—S.—T. J. H.—P. and C.—J. F.—J. C.—W. L.

"A Competitor" should communicate direct with the society.

"Ignoramus" should consult a solicitor.

"Our Water Supply" contains nothing but what has been said before in our pages.

Correspondence.

HOUSES IN GLASGOW.

To the Editor of the BUILDING NEWS.

SIR,—The following circular has been sent to "the architects of Glasgow" during the past week. It will suggest to you one of the many measures that are being taken in Glasgow in the way of sanitary reform, and may perhaps be not unworthy of either transcription to your columns or an editorial notice.—I am, &c., T. G.

Glasgow, June 6.

QUESTIONS SUBMITTED BY DR. GAIRDNER TO THE ARCHITECTS OF GLASGOW, AS THE RESULT OF A CONFERENCE WITH SOME OF THEIR NUMBER, ON THE SUBJECT OF CERTAIN PROPOSED ARRANGEMENTS WITH RESPECT TO HOUSE ACCOMMODATION, ESPECIALLY FOR THE CLASSES PAYING LOW RENTS.

1. In the laying out of new sites, what is the best direction of the streets—east and west, or north and south?

2. Are mewse lanes essential for the economical and proper removal of ashes and refuse, as well as for preserving the amenity of the property?

3. When there are several tenements under one management, is it advisable to have washing-houses attached to each tenement, or one washing-house, and proper laundry and drying-rooms for the use of several tenements?

4. Is it essential to have a water supply for each occupancy, however small? and is it possible, when there is a large extent of property under one management, to furnish a supply of hot water, especially to the labouring classes?

5. Should the water supply in the smallest houses be within the house, or at the landing, or elsewhere? and if you do not approve of a supply within the house in such cases, what arrangements do you consider essential with respect to the sink or jawbox, and waste pipe? Should the supply of drinking water be taken invariably direct from the main?

6. When waterclosets are to be fitted up in tenements occupied either as dwelling-houses or as places of business, should light ventilation by means of windows in the external walls be considered imperative; or, if not, what substitute, by means of internal shafts or otherwise, should be provided? and further, have you any practical suggestion to offer as to the proper disposal of the refuse?

7. Is it possible by some inexpensive system to provide, in connection with the construction of the building, a means of supplying fresh air and abstracting vitiated air from dwelling-houses, especially those of the working classes, without such system being liable to be interfered with by the occupant?

8. Having regard to the fact that between 30,000 and 40,000 households in Glasgow (comprising about one-third of the entire population) inhabit "houses" of one apartment; and considering that, in many such cases, the household consists not only of the members of a family, but of these with one or more lodgers; considering, also, that in many instances, tenements originally divided into "houses" of two and three apartments have been altered to suit the convenience of parties paying low rents, into aggregates exclusively of single-roomed houses; considering, further, the difficulty of accommodating tenants of this class, so as to give reasonable securities against the spread of epidemic disease; and the influence, to a certain extent inevitable, of such dwellings on the health and the habits of those who live in them; how far would you be disposed, in future, to encourage or to discourage the construction of tenements consisting chiefly or exclusively of single-roomed "houses?"

9. To the extent to which you would allow of such houses being built (the question, however, may be considered also as applying to low-rented houses generally), what is the best mode of access to the individual houses of a large tenement of several stories, much subdivided, as above described? Should there be any limit to the number of families having access by one common stair? and, if so, what ought to be the limit? What improvement have you to suggest on the long, dark, ill-ventilated passages and staircases presently in use? or are you favourable to the plan of open galleries, giving separate access to each house, as to a main door, or to the grouping of two or three houses, but not more, round a common access or entry?

10. In such cases, and under the various arrangements that may be suggested under query 9, do you consider the waterclosets system or the privy system the more suitable to the wants of the population, and the more expedient in a sanitary point of view? If the former, how would you dispose the waterclosets? one to each household, to each two households, three households, or more?

N.B.—It is presumed that under query No. 6, all the absolutely essential requirements of the waterclosets have been stated in general terms.

11. Should it be compulsory on proprietors of estates, in laying out their land for feuing, to provide open places or squares according to some defined rule; for example, wherever the property to feu amounts to five acres, an open space equal (say) to one acre, to be provided exclusive of streets, and so on in proportion to the extent of the land to be feued? If your answer to this question is in the negative as regards the "compulsory" element, state your views as to the mode in which the object in view might be attained, if thought desirable otherwise.

Sanitary Department.

Mr. J. F. Redfern, the sculptor, has been appointed to model eight figures to represent the Virtues which are intended for the Albert Memorial now in course of erection in Hyde Park. These statues will be reproduced by the electrotype process, and included in the canopy of the Memorial. We understand they are to cost about £1,000 each.

Intercommunication.

QUESTIONS.

[415.] — IMITATION IVORY PHOTO-CHROMOGRAPHS.—I read some short time since, but forgot to take a note of it at the time, of a method of colouring miniature photographs intended to be set as brooches or lockets. Can any of your readers say what this method is? B. O. T.

[416.]—FOREIGN TILING.—Can you inform me where there is a good collection of foreign tiles exhibited in London? Can you also point out the peculiarities of the two French tiles known as the Courtois and the lozenge? APPRENTICE.

[417.]—ZINC.—Does cement injure zinc? Z.

[We do not think cement affects zinc at all, but it is certain that the lime of Paris does. When cisterns or other zinc constructions are confined with brickwork, in mortar, it is important to fill them round with earth, so as to protect the zinc from the lime.]

[418.]—PAVING STONES.—I observe a paragraph which has "gone the round" of the press briefly referring to a steam machine for cutting paving stones. Can you give me any particulars relative to this curious invention? Has it been tried in this country? VIATOR.

["Viator" is informed that a short description of the steam machine referred to was published in the BUILDING NEWS some months ago. The apparatus consists of a sort of bridge extending over the bed of stone, and provided with rails, carrying the machine, which sets a heavy steel hammer in motion, by which the material is broken into pieces of the dimensions required, the strokes being dealt in three directions. The invention has not been introduced into this country, so far as we know.]

[419.]—SLATES.—Kindly say in your next number, if you can, whether it is the practice of managers of slate quarries to allow any number of slates over the number ordered. I believe it is sometimes done; but is the practice general? J. P.

[We believe it is. We have a trade circular before us, which says:—"As an allowance of 60 slates over in every 1,000, and one cwt. in every ton, is made to cover breakage, at the time of delivery of the slates on the wharf or shipment, or at the station for rail, and as the purchaser never pays for any excess he may receive beyond the quantity invoiced, viz., 1,200 slates to the 1,000, and 20 cwt. to the ton, no abatement or further allowance will be made for any deficiency from breakage or other cause, and the purchaser takes his chance whether he receives any surplus above the 1,200 slates to the thousand, and 20 cwt. to the ton, or otherwise."]

[420.]—EXPORTING CEMENT.—Can you inform me which is the best and cheapest mode of conveying cement on long voyages? ALPHA.

[It has been found that the most inexpensive and safest mode of conveyance of Portland cement on sea voyages is by means of packing it in wrought-iron tanks, measuring about 4ft. each way—a far more convenient mode than that of using casks. We remember hearing of a case in which an engineer had, on several occasions, sent cement in this way to some harbour works he was constructing without a contractor in South Africa. It appears to have resisted all moisture and damp on the voyage: and the iron tanks had been sold for more money in the colony than they had cost the engineer.]

[421.]—ARTIFICIAL IVORY.—I should be glad to be informed how artificial ivory is made. B. J.

[422.]—THE ELLESMERE MEMORIAL.—Can you, or any of your subscribers, favour me with the names of the three architects selected for the Countess of Ellesmere's memorial at Manchester. A COMPETITOR.

[423.]—GLAZED EARTHENWARE.—Can any reader of your valuable journal inform me how I can make good glazed earthenware for pharmaceutical purposes, as the common earthenware being glazed with a composition containing lead renders it unfit for this purpose? A. S.

[424.]—WINDOWS IN PARTY WALLS.—Will some learned subscriber be so good as to answer my little query. A has property in a country town, and wishes to build thereon, adjoining which B has a cottage with two windows in the back wall which will greatly inconvenience the builder. These windows are not wholly essential for a decent light of the rooms, as more are on the opposite side, but B has legally obtained a right of light, as I think these windows have been there more than thirty years. What distance must A keep his building from B's wall, so as not to incur the annoyance of pulling down after built? IGNORAMUS.

[425.]—PRIZE DRAWINGS FOR LABOURERS' COTTAGES.—Some three months ago the Bury St. Edmunds Agricultural Society advertised for plans, &c., for a double cottage for labourers, offering two prizes for first and second best, the drawings to be sent in by May 25, and the show of the Royal Agricultural Society to be held there in July, all drawings sent in to be then exhibited. Now I should like to know if any decision is to be published, or are the competitors to be kept in the dark until July? Can any of your correspondents oblige me with any information? A COMPETITOR.

[426.]—SURVEYORS' COMMISSION.—Supposing I was employed by a builder to furnish him with quantities for contemplated building works offered to open competition, in a case where the same are not supplied by the architect or his surveyor; what is the usual commission chargeable upon the amount of estimate, in the event of the said builder's tender not being accepted for such quantities? YOUNG SURVEYOR.

[The usual percentage for the work mentioned by "Young Surveyor" is 2½, but a very common practice is to make an agreement before hand, in such a manner as will include the contingency of the rejection, or rather non-acceptance of the particular estimate sent in.]

[427.]—THE COLLISION OF BODIES.—Can you inform me what are the different laws which govern the force or results of impact upon elastic and non-elastic substances? There is something very curious about the movements of bodies in collision, whether they be elastic or void of elasticity. No doubt billiard players have observed strange phenomena in playing, and they know by experience something of the effects of collision. I doubt, however, if any of them can explain the laws which must regulate and determine the movements of the billiard balls. Croquet amateurs, again, have opportunities of studying the remarkable consequences of collision; but few know how to account for them on scientific principles. INQUISITOR.

[428.]—EARTHWORK.—In these days of sanitary improvement and railway extension, and when the surface of the country is being constantly disturbed for the purpose of forming cuttings and embankments, or of putting in foundations for aqueducts, viaducts, bridges, and buildings, it seems to me of the highest importance that that branch of practical art known as earthwork, should be more generally studied and better understood. Can you, Sir, or some of your subscribers, give me and others, who must stand in need of the information, any reliable particulars on the subject? I am not aware that any of the railway engineers, who cannot have failed in gaining of late years a vast fund of knowledge in this direction, have imparted any of it for the benefit of the scientific public. The geological characteristics of England, Scotland, and Wales are so extremely varied as to have given occasion, in the construction of lines of railway especially, for the creation of every kind of earthwork. Have any rules been deduced from actual practice—that best of all teachers—for dealing with different soils and strata, so as to ensure stability? How are we to guard against settlements and slips? What are the proper angles for embankments, the best means of testing the subsoil upon which they rest, and, in short, which are the best modes of constructing earthworks generally? Perhaps I am asking too much, but I am sure that many of your readers are able, if they are only willing, to satisfy my demands. CLAYPOLE.

[429.]—CONCRETE COTTAGES.—Can any of your readers give me any information respecting the company that is now forming for the purpose of erecting cottages in concrete. I hear that the capital is to be raised in £10 shares, and that the first lot of houses will be erected somewhere near Brixton. SPEC.

[430.]—TRANSFERRING PRINTS.—Is there any way of transferring prints, such as the illustrations of the BUILDING NEWS, on to drawing paper so as they might be coloured. I have tried Rowney's preparation but without success, it only does when the prints have not dried. Also which is the best method to glaze water-colour drawings. IMPROVER.

REPLIES.

[369.]—SQUARING DIMENSIONS.—I waited for your last week's issue, expecting to see some one more competent than myself inquire of "Apprentice" how he can reconcile the first part with the last of his reply to the above. He first tells us, "there is no shorter method of squaring dimensions than that mentioned by W. Carter." He afterwards says, "I always use feet and decimals instead of feet and inches, as it shortens the calculation;" but admits the system is open to some objection as it can not well be checked by others not used to that plan of calculating. I have done a great deal in squaring dimensions, and I know a little about decimals, but I confess to be quite in a fog as to how "Apprentice" works his problem without a vast waste of labour, and then not arriving at a satisfactory result. Perhaps I shall be better understood by stating a simple question—viz., "What is the cubical contents of a block of stone measuring 7ft. 10in. × 5ft. 4in. × 2ft. 3in.?" If "Apprentice" will kindly work out this question by his system of decimals and insert it in your "Intercommunication" column he will confer a great benefit to many others than A. S.

[395.]—HOW TO DESTROY FLEAS.—Allow me to inform "W. King" that he can get rid of the fleas in his house by washing the floors well with hot water, then while the floor is wet to get a pailful of cold water strongly mixed with chloride of lime, and give the floor another good washing therewith. This will effectually clear the rooms of these troublesome visitors. P.

[401.]—IRIDESCENCE.—Under this heading "Grainer," in your number of the 31st ult., asks, not one but a small series of questions. The cause of iridescence is the first point to which he alludes, and it is rather a peculiar one. Several theories have been propounded upon it by scientific men. Dr. Brewster, an excellent authority, traces the beautiful appearance of mother-of-pearl to the action of light upon an innumerable number of microscopic grooves on its surface. These grooves or lines number two or three thousand to the inch, and lying parallel to each other they wind in all directions. The light is reflected from the edges of these lines, and their bendings give off the different prismatic colours. The same remark applies to the soap bubbles of which "Grainer" speaks. With regard to the practical application of this knowledge and these circumstances to decorative art, I should be sorry to venture a strong opinion, but I think it is quite possible they may. Certainly similar effects to those exhibited by mother-of-pearl have been produced by cutting fine lines on glass and in a lesser degree on metals. There is much in the subject to interest and to incite to experimentation. The colours of all transparent bodies depend much upon their thickness, and the density of the particles of which they are composed, and if the density be changed so will the

colour be. The varying and delicate hues of the wings of certain butterflies arise entirely from the action of light upon the equidistant and parallel strie upon their surfaces. I am not sure that I have satisfied your correspondent entirely, but I trust I may have gone some distance toward that consummation. IAIS.

[404.]—ARCHES.—The question of "New Style" may be reckoned as a mere matter of opinion. I have seen semi-arches in Gothic buildings and I do not know that they detract from the appearance and harmony of the design. "The style" appears to be a great bugbear of our time. In criticising a design I have often heard it remarked, "but it is not in accordance with the style which you have selected;" and nothing is more absurd, for so long as the work is in harmony with its surroundings it is enough. When we select the style of a particular time it must not be expected that in a given position we should insert precisely the same work as the great architects who first developed that style. They are dead, and hundreds of years have passed over their era. We may learn lessons from the past, without being tied to the rules or crotchets of a particular architect, age, or country. We may travel the wide world over and shall find sermons in stones, books in running brooks, and good in everything. There are much grandeur and many beauties in what is called Classic architecture; and since we cannot invent for ourselves, let us combine them with the Gothic of our own times, and then we may have the foundation of a new style, and raise therefrom the fabrics that may be the lasting monuments of an enlightened and progressive age. It will, however, be many years before these pretty dreams are realised. The architects of our day are settled into a kind of groove; and it would perhaps be neither profitable to themselves or their art to venture outside of it, for it may be granted they have selected that which they are the greatest adaptors of. But let them remember that those who lived 500 or 600 years ago did not invent all the pretty things. While architects are so poverty-stricken that they have to steal all they get, it is a pity they confine themselves to mediæval England or mediæval France, for they may find a country very rich at Rome, and if they will only put prejudice aside and collect the plunder into one lot with a strong smack of "England I love thee best," art may find itself very rich in the end, and quite able to live upon its fortune without drawing upon the strings of our great, great, great-grandfathers. J. H.

[411.]—RUBBLE.—There are the following among other descriptions of masonry:—Random rubble, which is set dry; ditto, set in mortar; ditto, set with quoins, joints, and architraves, and levelled in courses; snecked rubble, which is generally set in courses; rubble with ashlar binders; rubble in alternate courses, with bricks or with tiles; flint rubble, whole or cut; boulder or pebble rubble; slate rubble; herring-bone rubble, and so on.

[412.]—DOMES.—As a feature the dome externally is capable of very great variety; they may be of a number of different forms even in the same style. Mr. Samuel Huggins, in an interesting paper written some years ago, said:—"The simple Pointed dome, or that whose section is a Gothic arch without any surmounting object, except a statue, eagle, or in churches a cross, is a form, to the harmonious reception of which a classic pile may be fully adapted. And even in compositions wherein the spherical character of the dome must be preserved the best way of getting an elevated curve for the dome, which is often desirable, is by forming it of two arcs of a circle, that would meet at a faint point at the top. These are firmer than the elliptic curve, and the point, if needful, may be got rid of by the pedestal of any figure that surmounts it." Mr. Huggins thinks, as we do, that the dome is most worthily applied when it is made the immediate roof of the building.

WAGES MOVEMENT.

At the late arbitration meetings in Birmingham the whole of the trades discountenanced the system of making overtime, believing that it acted most prejudicially upon them, and it is somewhat surprising that a strike should have occurred because the masters declined to allow overtime to be made.

The eight-hour movement in the United States is gradually dying out. An eight-hour law has been passed in this State, as well as in Illinois and Missouri, but, as it has benefitted nobody, people are beginning to wonder why they made such a fuss about it. As a general rule, wherever the men insist on working only eight hours a day, they are only paid for eight hours, so that they are mostly glad to go on working ten hours as of yore.—*New York Letter.*

A Spanish engineer who studied his profession for many years in some of the largest machine workshops in Lancashire, and is now manager of a celebrated ironfoundry in the north of Spain, writes to a Manchester friend:—"Do you wonder why we don't order any machinery from England? The reason is simply that machinery to-day is constructed cheaper and quite as well in France as in England, and we get everything from there. Yes, my friend, don't you build castles in the air and think, as many of your countrymen do, that there is something in an Englishman superior to any other man. France and Belgium have caught you in the machine line, and will surpass you very soon on account of your strikes, disputes, and associations. It does not do to be too independent; a workman must always depend upon the master."

BARNSLEY.—There is no material alteration in the position of affairs with regard to the strike. The masters are making efforts to secure other men, but as yet without much success; a few have been set to work, but they were soon induced to desist by the men on strike. The union now allege that their number is reduced very much, many of the hands having obtained work elsewhere, while the portion is contradicted by the masters. Building operations, in many instances, are, of course, at a complete stand.

HUDDERSFIELD.—The strike of the labourers still continues, and there seems little prospect of a settlement being effected, as the men remain obstinate to their purpose, and the masters find little inconvenience from their being out. The demand of the men is for 20s. a week, and the employers will only consent to give 19s.

STATUES, MEMORIALS, ETC.

A marble memorial of Bishop Ken has recently been erected at Taunton, through the exertions of Mr. Kinglake and other Somerset gentlemen.

The Liverpool Town Council have resolved to place a statue of the Earl of Derby in St. George's Hall.

A statue to the memory of Henry Clay, the celebrated American statesman, was unveiled at Louisville, Kentucky, on the 30th ult.

Among the British sculptors now settled in Rome, writes a correspondent, Mr. John Adams has the prospect of achieving a most successful career. His studio has presented several works of great public as well as artistical interest this winter. In the first rank is to be placed the statue of Mr. Gladstone, which he is executing for the Corporation of Liverpool, and which, when finished, is to stand in juxtaposition with the statue of Sir Robert Peel in St. George's Hall. Mr. Adams is reproducing in bronze the bust of Mr. Gladstone, together with one of Lord Brougham—a most remarkable work for unflinching truthfulness in form and expression, and a capital likeness of Mr. R. Cobden, for Mr. Isaac Holden, M.P. for Keithley, in Yorkshire, for whom he is also casting in bronze the vigorous group of Orestes and Pylades carrying off the statue of Diana, which gained him the honour of being sent to Rome by the Royal Academy.

MEMORIAL TO RICHARD COBDEN.—London will shortly have its public memorial to this distinguished statesman. The site chosen is situated in Camden Town, at a spot where an extensive area is formed by the junction of the Hampstead-road, Eversholt-street, Crowndale-road, and High-street, Camden Town. The site was granted by the vestry of St. Pancras. The foundation, which was laid gratuitously by the contractor for the roads, consists of granite. The pedestal, now in the course of erection, will be of Portland stone, 8ft. square at the base; above the basement it will be hexagon in figure, tapering at intervals, and ornamented with carvings of fruit, flowers, and corn, the altitude of this portion of the monument being 15ft. It will be surmounted by a marble statue of the great freetrader, apparently addressing a public meeting. This important portion of the work is now in the course of completion by the sculptors, Messrs. Wills, of Euston-road. It is expected that the inauguration will take place in about six weeks from the present date.

LEGAL INTELLIGENCE.

CURIOUS APPLICATION UNDER THE MASTERS AND WORKMEN'S ACT.—An application was last week made to the stipendiary of Wednesbury, for an order for the discharge of Joseph Clarke, a workman in the employ of Messrs. Siddons and Sons, hollow-ware casters, Hill Top, from his contract with his employers. The application was made under one of the clauses of the Masters and Workmen's Act, and the ground of it was alleged misusage of Clarke by Messrs. Siddons, the misusage consisting in their not finding him sufficient work. It was stated that while they ought to have found him employment enough to enable him to earn £2 per week, he had not been able to get more than half that amount. The stipendiary asked plaintiff's counsel if he could show any authority in support of his view of the interpretation of the word "misusage." Counsel admitted that he could not, and the stipendiary accordingly dismissed the case, remarking that the applicant should seek his remedy against his employers in the County Court.

SEWAGE DRAINAGE.—An injunction which would interfere with an important public object, such as draining a town, will not be granted, on the ground of nuisance to a private individual unless there is an existing nuisance which materially diminishes the enjoyment of health or the value of property. This was the holding of Vice-Chancellor Malins in the case of Lillywhite *v.* Trimmer, which was a suit by the owner and occupier of a mill, dwelling-house, and premises, on the banks of the River Wey, to restrain the Local Board of Health for the district of Alton, in Hampshire, from causing or permitting a nuisance to his premises, or injury to the health of himself and his family, by pouring the sewage of the district into the said river, and from diverting the rainfall and the spring water which would have flowed into the river into their sewers.

General Items.

The medical journals record with regret that a decided case of cholera was last week admitted into the London Hospital. Is it not time to be at work? it is asked.

The first prize of £50 has been awarded to Mr. J. Neale, architect, Bristol, for his plan of Town Hall and Assembly Rooms at Luton.

The Eleanor Cross recently erected in front of Charing Cross Hotel has been subjected to many criticisms, and some of them not very favourable. Not so, however, thinks Archdeacon Trollope, who described it, before an architectural excursion party at Geddington last week, as a beautiful work of modern art, much grander than its prototype, and was deserving of all the praise that could be bestowed upon it, and consequently reflected the greatest credit on its architect—Mr. E. M. Barry.

A handsome promenade bridge and pier was inaugurated with great rejoicing last week at the attractive watering place of Weston-super-Mare. It stretches out to the well-known Birnbeck Island. The bridge, which is 1,150ft. long and 20ft. wide, extends from the extreme point of Anchor Head to Birnbeck Island, where at low tide there is always some depth of water. From the island the pier proper runs out into the Channel a distance of 250ft. The total cost of the bridge and pier is £20,000.

The opening of the extension line from Sindee to Nagpore took place on the 27th February. Passengers can now travel from Bombay to Nagpore, a distance of 520 miles, without changing carriages. It was a general holiday at Nagpore, and gentlemen came from far and near to do honour to the occasion. There were many gentlemen connected with the Great Indian Peninsular Railway present, including Major-General Harry Rivers, R.E., agent to the Great Indian Peninsular Railway; Mr. G. Berkley, C.E.; Lieutenant-Colonel Harry Maxwell, R.E.; Captain White, R.E.; Mr. G. Campbell; Major-General Shubrick; P. Arthur, C.E.; Mr. Rushton, &c. This extension will be of incalculable benefit to this district, inasmuch as it will bring Bombay and Nagpore within forty-eight hours distance.

The streets of Greenwich, says a morning paper, like other macadamised thoroughfares, are much complained of on account of the superabundance of dust in dry weather and of mud in wet, evils which are about to be remedied by an improved mode of paving, by which the small stones are united by a bituminous cement, and the macadamised surface thus laid ready made, without the tedious process of grinding into dust when the broken stones are scattered broadcast over the streets in the slovenly manner heretofore practised. This improvement will not only provide against the evils so generally complained of, but be much more economical to the ratepayers, as considerably less than one-half the materials will be required, as proved by specimens which have been subjected to heavy traffic there for the last two or three years.

We seem fond of doing things in an awkward and unreasonable way in London; and when the powers that be have a chance, they seem to delight to make things more awkward and unreasonable than they were before. A capital opportunity has just occurred in front of Westminster Palace of improving the main line of streets from Parliament-street and Westminster Bridge into Victoria-street. What then, in the name of all that is sensible, is the use of flinging it away and making a cross street as is now being done, which will be to all intents and purposes useless?

The Bishop of Oxford's Bill, anent the consecration of churchyards, has been printed. It provides that where adjoining ground is added to an existing churchyard, the bishop may, "at the churchyard or in the church," sign an instrument declaring or recording the consecration of such ground, without the presence of the chancellor or registrar of the diocess; and this instrument, attested by the chancellor or a surrogate, and deposited in the registry of the diocess, shall have the same effect as a sentence of consecration. There is to be a fee of 5s. to the registrar, on deposit of the instrument of consecration, but no fee to any officer of the bishop or of the diocess for attendance at such consecration.

Messrs. Clegg and Knowles, Messrs. Maynall and Littlewood, Mr. Salomans, Messrs. Speakman and Charlesworth, Mr. Waterhouse and Mr. Worthington, have been invited by the General Purposes Committee of Manchester to prepare competitive plans for the new Police Courts for that city. The sum of £50 is to be paid to each architect, such premiums to form a portion of the commission to be ultimately paid to the successful competitor.

In his last report to the Board of Trade, Captain Tyler directs attention to the practice of packing luggage on the roofs of railway passenger carriages. The system, he says, is no doubt convenient, but it is attended with serious disadvantages. The luggage is always liable to be set on fire by burning matters from the funnel of the engine; it obstructs the view of the guards along the tops of the carriages; and it makes the carriages top-heavy, and renders them more liable to fall over in the event of their leaving the rails.

As there is in London and elsewhere a demand for Staffordshire blue bricks, we beg to call attention to those manufactured by Mr. B H. Eberhard, of the Old Hill Blue Brick Works, near Dudley. We have seen samples of these bricks, which look exceedingly good, and we believe they can be delivered in London at a comparatively low rate. All who know Staffordshire blue bricks are no doubt fully aware of their great durability.

A compensation case, "Edwards v. the Metropolitan Board of Works," was decided yesterday before Mr. Under-Sheriff Burchell and a special jury. The amount claimed was £9,000, for premises at the corner of the Middle-row, Holborn. Evidence was given to show that the business of the claimant had been very profitable, and that his stock in trade was valued at from £3,000 to £4,000. It was said the loss by tender would be 50 per cent. of the value. A verdict for £6,243 was given.

A great compliment has just been paid to Sir Edwin Landseer by a lunatic. Dr. Cross, the medical officer of St. Martin's parish, has had to apply to the magistrate at Marlborough-street for an order to consign a man named John Adams to Hanwell Asylum, Adams having been for some time under the delusion that the lions in Trafalgar-square had got loose and were under his bed, growling at him. Mr. Knox, having satisfied himself as to the condition of the poor man's mind, gave the order.

The plans for the new offices of the Poplar Board of Works were received last week. It appears there was nearly a cart load of them, there being no less than forty five separate competitive designs. The chairman said the plans must be hung up for the inspection of the members of the board alone. Mr. Blott, however, thought that the public should have an opportunity of seeing the plans, as he did not think the board was capable of selecting the best design, and he thought they should have some experienced man to guide their judgment. It was decided that the exhibition should remain open in the boardroom to the members for a week. The public are not to be admitted, as the board are desirous that no undue influence shall be used in the adjudication.

The Metropolitan Board of Works has ordered the following alterations to be made in the names of streets in the metropolis:—Southampton-road, Regent's Park, to be renamed Gloucester-road; Winchester-street, Kentish-town, to be renamed Bassett-street; Mary-street and Brook-street, Euston-road, to be renamed Stanhope-street; Regent-place, Regent-square, to be incorporated with Compton-street; and Regent-place East, with Sidmouth street, Gray's-Inn-road. The subsidiary names in St. George's-road, Southwark, to be abolished. The subsidiary names in Arthur-street, Waterloo street, Lyndhurst-road, South-street, and George-street, Camberwell, to be abolished. The houses in all cases to be re-numbered.

MEETINGS FOR THE WEEK.

MON.—Royal United Service Institution.—"The Dress and Equipment of the Army," by Captain A. Walker, 8.30.

WED.—Geological Society, 8.

THURS.—Chemical Society, 8.

FRI.—Architectural Association.—Election of Officers—"On Mosaics," by Professor T. H. Lewis, 7.30.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

2837 W. GEEVES. IMPROVEMENTS IN SAW-MILLS. Dated November 1, 1866.

This invention is peculiarly applicable to the machinery described in the specification of letters patent granted to the present patentee, dated May 17, 1860 (No. 1226). According to the arrangement therein described the wood to be cut is fed up to the saw or saws in the saw frames at intervals; but the present invention consists in so arranging such descriptions of saw mills that the feed may be continuous, and the saws caused to cut in both directions by the two halves of the teeth of each saw being formed or set in opposite directions, and together with such arrangements rotary cutters are applied at the sides of the wood, so that, as it is caused to move continuously up to the saw frame by the quick rotary motion of the cutters, the sides of the wood are "squared," "matched," "tongued," "rabbetted," or otherwise prepared according to the nature of the rotary cutters which are for the time used in the mill; these operations are performed before the wood is divided by the saw or saws in the saw frame. *Patent completed.*

2850 R. J. GAY. AN IMPROVED COMPOSITION FOR COATING WALLS OR OTHER SURFACES SO AS TO RENDER THEM IMPERVIOUS TO THE ACTION OF WATER OR MOISTURE. Dated November 3, 1866.

This invention consists in combining together the following ingredients, matters, or substances. The patentee takes from 140 to 150 parts of methylated finish, 50 to 60 parts of shellac, 50 to 60 parts of any resinous matters, 1 to 3 parts of litharge, and 9 to 12 parts of any boiled vegetable oil, and he proceeds to mix these ingredients, matters, or substances together as follows:—He first mixes the methylated finish with the shellac and resinous matters. By preference he uses a boiler or vessel surrounded by a jacket, into which steam or hot water is admitted; he then mixes the litharge with the boiled oil in a separate vessel of any convenient size and form, and submits them to the action of heat sufficient to expel or evaporate all the water contained in the oil. He then mixes the oil and litharge thoroughly together by any suitable means, and places them in the boiler containing the dissolved shellac and resin, and mixes the whole thoroughly together by any suitable means whilst they are under the action of heat. He proposes, if desirable, to colour the above composition with any colouring matter capable of amalgamating therewith. The above composition when cool he strains and places in air-tight vessels ready for use. The composition may be applied to the surface of walls or other surfaces by any ordinary brush such as is used by painters. *Patent completed.*

2856 J. CHUBB AND W. H. CHALK. IMPROVEMENTS IN IRON SAFES AND STRONG ROOMS. Dated November 3, 1866.

The patentee claims, first, the arranging the bolts by which the door is secured to move in a diagonal or inclined direction, whereby the bolts are caused to hold the door frame to the door, as described. Second, the use of iron of an L form in section for the door frames of safes, in such manner that one limb of the L iron is caused to overlap the edges of the plating of the safe, as described. Third, the use of bridge or trough iron to strengthen the door frames of safes, and to receive the diagonal bolts, as described. *Patent completed.*

2862 J. S. GISBORNE. IMPROVED AUTOMATIC MEANS AND APPARATUS TO GIVE WARNING OF THE DANGEROUS EXISTENCE OF FIRE IN WAREHOUSES, SHIPS, AND OTHER STRUCTURES AND PLACES. Dated November 3, 1866.

According to this invention the fire or increase of temperature becomes the agent or inducing cause whereby electricity is made to give an instantaneous signal or signals, audible or visible, or both, to the person or persons in charge; or, which the inventor greatly prefers, to the fire police at the nearest fire-engine station. *Patent abandoned.*

2889 W. E. GEDGE. AN IMPROVED COMBINATION OF APPARATUS FITTING WITHIN EVERY SORT OF CHIMNEY, AND PREVENTING ANY SMOKE BEING DRIVEN BACK INTO APARTMENTS. (A communication). Dated November 7, 1866.

This invention is carried out as follows:—Two uprights are formed (rising from the hearth of the fireplace) with brickwork; these uprights are to be about 16in. apart, and rising uniformly to a height of about 3ft., and producing a depth of from 5in. to 6in. These uprights will be built against and keyed in the thick back wall of the chimney, and occupy the whole width of the chimney, except the width left between them, and run up to the jambs of the said chimney; then, starting from the above-mentioned height (one yard) the inventor continues to raise the same uprights in the chimney with the addition of the brickwork in front, so as to form in the body of the chimney a conduit pipe; he then fills in with brick, stone, or sheet iron all the space of the original chimney, starting from the height of the shelf. On one of the sides will, however, be left a small trap, which is raised at will to allow of the sweeping. The opening above mentioned, having a height of some 3ft., is intended to receive a sheet-iron apron or flap divided into three equal parts; a special groove must be made for each of these three parts, and a small wrought iron or brass framing is to be applied against the opening; the flap or apron is to be raised by means of a chain attached to a stud or ring on to the lower part of the flap or apron, and another stud or stop is placed at the base of the framing. The chain will pass behind the apron and raise the framing by means of two pulleys fixed in the top of the framing, which it will raise one part after the other to create a draught. The framing will be maintained in position by a counter weight on the other end of the chain. The dimensions of all the parts named will be regulated by the size or capacity of the interior of the original chimney. *Patent abandoned.*

A memorial window, the gift of Lady Haberfield, in memory of her late husband, Sir J. K. Haberfield, has been placed in Redcliff Church, Bristol. The subject is "Christ's First Miracle in Cana." The artist is Mr. Bell, of College Green.

Trade News.

TENDERS.

Tenders are required for the erection of a new church at Killingworth, a few miles from Gateshead, from designs prepared by Mr. Bassett Keeling, of Gray's Inn, London, in which a feature quite new to this district is introduced, namely, Bath stone dressings of both the blue and yellow kinds.

ABERDEEN.—The tenders for the erection of the extensive new county and municipal buildings of Aberdeen have been accepted as follows:—Mr. George Donaldson, Aberdeen, for the mason work; the estimate of Mr. James Coutts, Aberdeen, for the carpenter, joiner, smith, and glazier work; the estimate of Mr. Alexander Adam, Aberdeen, for the slater work; the estimate of Mr. Robert Henderson, Aberdeen, for the plaster work; and the estimate of Messrs. Charles Middleton and Sons, Montrose, for the plumber and gasfitting work—subject to the approval of Government in so far as relates to the portion of buildings of which they have to pay a part. The gross amount of the estimates accepted is £49,841 1s. 8d., which sum does not include painting, furnishings, architects' commissions, and other contingencies, which may amount in all to about £7,000. The estimated cost of the buildings given in in 1865 was £42,104, and the cost of the site £26,139. The figures above given show that the work of the buildings will be executed at about £2,500 under the sum originally estimated. The work of demolition on the site, preparatory to building, is to be set about forthwith.

BAYSWATER.—For rebuilding three houses, Alfred-terrace, Bayswater. Messrs. R. A. Withall and A. Evers, architects. Quantities by Messrs. Pain and Clark:—Bywaters, £4,880; Tongue, £4,666; Ebbs and Sons, £4 580; Webb and Sons, £4,385; Richardson, £4,092; Foster, £3,972.

CANTERBURY.—For alterations and additions to the Corn and Hop Exchange, Canterbury. Mr. J. G. Hall, architect. Quantities by Messrs. Pain and Clark:—Wilson, £3,092; Perry, £2,800; Naylor and Son, £2,697; Cosens Bros., £2,626; Lancefield, £2,595; Gaskin and Godden, £2,290.

DEVONSHIRE.—For the erection of the Chapel of St. Thomas the Apostle, in the parish of Swinbridge, county of Devon, diocese of Exeter. Messrs. Gould and Son, architects:—Gammon, £999; Hartnoll, £968 10s.; Oliver and Son, £900; Cock, £898 15s.

DEVONSHIRE.—For the restoration, enlargement, and reseating of the Church of St. Thomas à Becket at Newton Tracey, county of Devon, diocese of Exeter. Messrs. Gould and Son, architects:—Pulsford, £518 10s. 6d.; Dendle, £499 2s.; Hookway, £498; Bale, £368.

DEVONSHIRE.—For the erection of a vicarage house at Yarnscombe, North Devon. Messrs. Gould and Son, architects:—Oliver and Son, £1,220; Bowden, Son, and Cook, £1,190; Cook, £1,150; Howard, £1,096 15s.; Dendle, £1,085.

DEVONSHIRE.—For the erection of a parochial school and residence at Challacombe, North Devon. Messrs. Gould and Son, architects:—Pulsford, £378 7s. 6d.; Pile, £377; Delve, £318.

HANLEY.—For the erection of Bedford Chapel, Hanley, for the Methodist New Connection. Messrs. Scrivener and Son, of Hanley, architects. Quantities supplied:—Steel, £1,998; Matthews, £1,976; Bailey, £1,919; Wooldridge (accepted), £1,875.

HOLLOWAY.—For work at Blackstock Park, Holloway. Mr. Thomas J. Hill, architect:—Sabey, £405; Corbeldick, £400.

HOLLOWAY.—For a house at Tufnell Park for Mr. J. Robinson. Mr. George Truefitt, architect:—Carter, £3,140; Stimpson, £2,992; Saunders, £2,873; T. Warne, £2,600; Manley and Rogers (accepted), £2,590.

HOLLOWAY.—For a pair of houses Tufnell Park. Mr. George Truefitt, architect:—W. Warne (accepted), £2,051 14s.

HACKNEY.—For the erection of workshops at rear of, and alterations to, No. 47, Elizabeth-street, Hackney-road, for J. D. Link, Esq. William Mundy, architect:—Larke, £1,482; Read and Son, £1,198; Peters, £1,148; F. and F. J. Wood, £1,010; Forrest (accepted), £897.

LINCOLN.—For the erection of new parochial schools for St. Martins:—Young, £998; Kent and Otter, £996 10s; Huddleston, £914; Chambers, £843; Barnes and Wright, £838 10s.; Otter and Elsey, £823; Close and Goodbarne, £773; Fotherby and Taylor, £728. The last but one was accepted on Tuesday last.

LONDON.—For alterations and additions to the Horse Shoe Brewery Tap House (Meux and Co.), for Mr. Charles Best. Messrs. Mayhew and Calder, architects. Accepted tenders:—Curtis, general works, £900; Comyn, Ching, and Co., gasfittings, &c., £216; Angliss, pewterer's work, £101.

MILE END ROAD.—For alterations, &c., to the White Horse public-house, White Horse-lane, Mile End-road, for Mr. H. W. Payne. Messrs. Mayhew and Calder, architects. Accepted tenders:—Ennor, general works, £560; Grimes, pewterer, £112.

SHOREDITCH.—For alterations, &c., to the Star and Garter public-house, High-street, Shoreditch, for Mr. Radway. Messrs. Mayhew and Calder, architects. Tender accepted:—Curtis, general works, £152.

SOUTHALL.—For the erection of a lavatory and covered way and paving the infirmary of schools at Southall. Henry Saxon Snell, architect:—Brown, London, £278; Hanson, Southall, £248 15s.; Nightingale, London, £248; Gibson, Bros., Southall, £238; Brown, Southall, £285.

SOUTHALL.—For construction and erection of a steam engine, boiler, and necessary gearing for working a pair of pumps at Southall Schools. Henry Saxon Snell, architect:—Shand and Mason, £296; Jennings, £187; Pinchbeck, £185 18s. 8d.; Grinson and Co., £182 10s.; Lovelock, Bateman, and Co., £160; Potter and Son, £116; Bevington, Topham, and Cortauld, £110.

ST. LUKE'S.—For works at Norman's Buildings, St Luke's, Mr. Thomas J. Hill, architect:—Gadsby, £2,953; Moreland and Burton, £2,947; Patman, Bros., £2,897; Sabey, £2,853; Kilby, £2,796; Webb and Sons, £2,777; Henshaw, £2,658; Preedy and Son, £2,500; Anley, £2,490; Perry, £2,338.

THE TIPPLING PHILOSOPHER.—For pewterer's work, Tippling Philosopher, for Mr. William Owston. S. Brookes, 14, Clement's Inn, Strand, architect:—Hurst and Co., £78; Heath, £80; Hoare, £87 18s.; Richards, £91 16s. 6d.

PROPERTY SALES.

JUNE 10.

AT THE MART.—By F. and A. Mellersh.—Freehold estate, known as Meadfields and Brices, situate at Haslemere, Surrey, consisting of a house, with outbuildings, and 66a. 1r. of arable, meadow, and Woodland; also the leasehold property, known as Witley Farm, consisting of a cottage, buildings, and 28a. 0r. 36p. of arable, meadow, and woodland—sold for £3,850.

Freehold residence, with greenhouse, three tenements, farm buildings, and 93a. 1r. 16p. of pleasure ground, arable, meadow, and woodland, situate at Dunsfold, Surrey—£3,800.

Freehold and copyhold, 52a. 3r. and 12p. of land, with cottage, situate at Wyke, Worplesdon, Surrey—£1,090.

By Mr. Robert W. Fuller.—Freehold two cottages, situate in Myrtle-road, Sutton, annual value £45—£450.

JUNE 11.

AT THE MART.—By Messrs. Farebrother, Clark, and Co. Freehold estate, known as Newhouse, with farm residence, cottage, and 428 acres of land, situate at Etchingham, Sussex, let at £550 per annum—sold for £17,850.

By Messrs. Debenham, Tewson, and Farmer.—Copyhold residence, with grounds of about 2 acres, situate on Walton Heath, near Epsom, Surrey—£1,350.

Freehold cottage, known as Tadworth Lodge Cottage, adjoining as above, let on lease at £42 per annum—£500.

Freehold residence, known as Dowding Castle, Waltonon-the-Hill, near Epsom, Surrey, with stabling, grounds, and land, about 4 acres—£1,500.

By Mr. Hedges.—Leasehold two residences, Nos. 52 and 54, Addison-road, Kensington, annual value £130, term 99 years from 1851, at £17 per annum—£1,470.

AT THE GUILDHALL COFFEE-HOUSE.—By Messrs. E. and H. Lumley.—Leasehold stabling, No. 12, Bryanstone-mews West, Bryanstone-square, let at £50 per annum, term 42 years unexpired, free from ground-rent—£[illegible].

By Mr. Murrell.—Leasehold house, No. 23, Spencer-street, Dean-street, Commercial-road, let at £15 per annum, term 79 years from 1813, at £2 10s. 3d. per annum—£110.

Leasehold two residences, Nos. 45 and 47, Moreton-terrace, Lupus-street, Pimlico, producing £88 per annum, term [illegible] years from 1852, at £16 per annum—£830.

Leasehold three residences, Nos. 12, 29, and 33, Moreton-terrace, aforesaid, producing £132 per annum, term similar to above, at £24 per annum—£1,140.

Leasehold twelve houses, Nos. 5, 7, 9, 11, 13, 15, 17, 19, 23, 25, and 27, Floriston-street, Mile End-road, let at £12s. each per annum, term 81 years from 1863, at £[illegible]s. 2d. per annum each—from £175 to £195 each.

BATH STONE OF BEST QUALITY.

NDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, Cost for Transit to any part of the United Kingdom, [illegible]shed on application to Bath Stone Office, Corsham, [illegible].—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

[illegible]rge Freeman and George Page, Rhyl-street, Kentish Town, builders, June 20, at 1—Charles Grimley, Weedington-road, Kentish Town, plumber, June 19, at 12—Charles [illegible]ver, Edinburgh-terrace, Kensington, carpenter, June 20, at 1—John Ladd, British-street, Bow, builder, June 20, at 2—William Ross, Great Guildford-street, Southwark, carpenter, June 19, at 11—March Wiggs, Lambeth-[illegible] bricklayer, June 24, at 12—John Williams, Gyes[illegible] Vauxhall-gardens, builder, June 24, at 12.

TO SURRENDER IN THE COUNTRY.

[illegible]liam Carruthers, Everton, near Liverpool, joiner, [illegible] 8, at 11—Josiah Jackson, Tranmere Park, Cheshire, [illegible] June 21, at 2—Joseph Jones, Frondeg, Merionethshire, builder, June 17, at 11—Joseph Smith, Litchurch, [illegible]er, June 18, at 11—Thomas Warner, Hanley, carpenter, [illegible]ly 13, at 11—Middleton Young, Newtown, Dorset, [illegible]tranter, June 20, at 11—John Cooke, Denton, [illegible] June 27, at 11—William Common, High Buston, [illegible] Warkworth, millwright, June 21, at 12.30—Griffith [illegible] Newport, Monmouthshire, mechanical engineer, [illegible]1, at 11—Henry Graham, Brampton, Derbyshire, [illegible] June 25, at 11—Walter Raynes, Chase Town, Staffordshire, blacksmith, June 14, at 10.

PARTNERSHIPS DISSOLVED.

[illegible] and Gardiner, Manchester, iron merchants—Sidebotham and Co., Manchester, church furniture manufacturers—J., J., G., S. A., R., D., and E. Diggle, Heywood, [illegible]—King and Creba, Drury-lane, ironmongers.

DIVIDENDS.

[illegible] 26, J. Peerless, Bromley, builder—July 4, D. Jones, [illegible]well, ironmonger—June 8, S. R. Freeman and A. [illegible], Manchester, engineers—July 3, J. Horsley, Manchester, iron merchant—June 21, F. Smith, Birmingham, [illegible]er—June 26, H. Berry, Lewes, painter—July 1, [illegible]er, Tranmere, engineer—June 27, A. E. Harvey, [illegible]ton-road, Islington, builder—June 21, W. Price, [illegible] mason.

BANKRUPTCIES ANNULLED.

[illegible] Thompson, Lillington-street, Pimlico, journeyman [illegible]er, June 4—Henry King, Abinger-road, Deptford, [illegible] June 6—Elisha Wright, Budbrooke, Northamptonshire, carpenter, June 6.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak ..... load	£9 0	£10 10	Archangel, yellow ..	£11 10	£12 10
Quebec, red pine	3 0	4 10	St. Petersburg, yel...	10 10	11 0
" yellow pine..	2 15	4 0	Finland	8 0	9 0
St. John N.B, yellow	0 0	0 0	Memel.....	0 0	0 0
Quebec oak, white..	5 5	6 0	Gothenburg, yellow	8 10	10 10
" birch.....	3 10	4 10	" white	8 0	9 0
" elm	3 10	6 0	Gefle, yellow.....	9 0	11 0
Dantzic oak	3 10	6 0	Soderhamn	9 0	10 10
" fir	2 0	2 0	Christiania, per C., 12 ft. by 3 by 9 in. yellow	10 0	22 0
Memel fir	3 0	3 10	Deck Plank, Dantzic, per 40 ft. 3 in.	0 15	1 4
Riga.....	3 0	3 5	PUMICE STONE pr ton	5 0	8 0
Swedish	1 15	2 2	OILS, &c.		
Masts, Quebec red pine	6 0	7 0	Seal, pale....per tun	59 0	0 0
" yellow pine..	0 0	5 0	Sperm body .....tun	110 0	112
Lathwood, Dantzic, fm	4 10	5 0	Cod	40 0	0
" St. Petersburg	6 10	7 10	Whale, Sth. Sea, pale	40 0	0
Deals, pr. C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.			Olive, Gallipoli.....	62 0	0
Quebec, white spruce	14 10	21 10	Cocoanut, Cochin, ton	55 0	0
St. John, white spruce	13 10	15 10	Palm, fine	40 0	0
Yellow pine, per reduced C.			Linseed	39 10	0
Canada, 1st quality.	17 0	19 10	Rapeseed, Eng. pale..	37 10	38 0
2nd do.....	12 0	13 0	Cottonseed	30 10	36 10

METALS.

IRON:—					
Welsh Bars in London .. ..per ton	6 15 0	7 0 0	3
Nail Rod .....—	7 10 0	8 10 0	2
Hoops ..... do	8 10 0	9 10 0	
Sheets, Single ..... do	9 15 0	10 0 0	
Staffordshire Bars . ..... do	7 10 0	8 10 0	
Bars, in Wales ..... do	6 0 0	6 5 0	3
Rails ..... do	6 0 0	6 10 0	net
Foundry Pigs, at Glasg. No 1 .. do	2 13 5	3 7 0	
Swedish Bars ..... do	10 5 0	11 5 0	
STEEL:—			
Swedish Keg, hammered .....per ton	15 0	0 0 0	
Swedish Faggot ..... do	10 10	12 10 0	
COPPER:—			
Sheet & Sheathing, & Bolts ....per ton	82 0 0	84 0 0	
Hammered Bottoms ..... do	86 0 0	90 0 0	
Flat Bottoms, not Hammered .. do	91 0 0	93 0 0	
Cake and Tough Ingot ..... do	79 0 0	85 0 0	
Best Selected ..... do	81 0 0	83 0 0	
Fine Foreign ..... do	86 0 0	88 0 0	
Yel. Metal Sheathing & Rods ....per lb	0 0 7	0 0 7½	—
TIN:—			
English Block .....per ton	89 0 0	0 0 0	2½
do Bar ..... do	90 0	0 0 0	
do Refined ..... do	92 0 0	0 0	
Banca . . .. do	92 0 0	0 0 0	nett
Strait ..... do	87 0 0	0 0 0	
LEAD:—			
Pig, English .....per ton	21 10 0	22 10 0	2½
" Spanish Soft ..... do	19 15 0	0 0	
Shot, Patent ..... do	21 5 0	22 0	
Sheet ..... do	20 10 0	21 10 0	
White ..... do	29 0 0	29 10 0	
SPELTER:—			
On the Spot .....per ton	23 5 0	22 15 0	ne
ZINC:—			
English Sheet .....per ton	28 0 0	0 0 0	
Devaux's V. M. Roofing Zinc .... do	28 0 0	0 0 0	*
* And 5 per cent. discount if laid upon the new system.			
QUICKSILVER .....per btl	6 18 0	7 0 0	
REGULUS OF ANTIMONY.			
French .....per ton	34 0 0	0 0 0	

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JOHN WALDEN
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Estimates on application.

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GENUINE
SOLID PARQUET FLOORS
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PRICES LOWER THAN USUAL.
Specimens at Architectural Museum, 23, Maddox-street, W.
AND AT
Show Rooms, Cambridge Hall, Newman-street, London.

SALES BY AUCTION.

Courts of Justice Concentration (Site) Act.—Western Section.—Fourth Sale of Building Materials.

MESSRS. GLASIER and SONS are favoured with instructions from the Commissioners of her Majesty's Works and Public Buildings, to SELL by AUCTION, on the premises, on THURSDAY, June 27, at Twelve for One o'clock, in Lots, the BUILDING MATERIALS of FIVE HOUSES, Nos. 258, 259, and 260, Strand, Nos. 1 and 2, Clements Inn Foregate, and the Archway and Columns, leading to Boswell-court, comprising about 400,000 capital stock bricks, slates, timber in roofs, floors, and doors, sashes and frames, plate-glass public house and shop fronts, shop fittings, marble chimney-pieces, register and other stoves, iron columns, about 5 tons lead, stone paving, gas fittings and fixtures. May be viewed the day prior and morning of sale, and catalogues obtained at the office of her Majesty's Works, &c., 12, Whitehall-place; on the premises; and of the auctioneers, 41, Charing Cross.

Bromley, Kent.—Charming Freehold Building Sites for Gentlemen's Residences, immediately adjoining the Shortlands Station, between Beckenham and Bromley, in the midst of one of the most popular, picturesque, and healthy districts near the Metropolis, for Sale, in lots, with a fully registered, indefeasible title.

MESSRS. DEBENHAM, TEWSON, and FARMER are instructed by the Executors under the will of the late W. A. Wilkinson, Esq., to SELL, at the Mart, on TUESDAY, June 25, at Two, in lots of from half an acre to five acres each, the remaining portion of the SHORTLANDS ESTATE, land-tax redeemed and tithe-free, possessing a registered, indefeasible title, and affording most eligible sites for the erection of first-class houses and moderate-sized villas, the demand for which in the neighbourhood is so great and constantly increasing that any building operations judiciously carried out upon this property must become permanently lucrative. Particulars of Messrs. Burchell, solicitors, 5, Broad Sanctuary, Westminster; of Mr. John Whichcord, architect, 16, Walbrook; and of the auctioneers, 80, Cheapside.

Forest Hill.—Valuable Freehold Building Land, adjoining a gentleman's grounds, and offering charming sites for villa residences.

MESSRS. DEBENHAM, TEWSON, and FARMER will SELL, at the Mart, near the Bank, on THURSDAY, July 4, at Two, in one lot, valuable FREEHOLD BUILDING LAND, occupying a delightful position on the brow of the eminence on the favourite side, and within five minutes' walk of Forest Hill Station, and offering by far the choicest sites now available in this locality, where the demand for residences is almost unlimited. There are two frontages, one of 120ft. and another of 100ft., and an average depth from each frontage of about 200ft.—Particulars of C. Wellborne, Esq., 17, Duke-street, London Bridge; at the Dartmouth Arms Tavern, Forest Hill; and of the Auctioneers, 80, Cheapside.

Bushey Hill, Camberwell.—To Capitalists, Builders, and others.

MESSRS. DEBENHAM, TEWSON, and FARMER will SELL, at the Mart, near the Bank, on TUESDAY, July 2, at Two, the remaining 14 LOTS of valuable FREEHOLD LAND, possessing important building frontages on the east side of Bushey Hill, most eligibly situate nearly opposite Camden Church, near Lyndhurst-grove, midway between the Vestry Hall and Lyndhurst-road. The land lies high, and from its summit there are fine views of the Surrey hills; it slopes down from the High Level Crystal Palace and South London Railways to the Peckham road, whence there is constant omnibus communication to the city and West end, rendering it well adapted for the erection of first-class residences. The land-tax is redeemed. Particulars of Thomas Oliver, Esq., solicitor, 11 Old Jewry-chambers; at the Mart; and of the auctioneers, 80, Cheapside.

Clapham-common.—Sale of a portion of the richly timbered estate, known as Old Park, comprising the greater part of the extensive frontage to Nightingale lane, all being adapted and intended for houses of a good class, for which there is so great a demand in this favourite neighbourhood.

MESSRS. DEBENHAM, TEWSON, and FARMER will SELL, at the Mart, near the Bank on TUESDAY, July 9, at Two, in convenient LOTS, suitable for the erection of first-class detached or semi detached residences, the greater portion of the frontage to Nightingale-lane of the valuable FREEHOLD BUILDING ESTATE (land tax redeemed), known as Old Park, most pleasantly situate on the south side of Clapham Common, in a locality which in point of public esteem, stands second to none within a like distance of the city or West-end. The high character of the surrounding properties, and the fact of the estate being very richly timbered render it peculiarly eligible for building purposes. Particulars, with conditions of sale, and plans, had of T. G. Bullen, Esq., solicitor, 7, and 8, Barge-yard-chambers, Bucklersbury: of Messrs. Wimble and Taylor, architects, 2, Wallbrook; and of the auctioneers, 80, Cheapside.

Farnham, Surrey.—About ten acres of Freehold Land, occupying a pleasing position, and suitable for the erection of one or more houses.

MESSRS. DEBENHAM, TEWSON, and FARMER are instructed to SELL, at the Mart, near the Bank of England, on TUESDAY, July 9, at Two, about ten acres of FREEHOLD LAND, having a considerable frontage to the road near Waverley Hatch, within a short distance of the Farnham Station, and forming a part of the Lodge Hill Estate. The property is suitable for the erection of moderate-sized houses, being on a dry soil, and in a neighbourhood celebrated for the purity of its atmosphere.—Particulars in future advertisements; and of the auctioneers, 80, Cheapside.

Unreserved Sale.—Godstone, Surrey.—Capital Investment in modern Country Properties, producing rentals of £110 and £220 a year respectively, together with several acres of building land.

MESSRS. DEBENHAM, TEWSON, and FARMER are instructed to SELL, at the Mart, on TUESDAY, July 16, at Two, in lots, without reserve, a capital FAMILY MANSION, known as Tower House, beautifully placed on elevated ground, commanding very pretty views, within a few minutes of the station; the residence is surrounded by ornamental, park-like lands of about nine acres. It is approached by a private road, with a neat lodge entrance, there is good stabling, and other outbuildings. This property is let to John Stratford Kirwan, Esq., on agreement for lease at a rental of £170, and is held for 96 years direct from the freeholder at a ground rent. Also, a spacious, fully licensed hotel of ornamental design, occupying a capital situation, fronting the main road, within a few minutes' walk of the station, and in a central part of the important and extensive Godstone Park Estate, now being divided into lots, upon many of which first class residences are being erected. This, in addition to the natural advantages of the country, will, it is believed, make the hotel a favourite resort for families, so that under proper management it will doubtless prove a great success. Attached to the hotel is a large stable yard, with extensive range of stables, lock-up, coach-houses, &c.; and in the rear are gardens and a grass paddock covering in all about three acres, which are let on lease at the low rental of £220 a year, and are held for a term of 96 years at a low ground rent. Also, several desirable lots of building land, having frontages to the main road, and forming capital sites for the erection of superior residences. These lots will vary in extent from two acres to five acres each. Particulars of Messrs. Nokes, Carlisle and Francis, solicitors, 8, Finch-lane, City; and of the auctioneers, 80, Cheapside.

Egham, Surrey.—A first-class Investment in valuable Freehold Property, consisting of extensive manufacturing premises and upwards of 3 acres of land, occupying a commanding position in the parish of Egham, with a long frontage to the river Thames.

MESSRS. DEBENHAM, TEWSON, and FARMER will SELL, at the Mart, on TUESDAY, July 23, at Two, the valuable FREEHOLD PROPERTY known as the West Surrey Chemical Works, situate on Runnymede, in the parish of Egham, about equi-distance between Egham and Staines Stations, the whole let to Mr. Spice, a highly responsible tenant, on lease for 21 years, at a net rent of £200 per annum, and affording a first-class investment for trustees and others. Particulars of Messrs. Taylor Hoare, and Taylor, solicitors, 28, Great James-street, Bedford row; and of the auctioneers, No. 80, Cheapside.

Ashford Manor, Middlesex.—About 82 acres of valuable Freehold Land, with a registered indefeasible title, and fronting the main road from Staines to Kingston, about a mile from the Sunbury and Ashford Railway Stations, eligible for building, market garden, or accommodation purposes.

MESSRS. DEBENHAM, TEWSON, and FARMER will SELL, on TUESDAY, July 23, in lots (unless previously sold as a whole), the SECOND PORTION of the ASHFORD MANOR ESTATE, which is Freehold, land-tax redeemed, and great tithe free, affording eligible sites for the erection of superior residences or moderate-sized villas (being situate in a favourite and healthy locality, within a mile of Sunbury and Ashford stations on the South-Western line); also valuable as market garden or accommodation land. The sub-soil is gravel. Each lot has an important frontage to a capital road and there are numerous good houses in the immediate neighbourhood. Particulars of Messrs. Coverdale Lee, Collyer-Bristow, and Withers, solicitors, 4, Bedford-row; and of the auctioneers, 80, Cheapside.

WANTED.

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FREEHOLD LAND WANTED on the SURREY SIDE of the River Thames, within a radius of 1½ miles from the Oval at Kennington. The quantity required is from seven to ten acres, with early possession. Plans and particulars to be sent to Messrs. Hunt, Stephenson, and Jones, 4, Parliament-street, Westminster.

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TO ARCHITECTS and BUILDERS.—LIME GROVE PARK, PUTNEY HILL.—Very Desirable SITES on this Estate to be LET for building respectable private residences. It is situated on elevated ground, between the railway station and Wimbledon and Putney-heaths. There is a great demand in this locality for good villa residences, and a ready sale for them. For particulars apply to S. Wood, Esq., Architect, 10, Craig's-court, London, S.W.; or to Messrs. Baxter, Rose, Norton and Co., Solicitors, 6, Victoria-street, Westminster, S.W.

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THE BUILDING NEWS.

LONDON, FRIDAY, JUNE 21, 1867.

THE PARIS EXHIBITION.

ARCHITECTURE.—FOURTH NOTICE.

WE resume our notice of the architectural drawings exhibited in the Paris Exhibition by an examination of the works of the architects of SWITZERLAND, a country, or rather a bundle of countries, of such different character, feeling, and habits that we cannot expect to find in them any unity of expression in art. Geneva, Zurich, St. Gall, Dresden, and Paris all contribute to make up the exhibition of what is called the Swiss Confederation. By far the most representative of what is generally conceived to be Swiss architecture are the designs of M. Grindroz, of Geneva, for various châlets, chiefly exhibited by photographs from the buildings themselves; they are all picturesque, and show great knowledge of the legitimate use of timber in construction; and, however varied may be the style M. Grindroz adopts, he always adheres to a truthful expression of the material used, and has no intention of making us believe that weather-boarding is rusticated masonry, or that his balustrades are stone. His châlet for Prince d'Essling, at Bellerica, and that for Count Walewski, in the Savoy, are excellent illustrations of this truthfulness in opposite styles, and both are pleasing; the lower portion of these buildings is in both cases of masonry, and the upper part, with its large balconies and wide projecting eaves, is excellently well managed. Of a kindred nature are M. Gladbach's plates of timber construction in Switzerland; they show a true and thorough knowledge of carpentry, and a great power of obtaining effective ornamentation by simple means. We earnestly recommend all our colonial architects who may visit Paris to well and carefully study the works of these two architects, where they will find much to remember and treasure up for future use on their return to those countries where timber is plentiful and labour scarce. Following in the same style, but at a considerable distance, are the designs by M. Kumkler, of St. Gall, for various houses of a châlet character; his drawings of Wartegg, the residence of the Duchess of Parma, and of Wamertshafen, are interesting, but his ecclesiastical attempts are very poor. M. Stadler, of Zurich, sends a design for his Drikönigskirch, at Sachsonhausen, which is a very poor rendering of the worst style of bad German work; nor is his competition design for the Cathedral at Lille any better; and it is gratifying to us to call to remembrance the excellent designs our own country produces for this building. M. Bachofen, of Geneva, contribntes a small photograph of his synagogue in that town, which is a simple Eastern mosque, without a minaret; and it is curious to remark in this as in those Austrian edifices for the same purpose, how Judaism runs to Mahomet for its architectural inspiration in Europe, and avoids all contact with Christian traditions or Pagan exemplars. In England a contrary tendency manifests itself, and Renaissance Italian seems to be the prevalent style. Professor Semper disappoints us greatly; from so learned an author and so prolific a theorist we had hoped to have learned something new, but regret to find he gives us only commonplace renderings of ordinary materials. His design for a theatre at Rio Janeiro is a very poor medley of Doric colonnades—indeed, colonnades of all sorts and sizes, which break out virulently everywhere, and are interrupted in their course by Renaissance pavilions and crowned with a heavy pile of building in the centre, reducing them to insignificance by its ponderous and massive character. Nor is his interior any better; there is not a single new thought in the whole of it—the same regulation box fronts and proscenium, and the ordinary commonplace arrangements everywhere. His Festhau, or summer theatre at Munich, is somewhat better, but still very ordinary; and we may here remark that the only new idea for a theatre we have seen in the whole range of the many designs for this class of buildings comes not from an architect but from a musical instrument maker, and will be found in the musical instrument stall of M. Saxe, in the French department. It is a building the transverse section of which is a perfect circle, and the upper boxes and gallery—at least where a gallery ordinarily is—project over the lower boxes instead of receding from their line of front; its longitudinal section is that of an exceedingly ovoid ellipse, having its longer axis inclined at an angle to the stage, and is undoubtedly based on very sound acoustic principles. This design, though very poorly represented, is well worthy of the attention of architects, and in the hands of an artist might be well developed. We rejoice to see the essays of those well versed in acoustic construction placed before us, and recommend M. Saxe's design to the earnest study of the profession—of course, architecturally, it is very poor, but the idea set forth is excellent, and only wants able translation. M. Jager, who resides in Paris, sends a very clever drawing of his design for the annexe to contain the other contributions of Switzerland to the exposition of its fine arts, and his design for the screen dividing her industrial products from those of other nations in the building, but to these we shall revert when examining them in actual execution. We conclude our notice of the architectural productions of the Swiss Confederation with M. Dorrer's clever design for a fountain commemorative of the independence of his country. The three liberators are admirably grouped at the top, in the act of taking their oath—a very difficult subject most artistically treated.

The architectural works from SPAIN are neither numerous nor good, yet there is in some of them a lesson or two to be learned, and they are interesting in a comparative view, as illustrating her art position in contemporary history. Decidedly the best of her contributions is that of M. Cubas, for a maternity or lying-in hospital, which has a very well-considered plan well worthy of study; his elevations exhibit neither want nor waste of architecture, but are simple and refined, and the arrangement of his chapel, with its galleries screened off, is very good. M. Cubas has considered his subject with exemplary care; his arrangements for the transmission of patients from one part of the building to another by means of tramways are excellent, and there is much to be learned in what may be termed surgical engineering from his design. Hung out in the central promenade, are two designs for churches, which, though coming from widely different regions, present a notable similarity. The first of these is a design for a parish church, by M. Ozorio, of Cuba; the other is for a like edifice, by M. Ortiz de Villajos, of Madrid. Both of these partake of a Romanesque character, are transeptal in plan, and are good; the dome of the latter and the external ambulatories of the former being particularly worthy of notice, and if these two widely separated artists are representatives of any school of art in Spain, there is much more to be hoped for from that country than we had anticipated; indeed, the revelation afforded by this Exhibition of the state of the arts generally in Spain is a pleasing surprise to us, as we had thought them defunct in that country. M. Monlion sends a design for a building which, from its unusual character, will attract some attention; it is an amphitheatre for bullfights, but beyond the, to us, singularity of its purpose, is not noteworthy. M. Zaricabal's design for a hospital is of no great merit; and M. Ruis de Salas' design for an exhibition building for Spanish America is chiefly remarkable for its unfitness for its purpose.

From PORTUGAL we have but two designs—one for a monument to commemorate her conquests, represented by a very well executed model by M. Pascea, which is very near being good; indeed, if its various parts were united to its central composition, it would be very good. But the sculpture surrounding the base is detached from the main form, and the result is confusion of outline instead of mass. The other contribution is that of M. da Silva, who deserves the consideration of all the profession, having been the founder of the Archæological Museum and the Society of Architects at Lisbon. We wish we could have seen some more practical result of his labours here, for his sole contribution is a project for the restoration of the Church of Belem, at Lisbon. This is a singular specimen of what is known in Portugal as the Emmanuelian style, and was built about the year 1500, from the designs of Boutaca, an Italian architect, to commemorate the return of Vasco di Gama, and his opening out the sea way to India, and when it was little thought that the world would move so far round that people would revert to the ancient overland route again. It is an extraordinary, over-enriched building, laden with eccentric detail, and is perfectly barbaric in its love of finery and tinsel, and, clever as M. da Silva's restoration may be, and however beautifully executed his model, we cannot but regret that the same intelligence should not have been employed in a more worthy way.

GREECE gives us but sufficient to make us sensible of how little of her ancient glory remains to her, and is represented only by a burlesque upon her past traditions in the way of a quasi-Doric palace of justice, by M. Katzaros, which is very wretched. In the catalogue is mentioned a Byzantine church by M. Prinopoulo, which we regret not being able to find in the building.

From RUSSIA we have a few drawings, small in number but very excellent, and foremost amongst them as drawings are those setting forth the restoration of the Tower of the Infanta, at the Alahambra, by MM. Kohlman and Kahau, which are undoubtedly the very best architectural drawings in the whole Exhibition, and in point of "get up" are marvellous. Artists may learn much from the exquisite way in which the highly coloured decoration of this world-famed little building is represented in shade, and the whole series, which belongs to the Museum of the Academy of Fine Arts, at St. Petersburg, is well worthy of study. M. Bohnstedt gives a plan of the Narischkine Palace, at St. Petersburg, and a large number of most beautifully drawn interiors, each profusely decorated, in every possible variety of style, to such an exaggerated pitch, that we find the Tartar without the preliminary process of scratching the Russian. One-half the labour and money well bestowed would have produced twice as much; as it is, vulgar gaudiness is the sole result. M. Resanoff seems to be an able architect, and to study the national style of his country advantageously; his buildings have a national character, and having such, are remarkably interesting. His Church of St. Parskrovci, at Wilna, is an interesting little building—at least, if we may judge from the quaint low bell-tower, rising only a few yards from the ground, and its principal doorway. Unfortunately, his kremlin-like cathedral is hung too high to be distinguishable, but seems to be a careful study in an almost unknown art-language; and his small Chapel of St. Nicholas, at Wilna, is very singular. The Greek cross-formed plan, and the dome at the crossing which forms the nucleus of all this class of buildings, is very favourable to simplicity of outline, and consequently grandeur of effect, and the contributions of Russia are exceedingly interesting. It is, however, to be regretted that they are not described in French, or some civilised tongue. Stumbling amongst Russian characters is very hard work

to the uninitiated, and if we have made any error in the names we must attribute it to this cause, a knowledge of Russian not forming a part of our education.

From Italy we have many drawings of very different degrees of excellence. Amongst the most striking of these is a very able and well-represented design, by M. Balatri, for a monument to Pietro Perugino, in the style of Sta. Maria del Fiore at Florence, full of inlaid detail and of excellent character. Equally fine as drawings are M. Lombardi's illustrations of the Baldichino in Orsan Michale, and the northern side door to the Cathedral at Florence. As illustrations of this very beautiful phase of architectural art they are exquisite—indeed, almost equal to going to see the originals. We have in our notice of the drawings sent by Austria referred to M. Hasenauer's design for the western front of the Cathedral at Florence. In the Italian court are the designs of two Italian architects for the same, and it is interesting to study the variations thus presented to us. M. Calderini gives us two designs, neither of which is nearly so good, and M. Ceppi contributes one which is very nearly equal to M. Hasenauer's; indeed, the latter is in some points better. M. Ceppi boldly follows the line of the roof of the aisles, and in some minor details he is, as might be expected, more Italian than M. Hasenauer, but his general conception is not so grand, and we must still accord the lauret to the *Tedesco testa*, ungracious as it must seem to Italy so to do. M. Ceppi gives us also a design for the monument to Count Cavour, which is much too enriched to accord with the simple dignity of that great regenerator of modern Italy; nor does the modern costume of the Count agree well with the classic vestments and the allegorical figures at the base of his monument. A stout gentleman in a frock coat, perched upon a pillar, with daylight visible between his legs, is a trying attitude for any man, and Count Cavour does not seem happy under the circumstances. A sedant figure would have been much more becoming, and would not have made the contrast of costume so great. M. Mengoni sends a very spirited and able drawing of the Galleria Vittorio Emmanuale at Milan, which is unfortunately too overdecorated to be thoroughly good, but which will, nevertheless, repay the trouble entailed by hunting it out from under the gallery of the machinery court of Italy, where, by that wonderful systematisation we have heard so much of, but seen so little, it will be found in company with a very well designed, but to English eyes, very singularly arranged, cemetery for Milan, by M. Castelli, of Naples; and a carefully considered theatre by M. Danliani, of Palermo. M. Solari also here exhibits a very weak attempt at a Gothic church, which is almost infantine, and here, too, will be found a photograph of M. Cavallari's restoration of the Church of Randazzo, in Sicily, and a very good restoration it is, thoroughly Sicilian in its quaint mixture of Norman and Saracenic art, and a very pleasing illustration of it. M. Cavallari deserves good treatment from all architects, for he readily entertained with such all who ever visited Palermo some years ago, and we hope that the recent changes in the state of Italy have induced his return from his sojourn in the New World to the island he loved so well and knew so thoroughly. Whilst in this portion of the building we would especially call the attention of young students to the models of various forms of vaulting and groining executed by the pupils of the School of Applied Art and Engineering at Turin; they are a very interesting and useful series, and we should be glad to see similar studies prosecuted in England.

The Ottoman Empire contributes a few drawings so evidently the work of Italian or French architects as to have no national expression, and this completes the Exhibition of Architectural Drawings, excepting those sent by ourselves. We regret that the United States have not sent any illustration of the condition of architecture in their country, nor is there any record of the many buildings erecting in Brazil or Montevideo; indeed, the whole continent of America is, so far as architecture is concerned, entirely unrepresented. The architects of England have very great reason to complain of the treatment they have received at the hands of the British Executive in Paris. Whilst other countries have, as a rule, associated architecture with her sister arts, England turns her out to find refuge amongst manufactures in terra-cotta or wrought iron, and has pushed her into any hole and corner where nothing else would fit, and for which no one else would *pay*. "Only South Kensington and South Kensington alone!" seems to have been the war cry with which, under the black banner of Cole, C.B., our enemies have marched down upon us and swept us from the field—for almost the only visible representation of English architecture is a huge plaster model of that last new folly, the first stone of which was laid the other day—the Hall of Arts and Sciences. This occupies a very prominent space at the junction of four aisles, and challenges the whole world to regard it as the one exemplar of British architecture. Without much searching, the others cannot be found, and when found cannot be seen. That we do not without a cause complain of this treatment on the part of those who ought to have looked after our interest, at least equally with their own, is proved by the opinion of others; and we quote the review of M. Horreau in the *Journal des Travaux Publiques* in preference to expressing any further opinion of our own on this act of injustice—Listen!—"Lorsque a priori nous parcourions à grands pas toute l'entendue de l'Exposition pour avoir quelque idée de l'immensité de cette extraordinaire collection universelle, nous avions bien aperçu, dans la section Anglaise, au milieu de produits divers, quelques cadres à examiner plustard, et qui dans notre esprit appartenaient aux industries voisines; nous avons donc été bien surpris quand nous avons dû reconnaitre que c'etait au milieu d'objets manufacturés en fer en bois en pierre factice qu'il nous fallait chercher les œuvres des architectes Anglais. En verite, quelque restreint qu'ait été l'espace affecté à la section Anglaise, quand on voit la mangeaille et les instruments de mort si largement partagés, on ne conçoit pas que l'architecture Anglaise soit enchevètrée, ètranglée, garottée. [Thank you for that phrase, M. Horreau.] Au milieu de pierres factices que seraient mieux au dehors, qu'elle soit dans des espaces si étroits que deux personnes ne peuvent ensemble examiner les projets, alors surtout que la plupart de ces projets ne figurent à l'Exposition que par de petites photographies occupant trés-peu de place. Cette plainte est d'autant plus fondée que l'on voit encore des espaces inoccupés hors la grande bâtisse, et que pour obtenir plus de surface pour leurs beaux-arts. L'Autriche la Belgique et la Suisee out edifié des annexes speciales à leurs frais; pourtant les questions architecturales qui s'agitent en ce moment à Londres sont de la plus haute importance au point de vue de l'art et de la civilization." There! We might add to all this that our Government has spent, through the medium of that body which is supposed to protect and foster art, some £120,000 sterling, and yet thus treats that branch of it which Mr. Cole delights to snub in this manner. Of the drawings so maltreated we shall speak in our next, giving rather the reviews of other nations than our own, finding thus that boon Burns prayed for:—

> Oh, wad some power the giftie gie us,
> To see oursel's as ithers see us.

PORTLAND STONE.

Experience has proved that whatever other stones may be, the hard, almost unabsorbent, durable stone derived from Portland can be most relied upon. In very few cases, when well selected, does Portland stone disappoint us. It resists exposure to the atmosphere admirably, although it, of course, is sometimes affected in certain conditions, and occasionally does not show signs of lengthy durability, but this is almost always the result of improper selection. This stone, as its name indicates, is mainly obtained from the peninsula or island of Portland. Though not everywhere alike, the series of strata when grouped as a whole affords a vertical section of about 525ft., which, it has been found, is thus composed: hard rocks of a light colour, giving about 145ft; dark brown sandy deposits, about 45ft.; and the Kimmeridge clay formation the remaining 335ft. Between the Portland sand and the stone itself there is a stratum of blue clay, which receives the surface drainage, and supplies the fresh water for the island; next to which in an ascending order is a series of solid beds of stone interstratified by layers of chert, making up a total thickness of 75ft.* The thickness of these layers varies; but all are fossiliferous, and being broken and shattered are consequently of no marketable value. The beds of stone are from 2ft. to 5ft. thick, the cherty beds varying from 6in. to 3ft. The lower tier of the Portland stone follows, and is locally known as the "best" or "base" bed. It does not contain the best stone, but it is the softest, and is therefore largely used. It possesses the finest texture and the most uniform colour of any bed, and is eminently suited for interior work. For external purposes, however, it is not fitted, being liable to rapid decay when thus used. It can be had in any reasonable sized blocks, not more than 5ft. in one direction, since that is the average thickness of the bed. Mr. Abel, F.R.S., who a few years ago made an examination into the qualities of Portland stone, under the direction of the Inspector-General of Fortifications, reported that the main reason why the "base bed" stone was more generally uniform in structure than the "whit-bed" was in consequence of the comparative freedom of the former from distinct petrifactions, which, though they were found, from experiments made, to impart additional strength to the stone, frequently gave rise, by their existence, to cavities of sometimes considerable size. These cavities not only serve to weaken those particular portions of the stone, but if they exist in proximity to exposed surfaces of a block of stone they promote its partial disintegration by the action of frost. The whit-bed is undoubtedly the best bed; and the so-called "best bed" is, therefore, a misnomer. The first is the darkest and best, while the other bed is the lightest and worst. Mr. Abel awards it the palm for strength and compactness. There are varieties of this stone, however, which exhibit a greater degree of porosity than others. It contains, unlike the "best bed," a great quantity of comminuted shells, "the fragments being just small enough to impart a light brown tint to the stone without giving it a speckled appearance." Mr. Gray thinks that the durability of this stone, as compared to the base bed, may be occasioned by the quantity of crystallised carbonate of lime by which it is impregnated, derived from the contained shells. The top and bottom of the bed are soft, but the centre of the whit-bed proves the best for external purposes. This bed is generally 9ft. high. "When a block," says Mr. Gray, "the full height of the bed is parted in the centre two stones are produced, each of which has a hard and a soft face, the hardest being that part nearest the parting joint, and the softest the parts next the top and bottom respectively." The mason, in working the stone, in order to save labour, selects the softest part of the face; and the consequence is that there is less durability and uniformity of colour than should be in the stone used for external parts of a building. This is especially the case when the stone is laid *square* with the

* For this and some other information relative to the several beds developed in the island we are indebted to Gray's "Geology of the Isle of Portland," a book not well known but most useful.

direction of the bed, and not "*on* its natural or quarry bed." It is, however, so far as Portland stone is concerned, questionable "whether any advantage would be derived from insisting on laying the blocks on the quarry bed; it would require constant untiring supervision to secure the fulfilment of such a condition, and very few, except the practical workman, can detect in some blocks of Portland stone which way the bed runs, unless by the difference in quality between the centre of the layer and its top and bottom, and when this difference is apparent it would be indeed unwise to enforce the above rule, viz., that every stone should be laid on its natural or quarry bed."

The *Roach* stone, which is the most recent formation of the Portland stone, is celebrated for its unsurpassed durability. It is invaluable for external work, and especially for sea-works. It is light coloured, very hard, and compact, heavy, frequently containing numerous shells and cavities. Some, however, are apparently free from these cavities. Care should be taken in its selection. Some inferior qualities are like the best *Roach*, yet the superior description may be readily distinguished from the others by its darker colour. It is also more siliceous; and we are told that the cast of the *Cirithium Portlandicum* is peculiar to it. On an average the bed is 3ft. thick. Blocks of almost any lateral dimensions may be procured from the quarries. The *Roach* stone, it appears, will not cleave readily in the direction of a plane parallel with the bed or line of deposition; and so it is invariably cleaved in a direction square with the bed. The fracture is consequently uniform and regular, while by splitting the stone with the bed, the fracture would not only be irregular but wasteful.

Mr. Abel has recommended the following varieties of Portland stone for external work, and we give them in the order of what he regards as their relative value:—1. Stone from War Department Quarry, Vern Hill; Whitbed, stone, Admiralty Quarry. 2. Whitbed stone, New Maggot Quarry, Basebed stone, Admiralty Quarry, which may be considered quite equal in quality to Whitbed stone; Whitbed stone, Inmosthay Quarry, which is particularly adapted from its texture and uniformity for ornamental work. 3. Two varieties of Whitbed stone from Old Maggot Quarry, one of which is superior to the other in compactness although it is less uniform. For internal work he has recommended the following varieties for uniformity and comparative strength, viz.:—Basebed stone, old Maggot Quarry; Whitbed stone, Independent Quarry; Basebed stone, Waycroft Quarry; Basebed stone, New Maggot Quarry. These results, we may add, were only gained after long and careful comparative inspection, and after many experiments had been made as to the chemical composition of the stones, their strength and porosity.

A curious fact, which is not likely to be known to many of our readers, is this. In the Island of Portland there is what is known by the residents and quarrymen as the "Great Dirt Bed." It consists of a layer of black mould from 12in. to 16in. thick, and according to Mr. Gray, it contains silicified stumps of trees and remains of cycadeæ, with rounded stones of the size of an egg. "If it is difficult to account for the solidity of the Portland beds superimposed upon clay, it is a matter of no less surprise and difficulty that the fossil remains of plants should be converted into a hard siliceous stone, while the soil upon which they grew preserves its character unaltered."

An average specimen of Portland stone of good quality will weigh from 135lb. to 148lb. to the cube foot. Analysed it gives the following results:—Silica 1·20, carbonate of lime 5·16, carbonate of magnesia 1·20, iron alumina 0·50, water and loss 1·94. It contains therefore more carbonate of lime than Bath, Lincaster, or Ketton oolites. It can support a pressure of 3,279lb. without crushing. Mondelet, in his "L'art de bâtir" (tom. iii. p. 74) says that the piers which support the dome of St. Paul's Cathedral sustain a pressure on each superficial foot of 39,000lb. The price per foot ordinary block is 1s. 4d., and it is, therefore, costly. Being of a very hard texture it is, of course, more expensive to work. In London, the most notable building erected of this material is St. Paul's Cathedral, 1675-1717. The stone was obtained from the Grove Quarries, and it is said that when Sir Christopher Wren had the stone quarried he exposed it to the weather on the sea-beach for three years before he suffered it to be used. The following buildings have been erected in London of Portland stone. Our readers will be able to judge of the effects of the atmosphere upon this building material from the list.

Chancery-lane—Union Bank (shafts red granite), 1866.
Chancery-lane Law Institution, 1832.
Chelsea Hospital (and brick), 1682-92.
Christ's Hospital, Newgate-street (upper part of Hall), 1825-9
Clothworkers' Hall, Mincing-lane, 1858.
Coldbath-fields Prison (the gate), 1793.
Custom House, 1813-17.
Dyer's Hall, College-street, 1856-7
Cornhill, English, &c., Bank, 1857.
Fleet-street, Crown Life Assurance Buildings (and other materials), 1866.
Fleet-street, Legal, &c., Assurance Office, 1838.
General Post Office, St. Martin's-le-Grand (upper part), 1823-9.
Goldsmiths' Hall, Foster-lane, 1829-35.
Gracechurch-street, National Provident Institution, 1862.
Greenwich Hospital (not east end, which it is believed is of Roche Abbey stone) 1664, 1752
Gresham-street, Queen's Insurance Office, 1852.
Lincoln's Inn, Stone Buildings, 1756.
Lombard-street, London and County Bank (Jennings' patent faced bricks), 1866.
Lombard street, Pelican Insurance Office, 1756.
Lothbury, London and Westminster Bank (plinth of Bramley Hall stone), 1838.
Mark-lane Chambers (upper part Caen stone), 1857.
Monument, the, 1677.
Pall-mall, Reform Club, 1839.
Somerset House, parts now decaying (also Purbeck and Moor stone), 1776-92.
Southwark-street, Messrs. Tait's manufactory (also red and yellow Mansfield stone and bricks), 1865
Staple Inn, Holborn (with brick), 1843.
St. Luke's Vestry Hall (and white Suffolk bricks), 1865.
Whitehall, Montague House, 1862.

The following noted churches have also been erected of Portland stone:—

Bethnal Green, St. Matthew's Church (brick), 1746.
Broad Sanctuary, Westminster, St. Margaret's Church (tower recased), 1735.
Christ Church, Spitalfields, 1723-9.
St. Marylebone New Church, Marylebone road, 1813-17.
St. Margaret's Church, Lothbury (cleaned down 1858), 1690.
St. Mary Woolnoth Church, Lombard-street, 1716-19
St. Giles' Church, St. Giles'-in-the-Fields, 1734.
St. Paul's Church, Covent Garden, 1788.
St. Ann's Limehouse, 1712-29 (repaired after the fire), 1850.
St. Pancras New Church, 1819-22.
St. George the Martyr Church, Borough, High-street (brick dressings), 1736.

WHY WE HAVE SO LITTLE ART IN OUR CHURCHES.

THE June number of the *Ecclesiologist* contains a paper with the above title from the pen of Mr. W. Burges, and which was read by that gentleman before the Waynflete Society. Mr. Burges sets out by asking how it is that so much is spent upon the outsides of our churches and so little upon the insides? and how it is that one feels so seldom inclined to ask for the key of a new church? "The truth is," he answers, "that we know that there will be very little to see in the interior beyond some very indifferent stained glass, but too often combining bad drawing with worse colour; whereas, in the case of an ancient church, especially an unrestored one, we know we may possibly come upon some effigy which may supply us with a missing link in the history of costume or of art—some moulding or foliage which may help us in our architectural researches, or some piece of stained glass which may almost drive us to despair in attempting to discover why the old work looks like jewels, and why the new work resembles a bad kaleidoscope." With regard to painting and sculpture, Mr. Burges thinks it is undoubtedly the fact that the objections brought against them by the extreme Puritan party have had a great deal to do in retarding the progress of these arts. The same objections, however, do not apply to stained glass, and how is it, Mr. Burges again asks, that though the English Church has been most liberal in her patronage, yet, after thirty years, a really good stained glass window is the exception? "It arises, I believe, partly from a want of art education, and still more from the nearly practical disuse of our churches. As regards the want of art education I should observe that the evil is being remedied from day to day, but very slowly, and as regards ecclesiastical art, the remedy comes from without, and not from within. Why should there not be a professorship of the fine arts in our universities, and why should not our clergy be taught the difference between good and bad drawing and good and bad colour? Were this the case I imagine we should very soon see an æsthetic reformation in our sacred buildings, to say nothing of our secular ones, to the great discomfort of glass stainers, who would be obliged to employ artists, and of architects, who would have to draw the figure sufficiently to put their ideas upon paper. It is absurd to expect the architect of the present day, who is amply paid by a small percentage upon the money expended, to be a proficient in all the three great arts of architecture, painting, and sculpture; but it is not too much if we expect him to be able to show us, and show the sculptor or painter, how such or such a wall-surface can be filled up most advantageously, and in the manner most in harmony with the surrounding lines of the architecture."

Mr. Burges, who is evidently strongly imbued with continental notions as regards religious worship, is of opinion that Englishmen are careless about the interior of their churches for the reason that they use them only once or twice a week for two or four hours. He says, somewhat vaguely, that "private prayer has superseded public prayer. . . . Were men to say their prayers in churches instead of by their bedside, we should never hear that the largest city in the world had too many churches, or that the city clergy had nothing to do." His argument is, that were our churches open to the public all day long, they (the churches) would be "more sacred, and would inevitably in course of time become more splendid," because "the man of business would soon grow tired of looking at bare walls and colourless windows," and would contribute to decorate his place of worship—each after his own fashion. One would give a piece of glass, another a marble or a mosaic, and so on. Mr. Burges seems to use the argument of public prayer, not from any fervent religious feeling in the matter, but simply because it would lead to our churches being constantly open, and "this would result in an improvement in stained glass." He says, "Now this would result in an improvement in stained glass; the stained glass manufacturers would have to employ better artistic talent; they would either insist upon the manufacturers giving them the right sort of glass, or, laying aside their mutual jealousy, they would set to work in the usual nineteenth century manner, and, forming a limited liability company, manufacture it for themselves. For then it would be to their interest to do so, since their works would always be on exhibition, and always in juxtaposition with those of their rivals. In fact, it would not pay them to do bad glass: and whenever you can prove to an Englishman that a good thing pays better than a bad one, no obstacles will ever prevent him from producing the good one. Now all this happens from having the right thing (*i.e.*, good art) in the right place (*i.e.*, in a place to which the public have constant access). In the present state of affairs a bad window is produced, and is inserted in a church where it is seen only one day of the week, and in company with others just as bad. I have taken the case of stained glass because the employment of it is far more common than that of painting and sculpture, but it is obvious that painting and sculpture, under similar conditions, might be expected to improve in like manner."

The notion of daily public prayer is altogether foreign to English feeling, as well as directly opposed to the domestic habits and exclusive tastes of Englishmen. Mr. Burges proceeds to remark upon another kind of church embellishment. "There is also another employment for painters which very rarely is used at the

present day. In the middle ages, what are called pictures, as we understand them, were comparatively unknown; all the small paintings that have come down to us formed part of furniture, either domestic or sacred. It is almost impossible for us who have never seen a perfect specimen to conceive the effect of a first-class piece of mediæval sacred furniture, covered with burnished gilding, engraved and punched into patterns, enriched with paintings by an artist like Giotto, and glittering with mosaics of gilt and coloured glass. Yet such were at one time the great dossel of Westminster Abbey, the sedilia, such the coronation chair, of which only sufficient remains have come down to our time to afford us hints of what their pristine glory must have been, and such, I may add, might be our dossels, if we would only insist upon art, and give up the prettinesses of fluor spar cannon balls, inlaid dots of marble, incised stone (really only suitable for pavements or outside works), and other shams and vanities. Indeed it is such shams and vanities that have but too often taken the place of real art, and it is to them that we owe our slow progress. How often do we read of such and such a church being restored, and, after mentioning that the plan is the appropriate one of the cross, and that the columns have their capitals carved into wheat ears and vine leaves or passion-flowers, the penny-a-liner proceeds to state that Mr. Blank, the decorator, has covered the east end with an appropriate diaper, and that round the heads of the windows are texts illuminated upon zinc. It is, in fact, full time, if we are to make any progress, that this foolish and objectionable practice should be put a stop to. Inscriptions in letters that nobody can read are neither beautiful nor ornamental; and very often the money spent on them would have gone some way in procuring something much better. The popularity of this species of so-called decoration is quite wonderful."

Coming to the work of the sculptor we have the following:—"He, as well as the modern painter, can copy nature, and knows his anatomy; but surely more than those qualifications is required if he has to work for the church. He also must conventionalise his figures if he ever expects them to go well with the architecture. I remember the time when mediæval foliage was supposed to be within the reach of any clever common mason, and if he were very intelligent indeed he was promoted to do figures. This state of things, I am happy to say, has passed away, and a carver is now brought up to this business. As to the sculptor, we are yet in a transition state; we have not been able to secure the services of the first-class men, and those who do the work are hardly as perfect as they should be, for in many cases they have not been educated for it. Of course there are exceptions, but how often are we disappointed, upon looking into groups of figures, to find the faces without the least expression, and the attitudes without any meaning—in fact, so much chisel work in stone or alabaster, as the case may be. It is here, in my opinion, the architect should step in, and in a small sketch show what he wants. Doubtless, as the sculptor's art advances, this will become more or less unnecessary; but even then there will always be sundry lines which, in the architect's opinion, will conduce to the well-being of his architecture better than others.

Living under very different circumstances from those of our forefathers, it is evident, says Mr. Burges, that we must set to work to design our buildings in a different manner to them:—"We are richer than they were; we demand larger buildings. We can procure costly materials, which were hopeless for them to procure. We have immense mechanical contrivances utterly unknown to them, and it, therefore, becomes us to use all those advantages, and if we did use them, and use them loyally, under our present conditions, we should not be building little copies of thirteenth-century village churches with Kentish rag-rubble walls in the heart of the nineteenth-century commercial metropolis. On the contrary, we should build thick and high walls, of good sound stone or brick, so thick that they should bear vaultings or domes, and so high that they should overtop the huge warehouses which surround them. In them we should place great columns and slabs of precious marbles brought from afar and polished by that real slave of the lamp, the steam engine. The domes and upper parts of the walls would glow with imperishable mosaics from our glass-houses, and the same source would supply the gems for the windows. The dossel would shine with gilded metal and gems, and a whole history would be carved on the stalls. Now all these things have been done in very little bits here and there, but they have never been collected together, and we are therefore deprived of seeing how very glorious is the apparel of the King's daughter. Would not such a church be worth all the notchings and cuspings and tracery and encaustic tiles and wheat-ears and vine-leaves, and illuminated texts upon zinc, and, in fact, all the man-millinery which but too often has taken the place of art? This is an idea of a town church; the little village church would remain very snug as it was in the time of our ancestors, only let it have what few stained glass windows it may possess the best of their kind, and let them be connected with simple monochrome paintings. The village church is not the place for marble slabs or mosaic walls, and it strikes me that the fashion of lining the church with alabaster, which was so popular a few years ago, is more honoured in the breach than the observance.

"Some years ago I expressed an opinion that the next development of art would be a domestic one, and I am sorry to say that I at present see no reason to change my opinion. As long as ecclesiastical art is only brought before our eyes for a short time for one day in the week, I do not see very well how it can be otherwise. On the contrary, I see in the removal of the city churches from their proper sites where they ought to be in use all day long a most discouraging symptom. It looks as if, in the opinion of the heads of the church, private devotions should supersede public, and as if public devotion can only be carried on by means of seats or pews, reading the prayers, dull sermons, and such singing as would never be tolerated in a drawing-room; any innovation upon such time honoured practices being stigmatised as Popish or ritualistic. 'Celui-ci tuera celui-la,' said Victor Hugo, referring to the printed book and the cathedral; the world is still going on, and the printed book certainly appears to have the best of it."

PLATE GIRDERS.—No. 4.

In giving an example of working out the strength of a plate girder, the simplest mode will be to place it before the reader as taken from an office memorandum book, which most engineers keep by them for any future reference. The span being given, and the bridge made to carry a single line of rails, in the case before us we have

	ft.	in.
Span or width of opening	27	0
Depth of girders	2	3
Width of flanges	1	3

Load per foot run, $1\frac{1}{4}$ tons on each girder.

This load will include the weight of locomotive and the structure itself.

We must first find the strain on the centre of the bottom flange, which is done by the well-known formula

$$\frac{\text{Total distributed load} \times \text{span}}{\text{8 times the depth of girder}}$$

or in figures

$$\frac{33{\cdot}75 \text{ tons} \times 27\text{ft.}}{8 \times 2{\cdot}25\text{ft.}} = \frac{911{\cdot}25}{18} = 50{\cdot}625 \text{ tons strain}$$

at centre.

Now, as we stated in the first paper, as imperfect workmanship was always likely to occur, it was best to keep the strain on the iron at 4 tons per square inch of section, we divide this central strain of 50·625 tons × 4, which gives 12·656in. sectional area required in bottom flanges of girder.

We next proceed to build up the flange of plates and ⊥-iron of sufficient thickness to give this area and find

Two flange plates 15in. × ⅜in. thick gives	11·25
Two ⊥-irons 3in. × 3in. × 7-16in. thick gives	4·88
Gross sectional area in inches and decimals of bottom flange	16·13

The sectional area of ⊥-irons will be found by referring to the table given in paper No. 3. From this gross section of 16·13in. we must deduct the area lost by rivet holes, which is found as follows. There are four rivet holes through the flange plates in transverse section, and also four holes through the ⊥-irons. Multiply the thickness of flanges by the diameter of rivets, and we have the area which is lost by one rivet, which again multiplied by the number of rivets, 4, gives the area lost by all rivets in the width of flange, and the same with the ⊥-irons, thus

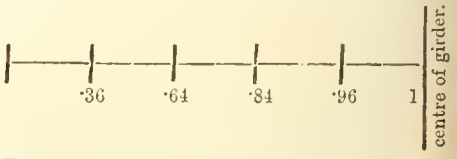
Thickness of 2 plates is ·75in. × ·75in. diameter across rivet hole = ·5625 × 4 holes = 2·25in.

Thickness of 7-16in. ⊥-iron is ·4375in. × ·75in. diameter of rivet hole = ·328 × 4 holes = 1·31in.

Summary. Gross section of flange plates and ⊥-irons =		16·13
Deduct for 4 rivet holes in flange	2·25	3·56
Deduct for 4 rivet holes in ⊥-irons	1·31	
Nett available section		12·57

Thus we see that a section of 12·656in. is required in the centre of the bottom flange, which is tension, and we have a nett section of 12·27in. of plate and ⊥-iron, which for all practical purposes is sufficiently near.

The strain on the flanges diminishes from the centre of girder towards the ends and the proportions of sectional area may be thus found. If half the girder be divided into 5 equal parts, and the area in centre being 1, the proportion of the other parts will be found by multiplying at the points of division by the decimals here given



From the fourth division to end it will be found simplest to continue the same strength of flange plate. It might be made less, but if dropped off to a less thickness, a cover plate will have to be used, and so there would be no saving of material This mode of constructing a bridge with the rails resting or bearing upon the transverse girders is very commonly done, and is in this case taken from a bridge lately erected.

PRIZES FOR ART-WORKMEN.

The Council of the Society of Arts offer prizes for art-workmanship, according to the following conditions:—

I. The works to be executed will be the property of the producers, but will be retained for exhibition, in London and elsewhere, for such length of time as the council may think desirable.

II. The exhibitors are required to state in each case the price at which their works may be sold, or, if sold previously to exhibition, at what price they would be willing to produce a copy.

III. The awards in each class will be made, and the sums specified in each class will be paid, provided the works be considered of sufficient merit to deserve the payment; and, further, in cases of extraordinary merit additional awards will be given, accompanied with the medal of the society.

IV. Before the award of prizes is confirmed, the candidates must be prepared to execute some piece of work sufficient to satisfy the council of their competency.

V. *Bona fide* art-workmen only can receive prizes.

VI. Although great care will be taken of articles sent for exhibition, the council will not be responsible for any accident or damage of any kind occurring at any time.

VII. Prices may be attached to articles exhibited and sales made, and no charge will be made in respect of any such sales.

VIII. All the prizes are open to male and female competitors, and in addition, as regards painting on porcelain, cameo-cutting, engraving on glass, decorative painting, and wall mosaics, a second set of prizes, of the same amounts, will be awarded among female competitors. If a female desire to compete in the female class only, she must declare her intention accordingly. The originals of the works prescribed may be seen at the South Kensington Museum.

IX. Any producer will be at liberty to exhibit, either in his own name or through his workmen, any work or works as specimens of good workmanship, in the various classes, provided that the work or works be accompanied with a statement of the name or names of the artisans who executed their respective portions; and if the work or works be sufficiently meritorious, extra prizes will be given to the artisans who have executed them.

X. Artisans may, if they think fit, exhibit works executed by them after other designs than those stated above, in any of the classes. Such works may contain the whole or portions of the prescribed designs, and must be of a similar style and character. Competitors must specify the class in

which they exhibit. If the works be sufficiently meritorious extra prizes will be awarded.

XI. All articles for competition must be sent in to the society's house on or before Saturday, the 21st of December, 1867, and must be delivered free of all charges. Each work sent in competition for a prize must be marked with the art workman's name, or, if preferred, with a cypher accompanied by a sealed envelope giving the name and address of the art-workman. With the articles, a description for insertion in the catalogue should be sent. The works will be exhibited at the Society's House, and afterwards at the South Kensington Museum.

Casts may be seen at the Society of Arts, Adelphi, London, and the Schools of Art at Edinburgh, Dublin, Manchester, Glasgow, Birmingham, and Hanley in the Potteries.

Photographs and rough casts in metal, &c., may be purchased at the Society of Arts, John street, Adelphi, at the prices named.

The plaster casts of the examples in classes 2 and 4 (except bas-relief 4 *a*) may be obtained from Mr. Franchi, 15, Myddelton-street, Clerkenwell, E.C.; the other casts from Mr. D. Brucciani, Galleria delle Arti, 40, Russell-street, Covent Garden, W.C.

*** The council are happy to announce that several of the works which received first prizes in the competitions of 1863, 1864, 1865, 1866, and 1867 have been purchased by the Department of Science and Art, to be exhibited in the South Kensington Museum and the Art Schools in the United Kingdom.

FIRST DIVISION.

WORKS TO BE EXECUTED FROM PRESCRIBED DESIGNS.

For the successful rendering of the undermentioned designs in the various modes of workmanship according to the directions given in each case.

CLASS 1—CARVING IN MARBLE, STONE, OR WOOD.

(*a.*) The Human Figure.—One prize of £15 for the best, and a second prize of £7 10s. for the next best, work executed in marble or stone, after part of a frieze of a chimneypiece by Donatello, No. 5,795, in the South Kensington Museum; or a relievo in terra cotta, Amorini supporting an entablature; original in the South Kensington Museum, No. 11,940. Dimensions—two-thirds the size of the cast (linear). The design may be adhered to strictly or adapted to any architectural purpose.—Cast, 15s.; photograph, 1s.

(*b.*) Ornament.—One prize of £10 for the best, and a second prize of £5 for the next best work, executed in marble, stone, or wood, after a carved chair back in the South Kensington Museum. Dimensions to be two-thirds of the cast (linear).—Cast, 12s.; photograph, 1s.

(*c.*) Ornament.—One prize of £10 for the best, and a second prize of £5 for the next best, work executed in stone, after a Gothic bracket in the Architectural Museum. Dimensions the same as the cast. In this design the details may be improved by the introduction of small animals, and the human head may be changed according to the taste of the art-workman.—Cast, 10s.; photograph, 1s.

(*d.*) One prize of £20 for the best, and a second prize of £10 for the next best, work carved in wood, after a panel in carved oak Original in South Kensington Museum, No. 274. Dimensions—optional.—Photograph, 6d.

(*e.*)—One prize of £15 for the best, and a second prize of £7 10s. for the next best, work carved in wood, after the entablature of a chimneypiece carved in wood, in the South Kensington Museum, No. 85, 1864. Dimensions—same size as original.—Photograph, 1s.

(*f.*) Ornament.—One prize of £10 for the best, and a second prize of £5 for the next best, work carved in wood, after an Italian pictureframe in the possession of Henry Vaughan, Esq. Dimensions optional. This design may be adhered to strictly or adapted in such manner as the workman may think fit.—Photograph, 2s.

(*g*) Ornament carved and gilt.—One prize of £10 for the best, and a second prize of £5 for the next best, work executed in wood, carved and gilt, after a console table in the South Kensington Museum, No. 6,497, of the period of Louis XVI. The work to be carved roughly in wood, then to be prepared in the white by a gilder, then cut up or carved in the white by the carver, then to be gilt in mat and burnished gold. As such work may probably be executed by two persons, the prize will be apportioned as the judges may determine.—Photograph, 1s.

CLASS 2—REPOUSSE WORK IN ANY METAL.

(*a.*) The Human Figure as a bas-relief.—One prize of £10 for the best, and a second prize of £5 for the next best, work executed after the Martelli bronze mirror case, No. 5,717, in the South Kensington Museum—dimensions, 6¾in. diameter; or a panel in low relief, the Virgin and Child, in South Kensington Museum, No. 66, 1866. Dimensions—one-third of original.—Cast of mirror case, 2s.; photograph, 1s.; cast of bas-relief, 3s. 6d.

(*b.*) Ornament.—One prize of £5 for the best, and a second prize of £3 for the next best, work executed after a tazza in silver, date 1688, the property of Sir W. C. Trevelyan, Bart., now in the South Kensington Museum. Dimensions—the same as the model.—Photograph, 1s.

CLASS 3—HAMMERED WORK, IN IRON, BRASS, OR COPPER.

Ornament.—One prize of £7 10s. for the best, and a second prize of £5 for the next best, work executed after a knocker in wrought iron, in the South Kensington Museum, No. 9,007. If the work is executed in brass or copper, it should be rendered subject to the conditions of these metals, either as split and riveted or partly beaten from the sheet, and the awards will be made in view of these conditions. The work must not be covered with colour or any coating which masks the workmanship.—Photograph, 1s. 3d.

CLASS 4—CARVING IN IVORY.

(*a.*) Human Figure in the round.—One prize of £15 for the best, and a second prize of £10 for the next best, work executed after an ivory plaque of Silenus and Amorini, by Flamingo, No. 1,059, in the South Kensington Museum. Dimensions—5in. greatest length; or after a relievo in marble, the Virgin and Child, No. 4,233 in the South Kensington Museum. Dimensions—to be reduced in height by one-third (linear).—Cast of the plaque, 2s.; and photograph of the Virgin and Child, 1s. each.

(*b.*) Ornament.—One prize of £7 10s. for the best, and a second prize of £5 for the next best, work executed after an ivory crozier head, in the South Kensington Museum. No. 214, 1865. Dimensions—the same as the cast.—Cast, 1s.

CLASS 5—CHASING IN BRONZE.

(*a.*) The Human Figure.—One prize of £10 for the best, and a second prize of £5 for the next best, work executed after a panel in low relief, the Virgin and Child, in the South Kensington Museum, No. 66, 1866. A rough casting in bronze, on which the chasing must be executed, will be supplied by the Society at cost price.—Plaster cast, 3s. 6d.

(*b.*) Ornament.—One prize of £10 for the best, and a second prize of £7 10s. for the next best, work executed after a silver gilt missal cover, in the South Kensington Museum, No. 2,639.—Photograph, 1s.

CLASS 6.—ETCHING AND ENGRAVING ON METAL—NIELLO WORK.

Prizes of the Goldsmiths' Company.

Ornament.—One prize of £10 for the best, and a second prize of £5 for the next best, work executed after arabesques by Lucas Van Leyden, A.D. 1528, No. 18,968 in the South Kensington Museum. To be engraved the height of the photograph, and, if round a cup or goblet, repeated so as to be not less than 9in. in length when stretched out. Photograph, 6d.

CLASS 7—ENAMEL PAINTING ON COPPER OR GOLD.

(*a.*) The Human Figure.—One prize of £10 for the best, and a second prize of £5 for the next best, work executed after a panel in low relief, the Virgin and Child, in the South Kensington Museum, No. 66, 1866. Ground to be blue. Dimensions—half size of original.—Photograph, 1s.; cast, 3s. 6d.

(*b.*) Ornament.—One prize of £5 for the best, and a second prize of £3 for the next best, work executed after the back of a plate, No. 8,428, in the South Kensington Museum. Ground to be blue. Dimensions—the same as the photograph.—Photograph, 6d.

CLASS 8—PAINTING ON PORCELAIN.

(*a.*) The Human Figure.—One prize of £10 for the best, and a second prize of £5 for the next best, work executed after a photograph of a drawing by Raphael, No. 20 in the South Kensington Museum. Dimensions—the same as the photograph. This work is to be coloured according to the taste of the painter.—Photograph, 9d.

(*b.*) Ornament.—One prize of £5 for the best, and a second prize of £3 for the next best, work executed after a photograph of ornament by Aldegrever, No. 2,118 in the South Kensington Museum, and coloured, according to the taste of the painter, with a gold ground. Dimensions—Double the size of the photograph (linear).—Photograph, 6d

N.B.—A second set of prizes of the same amount is offered to female competitors. See conditions, Section VIII.

CLASS 9—DECORATIVE PAINTING.

(*a.*) Ornament.—One prize of £5, and a second prize of £3, for a work executed after a photograph of ornament by Aldegrever, in the South Kensington Museum, No. 2,118. Dimensions—length, 3ft.—Photograph, 1s.

(*b.*) Ornament.—One prize of £5, and a second prize of £3, for a work executed after a picture frame, in the South Kensington Museum, No. 7,820. Dimensions—5ft. by 3ft. 11½in., outside measure. The works to be executed on canvas, either with or without stretchers, in cool colours. Some lines of the mouldings may be gilt.—Photograph, 1s. 6d.

N.B.—A second set of prizes of the same amount is offered to female competitors. See conditions, Section VIII.

CLASS 10—INLAYS IN WOOD (MARQUETRY OR BUHL), IVORY, OR METAL.

Ornament.—One prize of £5 for the best, and a second prize of £3 for the next best, work executed after a guitar inlaid with ivory, ebony, and mother-of-pearl. The ornament to be of the same dimensions as the original, but may be applied to any object. No. 9,611 in the South Kensington Museum.—Photograph, 6d.

CLASS 11—CAMEO CUTTING.

(*a.*) Human Head.—One prize of £10 for the best, and a second prize of £5 for the next best, work executed after a bust of Clytie in the British Museum. The head only.—Cast of the head, 5s.

N.B.—A second set of prizes of the same amount is offered to female competitors. See conditions, Section VIII.

CLASS 12—ENGRAVING ON GLASS.

Ornament.—One prize of £10 for the best, and a second prize of £3 for the next best, work executed after arabesques by Lucas Van Leyden, A.D. 1528, No. 18,968 in the South Kensington Museum. To be engraved the height of the engraving; and if round a glass or goblet, repeated so as not to be less than 9in. long when stretched out.—Photograph, 6d.

N.B.—A second set of prizes of the same amount is offered to female competitors. See conditions, Section VIII.

CLASS 13—WALL MOSAICS.

Human Head.—One prize of £10 for the best, and a second prize of £7 10s. for the next best, work executed after a female head (over the lame cripple) in the cartoon of the "Beautiful Gate." The dimensions of the work should be regulated by the size of the tesseræ proposed to be used, which size may be left to the choice of the artist. Although desirable it is not necessary to execute the whole subject in actual mosaic. The original is at the South Kensington Museum. Tesseræ of two sizes may be obtained from Messrs. Minton, Stoke-upon-Trent; Messrs. Maw and Co., Brosely, Shropshire; Messrs. Powell and Sons, Temple-street, Whitefriars; and Messrs. Jesse Rust and Co., Carlisle-street, Lambeth.—Photograph, 1s.

N.B.—A second set of prizes of the same amount is offered to female competitors. See conditions, Section VIII.

CLASS 14—GEM ENGRAVING.

(*a.*) Human Head.—One prize of £10 for the best, and a second prize of £5 for the next best, work executed after a cameo portrait of Savonarola, No. 7,541 in the South Kensington Museum. Dimensions—the same as the cast.—Cast, 6d.

(*b.*) Full-length Figure.—One prize of £10 for the best, and a second prize of £5 for the next best, work executed after a small Wedgwood medallion, No. 5,827 in the South Kensington Museum. Dimensions—the same as the cast.—Cast, 6d.

CLASS 15—DIE SINKING.

Human Head.—One prize of £10 for the best, and a second prize of £5 for the next best, work executed after a Wedgwood Medallion in the South Kensington Museum, No. 3,470. Photograph, 6d.

CLASS 16.—GLASS BLOWING.

Ornament.—One prize of £7 10s. for the best, and a second prize of £5 for the next best, work executed after an original in the South Kensington Museum, No 6,785. Dimensions—As given in the wood engraving.—Photograph, 6d.

CLASS 17.—BOOKBINDING.

(*a.*) Bookbinding.—One prize of £7 10s. for the best, and a second prize of £5 for the next best, work executed in bookbinding, after a specimen in the South Kensington Museum, No. 16,469. The work to be bound should be some classical author of the size given. Dimensions—The same as the photogreph.—Photograph, 1s.

CLASS 18.—EMBROIDERY.

Ornament.—One prize of £5 for the best, and a second prize of £3 for the next best, work executed, either after two angels, in an example in the South Kensington Museum, No. 1,194, 1864, or an Italian silk in the South Kensington Museum, No. 7,468, which may be adapted to a screen. Dimensions—According to the taste of the embroiderer.—Photograph, German, 6d.; Italian, 1s.

CLASS 19.—ILLUMINATIONS.

Ornament.—One prize of £5 for the best, and a second prize of £3 for the next best, copy made from an altar card, attributed to Giulio Clovio, in the South Kensington Museum, No. 2,958, or from a MS. border, date 1,450, No. 3,057, in the South Kensington Museum. Dimensions—One-half larger than the photograph (linear).—Photograph, 2s.

SECOND DIVISION.

CLASS 20.—WOOD CARVING.

(*a.*) Human figure in the round, in alto or in bas-relief. Animals or natural foliage may be used as accessories. First prize of £25 and the Society's Silver Medal. Second prize of £15. Third prize of £10.

(*b.*) Animal or still-life. Fruit, flowers, or natural foliage may be used as accessories. First prize of £10. Second prize of £7 10s. Third prize of £5.

(*c.*) Natural foliage, fruit, or flowers, or conventional ornament, in which grotesque figures or animals may form accessories, preference being given where the work is of an applied character for ordinary decorative purposes, as representing commercial value. First prize of £10. Second prize of £7 10s. Third prize of £5.

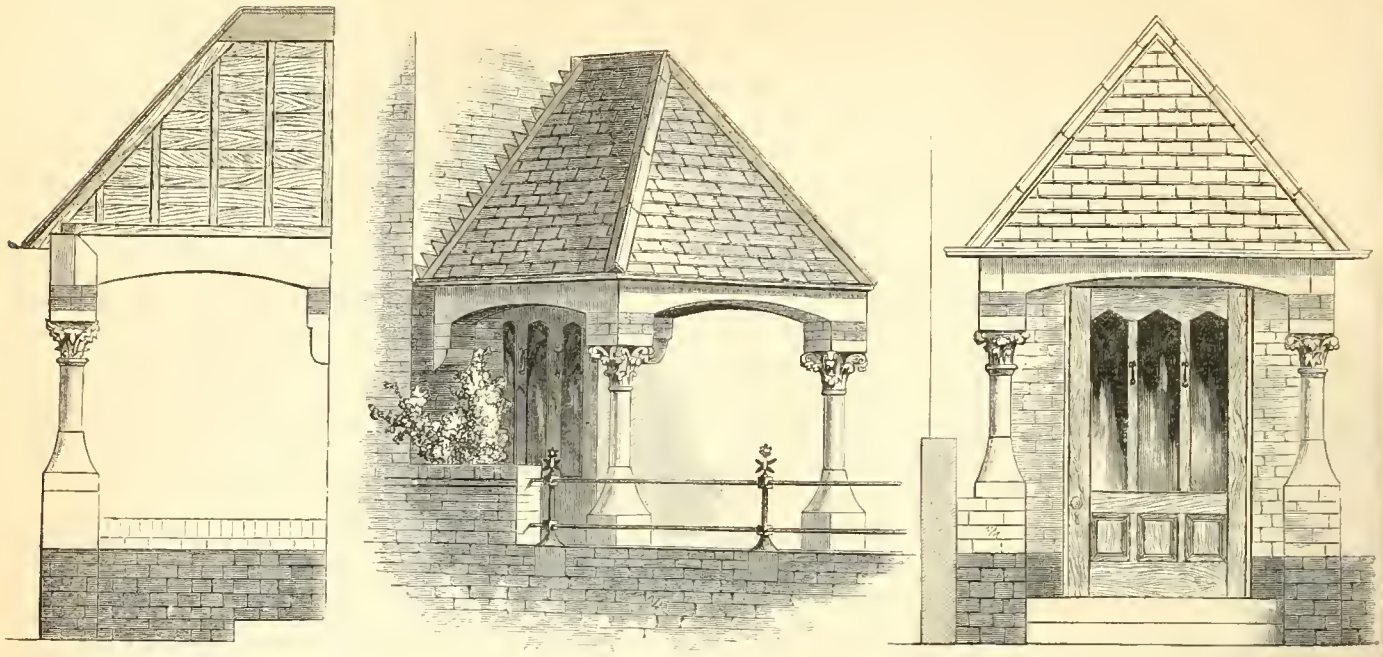
By Order,

P. LE NEVE FOSTER, Secretary.

PUBLIC PARKS, LIVERPOOL.

IT appears from a report of the proceedings of the Liverpool Town Council that the Improvement Committee, while selecting the design of Messrs. André and Hornblower for the laying out of Sefton Park, as the prize design, considered that it did not altogether meet the wishes of either the committee or the public. They accordingly consulted Mr. Nesfield, the well-known landscape gardener, who made various suggestions in regard to the plans which have been adopted as improvements. The work will now be proceeded with at once. At the same meeting the committee recommended the adoption of the plans of Mr. Kemp for laying out the Stanley Park, subject to the architectural portions of the work, and also to such modifications in matters of detail as might be hereafter agreed upon. A report was read from Mr. Kemp in reference to the plans. He stated that with the permission of the council he proposed to call in Mr. Scott, of Liverpool, to take charge of the architectural portions of the work. He estimated that the expense of laying out the park would be £27,792, and of the proposed architectural accompaniments £13,000; making together, £40,972. It appeared to him that the park ought to be kept in sufficiently good order for an annual outlay of £500; and he considered that that might be reduced £100 by letting the fifty acres of pasture land. A plan of the proposed park was exhibited in the Council chamber. The recommendation was confirmed by the Council.

The Imperial Commission of the Paris Exhibition have placed thirty seats for the ceremonial of the distribution of prizes by the Emperor on July 1, at the disposal of the Lord Mayor of London.



PORCH, WORCESTER LODGE, MIDDLETON ROAD, HOLLOWAY (THREE VIEWS).—MR. GEORGE TRUEFITT, ARCHITECT.

PORCH.

THE above illustrations represent three views of a porch of Worcester Lodge, Middleton-road, Holloway, of which Mr. George Truefitt is the architect. A front and side elevations, with plans of ground and first floor, are given in "Villa and Cottage Architecture," published by Blackie and Son, and noticed in the Building News of the 17th May last. We need scarcely say that the porch possesses the qualities of elegance and simplicity, and is consequently worthy of imitation.

CHURCH OF ST. JOHN THE BAPTIST, HARROW-ON-THE-HILL.

AN interior view and plan of this church was given in the Building News for November 16, 1866, No. 619. We now give a sheet of details, including a small sketch of the exterior, from the north-west, as the church will appear when complete. The description accompanying the previous illustration gives full particulars of arrangement, materials, and cost. The details will otherwise sufficiently explain themselves. They are of very simple character, as might be presumed from the outlay, viz., £1,600 for 450 sittings for adults on one floor, and including decorations, gasfittings, and heating, there being stepped lead flashings to all gables, oak doors, wrought metal work to special design, and throughout the best workmanship and materials. The brick arches are entirely of 3in., 4½in., or 9in. rings, ungauged, and only very slightly axed for the smaller arches. Being thus composed of single bricks in each ring, and the bricks used whole and undressed, a certain quaintness of effect, simplicity of construction, and the utmost economy of cost are secured. The heating is by Porritt's ground stoves. Messrs. Dove Brothers were the contractors, and the architect was Mr. Bassett Keeling.

PURE WATER FOR LONDON.

NEXT to the granite rock reservoir of Loch Katrine, which supplies perhaps the purest water in the world to Glasgow, the water from the gathering grounds supplying the town of Farnham, in Surrey, is the most free from any kind of adulteration. These gathering grounds, which lie on the hill side near the town, are composed of layers of siliceous sand covered with heath. These receive the rainfall, and form, in fact, gigantic filter beds, which free the comparatively pure rain water from any little impurity it may have contracted. The water is gathered in ordinary drain pipes, a few feet below the soil, and from these pipes it flows into deep storage tanks which provide against a season of drought. These drainage pipes spread out in every direction like the roots of a tree, and collect from every particle of the large area of heath: these ramifying gathering ducts form the scientific parallel and corollary of the ducts of delivery which spread the water at present into every house in the metropolis. These gathering grounds are no mere matter of theory, as many towns in the North, besides Farnham, have depended upon the supply they afford. If it is asked where are such gathering grounds to be found near London, any traveller by the South-Western Railway will answer, the long tract of moorland which stretches north and south from Bagshot to Haslemere, and east and west from Farnham to Woking, a tract covering an area of at present nearly valueless heath, of not less than one hundred square miles—a gathering ground sufficient, with proper storage reservoirs, to supply the metropolis to the end of time with a water not less pure than that of the celebrated Bala Lake, in North Wales. It is well to know that if chartered water companies fail, there is abundance of water of a far purer quality than it is possible for them to supply, which only awaits the hand of the hydraulic engineer to issue forth into our houses from the apparently dry and thirsty desert at our doors.

Andrew Wynter, M.D.

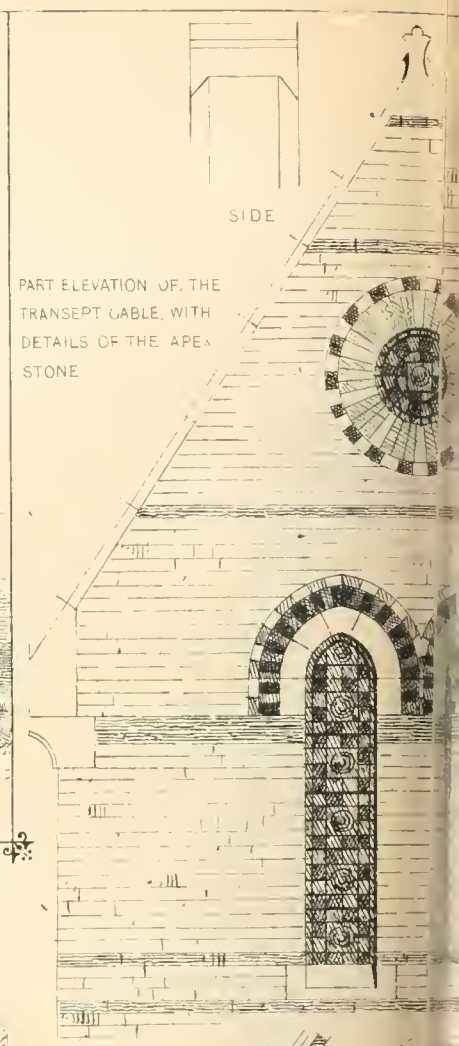
THE DUTIES OF BOROUGH SURVEYORS.

A SPECIAL meeting of the members of the Northern Architectural Association was convened at Newcastle-on-Tyne on the 12th inst., under the presidency of Mr. John Johnstone, to consider the propriety of sending a deputation to confer with the committee of the Town Council respecting borough surveyors accepting private practice. The honorary secretary (Mr. Thomas Oliver) said he had been requested to convene the meeting by a large number of the members of the Northern Architectural Association, in consequence of certain reports which had been circulated in the town. A conversation ensued, in which the president, the honorary secretary, Mr. Thompson, Mr. Gibson Kate, and others joined. It was generally deemed inexpedient for official persons to undertake private practice; and a committee, consisting of Mr. John Johnstone, Mr. A. M. Dunn, Mr. Matthew Thompson, Mr. Septimus Oswald, and Mr. Thomas Oliver, was appointed to wait on the committee of the Town Council of Newcastle to inquire into the duties of corporate officials, and for the purpose of presenting a memorial respecting the custom and propriety of borough surveyors undertaking such practice.

RESTORATIONS IN PARIS.

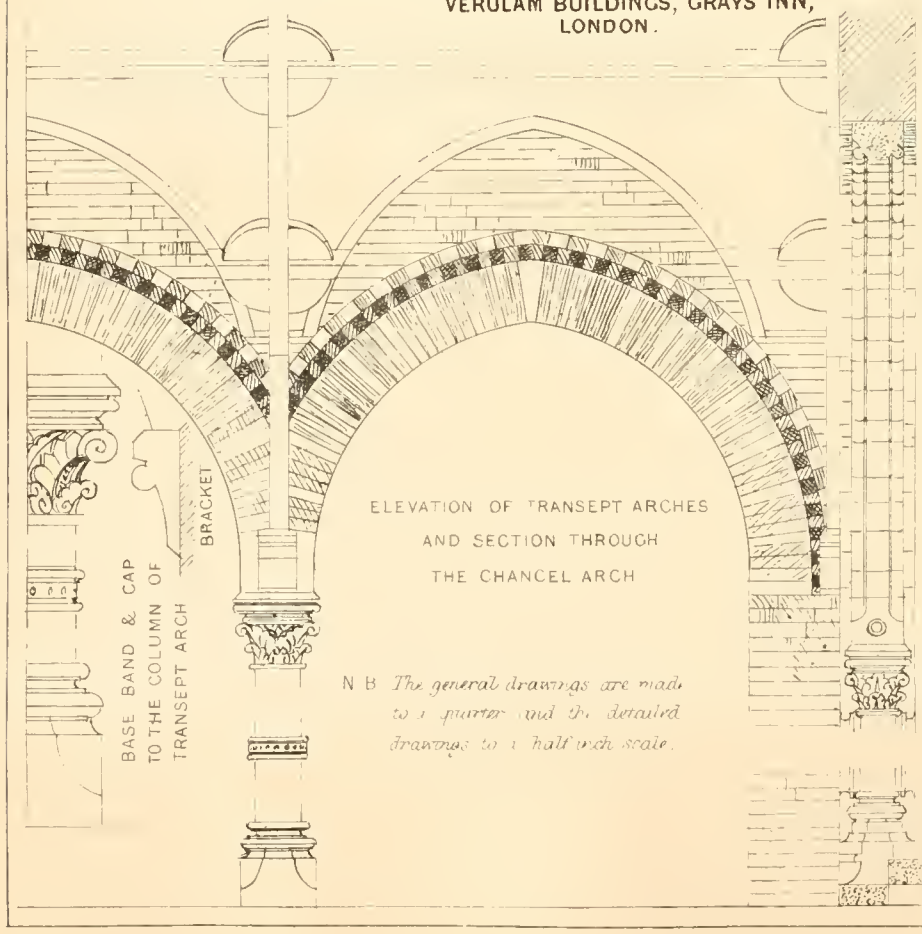
VISITORS to Paris this year, says the *Journal of the Society of Arts*, will find several interesting buildings recently restored or now under hand. The ancient priory of St. Martin des Champs, occupied by the Conservatoire des Arts et Métiers, has been many years in the hands of the restorer, and is now approaching completion; the priory church has long been occupied by machinery in motion, but the apse, which is very fine, has only recently been restored. The outside of the church, like most cathedrals and other ecclesiastical edifices on the continent, is masked by a row of wretched tenements, which are now being removed. Visitors who are not acquainted with Paris must not omit to visit the ancient refectory of the priory, a very remarkable building of the thirteenth century, attributed to Pierre de Montereau, which stands parallel to, and not far from, the inner wall of the church, and is now the library of the Conservatoire; it is a curious, long, narrow structure, with a row of columns up the centre. The restorations of Notre Dame are now entirely terminated, with the exception of a portion of the side chapels and some subsidiary work. The whole of the main structure is restored, and the general effect is excellent. The upper floor of the beautiful *chapelle* of St. Louis was completely restored and embellished some years ago, and the lower chapel is now in the hands of the restorers, and approaches termination. The city of Paris is occupied with the restoration of the Hôtel Carnavalet, which is destined to contain the museum of the antiquities of Paris. The opening up of new streets not far from the central markets has laid bare one of the most remarkable monuments in Paris, namely, the tower of the ancient residence of the Dukes of Burgundy, built by Jean Saint Peur, which is fortunately in an excellent state of preservation. This will be a remarkable addition to the architectural antiquities of Paris, for it has been completely masked for a long period by houses, and lost to all but earnest students; it is an admirable specimen of the Burgundian architecture, which is seen in such grand forms at Dijon, the capital of the once powerful Dukes of Burgundy. The city of Paris has also recently acquired the Hôtel de Sens, occupied in the middle ages by the Kings of France and the Archbishops of Sens, and is about to cause it to be restored.

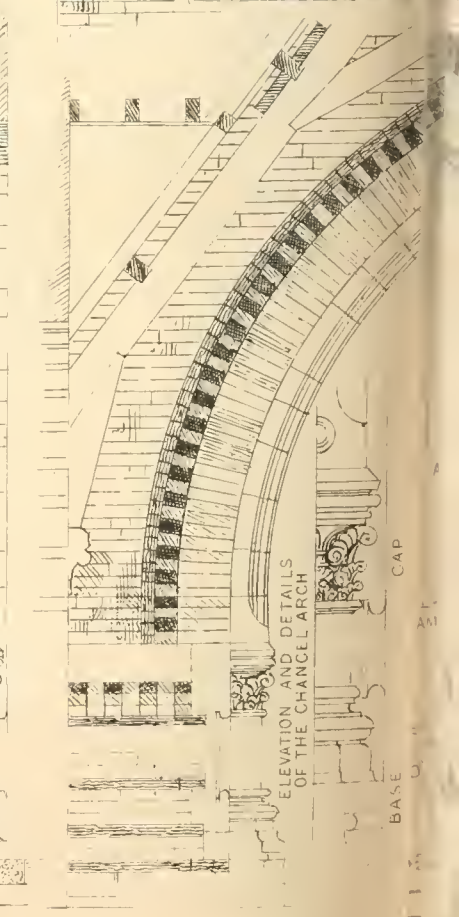
We have received a long communication which echoes the rather vulgar grumble which is heard everywhere just now. The writer attributes the dullness of the building trade in London, and particularly in the West-end, to the absence of the Queen. He says noblemen and others will not have their houses "done up," that house decorators have but comparatively little to do on account of the sleepiness which has come over the aristocracy by the absence of the Queen. No doubt some few West-end houses are suffering from the cause specified, but the wealth of the country does not diminish because "the Court" is at Balmoral instead of Buckingham Palace. The engineering profession is at the present moment in a very dull state, but certainly that is not the fault of the Queen. Is it not rather the fault of middle class blundering and cupidity, which caused such an awful crash in banks, firms, railway companies, &c., last year?

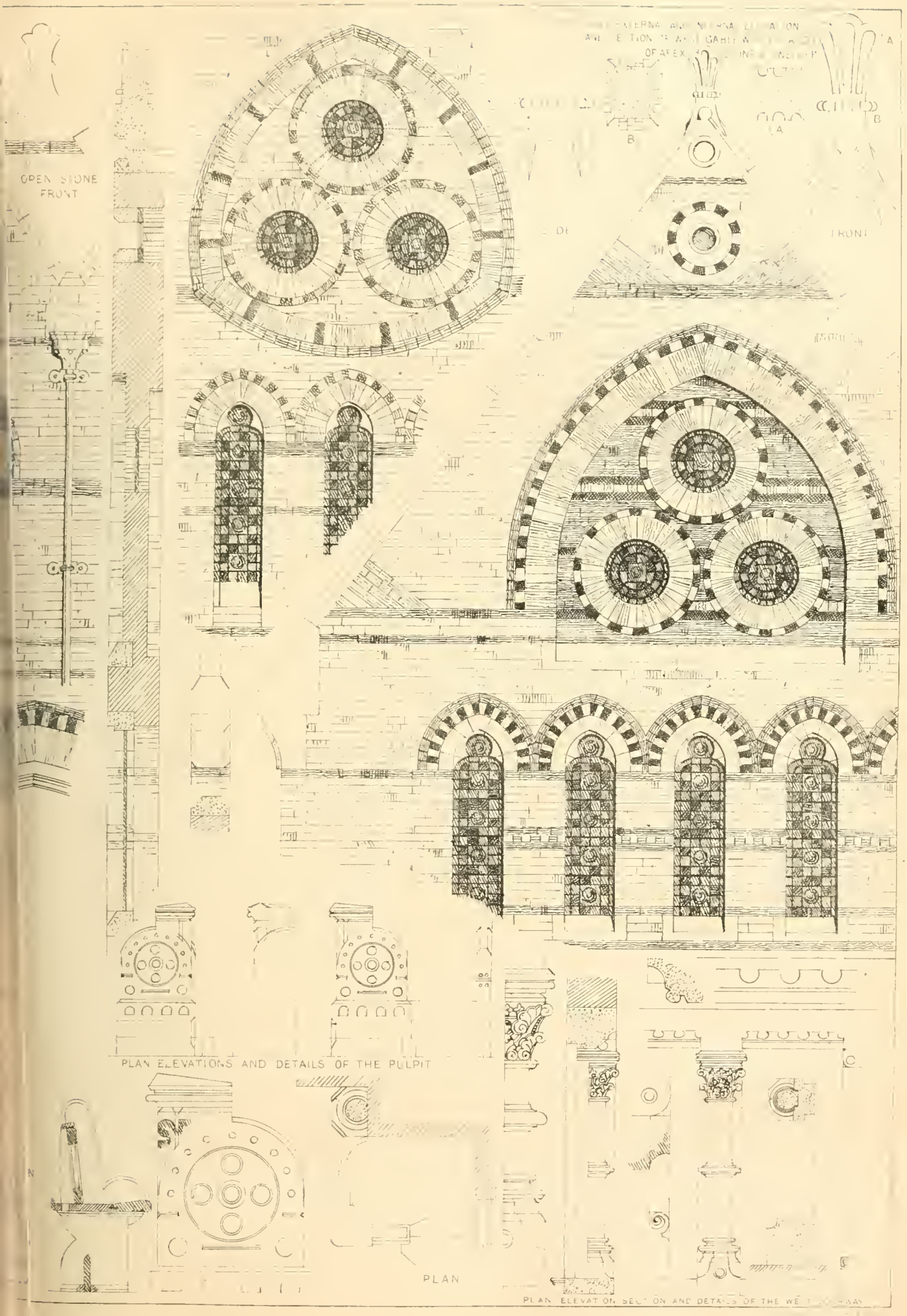


North West View and Details of the Church of St. John the Evangelist, erected at Greenhill, Harrow.

ARCHITECT, BASSETT KEELING, A.R.I.B.A.
VERULAM BUILDINGS, GRAYS INN,
LONDON.






OPEN STONE FRONT
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PLAN ELEVATIONS AND DETAILS OF THE PULPIT
PLAN

THE NEW LAW COURTS.

IT is, we suppose, only reasonable that, whilst the decision as to the successful competitor in this matter is unknown and unrecorded, rumour—never a very reliable authority—should circulate unfounded reports. We never expected that the judges would make their award before the middle or latter part of July next. Several papers have not only given the world specimens of their prophetic ability, but given what was supposed authoritative information on the matter. The *Morning Advertiser*, nearly a month since, said :—"We hear with something approaching to consternation, that the choice of the judges will soon be declared, and that it will amount to a national disaster." As the *Advertiser* is reputed for finding mares' nests, no one thought much of this announcement; but when it was repeated, or something like it, by a correspondent in the *Builder* a short time afterwards, many people opened their eyes wider than usual. We need scarcely say that there is not a word of truth in these reports. No decision has been come to, and at the time we write it would be difficult to name what it will be. There are in this, as in all important decisions of the kind, a variety of conflicting influences and interests at work. The Bar and Solicitors' Committee who have been consulted in the matter have sent in their report, and as might have been anticipated, is decidedly in favour of Mr. Waterhouse. Messrs. Pownell and Shaw's report, however, points unmistakably in the direction of Mr. Barry, and after him to Mr. Scott. These reports, however, are only elements in the problem which has to be solved. What with the legal opinion pointing in one direction, and architectural opinion pointing in another direction, the judges have not an easy work to perform, and when they shall have performed it, much dissatisfaction will be felt in many quarters. Mr. Gardner is daily at work analysing the estimates, and we suppose two or three weeks will elapse before he delivers his report; and very soon after that we shall, in all probability, be in a position to announce the winner of the Blue Riband.

BRIDGING THE CHANNEL.

PEOPLE have recently become so familiar with vast engineering projects and achievements that we need not be startled by the announcement of anything that is contemplated within the reach of scientific possibility. There has, for instance, been more than one plan suggested for uniting England and France by a railway. Not long ago we noticed a project by Mr. James Chalmers, which involved the idea of a tube placed along the bottom of the Channel, surrounded and made stable by rubble. We were not, however, fascinated with Mr. Chalmers' plan. We considered the difficulties which frowned upon it as vast, if not insuperable. To put a railway *under* the ocean must, we think, for ever remain a dream. Supposing, however, the engineering obstacles to be conquerable, the cost of such an undertaking must be fabulous, and even if it were accomplished, very few, we opine, would prefer going to France by such a route. The tunnel would be so long, and the air it contained so suffocating, that almost everyone would prefer a sea voyage to such a submarine way. We admit Mr. Chalmers' scheme provided for one or two ventilating shafts, but even with such assistance the journey would be dreary, uncomfortable, and oppressive. Since the publication of Mr. Chalmers' suggestion, another, that of boring a tunnel under the ocean-bed, has been discussed, and is, we believe, now committed to the limbo of unfulfilled suggestions. Mr. Hawkshaw, who has paid particular attention to the subject, has shown that the geological difficulties in the way are insurmountable.

We are now favoured with another project, equally bold in conception, and, we think, more easy in execution. Instead, then, of the long talked-of tunnel beneath the Channel M. Boutet, a French engineer, proposes to build a bridge across it. This bridge, according to the *Moniteur*, would be broad enough for a double line of railway, a carriage road, and a footway for passengers. The bridge would rest on thirty-two vertical rectangular iron piles; these piles to be connected by means of sixteen cables of plaited wire, stretching in parallel lines from Shakspeare's Cliff to Cape Blanc Nez, a distance of about twenty miles. The piles would be a little less than two-thirds of a mile apart. The question, then, arises, can these piles be planted on or in the bottom of the sea? and, secondly, can they, when planted there, be united by wire, as here suggested? There is but little doubt that both questions can be triumphantly answered in the affirmative. It resolves itself purely into a matter of cost. The project is not beyond the reach of possibility. Uniting England and France by railway may no longer remain a magnificent dream. M. Boutet estimates the cost at 200,000,000f. But supposing that it would cost that, or twice as much, England and France, united in the same great work, could accomplish it without any sensible inconvenience. Here, then, is a project greater than tunnelling the Alps, or cutting the Isthmus of Suez; the one certainly will unite France to Italy by railway, and the other will unite Europe to Asia by water; but England and France, forgetting their hereditary hatreds and historical wars, and mingling their might to bridge the Channel, would acquire a new conquest for civilisation and give an additional guarantee for peace.

TRADES' UNIONS' COMMISSION.

THE evidence of Mr. Mault, of the Master Builders' Association, before the Royal Commission, having been suspended in order to allow Mr. Hewitt, ironmaster, of New Jersey, U.S., to make a statement to the Commission (which we gave), was resumed on the 14th ult. From the position which he occupies, Mr. Mault is regarded as a most important witness in the inquiry, and his evidence is attracting much attention. Proceeding with his statement from the point where he left off, the witness said his sixth point was that trades' unions endeavour to prevent the introduction and use of machinery. That is done more particularly by the masons, the bricklayers, and the brickmakers. In connection with the masons he mentioned the case of Messrs. Coulter and Harpin, a firm who have invented stone-working machinery, which Mr. Mault said was admirably adapted for the purpose of dressing all manner of hard stone. This machinery they have endeavoured to introduce into various parts of the country, but are met everywhere by the fact that the masons forbid the use of machinery. Other cases were mentioned where employers had been threatened with a strike by the men for attempting to introduce machinery. At Burnley and Darlington the masons had a direct rule against its use. The cost of machine-worked stone was stated to be at least 35 per cent. less than the cost of hand-worked stone, and in many cases it is very much superior to hand-worked stone, especially in the case of large stones. The masons will allow the stone to be sawn on the ground where it is actually used, but they will not allow sawn stone from the quarries to be brought into the towns. Again, the bricklayers of Manchester and Sheffield refuse to allow machine-made bricks to be used on any work they have to do with; they insist upon having hand-made bricks. On the other hand, the carpenters and joiners, as a rule, are quite content to allow machinery to be used. It was further asserted that the unions also endeavour to lay an embargo upon the manufactured goods of each district. As an instance of the loss which a builder is sometimes put to by the operation of such a rule, Mr. Mault stated that there is a Manchester contractor at the present time engaged in a large contract for the Midland Railway Company. In that contract he requires a great deal of Yorkshire stone to be used as coping upon walls. The masons of Manchester, however, have a rule, allowing Yorkshire stone which is worked upon one side to be brought into their districts; but if it is worked on two sides it cannot be brought in, or if it is worked upon the edge, it is disallowed. The Manchester masons must work the edge of the stone and join it, and work the other side of it should it require working. And because under these circumstances this contractor cannot get the stone which he requires for coping worked at the quarries in Yorkshire, he calculates that it will cost him 35 per cent. more to put that coping on the walls than it would do if this rule did not exist. Other cases were given of a similar nature, after which Mr. Mault proceeded to state that there is an agreement between brickmakers and bricklayers as to the use of a particular brick. It is an understanding that the bricklayers are not to lay bricks which do not come from a certain locality, or which are not made in a certain way, the object being to encourage the brickmakers of the district, and to give them work. This was rather common about Lancashire, but witness did not think the practice applied to London. He, however, never read a code of masons' rules in his life which did not include a worked stone rule. So far as he was aware the objection to use machine-worked stone was exclusively confined to the union men, and to districts in which the union men are so much in the majority that they can control the other men. He considered that but for the objection of the union the patent for cutting stone to which he had referred would be very extensively used, and he knew that architects approved of it. The bricklayers themselves have no objection to machinery; it is solely in the interests of the brickmakers. Witness never knew an objection made by a bricklayer to machine-made bricks as being more difficult to work, or as being of worse quality than hand-made bricks; he had heard, however, that the bricks which are made with Platt's machines, at Manchester, are much better than the hand-made bricks. It was only in connection with the unions that the objection existed to the use of machinery. Supposing a better description of brick was made abroad than we have here, and that it would pay a builder to import that brick, he believed that he would be practically forbidden by the rules of the unions to import it, because he could not use it when he got it. Mr. Mault's next point was that trades' unions endeavour to confine the performance of certain work to certain arbitrarily defined classes. Not only do the unions confine the performance of work to their own members, but they say that certain work shall only be done by certain classes of persons, and that other classes of persons shall not under any circumstances do that work, not because they cannot do it, but because they do not belong to the class for doing that particular kind of work. In illustration witness quoted a rule of the Leeds plasterers, which says that "Providing any labourer, bricklayer, mason, or the like, commence any job by lathing, or any other portion, being a part of the business of a plasterer, no member of this society will be allowed to work on the said job; any member breaking this rule will be fined £1, and one month will be allowed to pay the fine, and if neglected will be liable to expulsion from this society." The operation of this rule was in effect this, that a man who is now a labourer shall remain a labourer to the end of the chapter, although he may have shown special aptitude for skilled work, and is likely to distinguish himself in it. Witness admitted that it would be right for five or six plasterers to say in regard to one of their own

number who had undertaken to do (say) labourers' work, "We will all strike if he does it." The question was then put, Is not that the principle of the trades' unions? to which witness answered, But the trades' union goes on to say, neither will we do it ourselves, nor will we allow anybody else to do it. In the one case they are voluntarily sacrificing their own independence, while in the other case they are compulsorily making another person who does not agree with them in opinion fall into their particular views. His objection to trades' unions began only where compulsion is introduced. He thought it right for any body of men to say "We will not do work except under such conditions, and will mutually pledge ourselves not to do it except under such conditions," but "my notion is," said Mr. Mault, "that trades' unions get beyond their legitimate sphere when they profess to lay down the law, not simply for themselves, but for the masters and the non-union men also." His objection was not to the unions in themselves, but to the unjust and tyrannical manner in which he considered they use their powers.

DECORATIVE MANUFACTURES OF JAPAN.

JAPANESE FURNITURE.

THE Japanese use very little of what we call furniture; trays, stands, and similar small articles take the place of tables or chairs. Their inlaid work—sometimes on a considerable scale, such as open shelves for the display of porcelain or the like—is apparently the original of all our papier maché manufactures (though the Japanese material is wood, not paper), and is of singular beauty and excellence in that line. Nothing can be more brilliant than the general aspect of such a set of shelves in black lacquer work, inlaid with designs, in coloured mother-of-pearl, of birds, flowers, fruit-laden branches of trees, and so on. The principle of all Japanese decoration is unsymmetrical. Thus we shall find ornamental figure-work of this sort scattered over the plain surface just where the artist chooses to place it, and without his feeling at all bound to provide a balance here for a saliency there. The fine sense of the people is evinced in the fact that the resulting design does not look unpleasantly ragged or straggling; it is emancipated from systematic restrictions, yet exquisitely in its place, and full of nitid nicety. The lacque used by the Japanese is composed, among other (and we believe unascertained) ingredients, of the sap or juice of the tree named Rhus vernix, and the oil of the Bignonia tomentosa. But all modern lacquer-work is considered poor in comparison with the ancient, the components of which remain more or less a secret. Fine old specimens are in great request among the natives themselves; as much as some £60 sterling being forthcoming from a Japanese gentleman's purse, it is said, for a choice lacque-box hardly a foot square. Even the modern work, whether with gilt and iridescent inlays, or with raised figures in gilding, is often charming enough to any pure taste; it is only by habit and connoisseurship that one learns to slight it relatively to the old.

BRONZES AND PORCELAIN.

The bronzes are of all kinds, and of conspicuous excellence, but continually, according to our observation, with a more or less grotesque tendency. Now it is a massive and very taurine bull, to be used as an incense burner; now a crayfish, apparently serving as a paper weight; now a covered chafing dish with dragons. The colour is sometimes lightish, with golden reflections; sometimes very deep and solid, verging to a coffee or dense chocolate tint. Japanese porcelain, again, is extremely various, and, like the lacquer-work, much less perfect now than in former epochs. The white and blue ware would seldom, if ever, be found to equal the nobler Chinese specimens from the Imperial manufactory—such as the "six-markers" or "four-markers," which illustrate the period from about the middle of the fifteenth to that of the eighteenth century. But even the ordinary Japanese china of the present day presents endless artistic attractions and hints; it may mostly be distinguished from the Chinese by its robust precision of lines. One piece will show a group of storks exulting amid the foamy rush of shore breakers, the sun rising amid the waves in glowing red, and raying out his gilded beams. Another piece will have quaintly designed decorative circles scattered over its surface, some in gilt contours, some in blue. One of these circles is the figure of a swooping stork; another of a tortoise drawing a long wake of water; another of larch foliage; another of key-like geometric lines. Or one handles daintily the daintiest of manufactures—a miniature cup of egg-shell china, with a gilded design (say of a kingfisher on a spray of river grass, his long beak cutting against the circle of the moon behind him)—the china being enclosed in a wondrous network of cane or young bamboo of the finest meshes, and so perfectly adjusted to the form of the porcelain that one almost refuses to believe the whole can be an actual combination of two so diverse materials. These are termed basket cups. Sometimes, where the patterns of Japanese porcelain are elaborate, with many hues often disposed in compartments, the colour is not to be unreservedly approved, sinning by harshness of the stronger tints, which are too glaringly and cuttingly opposed to those of a more delicate description. Indeed, with all its vigour, and often gorgeousness, Japanese colouring, on whatever material, is too frequently chargeable with harshness. The paper stamped after the manner of stamped leather is, we believe, peculiar to Japan. It is illusive in its general aspect, and often admirable in pattern and colouring. One specimen is a design of the eyes of a peacock's train; another we have seen is a curious and not much distorted reproduction, in fine burnished coppery tints, of an old European model, giving the intertwined and crowned monogram of Louis XIV. and Amorini amid the scrolls of foliage work.

IVORY CARVINGS AND ARTICLES IN STRAW WORK.

Japanese ivory carvings—all of them small, as far as our observation extends—are of very various merit; the old ones, as usual, mostly the best. Really fine specimens are surprising for character, quaintness, and minute finish; which is constantly carried out in a form of curious completeness—the base of the figure, as for instance, the sole of the feet, though flat through the necessity of standing the object firmly up, being all made out like the other portions, with toes, lines of drapery, &c. We have before us an old fellow carrying a monster toad on his shoulder; then a fledgling bird, with black eyes inserted, an erected incipient tail, fin-like wings, and the most aldermanic obesity of person—you turn him up, and his claws are carefully incised on its abdomen. Then there is a rabbit with pink eyes, holding a truncheon, and climbing a globe, the surface of which is studded with three curious objects, presumably univalve molluscs. And next, in a space of about an inch square, a Japanese open house fully made out, canopied with trees, and with five or six human figures within the dwelling, in the shadow of its verandah. The tortoiseshell carvings are equally elaborate in their way, with figures, landscapes, &c., relieved on rounded surfaces hardly bigger than a crown-piece. We say carvings, but are almost disposed to surmise that the designs are in fact stamped by some great force of pressure, like the devices upon coins. For articles in straw work, with ornamental designs, the Japanese stand, we presume, unrivalled. The designs are sometimes only decorative, or even reduced well nigh to mere arrangements of colour in compartments; but they are, in other instances, quite the high art of this very unpromising material. This is especially the case where single figures, or occasionally whole groups, of birds are given, with their true colours, and a dignity of arrangement and draughtsmanship strictly analogous to that which is bestowed by the Japanese upon the like subjects in less exceptional methods of execution. Specimens of this manufacture are, however, so well known among us that details would be out of place.

PAINTINGS IN WATER COLOUR.

We shall mention here only one other sort of art work—paintings in water-colour, often of the full natural size, adapted to serve as wall hangings. These are consummate for delicacy, beauty, and fine study; and, indeed, will bear comparison with, and in many cases would altogether outshine, elegant European work of the same kind. Flowers, plants, bushes, birds, or small animals are the ordinary subject matter of these water colours. Full as they are of items, and gracefully free in spirit, they are at the same time among the most sober, pure, and quietly harmonised of Japanese art work, avoiding for the most part that tendency to the *outre* and overcharged with which the genius of the nation is blemished. We speak of choice specimens, for doubtless many of a commoner kind might be found less tasteful both in style and in the selection of the subject. A melancholy piece of news appeared in our newspapers towards the beginning of May—the death-knell, one may fear, of one of the genuine and irreplaceable phases of the world's fine art, the Japanese. Intercourse with Europe, brief as its term has been, may already be traced in baneful influence upon many examples of the empire's art. Now comes a too ominous symptom of the catastrophe. "The Government of Japan," so ran the news, "has ordered all its officials throughout the empire to go into European costume from and after a prefixed date." With gloomy brow and forebodings may the lovers of Japanese art scan this sentence, and inwardly mutter, with the pagan believer in annihilation of Mr. Swinburne's "Ilicet,"

An end, an end, an end of all.

—*The Chronicle.*

ARCHITECTURAL PUBLICATION SOCIETY.

THE annual general meeting of this society was held on Friday, the 31st ult., at the rooms of the Royal Institute of British Architects, 9, Conduit-street. The chair having been taken by Professor T. Hayter Lewis, the secretary read the report of the committee, which stated that during the past year the attention of the committee had been directed to the completion of the publications for the sixteenth year (1863-65) and to the furthering of those for the seventeenth year (1866). For the former period, which comprises, in one subscription, three years combined, Part XVI. of the "Dictionary of Architecture," containing the letter I, "Impact to Iron," had been issued, and a series of six plates illustrating Jubé and Chancel Screen, Lead Quarry for casement glazing, Timber Church, Timber House (2), and Tower. For the contribution of the sketches on which these illustrations have been based, the society was indebted to the kindness of Messrs. Andrew Murray, G. J. Aitken, C. H. Purday, T. Roger Smith, and T. H. Watson. The issue of this part completes very satisfactorily the publications for the sixteenth year. For the seventeenth year, ending December, 1866, the first part of the publications has also been issued, containing sixty-seven pages of the text of the dictionary, comprising the completion of the letter I, the whole of the letter J, and a considerable portion of the letter K. The remainder of the letter K has been printed off. Much progress is being made with the letter L, and the next part, completing the issue for 1866, will carry the Dictionary far towards the end of the articles in that letter at least, if not into the following one also.

In moving the adoption of the report, the chairman called attention to the favourable progress which had been made with the Dictionary. The completion of the letter K and the progress made with L were very encouraging, and if the subscribers would exert themselves in the spirit mentioned in the report and make this valuable work more widely known, the progress to completion would be rapid. The Dictionary was so highly esteemed that all the early years had been for some time out of print, until the committee incurred a heavy expenditure to reprint them. This stock was, however, limited, and when once exhausted could not again be replaced, so that there was every inducement for all to whose interest it might be to possess a work of reference of such authority, to at once become subscribers and secure copies before they became as scarce as the earliest publications of the society. The valuable labours of Mr. Wyatt Papworth in conducting the literary portion of the work, and devoting so much time and care to this labour of love, were made subject of warm eulogy.

An animated discussion ensued, in which Messrs. C. C. Nelson, H. R. Newton, Robert Kerr, Wyatt Papworth, Arthur Cates, and others took part. The speakers strongly urged the committee to use all endeavours in their power to expedite the production of the text, and to devise some scheme by which the liberal donation of £100 promised by Mr. T. N. Wyatt might be applied usefully to that end, and he made the commencement of a loan or subscription to place in the hands of the committee sufficient funds to justify them in proceeding to conclude arrangements by which the constant services of a responsible editor might

be procured, and other steps taken to secure the completion of the text within a reasonable period.

In acknowledging a very cordial vote of thanks, Mr. Wyatt Papworth observed that no one more earnestly desired the completion of the work than he himself. He hoped to be able to afford at least the same amount of time as formerly during the ensuing year for what was to him such agreeable labour. A vote of thanks to the chairman terminated the proceedings, and the meeting then separated.

Building Intelligence.

CHURCHES AND CHAPELS.

The foundation stone of a new Wesleyan Chapel about to be erected at Knaresborough, was laid last week by Mr. Holden, one of the borough members. It is estimated to cost £8,000.

A new Congregational Church is being erected at Dalkeith, Scotland. It is in the Early English style, and is designed by Mr. J. W. Smith, architect, Edinburgh.

Brompton Church, near Northallerton, is about to be restored, under the direction of Mr. Ewan Christian, architect, Whitehall-place. The alterations will cost about £1,300.

A new Free Church has been opened in Arbroath, Scotland. The style is Gothic, and the edifice was designed by Mr. Maclaren, architect, Dundee. It is seated for 700 persons, the estimated cost being about £2,200.

A new church at Chetwynd, Shropshire, was recently consecrated by the Bishop of Lichfield. The church is in the Geometrical Decorated style, and consists of a nave and south aisle 57ft. long and 33ft. wide, and a chancel 31ft. long and 19ft. wide. The total cost of the erection of the church has been about £4,100. Mr. Ferrey, F.S.A., was the architect, and Mr. Yates the contractor.

On Wednesday, the 5th inst., the memorial stone of a new Congregational Chapel, with schools, class-rooms, and vestries, at Blandford, was laid by M. Fisher, Esq., on the site of the old chapel. The design (Early English) is by Mr. Stent, architect, Warminster, and the contractor is Mr. William Walden, builder, Christchurch.

BALBY.—The ceremony of laying the corner stones of a new chapel about to be erected by the Wesleyan Methodists at Balby, near Doncaster, took place last week. The building is of Classic character. Mr. Harold Arnold, of Doncaster, is the builder, from the drawings and specifications and under the superintendence of Mr. William Watson, architect, of Wakefield.

BIRMINGHAM.—On Tuesday the Bishop of Worcester performed the ceremony of laying the foundation stone of St. Laurence Church, Dartmouth-street. The length of the church will be 95ft. 6in., and 55ft. 8in. across the nave and aisles. It will be of brick, with the tracery of windows of Corsham Down Bath stone. Mr. J. A. Chatwin is the architect, and the church is being erected by Mr. Charles Jones, of Belmont-row, whose contract is £3,199.

BOLTON.—The foundation stone of St. James's Church, Waterloo-street, was laid the other day by the vicar. The church comprises a nave of four bays, divided from the north and south side aisles by four arches. These arches will spring from moulded and carved capitals of white stone; the cylindrical shafts which sustain the capitals being of a fine red stone, obtained from a quarry near Liverpool. The style is Early Decorated Gothic. The church will seat on the ground floor about 800 persons, there being no galleries. The amount of the contract, which has been taken by Messrs. Warburton, is £4,600. The architect is Mr. J. M. Taylor, of Manchester.

BRISTOL.—The Guthrie Memorial Chapel at Clifton College was opened on Sunday. The building is designed in the Early Decorated Gothic style, and has cost nearly £7,000. The architect is Mr. C. F. Hansom, the builder being Mr. James Diment.

HARTLEPOOL.—The venerable parish church of St. Hilda, at Hartlepool, has been reopened, after restoration. St. Hilda's Church is acknowledged to be one of the finest specimens of mediæval architecture in the county palatine. The contractor for the work was Mr. Graydon, of Durham, and the cost has been about £2,700.

OAKES.—A new Baptist Chapel has been founded at Oakes, near Huddersfield. The edifice will accommodate 660 persons, exclusive of children, and will cost about £4 000. The architect is Mr. G. Woodhouse, of Bolton.

OVER.—A new Independent Chapel has been erected at Over, near Chester. It is in the Lombardic Italian style of architecture. Accommodation is provided for 350 persons, and the total cost of the chapel has been £2,000. The architect is Mr. John Douglas, of Chester; the builder, Mr. Dutton, of Winsford.

BUILDING AND REPAIRING CHURCHES.—The Incorporated Society for promoting the Enlargement, Building, and Repairing of Churches and Chapels held its last meeting but one for the present session at the society's house, No. 7, Whitehall, S.W., on Monday, the Lord Bishop of Llandaff in the chair. Grants of money were made in aid of the following objects:—Building new churches, Birmingham, St. Ann; Falsgrave, in the parish of Scarborough; St. John's, Fulham, Middlesex (a new district): Southampton, St. Matthew rebuilding the churches at Beeston, in the parish of Leeds, and South Huish, near Kingsbridge, Devon; enlarging or otherwise increasing the accommodation in the churches at Castlebigh, near Fishguard; Donington, near Spalding; Harmston, near Lincoln; Heple, near Hull; Metheringham, near Sleaford; Moulton, near Spalding; Norton, near Presteign, Radnor; Walgrave, near Northampton; and Yatton Keynell, near Chippenham. The grant formerly made towards building a new church at Hackney Wick was increased. The society likewise accepted trusts of money as repair funds for the new churches at Kidbrooke, near Charlton, Kent; St. Peter's, South Kensington; Lane-end, Bucks, and Trinity Church, Southwell, Notts. Plans and papers for the next meeting in July must be sent in on the 1st day of the month. The following extracts were read, showing the urgency of the present applications:—"At the present time there are 20,000 inhabitants of St. Matthew's, Birmingham, and church room for 1,216 persons, and the district in which the new church is to be erected is the worst in the parish. There is no chance of any religious instruction being provided except by the Church of England." "Scarborough is in the greatest want of church accommodation. It is calculated that there are 20,000 resident inhabitants, and the town is increasing yearly at the rate of 200 houses, and during the season the population is augmented by many thousands, and notwithstanding there are double services on the Sunday, many are turned away who cannot find room." "This is a new district to be taken out of St. John's, Walham Green, and will contain a population of 6,000. At present there is a temporary iron church that is filled at each service, but is most inconvenient, especially in the hot weather, and it is important a church should at once be built to keep the congregation together." "This district extends over four square miles, with high hills and bad roads, increasing the difficulties of the distance from the parish church, but the want of free seats there has led to the alienation of numbers from the Church of England, and another church is greatly desired by them."

BUILDINGS.

Messrs. Simpson and Lynam, builders, Nottingham, have obtained the contract for the first instalment of the new Town-hall buildings at Grantham. The amount is £2,179.

Alterations and additions are now being made to the residence of the late Chancellor Raikes, Chester, which is destined to be the palace of Dr. Jacobson, the newly appointed bishop of that diocess. Two wings have been added to the old mansion, and the work is under the superintendence of Mr. Bramwell, architect, of Oxford. The builder is Mr. Hughes, of Alford, the contractor for the Grosvenor Hotel, who is also erecting the Town-hall at Chester.

The foundation stone of a new Wesleyan Theological College at Headingley, near Leeds, was recently laid by Mr. Isaac Holden, M.P. The building is planned to accommodate sixty students. It consists of two stories, and is designed in the twelfth century Gothic style.

SWANSEA.—The theatre here having undergone extensive alterations and improvements, was reopened last week. A new stage has been laid down, the pit has been enlarged, giving increased accommodation to 250 persons. The proscenium, boxfronts, and ceiling of the theatre have been redecorated, and a number of other improvements have been effected. The work has been done from the designs and under the superintendence of Mr. C. J. Phipps, architect, of London and Bath. The contractors were Messrs. Thomas, Watkins, and Jenkins, and the decorations were executed by Mr. George Gordon, of Bristol. Mr. H. Hill was clerk of the works.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the EDITOR, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty four Words.

RECEIVED.—J. R.—C. S. M.—F. P.—E. A.—B. Bros.—A. W. F.—B. and Son.—S. P. F. D. R. G. B. E. B.—T. G.—B. J. T.—G. W.—J. H.—R. N. W.—W. P. M.—D. G.—L. and N.—E. W. P.—J. F.—J. S. R.

DAVID GRANT.—The number of the BUILDING NEWS for February 9, 1866, is out of print.

Correspondence.

THE TRIANGULAR LODGE, RUSHTON PARK.

To the Editor of the BUILDING NEWS.

SIR,—In your issue of the 14th inst. you gave an interesting description of the Triangular Lodge of Rushton Park, visited by the architectural societies in their recent meeting at Kettering. As there may be a few of your readers, like myself, interested in the subject of geometrical architecture, may I ask the favour if any of your numerous correspondents would furnish a rough plan or sketch of this rather singular and unique example, showing its internal arrangement? Individually, I do not think an equilateral triangle or any figure of which it is the primary element is satisfactory in plan, being far less constructively valuable than the square octagon or any compounded figure of which 4 is the basis. This objection arises chiefly from the practical difficulty of adapting the angles of a triangle; but æsthetically, also, the awkwardness of triangular forms on plan is well known to every artist of form. The adaptation of the triangle as an element of design is, I think, highly important; but it is only when used orthographically, *i.e.*, when visibly presented to the mind, that it becomes permissible. Thus we can all value triangular gable, the triple window, or the trefoil, in whatever style or combination they appear; but I think we are not all so mystically wedded to the power of 3 as to mistake its theological significance for its ichnographic value.—I am, &c.,

G. HUSKISSON GUILLAUME.

Southampton.

[Should any correspondent furnish us with a sketch of this Triangular Lodge we should be glad to give an engraving of it in our pages.—ED. B. N.]

Suggestions.

BLEACHING GLUE.

Soak in moderately strong acetic acid for two days, drain, place on a sieve, and wash well with cold water. Dry on a warm plate. This method is given in *Dingler's Journal*.

WHITEWASH AND STARCH.

The *Chemical News* promises that a strong solution of sulphate of magnesia will give a beautiful quality to whitewash, and a little of it used with starch will add considerably to its stiffness, and render cotton or linen garments to a certain degree incombustible.

WELDING COMPOSITION.

For iron or steel or both together, calcine and pulverise together 100 parts iron or steel filings, 10 sal ammoniac, 6 borax, 5 balsam copaiva or copæiba. One of the pieces is to be heated red, carefully cleaned of scale, the composition is to be spread upon it, and the other piece applied at a white heat and welded with the hammer.

DRILLING GLASS.

To the old mode of boring glass with a file wet with oil of turpentine, a correspondent of the *Chemical News* adds an amendment from a German source, confirmed by his experience, to the effect that dilute sulphuric acid is much more effective, with less wear of the tool, than oil of turpentine. It is stated that at Berlin, glass castings for pump barrels, &c., are drilled, planed, and bored like iron ones, and in the same lathes and machines, by the aid of sulphuric acid.

Intercommunication.

QUESTIONS.

[431.]—GLAZED PIPES.—Can any of your readers inform me how to glaze sanitary pipes after they come out of the kiln warm? F. P.

[432.]—AIR VESSELS FOR PUMPS.—Are there any specific dimensions for air vessels to be placed on the delivery and suction pipes of pumps so as to prevent the shocks and consequent breaking of joints resulting from the otherwise unequal flowing and forcing of water through the pipes? This is a point upon which doctors mechanical seem to differ widely, but it is also one of great practical and pecuniary moment to those who like myself employ pumps worked by steam power. An answer will be thankfully received by ANTI-CONCUSSION.

[433.]—PRESERVATION OF IRON.—Can you inform me if there are any means of coating iron—whether wrought or cast—which is intended to be exposed to the action of the weather with any substance to preserve it effectually from exidation and deterioration? Iron is so much used now for out door as well as indoor work that it is desirable to know how best to protect it from atmospheric influences. All the compositions and non-corrosive paints I have seen are comparative failures, but what plan do you, Sir, recommend? PLUVIUS.

[434.]—WATERCLOSETS.—Do you think that the waterclosets in general use in dwelling-houses are as well contrived for their purpose as they ought to be? I know that the defective supply of water in many of the populous quarters of the metropolis is answerable for many of the evils of an olfactory nature which attend the use of waterclosets. My own impression, nevertheless, is that the defective construction and unsound principles of the apparatus itself are often responsible for the unsavoury consequences attending their employment. This is a question of health as well as of domestic comfort. We don't want to leave loopholes in our dwellings for the admission of typhoid and other fevers, if we can help it. "To the pure all things are pure," and therefore I feel no hesitation in putting the foregoing question to you and your readers. N.

[435.]—WHY NOT GET PURE METAL?—It has been stated, rather positively, that it is impossible to deprive iron ores of all their various impurities in the operation of smelting. If this be so the art of smelting must be very imperfectly understood, and hence the bad iron constantly met with. I should think that chemistry and practice ought, from their union, to produce better results. It should be possible to remove every trace of sulphur, phosphorus, and what-not, which they say is mixed more or less with iron ores of every kind, and to leave a residuum of pure metal. Cannot this feat be performed? or, are there other reasons for its non-accomplishment? CHARCOAL.

[436.]—WHITEWASH.—Can any of your readers inform me of the preparation of the new whitewash, said to be almost as durable as paint and possessing considerable beauty, invented by Dr. Jacobson, of Hamburgh? MECHANICAL.

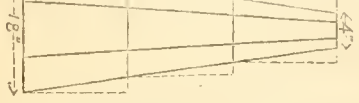
[The preparation of Dr. Jacobson's whitewash is rather tedious and complicated, but the result may possibly be worth trying. The inventor dissolves 50 parts of glue in 150 parts of hot water. He then adds 2 parts of a solution of caustic soda, specific gravity 1·34, and boils. A flocculent precipitate separates, which may, however, be disregarded. When the above mixture has cooled he adds 50 parts of commercial water glass solution, and then stirs in enough oxide of zinc to give a proper consistence for painting. If necessary the mixture must be passed through a mill to make it smooth. This composition, it is said, is well suited for either wood, metal, or brickwork. Two coats should be laid on, and when they have perfectly dried, a solution containing 10 per cent. of chloride of zinc should be applied. This will give a beautiful gloss, and great durability to the composition. Earthy pigments not affected by alkalies may, of course, be mixed. The worst feature about the composition is that it cannot be kept, and must be applied quickly.]

[437.]—GLAZED FLAT ROOFING TILES, 6in. × 4in.—Would you kindly inform me in your next where the above are to be obtained?
R. KETTERINGHAM, Builder, Attleboro', June 19.

[438.]—IRISH SLATES.—Can you oblige me with an address in London where Irish slates can be bought? I see by the number for December 7, 1866, they are well recommended. PERCY LEICESTER.

[439.]—LENOIR'S GAS ENGINE.—Will some of your readers kindly inform me in your "Intercommunication" column where I can obtain one of Lenoir's or any other gas engine? W. E. WILLIAMS, Tiverton, June 10.

[440.]—OCTAGON PINNACLE.—I should be obliged if some practical quantity surveyor would kindly inform me how to measure the annexed figure of an octagon pinnacle



to obtain the cubical quantity of stone required to work it. Supposing it was constructed of three stones in height, may I not reasonably assume that previous to working it, each stone was square or nearly so, and should I not therefore, be right in taking the frustrum of a square pyramid, and calculating the contents thus:—18·in. + 4²in. + 18in. × 4in. = 412in. × 54in. ÷ 3 = 7416, for the answer in solid inches? STONEMASON.

REPLIES.

[406.]—ENCAUSTIC TILES.—"Hepeful" will get some useful information on laying encaustic tiles in our number for February 15 this year.

[415.]—IMITATION IVORY PHOTO-CHROMOGRAPHS.—"B O T." is informed that the photo to be coloured must be printed rather larger than that part of it which is intended to be finished, in order that a margin be left to paste on to the frame. An aperture is cut in a thin piece of wood, rather larger than that part of the photograph to be coloured. This constitutes the frame, and on to it the photograph is pasted, by being damped and put on so that the part to be coloured is over the aperture. By thus placing it on the frame damp, when dry it is found to be stretched quite tight. The picture must now be painted at the back with water colours, but the colours must be laid on more forcibly than is usual, as the last part of the operation renders the picture pale. When the colouring is quite finished and perfectly dry, the picture is heated before a fire, and a small quantity of melted white wax applied to the back of it with a camel's hair pencil. ARTIST.

[421.]—ARTIFICIAL IVORY.—"B. J." can make good artificial ivory as follows:—Take amber 12oz., Kourie gum 3oz., and dissolve them in wood spirits or common alcohol; then add to this 7oz. of fine China clay and mix them thoroughly together by stirring, aided by a gentle heat, and the composition may then be placed in dies and made into various forms. It is stated that dry collodion, when mixed with gutta-percha or india-rubber, forms a compound of great hardness and elasticity, which makes a very good substitute for ivory. A SUBSCRIBER.

[423.]—GLAZED EARTHENWARE.—In reply to "A.S.," in last week's "Intercommunication," Dr. Wiederhold gives a recipe for glazing free from lead, and it is a mixture of silicate of soda or potash and borate of lime—the ordinary boro-calcite from South America answers. The two have only to be mixed together so as to form a thin paste and can then be used in the ordinary way. Dr. Wiederhold speaks doubtfully of the value of the glaze, but the process deserves a trial. B. A. SUB.

[423.]—Allow me to inform "A. S." that the following glaze has been proposed among others as a substitute:—100 parts of washed sand, 80 of purified potash, 10 of nitre, and 20 of slaked lime; all well mixed, and heated in a blacklead crucible, in a reverberatory furnace till the mass flows into a clear glass. It is then reduced to powder. The goods to be slightly burned, placed under water, and sprinkled with the powder. FILS.

[424.]—WINDOWS IN PARTY WALLS.—"Ignoramus" states a case of windows in a flank wall, not a party wall. I presume that he intended to ask, "What distance must A keep the wall of a house he intends to build away from the "flank" of his neighbour B on which two windows are placed, that have existed over thirty years? There is no specified or technical distance that can be named, but A must take into consideration the height of his proposed wall and must keep far enough away to prevent the darkening of the rooms lighted by the windows in question to such an extent as to cause them to be less fit than now for the ordinary and usual purposes to which they are devoted. Consult a surveyor experienced in dilapidations, &c. A.H.

[427.]—THE COLLISION OF BODIES.—"Inquisitor," in your last issue, has suggested one or two peculiar points in reference to the above subject, and it is questionable, as he remarks, whether they have been as a rule properly attended to. Billiard-players produce wonderful results, if not striking effects, by their skilful manipulation. In fact, the movements of a ball appear sometimes to violate the laws of motion under their cunning hands, and it may be made to pass round a hat and strike a ball behind into a pocket. This action is, however, governed by law, as all things are. The numerous particular cases concerning the collision of bodies may, for brevity's sake, be reduced to four. In the first it may be that one body only is in motion at the time of the stroke. In the second, both bodies may be moving in the same direction. Thirdly, they may move in direct opposition to each other, propelled by equal quantities of motion; and fourthly, they may be carried with unequal motions in directions contrary to each other. As the bodies may be unequal or equal, each of these divisions may be subdivided. Now the quantity of motion in any body is as the product arising from the multiplication of that quantity into its velocity. Hence, according to the first proposition, the common velocity of the two bodies will be just one-half that of the moving body before the impact or stroke was given. In the second case let the sum of their motion before the stroke be divided by the sum of the bodies themselves, and the quotient will be the common velocity. In regard to the third axiom, bodies striking with equal quantities of motion will lose all motion at once. When two bodies, however, meet with unequal quantities of motion, the difference of their motions must be divided by the sum of the bodies, the result will express their common velocity after the blow. Such are, in very summarised terms, the laws which govern the collision of bodies void of elasticity. Those relating to elastic substances are different and would require more space to define. I trust that "Inquisitor" will consider himself, so far at least, answered. CROMLECH.

[428.]—EARTHWORK.—Under the above heading "Claypole," last week, asked certain questions, some of which possibly it may be permitted me to answer. It is true, as your correspondent observed, that the surface of the ground in this country is being continually broken up for purposes connected with building of one kind or another. Earthwork is, therefore, an important branch of practical knowledge, and one which ought to be well understood by civil engineers, architects, and builders. When we come to the point of "rules" for the guidance of those engaged in the construction of earthwork, it must be admitted, however, that difficulties present themselves, and much must be left to individual and experienced judgment in particular cases. Generally it may be said that earthwork is of two distinct kinds, excavation or cutting, and embankment or filling. In both of these operations there is risk of sliding or slipping, and in the latter of subsidence or settlement. The nature of the soil to be worked upon must, therefore, be the elementary information gained. It must be remembered, too, that the adhesion of earth is much interfered with by the action of water and air, and that friction is the great binding force from which stability results. Friction will, as a rule, maintain the sides of a cutting or embankment at what is well known as the angle of repose or the natural slope of the earth. The permanent durability of earthwork of these kinds depends on effective drainage for the rainfall, and this (the drainage) is governed by the material used, the best being gravel, sand, shingle, shivers of rocks, &c. In all cases close observation of the peculiarities of soil, and of existing constructions which have stood the test of time, is better than mere deductions from "bookish theory." As to testing subsoils to which "Claypole" alludes, by right trial-pits should be sunk down to the intended base of the work. It is a more expensive process than boring, but it is far more satisfactory in its results. A good plan it would sometimes be found to combine both boring and sinking. I do not suppose that your correspondent desires to know how best to perform these operations, and indeed it would involve too much of your space to tell him. The "best modes of constructing earthworks generally," as a very broad subject, must also stand over. May I suggest that a series of papers on the question of earthworks generally might very profitably be written by a civil engineer, made competent by experience for the duty, and that your columns, Sir, would be a good vehicle for their publication. SHOVELLER.

WAGES MOVEMENT.

It is stated that 800 men, formerly in the employ of the North-Eastern Railway Company, are still out of employment in consequence of the late strike.

DEWSBURY.—About one hundred joiners are now on strike in this place, for the purpose of seeking to reduce the hours of work from 52½ to 49½ hours per week. This reduction is opposed by the masters as being injurious to the trade, and also calculated to render working time in Dewsbury shorter than it is in any other town of the country.

WATER SUPPLY AND SANITARY MATTERS.

Mr. Samuel Clarke, the sanatory inspector for the city of Norwich, declares that in the majority of cases the dwellings of the agricultural labourers in Norfolk are the meanest, unhealthiest, and most disgusting that can possibly be imagined. He says some of the homes of the poor are "nearly equal to those enjoyed by the brute creation."

By Dr. Frankland's analysis, it appears that while the water of Loch Katrine, supplied to Glasgow, contained in every 100,000 tons, three tons of foreign matter, the same quantity of the Thames water in May contained from 27 to 29 tons; of the New River water, 25 tons; of the East London, 27 tons; of the Kent Company, 39 tons. The traces of previous sewage contamination were least in the East London; greatest in the Kent waters. The waters were much purer in May than in April, and this was followed by an evident improvement in the health of the people.

The water supplied to the inhabitants of Doncaster would seem to be not the most pellucid or wholesome in the world. According to a correspondent the source of supply is the Don, "and during the past week the mouth of the subterranean channel that conducts the water to the wheel to be pumped up into the town for the use of the inhabitants was cleaned out, when the following amongst other 'ingredients' were found in the water, namely, twenty-eight dogs, eight cats, two pigs, one sheep, one goat, sundry rats, and divers other things belonging to the animal and vegetable kingdoms." We understand that Mr. Lawson, the engineer of the Rotherham Waterworks, has visited Doncaster recently and took samples of the water, which will be duly tested and reported upon, as also some matters of importance affecting the drainage of the town.

PAISLEY.—The works about to be commenced by the Paisley Water Commissioners consist in the construction of a store reservoir, fit to hold 76 millions of cubic feet having an area of 100 acres, and a maximum depth of 35ft., and a catchment of 1,220 acres, with an aqueduct of about 6½ miles in length, thence to filters to be constructed above the present store reservoir at Stanely, about two miles from the centre of Paisley. The works are also intended to provide a supply to the towns of Johnstone and Elderslie. The designs have been prepared by Mr. Leslie, C.E., and the contract has been let to the following parties—viz., store reservoir, Alexander Wilson and Sons, Grantou, Edinburgh; aqueduct, John Pollock, Bathgate; cast iron pipes, D. Y. Stewart and Co., Glasgow.

MALTA.—Owing to a drought of two years the supply of water at Malta has fallen far short of the wants of the population. A special meeting of the local Government was held recently for the purpose of considering the report of Mr. Bateman, C.E., who had been despatched to Malta by the Secretary of State for the Colonies to ascertain the best measures to be adopted to increase the supply. Mr. Bateman recommends the excavation of wells in the porous sandstone, and raising the water by steam power. He is most sanguine as to the result of the experiment, and promises an abundant supply of water for Valetta and the three cities for an outlay of about £14,000, to include the cost of digging the shaft, expense of machinery, piping, &c. The sum asked for by the Government for sinking the shaft was voted unanimously, and the Imperial Government are prepared to contribute a fair proportion of the cost of carrying out Mr. Bateman's plan.

COMPENSATION.

THE NEW LAW COURTS.—A heavy compensation case, "Tuxford *v.* the Royal Commissioners of the Law Courts," was brought to a conclusion on Saturday. The claim was about £30,000, for the leasehold premises 246, Strand, and the loss by removal, the claimant being the proprietor of the *Mark Lane Express*. The case was settled soon after the sitting of the Court by a verdict by consent for £16,000, and an arrangement was made as to the occupation till Michaelmas and as to the machinery, &c.

STATUES, MEMORIALS, ETC.

THE LATE LORD DEAN OF GUILD OF EDINBURGH.—A tablet to the memory of Dean of Guild Lorimer, who lost his life at the fire at the Theatre Royal, Edinburgh, two years ago, has been erected in the vestibule of St. Giles's Cathedral. Mr. D. Bryce, jun., prepared the design.

THE LATE DUKE OF HAMILTON.—A monument to the memory of this nobleman is about to be erected on the banks of the River Avon at the entrance to Cadzow Forest, Scotland. The design has been prepared by Messrs. Heath, Wilson, and Thomson, architects, Glasgow. The structure is to be circular, in the Italian style, 26ft. high, 22ft. in diameter, and will be formed of polished freestone from Dalpatrick Quarry. There are to be nine openings in the circumference, which will be divided by as many granite pillars. The roof is to be of wood, covered with lead. In the centre of the monument, a pedestal is to be placed, surmounted by a bronze bust of the Duke. The total cost of the erection is estimated at £1,500.

LEGAL INTELLIGENCE.

ANCIENT LIGHTS.—Before Vice-Chancellor Malins, on Wednesday, the case of Harris *v.* Hilliard came on for hearing, involving the question whether the defendants by building in the rear of the plaintiff's tavern and dining house, being the Three Tuns, Coleman-street, had done such injury as to entitle him to relief. A question was also raised as to the application of the custom of London which permitted building on an old foundation, and whether there was not a case for relief (even supposing the case of obstruction of light failed) in respect of the obstruction of air. There had been an abortive attempt at an arbitration. His Honour, after deciding that the custom of London did not apply, said he was satisfied that the plaintiff had sustained considerable injury. There must be a reference as to damages, in the terms of that ordered in "Senior *v.* Pawson," before Vice-Chancellor Wood. As to the costs, on the whole, considering the circumstances under which the arbitration went off, after much doubt, he thought the defendants must pay them.

General Items.

The death is announced of M. Le Bas, member of the French Institute, senior member of the Section of Architecture. He was 85 years of age.

The subscribers and donors to the Builders' Benevolent Institution are informed that permanent offices have been taken at No. 4, Vernon-place, Bloomsbury-square, W.C., where all communications for the future are requested to be addressed.

The Royal Institute of British Architects will hold their annual *conversazione* on Monday next.

The following gentlemen have been elected Associates of the Royal Institute of British Architects:—T. Arnold, of 5, Vincent-terrace, N.; Richard Groom, of 28, Alwyne-road, N.; G. G. Hoskins, of Darlington; S. E. Williams, of 67, Victoria-street, Westminster.

Mr. R. A. Bonson has been appointed secretary to the Rivers Pollution Commission, by the Home Secretary.

The Manx Legislature has approved of Mr. J. Coode's plan for a breakwater at Douglas. The proposed works will enclose an area of 42 acres, and Mr. Coode estimates that the works will occupy seven years in construction. He calculates the cost at £179,055. The central breakwater will be 1,200ft. in length, and will cost £129,280.

On Saturday last some of the members of the Architectural Association visited the new Freemasons' Hall in Great Queen street, and minutely examined the internal arrangements of the building, under the direction of Mr. Dudley, the clerk of the works, who, in the absence of Mr. Cockerell, took considerable care to show the members every part of the building. It is a pity that more young architects do not avail themselves of such opportunities to acquaint themselves with practical works that are springing up around them.

The *Athenæum* is sorry to observe that, probably from the excessive use of the silicate solution in painting "The Interview between Wellington and Blucher after Waterloo," by Mr. Maclise, in the Royal Gallery, Westminster, the surface of that noble work—the first executed water-glass picture in this country—is seriously affected by an appearance like that which painters call chilling; the appearance of a greyish film on the face of the picture in question is certainly much more extensive and deeper in its tint than was the case about two years since. Our contemporary suggests that probably this might be removed by washing with water or rubbing with a soft substance, but if the appearance is due to the rising of an excess of silica to the surface of the painting nothing of this sort would avail.

The Peel Park Museum at Salford has the merit of being the most favourite place of the kind in the country with the working classes. There is no other public institution that can boast of such continuous and undiminished popularity. The number of visitors to the museum during Whit week was 81,680, a higher return than any year since 1862. The total decennial return of visitors during Whit week is nearly a million, or an average of about 15,000 a day. The South Kensington Museum is, perhaps, the costliest national institution in the metropolis, and, withal, very attractive, but, even with all the combined efforts of extravagant expenditure, evening exhibitions, and the finest collections in the world, the yearly number of visitors is not equal to that of the Peel Park Museum, while only about one-sixth the number visit the Edinburgh and Dublin museums. It is still more gratifying to learn that a million of visitors, all working people, can walk through this free museum, filled with valuable paintings and fragile objects of art and science, without a single article being damaged or defaced.

The annual dinner of the United Society of Ironmongers will be eaten, and we hope heartily enjoyed, on Wednesday next, the 26th inst., at the Freemasons' Tavern, at six o'clock.

A commendable step has been taken to educate some of the art workmen of this country, by facilitating cheap excursions to the Paris Exhibition. The first batch of excursionists have returned to town after spending a profitable week in the French capital, and have expressed themselves highly delighted with the various arrangements made both for their instruction and comfort. No doubt such visits tend materially to promote the art education of the people, and assist in establishing a better undertanding between rival nations.

The president, vice-president, council, and members of the Society of Engineers returned from their trip to the Paris Exhibition on Friday last. They were enabled, by the courtesy of M. Eugene Flachat, president of the Society of Civil Engineers of France, to inspect the various large manufactories, as well as the great public works now being carried out in Paris. The Society's dinner took place at the Trois Frères Proveneaux; the president, Mr. W. H. Le Feuvre, occupying the chair. A dinner was also given in the Exhibition, by the members of the Railway Congress, assembled at Paris, when the chair was occupied by M. Eugene Flachat. The chairman, in the course of his remarks, made special reference to the Society of Engineers, stating that their transactions were held in much regard by continental engineers, on account of the ready publicity given to the views of the authors of the various papers, which, unfortunately, was not the case abroad. M. Le Feuvre replied on behalf of the Society of Engineers. The meeting was altogether of a very agreeable character, and, it is to be hoped, may not be the last of such meetings between French and English representatives of the profession.

The Trades' Union Commissioners have agreed to their first report, which simply states that the Commissioners have held several meetings, and they beg leave to submit to her Majesty the evidence given before them up to May 21. The evidence fills 160 pages.

The Rembrandt drawings and etchings are now on view at the Burlington Fine Arts Club, 177, Piccadilly.

Material for sculpture and architecture, of the finest quality, is found in Vermont. The correspondent of the Boston *Courier* pronounces this region the Mount Pentelicus, the Paros and Carrara of the New World. The finest qualities are quarried in Brandon; but the whole Green Mountain region teems with marbles as fit for artistic, ornamental, and architectural purposes, as those of the Alps or Apennines. The *verde antique* of Europe, which is wrought into pillars, pilasters, table-tops, &c., in Germany and Spain, is less durable than the *verde antique* or serpentine which is found in Roxbury. The back marble of Isle La Motte, in Lake Champlain, is excellent for floor tiling and abutments of bridges, and was largely used in the construction of the Victoria Bridge, at Montreal. The brecciated marble of Plymouth is highly ornamental, and Professor Hagar says it equals in beauty the artificial mosaic works of Herculaneum and Pompeii. Since the recent tariff went into operation, these marbles have been worked much more extensively than before.

The last information from Germany says that Mediævalism is "dying out, shred by shred," in that country. The Gothicists of this country, however, need not fear, as the statement only refers, in this instance, to the disuse of Latin in the German universities.

The familiar object known as the Wellington Clock Tower, at the south end of London Bridge, has been pulled down to make way for the traffic. It was erected by subscription in honour of the Duke of Wellington, after his death in 1852.

The national competition drawings from the schools of art are now being exhibited at South Kensington Museum. The gold and silver medals have just been awarded by the president of the Royal Academy, and Messrs. Maclise, Leighton, Horsley, and Redgrave. In the architectural branch of the competition, Herbert A. Gribble won the gold medal, B. Samuiloff the silver medal, and A. Foster the bronze medal.

An exhibition of fine arts, manufactures, and industrial products was opened at Coventry on Wednesday last. The exhibition represents the principal trades of that city and district on a scale never before attempted in any locality. Coventry has for some time past been under a commercial cloud. Let us hope that this exhibition may be the turning point in its industrial history.

MEETINGS FOR THE WEEK.

MON.—Royal Geographical Society. — The following papers will be read:—1. "Visit to the Russian Settlements on the Coast of Manchouria," by the Rev. W. V. Lloyd. 2. "On Communication between India and China, by the Line of the Burrampooter and Yang-tzeu-Kiang," by General Sir A. Cotton. 3. "A Journey to the North-West of Pekin," by Dr. Jones Lamprey, 8.30.

Royal United Service Institution.—"A New Mode of Marine Propulsion," by Captain C. H. Simpson, R.N., 8.30.

FRI.—Royal United Service Institution.—"Primitive Warfare" (Illustrated by Specimens from the Museum of the Institution), by Colonel Augustus H. Lane Fox, 3.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

2904 W. E. NEWTON. AN IMPROVED MODE OF, AND APPARATUS FOR CLEANSING THE EXTERIOR OF HOUSES, PUBLIC BUILDINGS, OBJECTS OF ART, ORNAMENTAL SURFACES, WALLS, CARRIAGES, AND OTHER ARTICLES OR THINGS. (A communication.) Dated November 7, 1866.

This invention relates to an improved mode of, and apparatus for, cleaning the walls of public buildings or private houses, objects of art in stone, marble, or metal; walls, pictures, carriages, waggons, and all objects generally that require a complete cleaning, and consists in the application of steam pressure and the employment of different liquids suitable for cleansing or for coating or washing with a solution for silicating the surface when desired. The apparatus employed for this purpose consists of an injector or suitable apparatus for raising and delivering the cleaning liquids, and also a steam pipe connected with a movable generator. *Patent completed.*

2915 J. T. KERSHAW. AN IMPROVED VENTILATOR. Dated November 9, 1866.

This invention consists in the adoption of a back or valve falling into the chimney in such a manner as to throttle the said chimney, and so prevent it withdrawing from the lower part of the room, apartment, or shop to be ventilated, or from the lower part of the room, apartment, or shop below or adjoining, all the air it is capable of carrying off, and so compelling the chimney to withdraw the rest of the air it is capable of carrying off from the upper part of the room or apartment or shop to be ventilated, which air is the hot or impure air to be got rid of. *Patent abandoned.*

2920 S. W. WOODROFFE. IMPROVEMENTS IN THE CONSTRUCTION OF PRIVIES, DUSTHOLES, COMMODES, WATER-CLOSETS, ASHPITS, AND TANK COVERS, AND FOR OTHER SIMILAR PURPOSES. Dated November 9, 1866.

This invention consists in the employment of one or more discs, flaps, doors, or covers hinged or otherwise attached to the underside of a seat, flap, door, or cover, above which is placed another seat, flap, door, or cover. This last-mentioned seat, flap, door, or cover is capable of being depressed by hand, or by the weight of the user, or other weight; such upper seat, flap, door, or cover has projections on its under side which pass through slits or apertures in the lower seat, flap, door, or cover, and press upon projections on the upper side of the first-mentioned disc or discs, flaps, doors, or covers, which has or have weights or equivalent contrivances on its or their lower side, so that it or they shall effectually close or cover over an orifice or orifices at, to, or near which it or they is or are attached whenever there is no pressure upon the upper seat, flap, door, or cover. But when pressure is applied to the upper seat, flap, door, or cover such hinged or otherwise attached discs, flaps, doors, or covers will recede, slide, or fall away from beneath the orifice, leaving the whole space below such orifice open for the passage of any substance or liquid which it may be desirable to pass through the same, and on the seat being relieved of pressure the discs, flaps, doors, or covers will assume such position that they shall form an airtight closure, and thus prevent escape of effluvia or noxious gas or vapour. *Patent completed.*

2935 H. HITCHINS AND W. WOOD. CUTTING OR DRESSING STONE FOR BUILDING PURPOSES, AND FOR MOULDING OR TURNING SAME FOR ORNAMENTAL PURPOSES. Dated November 10, 1866.

The stone to be cut, dressed, or moulded is placed upon a travelling or revolving platform, and caused by the aid of machinery to slide under a framework of wood, iron, or other metal, in which are fixed cutters, chisels, or picks used for the cutting, dressing, or moulding the stone, in order to bring the stone in contact with the cutters, chisels, or picks fixed in the said frame. When the stone is to be turned, it is made to rotate on centres; a vertical or curvilinear motion is given to the frame containing the cutters, chisels, or picks, through the medium of tumblers, cams, tappets, eccentrics, or cranks, all or either being put in motion by means of wind, water, steam, air, compressed air, galvanism, electro-magnetism, human, or other motive power. The cutters, chisels, or picks are tightened or depressed as may be necessary to form the pattern of the moulding required. *Patent abandoned.*

Trade News.

TENDERS.

ABINGDON (BERKS).—For erecting a new vicarage and stabling, &c. Mr. Edwin Dolby, architect:—Townsend and Sons, £2,965; Barrett, £2,702 14s.; Bowler, £2,679; Peyman, Townsend, Sheppard, and Rogers, £2,623 13s. 6d.; Townsend, £2,600; Dover, £2,575; Jones and Co., £2,550; Thomas, £2,542; King, £2,505 5s. 8d.; Selby, £2,423; Ballard, for smith, &c., £85 5s.; Howes, plumber, £257 15s.

BOURNEMOUTH.—For new house. Mr. Robert W. Edis, architect:—Hapgood, £3,574 8s. 6d.; Dunford, £3,500; Dyke (accepted), £3,450.

BEDFORD.—For a new bakehouse, flour chambers, warehouse, baker's shop, and fittings for Mr. Walker. John Day, architect:—Cunven, £447; Lawson, £409 19s. 6d.; Richards, £408 18s. 6d.; Haynes, £403 7s. 11d.; Spencer accepted), £379 10s.

FELPHAM.—For two houses at Felpham for Mr. G. H. Rush. Mr. Arthur Smith, architect. Quantities supplied by Rake and Ranwell:—Goble, of Bognor (accepted), £648.

FELPHAM AND BOGNOR.—For new sluices, &c., at Felpham and the Bognor Levels. Mr. Arthur Smith, engineer. Quantities supplied by Rake and Ranwell:—Plews, London, £4,587 11s.; Coker, Brighton, £3,432 4s.; Simms and Marten, of London and Portsmouth, £2,798; Weekes, London, £2,575; Lawrence, Southsea (accepted), £2,500.

GODSTONE.—For a villa for Henry Rose, Esq., exclusive of bricks, lime and sand for walls and plastering. H. Saxon Snell, architect. Quantities supplied:—Ebbs and Son, £4,170; Sharpington and Cole, £4,147; Manley and Rogers, £3 945; Newman and Mann, £3,886; Stimpson, £3,750; Gabyer, £3,690; Crabb and Vaughan, £3,521; Chappell, £3,516; Gibson Brothers (accepted), £3,490.

GRANTHAM.—For the new townhall, first contract. The work includes the whole of the prisons, governor's house, &c.:—Stanley, Close, and Co., £3,209 15s.; Stevenson and Co., £2,920; Halliday and Co., £2,760; Paterson, £2,700; Dennett, £2,642; Fast, £2,580; Rudd and Son, £2,489 12s.; Wartuaby, £2,480; Simpson and Lynam (accepted), £2,179.

HILLINGDON.—For new house at Hillingdon. Mr. Robert W. Edis, architect:—Fassnidge and Son (accepted), £2,550.

HUNTINGDON.—For new house at Houghton. Mr. Robert W. Edis, architect:—Maile and Richardson, with additions (accepted), £4,200; Conder, £4,078.

HIGHBURY.—For a pair of semi-detached villas at College-hill, Highbury, N. Mr. J. Messenger, architect. Quantities supplied by Mr. J. Glenn:—Hemmings, £2,100; Stains and Son, £2,044; W. Warne, 1,975; Shurmun, £1,945; Maley, 1,926; Johnson, £1,900; Langmead and Way, £1,874; Nightingale, 1,849; Elms, £1,740; Roy, £1,620.

KINGSCLERE (HAMPSHIRE).—For erecting a small church at Headly, in the parish of Kingsclere. Mr. Edwin Dolby, architect:—Keats, £763 15s. 6d.; Thomas, £665; Dover, £600; Rabbitts, £456 7s. 8d.

KENT.—For bailiff's house at Stone, Kent, for C. White, Esq. Herbert Ford, architect. Quantities supplied by Mr. J. W. Dennison:—Hill, £1,525; Piper and Wheeler, £1,191; Turner and Sons, £1,161; Gumbrell, £1,150; W. Brass, £1,148; Browne and Robinson, £1,130; Pritchard, £1,114; W. Henshaw (accepted), £1,065.

LONDON.—For the erection of new warehouse, King Edward-street, E.C., for T. N. Debenham, Esq. Mr. Wimble, architect:—Patman and Fotheringham, £5,285; Colls and Son, £5,250; Hill and Sons, £5,130; Kelley, Brothers, £4,965; Scrivener and White, £4,963; Conder, £4,919; Newman and Mann, £4,765; Killby, £4,599; Morter, £4,443.

MORTLAKE (SURREY).—For building the King's Arms Hotel, for Messrs. Phillips and Wigan. Mr. R. P. Pope, architect:—Lovatt, £3,645 3s.; Goodall, £3,380; Searle, £3,316 15s.; Brown, £3,310; Bouing, £3,300; Adamson and Son, £3,208; Wigmore, £3,198 10s.; Sharpington and Cole, £3,030.

NORWOOD.—For five pairs of villas, for the London and Suburban Building Society. Messrs. Hammack and Lambert, architects. Quantities supplied:—Nixon, £8,289; Newmann and Mann, £8,075; Hearle, £7,557; Gibson Brothers, £7,477; Mann, £7,045; Ennor, £6,898; Hedges, £6,857; Darby, £6,745.

RIDDLESDOWN PARK (SURREY).—For the erection of a detached residence for Mr. J. J. Vonder Heyde. Mr. Thomas Danby, architect. Quantities supplied by Mr. Shrubsole:—Barnes, £3,204; Richards, £2,776; Garrud, £2,612; Warne, £2,600; Nightingale, £2,407; Hazell, £2,355; Wilcox, £2,311; Poxon and Smith, £2,270; Neale, £2,263.

WANTAGE.—For new warehouse and repairs to house for E. Ormond, Esq. Mr. J. P. Spencer, Wantage, architect:—Wheeler, £341 3s.; Kents, £310 10s.; Partridge and Aldworth (accepted), £280 13s.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Robert Austin Ellis, Chelmondiston, Suffolk, builder, July 2, at 12—James Benjamin Surridge, Scarsdale-road, Camberwell, house decorator, July 3, at 2—Charles Robert Teague, Old Jewry, surveyor, July 4, at 11—Charles James Watts, Norwich, engineer, July 2, at 11—James Worm, Ireland-yard, Doctor's Commons, builder, July 2, at 1—R. Chidley, Crown-street, Soho, proprietor of saw mills, June 27, at 1—Joseph Markwell, Brownlow-road, Dalston, builder, June 26, at 1—George Mayston, Waterloo-terrace, Cambridge-heath, gasfitter, June 27.

TO SURRENDER IN THE COUNTRY.

Thomas Aston, Hereford, carpenter, July 16, at 11—Robert Glover, Bideford, mason, July 3, at 2—Owen Griffiths and William Evans, Llandudno, builders, June 26, at 12—George King, Reading, plasterer, June 29, at 10—William Stoakes, New Church, carpenter, June 19, at 11—William Winkless, Leicester, builder, July 3, at 10—George Edward Young, Middlesborough, joiner, June 28, at 11—William Ashton, Lincoln, bricklayer, June 24, at 11—John Bower, Llanberis, manager of a slate company, June 25, at 11—John Edwards, Aberdare, builder, June 26, at 11—Robert Howard, Southport, plumber, June 26, at 10—Henry James Lewis, Nettlebed, Oxfordshire, plumber, July 1, at 12—Samuel Pepperdine, sen., Lincoln, sawyer, June 24, at 11—Henry Sirrell, Holmer, Herefordshire, blacksmith, June 28, at 11—Thomas Stringer, Brighton, carpenter, June 29, at 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

July 11, T. Cracknell, Maida Vale, builder—July 15, J. Wilde, High-street, Forest-hill, house painter—August 1, T. Cook, Northam, builder—July 9, G. Turner, Stockton, painter—July 12, G. Rogers, Forest Hill, contractor—July 19, T. D'Arcy M'Nally, Water-street, Blackfriars, builder—July 9, G. and R. B. Geldard, Spennymoor, blacksmiths—July 4, J. Jones, Briton Ferry, builder—June 27, J. Beck, Andover, plumber—June 25, P. Presant, Norwich, bricklayer—July 22, C. Hibberd, Sutton Mandeville, stonemason.

PARTNERSHIPS DISSOLVED.

Evans and Jones, Liverpool, joiners—Scott and Co., Kingstown, Cumberland, brickmakers—Broadbridge and Epps, Boughton-under-the-Blean, Kent, builders—T. and J. Groves, Shrewsbury, builders—Dilworth and Wilson, Halifax, stonemasons.

DECLARATIONS OF DIVIDENDS.

A. N. Lea, Hoole, surveyor, div. 11d.—A. Goldsworthy, Redruth, cabinet maker, div. 4s. 6d.

DIVIDENDS.

July 11, R. Johnson and J. Addie, York-street, York-road, Lambeth, slate merchant—July 11, A. Collins, Stalbridge, ironmonger—July 11, R. Spencer, Freshwater, builder—July 5, W. Bayliss, Hereford, plumber—July 19, J. H Little, Newcastle-upon-Tyne, plumber—July 10, J. F. Mathews, Reigate, surveyor—June 25, T. Buttress, East Norton, builder.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9 0	£10 10		Archangel, yellow ..	£11 10	£12 10	
Quebec, red pine	3 0	4 10		St. Petersburg, yel...	10 10	11 0	
" yellow pine...	2 15	4 0		Finland	8 0	9 0	
St. John N.B. yellow	0 0	0 0		Memel	8 0	0 0	
Quebec Oak, white ..	5 5	6 0		Gothenburg, yellow	9 10	10 10	
" birch.....	3 10	4 10		" white	8 0	9 0	
" elm	3 10	5 0		Gefle, yellow.....	9 0	11 0	
Dantzic oak	3 10	5 0		Soderhamn	9 0	10 10	
" fir	2 0	3 0		Christiania, per C., 12 ft. by 3 by 9 in.			
Memel fir	3 0	3 10		yellow	16 0	22 0	
Riga	3 0	3 5		Deck Plank, Dantzic, per 40 ft. 3 in.	0 15	1 4	
Swedish	1 15	2 2		PUMICE STONE pr ton	5 0	6 0	
Masts, Quebec red pine	5 0	7 0		OILS, &c.			
" yellow pine...	5 0	6 0		Seal, pale ...per tun	37 0	0 0	
Lathwood, Dantzic, fm	4 10	5 0		Sperm body 110	0	112 0	
" St. Petersburg	5 10	7 10		Cod	40 0	0 0	
Deals, pr C., 12 ft. by 3 by 3 in., duty 2s per load, drawback 2s.				Whale, Sth. Sea, pale	38 0	40 0	
Quebec, white spruce	14 10	21 10		Olive, Gallipoli.....	62 0	0 0	
St. John, white spruce	13 10	15 10		Cocoanut, Cochin, ton	55 0	0 0	
Yellow pine, per reduced C.				Palm, fine	40 0	0 0	
				Linseed	39 0	0 0	
Canada, 1st quality.	17 0	19 10		Rapeseed, Eng. pale..	37 0	0 0	
2nd do.....	12 0	13 0		Cottonseed.....	30 0	36 0	

METALS.

IRON:—					
Welsh Bars in London .. ..per ton	6 10 0	6 15 0	3		
Nail Rod .....—	7 10 0	8 0 0	2		
Hoops ..... do	8 10 0	9 0 0			
Sheets, Single ..... do	9 15 0	10 0 0			
Staffordshire Bars ..... do	7 10 0	8 10 0			
Bars, in Wales ..... do	6 15 0	6 0 0	3		
Rails ..... do	6 5 0	6 10 0	net		
Foundry Pigs, at Glasg. No 1 .. do	2 14 0	3 5 6			
Swedish Bars ..... do	10 5 0	11 0 0			
STEEL:—					
Swedish Keg, hammered .....per ton	15 0 0	15 10 0			
Swedish Faggot ..... do	10 10 0	12 10 0			
COPPER:—					
Sheet & Sheathing, & Bolts ....per ton	83 0 0	89 0 0			
Hammered Bottoms ..... do	95 0 0	98 0 0			
Flat Bottoms, not Hammered .. do	91 0 0	93 0 0			
Cake and Tough Ingot ..... do	73 0 0	0 0 0			
Best Selected ..... do	81 0 0	83 0 0			
Fine Foreign ..... do	83 0 0	87 10 0			
Yel. Metal Sheathing & Rods ....per lb	0 0 7¼	0 0 7¾			
TIN:—					
English Block .....per ton	89 0 0	0 0 0	2½		
do Bar ..... do	90 0	0 0 0			
do Refined ..... do	92 0 0	0 0			
Banca ..... do	91 0 0	0 0 0	nett		
Straits ..... do	86 0 0	88 10 0			
LEAD:—					
Pig, English .....per ton	21 15 0	0 0 0	2½		
" Spanish Soft ..... do	19 10 0	0 0 0			
Shot, Patent ..... do	21 0 0	0 0 0			
Sheet ..... do	21 0 0	0 0 0			
White ..... do	30 0 0	31 10 0			

SPELTER:—			
On the Spot .....per ton	21 0 0	21 2 6	net
ZINC:—			
English Sheet .....per ton	26 10 0	27 0 0	
Devaux's V. M. Roofing Zinc .... do	28 0 0	0 0 0	
* And 5 per cent. discount if laid upon the new system.			
QUICKSILVER .....per btl	6 17 0	0 0 6	
REGULUS OF ANTIMONY.			
French .....per ton	35 0 0	0 0 0	2

CONTRACTS.

BOARD of WORKS for the POPLAR DISTRICT.—To SEWER CONTRACTORS.—Notice is Hereby Given, that this Board will meet at the Board-room, on Tuesday, July 2 next, at six o'clock in the evening precisely, to receive TENDERS for the CONSTRUCTION of 1,569ft., or thereabouts, of 2ft. by 2ft. 4in. BRICK; 475ft., or thereabouts, of Jennings's 15-inch Pipe; and 3 090ft., or thereabouts, of Jennings's 12-inch Pipe Sewers, with Gulleys, Junctions, &c., in Devon's-road Brickfield-lane, Burdett-street, Tibbett's road, Reeves'-road, Grace-street, Park street, and Mary-street, in the parish of Bromley, St. Leonard. The parties tendering must furnish the names of two responsible persons willing to enter into bond with them in the sum of £300, for the due performance of their contract, and will be required immediately to pay down the sum of £2 on the acceptance of their tender, for the expense of the contract and bond. A separate amount for each street must be stated in the tender. The Board do not bind themselves to accept the lowest or any tender; and the parties offering to contract, or some one on their behalf, are required to be in attendance on the day, and at the hour, above named. Tenders upon the forms prepared for that purpose, sealed and endorsed "Tender for Sewers," none other will be received, must be delivered at my office on or before July 2, at twelve o'clock, noon, after which time no tender will be received. Plans and specifications can be seen, and further particulars and forms of tender had, on application at the Surveyor's office, any day until July 1, 1867, inst., between the hours of ten a.m. and four p.m.

JOHN LAYTON, Jun., Clerk to the Board.

Offices—East India Dock-road, June 20, 1867.

CONSERVATIVE LAND SOCIETY.—NORTH LONDON ESTATE, FINCHLEY, MIDDLESEX.—TENDERS are invited for the EXECUTION of DRAINAGE WORKS and ROAD-MAKING on the above estate. In order to indicate approximately the extent of the proposed works, the following rough quantities are stated, but parties tendering will be understood to have taken out quantities for themselves:—

770ft. of 12in. pipe sewers } Average depth to invert, 11ft.
510ft. of 9in. pipe sewers }
No. 38 Allotment eyes 6in. on 12in.
No. 15 do. 8in. on 9in.
No. 11 Gulley Cesspits, including gratings complete, and 6in. branch drains to main.
790ft. of 32ft. roads, including two 8ft. footpaths.
200ft. of 8ft. footpath.
190ft. of 6ft. footpath.

The plan, sections, details, and specification may be seen on and after Wednesday, June 26, 1867, at the offices of the Society's Surveyor, Mr. James Wylson, 33, Norfolk street, Strand, London, W.C. Tenders to be sent in on or before Friday, July 5, 1867, sealed, and addressed to the Surveyor as above, and endorsed "Tender for Works at Finchley." The Committee do not bind themselves to accept the lowest or any tender submitted.

By Order of the Board,
CHARLES LEWIS GRUNEISEN, Secretary.
33, Norfolk-street, Strand, London, W.C.,
June 20, 1867.

TO BUILDERS. — Persons desirous of giving TENDERS for the ERECTION of a PUBLICHOUSE, Upper Holloway, N., can see the plans and specifications and obtain quantites at my office. Tenders to be delivered at twelve o'clock at noon, on Tuesday, July 2. The proprietors do not bind themselves to accept the lowest or any tender.

20, Guilford-street, W.C. M C W. HORNE, Architect.

TO BUILDERS, CONTRACTORS, MASONS, and Others.—The Churchwardens of St. Paul, Shadwell, Middlesex, Hereby Give Notice that they are prepared to receive TENDERS for the REPAIRING of the EXTERIOR of the PARISH CHURCH of St. Paul, Shadwell. Parties desirous of sending in tenders for the works may inspect the specification at the office of the Vestry Clerk, No. 141, High-street, Shadwell, or at the office of the architect, Mr. Charles Dunch, district Board offices, White Horse-street Commercial-road, East. The tenders are to be sealed up and endorsed "Tender for Repairing Shadwell Church," and are to be delivered at the Vestry Clerk's office, High-street, Shadwell, not later than twelve o'clock on Monday, July 1 next. The Churchwardens do not oind themselves to accept the lowest or any tender, and the party whose tender shall be accepted will be required to provide two approved sureties, whose names must be inserted in the tender for the due and satisfactory performance of the works.

AUGUSTIN MELLISH, Vestry Clerk.

High-street, Shadwell, E., June 20, 1867.

WAR DEPARTMENT CONTRACT.—NOTICE to BUILDERS.—TENDERS are required for the ERECTION of a GYMNASIUM, and COAL YARD at Walmer Barracks, in the County of Kent; the plans and specifications of which may be seen on application at the Royal Engineer Office, Dover. Parties desiring to tender for the erection of these works must leave their names at the Royal Engineer Office, Dover, on or before Saturday, the 29th inst., and pay the sum of 10s. 6d. for the bills of quantities, which will be forwarded to each party as soon as prepared by the Government Surveyor. The Secretary of State for War does not bind himself to accept the lowest or any tender.

Signed, A. P. G. ROSS,
Colonel Commanding Royal Engineer.

Royal Engineer Office, Archcliff Fort, Dover,
June 5, 1867.

WAR DEPARTMENT CONTRACTS.—NOTICE to BUILDERS.—TENDERS are required for the ERECTION of an additional block of TROOP STABLES, with Harness-room, Picquet-room, Entrance gates, &c., &c., for the Military Train, Mill-lane, Woolwich. Parties desiring to tender for the execution of these works must leave their names at this office on or before July 2, 1867, and pay the sum of 10s. 6d. for the bills of quantities, which will be forwarded to each party as soon as prepared. The Secretary of State does not bind himself to accept the lowest or any tender.

W. DRISCOLL GOSSET,
Lieutenant-Colonel Royal Engineers.

Royal Engineer Office, Woolwich, June 18, 1867.

WANTED.

*** *The* BUILDING NEWS *inserts advertisements for* "SITUATIONS WANTED," *&c., at One Shilling for the first Twenty-four Words.*

TO ARCHITECTS and ENGINEERS.—A youth, aged 15, who writes a fair hand and can do Tracings, wishes for an ENGAGEMENT AS JUNIOR in the office of an architect or engineer.—Address, A. B., 75, Arlington-street, Mornington-crescent, S.W.

WANTED, by a Youth, EMPLOYMENT in the Office of an Architect.—Address, M. H., 6, Jeffreys-street, Camden Town.

THE BUILDING NEWS.

LONDON, FRIDAY, JUNE 28, 1867.

THE PARIS EXHIBITION.

ARCHITECTURE.—FIFTH NOTICE.

ENGLAND is represented by about fifty architects, and amongst them are many of our men of note, so that we might at the first sight expect to see a fair exposition of the state of architecture. Unfortunately, this is not so, most of our best men being only represented by some small photographs, and many by a secondary work, or even some study for an unsuccessful competition. Conspicuous, too, by their absence are the names of Butterfield, Pugin, Goldie, and others, who have done much to raise our position in the ranks of Art; and, whilst sorry to lose the influence of their presence, we must congratulate them on their wisdom in abstaining from exhibiting their works to such a disadvantage. We reviewed the English contributions before they were sent to Paris, and shall in this case make but small comment of our own, gleaning our remarks from the reviews of others, and premising them with the regret that so few plans or geometric drawings have been sent. Continental architects search primarily for the plan of the building represented, and having found it commence their study of the design from this point; and loud are the outcries of those who have found us in our "lost corner," at the absence of this keynote and initial to their method of study. The first search of our foreign brethren is for the drawings submitted in competition for the new Law Courts, and, great as is their disappointment at not finding these in the catalogue, it is far surpassed when they find in a small black coffin some little photographs without name or number, and hung without the slightest regard to sequence—a portion of one design being detached from its other illustrations and just fitted in anywhere its size allows, without reference or relationship to its neighbours. Mr. Scott, it is true, has a stall all to himself, but he is a favoured individual, and a sort of royal personage, being the immortaliser of Prince Albert, and South Kensington dare not quite extinguish him; but, as for the others, they are merely architects, and, coming of that long-enduring and patient race, they may be stabled in any crib and herded together in any fashion or no fashion at all. The reviewer in the *Journal des Travaux Publiques* thus refers to this portion of our exposition:—"The new Palais de Justice will be as large as the old and new Louvre at Paris together, and is an affair of some thirty millions of francs, for which eleven English architects have competed together amongst themselves. Well! this competition (too exclusively English) is only visible in the Exposition through some little photographic views, and without any geometric drawings to enable us to appreciate the relative value of the designs." This last sentence is the burden of all the notices on this portion of the Exhibition, and serves as a refrain to all the comments; and, after remarking on the absence of the designs by Messrs. Abrahams, Garling, and Street, who he supposes would not allow their works to be exhibited because there was so little room, says of Mr. Barry that his design lacks simplicity, and of Mr. Brandon that his five views, both externally and internally, are too reminiscent of churches and cathedrals. It is singular to remark that Mr. Burges's design, which has called forth so many comments in England, is passed over without a remark, excepting one we hope he will appreciate—he is coupled with Mr. Deane, and the two dismissed in three short lines. Mr. Lockwood achieves a greater success, and is described as an architect of great taste and an able draughtsman. Mr. Scott "has sixteen views without a single geometric design and [mark this] it is impossible for us with these picturesque drawings to form an opinion of it as a work of architecture." Most English architects nowadays conceive a picturesque drawing to be the one thing needful, and getting that somehow or another leave the rest alone to time and circumstances to develope as they may. "Plenty of time to study the building when we have won the competition is the cry." "Only let us have a decent perspective and we are safe;" and so in this case we have sixteen.

Mr. Seddon, we read, "presents to us, 'un fâcheux assemblage de maisons à pignon,'" and the rest of his design meets with similar treatment; and, finally, even Mr. Waterhouse is, on account of his having nothing but his picturesque views, despatched without further comment. It is quite impossible to make a foreign architect understand that this paucity of illustration of so important a national undertaking arises from the executive. We are stigmatised as being "afraid to show our plans;" "we fear the rest of the world, else we should have invited them to compete for this 'affaire d'une trentaine de millions de francs,'" and often as we have explained the fact that the original drawings are yet under adjudicatory inspection in London, and could not be sent, so often have we seen the bland incredulous smile steal over the face and the shoulders steal up to the ears, and listened to the inquiry, "But, then, why not photograph your plans and geometrical drawings?" Surely, says another critic, "the fair exposition of the designs for this largest project in the world would have done more for the arts than the exhibition of a plaster cast of a Pisan Pulpit already known to every student, and would neither have cost so much money nor occupied so much space;" but the happy man who made it knew not Cole, or he would never have ventured on such a remark, and we, in our turn, shrug our shoulders and point to the grim black coffin we have just emerged from, and before getting quite away from it give this general criticism of M. Horreau, which is too good to be translated:—"Dans ce grand concours à petites photographies, on remarque en general une trop grande richesse qui ne convient pas au temple de la justice, et un fâcheux esprit de reproduction d'architecture passée," and after expressing an opinion that Italian architecture of the Florentine type would have better suited the place and purpose, M. Horreau winds up with another lament at the absence of any geometrical drawings.

After the Law Courts the object next sought for is Mr. Scott's design for the Prince Albert Memorial in Hyde Park, and opinions vary greatly. "It is not a monument but a tomb," says one; "a tabernacle for an altar," says another; whilst a third regrets "that there are neither seats, nor candelabra, nor *drinking fountains* upon its extended base, that its flight of steps, which are octagonal in their last stage, do not take that form in their first;" "that the four main arches do not extend upwards with the tympana instead of being kept down by the horizontal band," and remarks that "if they had been larger they would have given more space for the statue, which, like them, is too small;" "that these tympana have no square base provided for the pinnacles which spring from the angles, and which are thus poised on a point, and that the central flèche should be so equally subdivided in its height;" "that the construction should be composed of too many small elements 'soldered' together to last long;" and as a *finale* the reviewer feels acutely for the Prince, who is here exposed to a thorough draught, and placed in very reduced circumstances compared to the rest of his surroundings. There is much that is very just in all this, and much that we have said before, and we are forced to agree with his response to the question he puts, and answers thus:—"Le monument proposé à la memoire du prince Consort sera t-il un beau monument? Nous ne le pensons pas; *la statue, objet principal* est trop accessoire dans l'ensemble et le prince tourne le dos à une façade qui est tout aussi belle qui les trois autres façades." In fact, the casket is made of more importance than the jewel, and, like much of Mr. Scott's other work, it may achieve prettiness, but has not attained to dignity.

Messrs. Donaldson, Barry, Fergusson, and Pennethorne exhibit their designs for the same competition, which do not seem to attract much attention, and are thus commented on: "The projects of the competitors of Mr. Scott shade the statue less, it is true, but they leave much to be desired in other respects. Some of them surround it too much, and Mr. Fergusson raises, moreover, four angle pavilions, which are justified by nothing, and which hinder the view of the statue, already too much masked by two advanced pillars, pillars which are composed of *fagots* of columns of all colours." We are glad to see a voice raised against this said *fagoting*, and the promiscuous huddling together of all kinds of materials, with the idea that richness necessarily results from costliness. Many a good detail and well-conceived accessory is spoiled by the ill-assorting of these so-called "coloured decorations" in marble shaftings; and the utter disregard of all contrast or harmony of colour exhibited in the haphazard way in which they are allowed to find their own places betrays ignorance in art. Of the designs for the new National Gallery submitted in competition, four are here represented by photographs. They are those of Messrs. Barry, Broderick, Somers Clarke, and Owen Jones, "which present to us all known species of architecture—Roman, Gothic, or Renaissance, with more or less of columns, of towers and domes, and seem to us, even after comparison with many other buildings exhibited, to be almost barbaric in their attempted decoration." There is, undoubtedly, a want of refinement in our work which is unpleasant to a French or German architect, whose spirit is more subtle and less rash. The portion of our exhibition which attracts most continental attention is that which embraces the numerous designs for churches; for "L'Angleterre est, detout le monde entier le pays où l'on construit le plus d'Eglises et de chapelles;" and Mr. Street's churches at Westminster and Clifton attract a good deal of attention, but again comes the old refrain, "nous regretton tous jours l'absence de dessins géometraux à échelle suffisante pour fair apprécier les œuvres. Il semble que les architectes Anglaise ne s'occupent que l'effet décoratif, que de presenter de belles images sans creuser les importantes questions d'economie dans les dispositions et constructions de les œuvres." We assure our continental brethren that these questions are as much forced on the attention of English architects as on those of any other country, and regret that we have not had the opportunity of exhibiting to them many of these same works in geometric representation, when they would have seen how very well we construct, and how very badly draw. At present the converse only is their impression, and inasmuch as these drawings are mainly the work of the professed perspective draughtsman and the architectural colourist, we do not wonder at it. The very beautiful drawing of the crypt of St. Stephen's, at Westminster, by Mr. Barry, and the no less clever ones by Mr. Slater, of the restoration of Sherborne Minster, attract much attention, and we are sure to find some foreign architect, with his nose almost adhering to the glass, minutely examining these and Mr. Burges's drawings. But the photographs from Mr. Burges's drawings of St. Simon Stylites, and his fountain, are puzzles they cannot solve. We have heard the former wondered over and explained as an illustration of the ultra Catholic feeling of Protestant England, and the latter described as one of the fountains in Trafalgar-

square; indeed, these are some of the mysteries of the Exhibition, and excite almost painful interest. Of the secular buildings, we cannot find, in the remarks of foreigners, very much praise. Messrs. Banks and Barry's design for the Manchester Exchange is described as "*too* Roman," and Mr. E. Barry's hotel, with its "unjustifiable flèches," generally condemned as being too much cut up into little bits; whilst the Endell-street Schools meet with general commendation. Mr. Cockerell's Freemasons' Hall is rather a puzzle, but all regard his father's drawing for the sculpture to the tympanum of St. George's Hall with a feeling akin to veneration, as much for the memory of a man everywhere loved as for its intrinsic value. Mr. Gibson's National and Provincial Bank is described as "coarse," and as being of an "ordre romain dont l'echelle n'est pas appropriée a l'etendue et à la fonction de l'edifice;" and his circular-headed doorway under his circular arch is generally condemned as an instance of great poverty of invention. Nor is Mr. Giles's Langham Hotel much of a favourite. The extreme disruption of all leading lines is an unpardonable offence in the eyes of foreign professors. Mr. Broderick is a puzzle to many, and his love of column is regarded as an amiable instinct, and both in this and in his National Gallery drawings he is considered to work in a style "trop romanisé," though he would hardly know himself when he figures as MM. Guthbert et Broderick; but after the extraordinary maltreatment of foreign names in an English architectural newspaper we have seen, we certainly think our continental contemporaries are entitled to a little revenge. Mr. Hardwick's beautiful drawings are considered to be "rather the work of a decorator than an architect," which we think slightly too severe; but Mr. Hayward, who "moutrent des hôtels qui manguent d'unitè," is by compensatory justice let off very easily. One of the most pleasing drawings in the Exhibition is that of Mr. Lynn for the Parliament House at Sydney and attracts very great attention, although he, too, comes in for blame for presenting his design with "un trop petit plan et sans dessins géometraux," and also receives a very justifiable criticism as follows:—"L'architecture Gothique exportée au Sydney n'a rien qui nous seduise." Yet we confess it would be rather hard upon an architect settled in new diggings if he had to "evolve from his inner consciousness" a new and appropriate style all at once; nor can we endorse the sentiment that "l'architecture orientale arabe, qui offre tant de ressources à l'artist et qui est plus appropriée au climat et aux besoins actuels, nous ent paru plus convenable." When we see a practical and useful development of Arabian architecture in the French colony of Algiers we shall begin to think seriously about it in our own, and had Mr. Lynn taken an English type of Gothic instead of an Italian one we should have felt that he had at all events a logical basis for his style. Mr. John Prichard's design for a mansion for Don Senor Manuel M. Gonzales at Jerez de la Frontera, is usually considered to be a "château en espagne," and one "qui ressemble plus à un decor qu'a un projet à executer;" and his small photographs of Eatington Park, for Evelyn Shirley, are looked upon much in the same light, though we confess that the introduction of the episodes in family history—mere display—is to us a pleasing conceit. Had the sculpture been placed elsewhere it would doubtless have been better, but in England good work of this kind is so scarce we are pleased to welcome it anywhere. Mr. Waterhouse's marvellous drawings are the wonder of all his foreign confrères, and his design for the Manchester Assize Courts attracts very great attention. We confess we like his drawing better than the building. "We wish we could see more of unity and simplicity," says a foreign critic. What he would say if he could see Mr. Waterhouse's Law Courts drawings we don't know; and the same reviewer cries out loudly at the affectation of introducing gurgoyles nowadays. Mr. Digby Wyatt's interior court of the India Office "est trop riche; et dans les angles de laquelle nous regretton de ne pas rencontre de pans coup s," and certainly the introduction of that queer-looking tablet at this point is a great mistake, and weakens the whole arcade. Mr. Thomas Wyatt gets praise for his interior of his Liverpool Exchange: "Qui est remarquable par sa disposition architectural." Why some of the drawings here exhibited were sent we are quite at a loss to divine, unless it be to show how badly we can do in England when so minded. With all the apparatus of committee of selection and a South Kensington supervision, we certainly think a better series might have been obtained, and it is with a feeling of disappointment that we extricate ourselves from the labyrinthine "jumblement" of all sorts of things, and again encounter "un gros modèle en plâtre que nous ne pouvons passer sous silence, encore bien qu'il ne soit pas mentionné au catalogue, appelle l'attention des visiteurs, mais ne laisse après examen qu'un regret dans l'esprit de l'observateur: couvrir, sans points d'appuis intermédiaires, un immense espace pour abriter les arts et les sciences est certainement une bonne idée. Pourquoi faut-il, hélas! que cette charpente monumentale, qui prouve les ressources offertes à l'architecture par l'industrie Anglaise, soit établie sur une muraille à ouvertures aussi vulgaires que mesquines, n'annonçant à l'extérieur rien de grandiose intérieur? Pourquoi cet édifice destiné à recevoir les œuvres d'art de tous pays? n'est-il pas le résultat d'un concours international? par ce système, on a édifié de si beaux édifices et monuments? Que nous pouvons passer sous silence!" We try to, but in vain, we groan; it is veritably a mausoleum of art, and we weep over it. The agonising throes of its birth are faithfully recorded in a series of small sketches by Mr. Townroe, and each one gets more painful till the final result is beyond endurance. Alas! we wish it were; we fear we shall have to endure it for many a year. We believe there was an architectural committee connected with this scheme; do they know anything about it? or are they, like the celebrated catalogue committee, in utter ignorance and utterly ignored till all is done? Mr. Cole has a wonderful way of doing without such encumbrances; he is evidently of poor Pugin's opinion, that "a committee of three is two too many, and that one is more than enough." Listen to the following:—

"En général, nous pensons que l'exposition des architectes anglais montre une trop grande passion des images *water colored* et l'esprit de reproduction des œuvres du passé. Que diraient les architectes d'autrefois, dont nous admirons les œuvres, s'ils voyaient le plagiat inintelligent, servile de lour travaux, et l'oubli complet des principes d'architecture, eux qui, sans copier leurs devanciers, sans fair de belles images, sont parvenus avec les ressources si limitées de leur époque, à élever des édifices où tous les services, les besoins et les moyens d'exécution étaient si bien, si harmonieusement pondérés entre eux. Nous ne cesserons de rappeler que c'est dans cette pondération que'est toute l'architecture, et qu'elle peut seule ouvrir à nos contemporains une ère nouvelle où ils pourront s'illustrer comme lours devanciers. Etudier c'est arriver à dépenser moins pour faire mieux."

Seriously, we think that rather too severe, and do not think we are quite so black as painted, but the last apothegm repays us for bearing the infliction patiently, and there is much that is very true in this critique. Our own opinion is, that in some points we are before our neighbours, and in many they are better architects than we are. For variety of outline no nation equals us; indeed, we run too much in the direction of the so-called picturesque, and the very uneasiness of striving to stand in some strange attitude ofttimes renders us truly ridiculous. There is an air of acting and a footlight aspect about much of our work which proves it to be at best but seeming, and this we should strive to remedy. Such a collection as this may be of great service to us if we carefully note our own weaknesses, and look for others' strength. We can with much benefit learn from France the quiet repose and dignity she offers us in her best works. She is our host now, and we will not look out for her faults; some we cannot help seeing, but we prefer to learn from her all the good she has to teach us, and say no more about the evil we would avoid. In mediæval art we can learn more from her through her authors than her artists, but in her revival of classic forms we will sit reverently at her feet, and acknowledge that she is there vastly our superior. With her the art is not merely a *rechaufé* of old form and old details but a living phœnix rising from the lambent ashes of the past. The refined elegance of her detail, the graceful contour of her mouldings, and the sparing but appropriate use of ornament in her best works, are all lessons we can most lovingly receive from her. Could we temper her somewhat feminine grace with a little of our rugged vigour we should, perhaps, improve her. She is apt to be a little too *debonnaire* and gentle, but in her best moods we love her vastly. Let us try to retain the vigour and boldness we have in our works, but to acquire by a similar course of patient study some of the graces which adorn our art in France. Above all things, let us use the pruning knife abundantly on our works. We are rapidly falling into the besetting sin of vulgar enrichment, bedizening our works with incongruities of every kind, and effacing the pure form of true art by loads of architectural millinery.

Another lesson we may learn from France is the more practical one of geometric drawing. Of this we are profoundly ignorant in this country, and we do not hesitate to say it would be perfectly impossible for us to mass together such a collection of geometrical drawings as are exhibited by France. Taking them as merely technical expressions they are most eloquent renderings, and have a great tendency to refine the eye and mind. Slovenly drawings beget slovenly work, and the architect who will have his drawings prepared carefully to a large scale, like those of M. Hénard, will by that process eliminate many crudities which creep in from small scale drawings. It is, no doubt, owing to this cause that much of the refined elegance of modern French architecture is due, and if this Exposition will teach us no other lesson than this we shall hail it as a great art boon. We in our turn could teach her much, and were she to study her buildings more by perspective drawing than she does they would assume a bolder aspect and have more light and shade and more variety of outline; indeed, an alliance of our two qualities would be of mutual value, and it is our own fault if we do not, by such a juxtaposition as this Exhibition brings about, reciprocally improve each other. After France, the country most improving to examine is Austria, though in the tendency of her art expression she much more nearly resembles us than does any other nation. Her habit of drawing in perspective and the effect it has upon her art is much the same as our own; yet there is a general repose about her work and an absence of the fidgetty striving for novelty and what is miscalled "effect" that destroys our work so frequently. There are without doubt some preposterously overladen designs in the Austrian gallery, and therein it greatly resembles our own, and she too may study from France many of the same lessons we have to learn. From the other countries we have not much to gain, excepting here and there a line and now and then a precept, but these rather from individuals than the collective efforts of the nation or the tendency of a school, and these we have pointed out as we have passed through the various courts. To those who will go and learn, this Exhibition teaches much, and we have striven to indicate the way to reap rather than empty our few

gleanings; there is enough and to spare for all who go, and we sincerely hope the architects of England will study well the worth of their brethren abroad, and then we are certain that the influence of such study will bear good fruit at home. We now take leave of this portion of the Exhibition, and in our next shall enter upon the more practical portion of our review, where we shall find as much and even more of value to point out and comment upon.

USE OF IRON IN THE CONSTRUCTION OF TUNNELS.

THERE is not a phase in the whole art of construction which undergoes so many and such incessant alterations as the substitution of iron for its ancient predecessor, timber. We find wrought-iron girders supporting the main spans of the temporary Blackfriars Bridge, and the same material doing important duty amid the forest of timber erected for the purpose of carrying out the works of the permanent structure in its immediate vicinity. In the Thames Embankment river dams, iron piles are disputing the ground, we might almost say inch by inch, with the old 12 × 12 or 14 × 14 balks; and the primitive wooden permanent way of railways is rapidly yielding to the irresistible advance of the iron usurper. Recently a new field has been opened to this chief of constructive materials, by applying it to the centreing, staging, and supporting of tunnels during the progress of their execution. Timber is employed on a vast scale in the temporary works indispensable to the making of tunnels, whether they be cut through the solid rock, excavated in strata of different density, or pierced with hazardous uncertainty beneath a river or canal. Every year it becomes not only more expensive but more difficult, whatever may be the price offered, to obtain timber of large scantlings combined with first-rate quality. Bearing in mind that timber has frequently to be transported in the log, and that iron is five or six times stronger than oak, volume for volume, it is not to be wondered at that the latter must give way where the cost and difficulty of transport become considerable. Supposing that a country similar to America possesses large resources in timber, the question to be decided respecting the material to be employed in erecting a permanent structure—a railway bridge, for instance—is, whether the cost of maintenance and repair of a wooden bridge would be greater than the interest of the difference of the sum it would cost and that incurred by building the same bridge of iron. It would also be necessary to take into consideration the fact that, in spite of all repairs, the timber bridge must eventually be replaced by another of a more durable material.

The nature of the soil through which a tunnel is excavated will manifestly exercise some influence, although not to the extent usually imagined, upon the quantity of timber required for the temporary works; and it may be laid down as a rule, with very few exceptions, that the more humid the strata, the greater the quantity of timbering, shoring, and strutting necessary to keep the tunnel open. It is impossible to take out a tunnel with any chance of profit without laying in two lines of way, one for the ingress and the other for the egress of waggons. There is, of course, no necessity for preserving the orthodox six foot way required by the Board of Trade upon lines of railway unless the tunnel be intended for a double line, and then three temporary lines of way would be got in, but space must be left between the rails for the waggons to clear one another. If a tunnel be excavated through a wet argillaceous stratum, it will require for every half mile the following quantity of timber, a portion of which may be round and some also square in section:—About 60,000 cube feet of round beech, oak, or other readily obtainable wood in the log, in addition to 20,000 cube feet of roughly squared balks. The uprights, props, and struts will absorb over a quarter of a million cube feet of squared timber, while some 20,000 cube feet will be required for planking and sheathing; without including the cross ties and struts forming the bracing to keep the sheeting or walls in position. Over 100,000 running feet will be consumed in the laggings, and double as much in sleepers, joists, and centres, besides making an allowance for wedges and packing pieces. Another evil attendant upon the employment of timber for temporary purposes is that it is totally unfit to be used a second time, at any rate not for a work upon the same scale of magnitude. It is so knocked about and damaged by bolt holes, scarfing, straps, spikes, and other injuries that it is seldom worth purchasing for cutting up into smaller lengths. The construction of a tunnel may be said to consist of three distinct operations—firstly, the actual execution; secondly, the maintaining and supporting the sides and top of the space excavated, and thirdly the "lining," as it is technically termed, or the building of the arch, invert, and side walls. Where the tunnel is through rock the lining is frequently altogether dispensed with, the nature of the rock determining where this arrangement is feasible. It is a very common occurrence to witness a tunnel "lined" through a portion of its length where a fault has occurred in the rock through which it is excavated.

Similarly to iron piles, iron centreing would be able to be used over and over again, and it has been proposed to construct them with this end in view. They would consist of a series of cast or wrought-iron voussoirs connected together by bolts, and capable of being removed one by one as the work progressed, to allow of the introduction of the masonry. Wrought iron is preferable to cast, in consequence of the jerks and violent shocks the frame would be liable to. All practical men are aware that the contraction and expansion of wet earth will snap stout props and uprights like a bit of glass, and the brittleness of cast iron would certainly leave it exposed to this contingency. By thus employing an iron frame nearly similar to the profile of the tunnel, the three advantages of simplicity, economy, and security would be ensured. A disadvantage attending the older plan is, that the excavation must be considerably larger than the ultimate size required, whereas by the new method its dimensions can be accurately adjusted from the commencement. All bulging inwards of the sides is also prevented, and from the absence of all strutting and shoring up, a clear unincumbered space is available for the transit of men and materials, one of the first essentials to rapid construction.

COVENTRY INDUSTRIAL AND ART EXHIBITION.

(FROM OUR SPECIAL CORRESPONDENT.)

THE ancient city of Coventry, of old renowned for its pageants, and still more recently for its cry of distress, has shown at last that there is "strength in her woe;" and, by an effort almost spontaneous, has successfully inaugurated an Exhibition of Art and Industry. This Exhibition is worthy of note in an architectural sense, for it is held in the spacious Market Hall just erected by the corporation, and which is for the first time thrown open to the public. The building, which is built of brick, has a lofty clock tower, not yet finished in its details, which is likely to form a feature in the future views of Coventry, with the three famous spires. The lesson of the Exhibition commences at the very doors, the vestibule being lined with specimens of old oak panelling, taken from some old building which formerly stood in Palace Yard, Coventry. Much of this is simply a broad riband pattern interlacing the panels, but there are some fair specimens of tracery which do credit to the old Coventry joiners. There is a solidity about their work at any rate which the elegant ornamentation of Messrs. Holland, of Warwick, which appropriately adjoins it, does not pretend to. This firm exhibits some fine specimens of stained glass windows and examples of modern house decorations at the very entrance of the great hall, which has a fine effect from this point. The most remarkable feature of the Exhibition is the large number of architectural and other models exhibited by working men. Some of these models are coarse enough, and deficient in essential points of detail, but others are minute and marvellous reproductions of "poetry in stone." Of these a model of Lichfield Cathedral, in zinc, by John Tuffley, a Warwick man, now residing in Westminster, and a model of Watt's warehouse in Manchester, are far the best in an artistic point of view, though some of the house models by agricultural labourers are perhaps the most meritorious. We pass from these to the special features of the Exhibition, exhibited by the Skidmore Company, manufacturers of art metal-work. This stand of ecclesiastical ornament and of art-workmanship occupies the place of honour in the building. Here are specimens of the metal-work for the National Memorial to the Prince Consort, and a variety of gas standards for cathedrals, sacramental plate, and, above all, specimens of domestic furniture, which at least are remarkable for novelty of form. Mr. Lea, of Lutterworth, seems to have been educated in a similar school of art. His bookcase, made of pitch pine, and ornamented with portraits of Wycliff and Chaucer in the panels, combines elegance, cheapness, and lightness in a marked degree.

The numerous bronzes exhibited by Messrs. Elkington and Mason, though displaying their well-known excellence, exhibit no new feature. Not so the beautiful Alhambra decorations shown by Mr. W. D. Bromley, M.P., which are gems of art, and worthy of the highest place in the art annals of the Exhibition. But what can be said of the Temple of Thought of Mr. F. Wilson. This gentleman put a "whole scheme of social morality" into a dozen or so of travestied proverbs; the best of which are, "Hurry hinders haste," and "Work and prove." These are portions of a scheme of philosophy extracted from the hues of the rainbow, and to be embodied in an architectural temple in some Utopian village, the model of which seems to have been taken from Nash's famous pavilion at Brighton. The general furniture, shown principally by Birmingham firms, does not pretend to anything beyond decorative upholstery. Far greater advance is shown in the kitchen ranges, many of which combine some new features of increased usefulness and greater simplicity.

The Gallery of Art contains some 300 pictures, selected from the galleries of Lord Ward, Lord Warwick, Lord Leigh, Lord Craven, and the neighbouring gentry. In this gallery is the famous Kenilworth buffet, exhibited in 1851, and which has since found a home in the dining-room of Warwick Castle. Taken as a whole the Coventry Exhibition is, as stated by Lord Granville, beyond the simple category of a local Exhibition. It contains much that is valueless; but, as an indication of the industrial life of the people, paralysed as their staple manufacture has recently been, it is creditable and peaceful. The riband and other textile fabrics and the manufacture of watches are, of course, largely and successfully represented.

TRADES' UNIONS' COMMISSION.

WE resume Mr. Mault's evidence. Witness said his next point was, that unions hamper and restrict trade by endeavouring to enforce unreasonable and foolish trade rules. As to the different systems of reckoning time, for instance, it was stated to be the feeling of the builders of the country generally, that it is very desirable that payment by the hour should become universal. The men, however, especially the masons, had taken "a most unreasonable prejudice" against this system. Payment by the hour had been agreed to by the men in London, and witness remarked that the masters in the country would be very glad if they were in the same position as London masters. But all over the country the masons very persistently refuse to have their time measured under any other system than that of days and quarter days. The masters were put to the most unreasonable inconvenience (to say nothing else) under this opposition to the hour system. One reason why the masons have always refused arbitration was because they objected to the rule as to working by

the hour. The rule is admitted by the other trades—the joiners, the bricklayers, and the plasterers. The masons had also a very unreasonable objection, as the masters considered (it only existed however, in certain parts of the country), to work by artificial light under any circumstances. In Nottingham and Bradford the men had actually struck work rather than accede to it. The indisposition of the men to work overtime was next dwelt upon. Witness had known a case in which they had refused to work on to clear away scaffolding from a market-place, though they knew perfectly well that the space was wanted, and that the master would very likely get into trouble with the town authorities for not clearing it away. In reference, again, to what is called "walking time," the men in many places (though not in London) were declared to be most unreasonable. It was stated that the masters all over the country acknowledged that when a man is asked to walk any distance to his work, that walking forms part of his day's labour, and they were willing to take their share of the payment of it, and, consequently, the usual regulation in the country is that the men walk one way in their own time, and the other way in the master's time. This rule had been turned and twisted very much to the injury of the masters The men had in many places interpreted it, that every person who is employed on any job that is at a distance from the head-quarters of the master shall be allowed walking time, whether he requires it or not. After citing a case at Malvern, by way of illustration, Mr. Mault proceeded to give another instance of the way in which he said the masons interfere with the masters in the conduct of their business.—In many districts they claim to have a voice in the rating of the wages of all men employed. He quoted rules of the Bristol and Sheffield masons, to the effect that no waller or builder of stone shall be paid less than a certain amount per week when considered a skilled workman, neither shall an employer or foreman be allowed individually to judge a man as to his qualifications. But a meeting shall be called of all the members on the job, who, together with the employer or foreman, shall decide the question. All members known to violate this rule are fined at the discretion of the lodge." Among the plasterers there are also some very curious rules, which had the effect, according to witness, of interfering unduly between the master and men. For instance, the 22nd rule of the Bradford plasterers is as follows:—"That no member be allowed to be at the shop or any job more than ten minutes before the time to start work and not to leave his shop or start work before the specified time, under a penalty of 1s." Another rule, rule 27, is:—"That no member of this society be allowed to work for any firm consisting of more than two masters, unless every partner's name is publicly stated in full"—that is, whose names are not put up on the signboard. Witness was asked if the following was one of the rules of the Bradford Masters' Association:—"Should a strike of the workmen of any member of this association take place, it is hereby agreed and understood that such workmen are not employed by any member of this association during such strike?"—He replied: It may be so, I cannot say; all that we have to do with local associations is to give them support in connection with objects that are consonant with our rules, not theirs. Again asked: Is not the effect of your evidence to hold the general association of masons liable for these little acts of oppression which go on in different parts of the country, and respecting which not one word appears in their rules?—Yes; but if you desire it I can read evidence to show that the masons' society does actually interfere in these cases. In reference to a rule of the Bury Branch of the General Builders' Association, to the effect that no member of the branch association be allowed to let or sub-let the whole or any portion of any work to any employer of labour who is not a properly affiliated member of that society, it was stated that that rule was not passed with the sanction of witness's association; they had nothing to do with it, and they should not support a strike in connection with it The present strike at Blackpool was mentioned as a case in point. These rules were not transmitted to the central committee of the association, who is in no way responsible for them. They afforded support with regard to certain points only, as on a question of piecework or overtime, or where the men have refused arbitration. The whole of the wages question, the direct amount to be paid, was left to the masters of the place to deal with, who, in the opinion of the committee, must know a great deal more of it than any one central authority. The brickmakers' rule, which limits the size of bricks to one standard, he considered, damaged the building trade, and every master looked upon it as tyrannical. Any rule which prescribed to a master an arbitrary concession to any demand made upon him was so, and the compulsory enlistment of the masters into the union had a very bad effect.

PAINTED DECORATIONS IN CHURCHES, &c.

At the ordinary meeting of the Architectural Association at the house in Conduit-street, the Rev. Mr. Cutts made some observations on painted decorations in connection with ecclesiastical architecture. He remarked that when an amateur was asked to speak on a professional subject, he did so with some diffidence, and could only take the view of an amateur or perhaps of a critic. In ancient time the use of coloured decorations was much in vogue. In Egypt it was extensively used, while in Greece it was applied not only to architecture, but to the most magnificent work of the sculptor's art. In Rome, too, it was made to contribute to architectural effects; while in Gothic architecture, also, it was largely introduced. In the opinion of ancient architects, colour was essential to heighten the effects of building, and in their opinion, no building could be perfect without it. Indeed, in the matter of decorations, the sister arts went hand in hand, and no building could be said to be perfect which did not contain the accessories of sculpture and painting. It might also be conceded that colour gave effects which nothing else could do. A chalk drawing, for instance, or an engraving, although careful and elaborate, still could not impart the idea of colour. So, too, it was with a building. Let them take, for instance, a modern church. It might be a beautiful example of architecture; but contrast it with a church built 400 years ago, where colour had been judiciously introduced, and how very different would the appearance be. With stained glass, appropriate hangings, and rich furniture, how much more glorious was the interior of a church then when it was denuded of those appanages. Let them imagine, if they could, the Church of St. Mark, at Venice, churchwardenised. That church depended for its magnificent effects very much upon colour. While advocating the introduction of colour generally, he did not, however, recommend the practice of copying old colouring. On the contrary, he believed that any servile imitation would have an injurious effect, and would seriously retard the application of colour to architecture in our own day. If they were to put bits of green where they found green, and bits of red where they found red, and so on, the effects would be clumsy, hard, and bizarre. What was wanted really was to get at the general system upon which old churches were coloured. Colour might be applied in various ways—first, in mere lines and tints, so as to bring out the architectural effects; or, again, it might be applied to the ornamental features of the buildings, especially in cases where sculptured work had not been introduced, such as in the bell of a capital, or on a stringcourse. In this way colour might be used to help the proportions of a building. If a building were too low, it might be made to look higher by the introduction of vertical lines. On the other hand, a building might be spoiled by injudicious colouring, and made to look high where it ought to be low, or low where it ought to look high. For walls a tinted slate colour might be used, or a pale claret colour with diaper, or powdered with some other pattern. There was, he thought, much to be done in this way to a church after the mason had performed his part of the work. It was, he ventured to assume, the duty of the architect to study the application of colour to architecture. The study of old buildings showed that the great architects and painters on glass and vellum in past ages were able to produce a harmonious effect over the whole of the interior of their buildings. The usual foundations for wall paintings appeared to have been, so far as he could judge, a thin coat of fine plaster of the colour of the vellum or parchment of which old manuscripts were composed. He presumed that the same artists who painted on glass, and who illuminated manuscripts, were also the persons who executed wall decorations, because he had found in the British Museum fac-similes in manuscripts of wall decorations which he had found in country churches,—proving, he thought, that the same artist had executed both. The colouring was almost always in distemper, and the tints were flat and not vivid. It was only in small architectural features that brilliant colours were used. There might be said to have been two styles of colouring used in former days, namely, the Norman and the Tudor; and these were succeeded by the churchwarden style, which, however, he was glad to say was rapidly dying out. In the Tudor style there was the same ground colour, with the open spaces provided with *fleurs-de-lis*, or some other pattern; paintings from sacred history were then introduced in dark red lines, boldly drawn, with a few flat tints for the drapery. Some excellent illustrations of this kind of decoration were to be found in a little detached chapel standing within the churchyard of a church in Jersey. The paintings were subjects chosen from the life of our Lord. So, too, at an Early English chapel of thirteenth-century work with which he was acquainted, the walls were covered with masonry pattern, done in double lines. In this case the floor of the church was paved with coloured tiles, which had a very good effect. The usual ornamental portions of church architecture were, of course, the work of the architect; but if really high art was to be appealed to, it would be necessary, as in ancient times, to have accomplished artists. So long, for instance, as stained glass was paid for by the yard, it would be impossible to expect any high development in that particular development of art. He might, he was aware, be asked whether they would be allowed to carry out all that the cultivated taste desired to see accomplished in reference to coloured decorations and cognate subjects; and his answer was, that he believed the architects of our own day would insist upon directing the public taste and feeling in those matters, and that eventually the public themselves would demand what the architect would now fain accomplish, if allowed. He ventured, therefore, to recommend young architects to take up painted decoration as a special subject of study, always remembering that if they were commissioned to adorn a church, they could never make it too beautiful for the holy uses to which it was to be dedicated.

Mr. T. H. Watson, in moving a vote of thanks, observed that the subject to which Mr. Cutts had called attention was one of great interest to architects. There was much more to be done in the way of colouring than to put on crude masses of colour, for it seemed to him that much of the colour now used could only be justified in cases where the whole building was to be coloured.

Mr. R. P. Spiers thought we were very backward in the present age in the matter of colour, as it was seldom used for designs and drawings, the majority of which left the architect's office without any colour at all. Although agreeing with much that had fallen from Mr. Cutts, he could not think it inadvisable to copy old work, because it would be necessary for the student to have something to guide him. In dealing with coloured decorations also, it would be necessary to bear in mind that we lived in a peculiar atmosphere, unfavourable to bright colours. In Eastern countries (in Egypt, for instance), where the atmosphere was clear and dry, the ancient architects appeared to have used three simple colours, and yet with these they produced effects which we could not hope to realise. There were, he thought, two notable works at present in the metropolis in which glaring colours were being used, and which, he feared, when completed, would have anything but a pleasing effect. There were in Paris two or three modern chambers in which coloured decorations have been introduced with the best results, and there was also at Rouen the church of Notre Dame de bon Secour, which was a fine illustration of the judicious application of colour to church architecture. He had much pleasure in seconding the vote of thanks to the reverend essayist for his useful paper.

Mr. W. F. Potter begged to be allowed to third the vote of thanks, and fully concurred with Mr. Cutts in not recommending the practice of too closely copying old colouring, and "that servile imitation would have an injurious effect." There were some gentlemen who went so far in their advocacy of copying ancient art as to say we ought to imitate the ancients even in their bad perspective. This was tantamount to saying we ought to begin art afresh. He approved of progress in art, and strongly approved of the decorations that were now going on in St. Paul's Cathedral. He was confident that all who visited the City and could spare five minutes to look inside the cathedral must have had their eyes gladdened by the mural decorations there; and the only regret was

that the authorities had taken two hundred years to think about it. He, however, recommended that they should not rush into the opposite extreme of two quickly painting their walls, but should wait a year or so till the walls were thoroughly dry. In the church of St. Albans, Baldwin's Gardens, Gray's Inn-lane, which he had lately visited the colours on the walls presented a very mottled appearance, apparently arising from the dampness of the walls.

Mr. G. H. Birch said the effect to which the last speaker referred was not owing to the dampness of the walls themselves, but through the general atmosphere of the locality in which the church was situated, which could be obviated by the building being better heated.

Mr. Tarver and Mr. C. H. F. Lewes next offered a few remarks, and Mr. T. H. Watson recurring to the opinion of Mr. Cutts that "the same artists who illuminated manuscripts were those who executed wall decorations," said this undoubtedly was so—he himself having found original sketches in the British Museum.

Mr. W. F. Potter could confirm the observation of Mr. T. H. Watson as to original sketches for mural designs being in the British Museum. But for finding such original drawings there, the late Prince Consort and his artist, Mr. Merrit, would have had some difficulty in restoring the recently discovered mural paintings in Marlborough House.

The President of the association (Mr. R. W. Edis), in putting the vote of thanks, said they were all under a debt of gratitude to Mr. Cutts for introducing to the meeting so interesting a subject. He highly eulogised his essay, and the great number of illustrations with which it was embellished.—The Rev. E. L. Cutts, M.A., in returning thanks, said he did not take so much credit to himself for writing his paper or preparing his sketches (which was with him a work of love) as he did for being the cause of the discussion that had taken place, and the attention they had paid him was a sufficient reward.

PROFESSIONAL PRACTICE AND CHARGES OF ARCHITECTS.

WE are in the habit of receiving frequent communications from correspondents relative to the professional practice and charges of architects, and have reason to believe some doubt exists in the minds of young architects and students on the subject. We think it desirable under the circumstances to give the charges of architects from the printed list of rules of the Royal Institute of British Architects, for the guidance of such of our readers as may be more specially interested in the matter.

NEW BUILDINGS.

1. The usual remuneration for an architect's service, except as hereinafter mentioned, is a commission of 5 per cent. on the total cost of the works executed from his designs; besides which, all travelling and other incidental expenses incurred by the architect are paid by the employer, who is also chargeable under certain conditions, as hereafter mentioned, for time occupied in travelling.

2. But for all works in which the art required is of a high kind, and the expenditure mainly for skilled labour and not for materials, *e.g.*, in designs for the furniture and fittings of buildings, for their decoration with painting or mosaic, for their sculpture, for stained glass, and other like works, the architect's charge is not made by way of commission on the cost, nor does it depend upon the time employed in making the design, but is regulated by special circumstances, and varies according to the skill and artistic power of the architect.

3. A commission of 2½ per cent. is to be charged upon such works as sculpture, stained glass, and others of a similar nature, for which the architect does not give the design, but arranges with the artists or with the tradesmen, and directs the work generally.

4. In works under £500 in amount, 5 per cent. is not fairly to be considered as remunerative, and in such cases it is just to the employer as well as to the architect, to charge by time or by a scale, varying from 10 per cent. for works under £100, to 5 per cent. on amounts above £500.

5. The commission is reckoned upon the total cost of the works, valued as if executed entirely by labour and of new materials provided by the builder.

6. The commission is to be charged upon the whole value of the work executed, with the addition of 2½ per cent. upon any omissions.

This is exclusive of the charge for measuring extras and omissions.

7. The architect is entitled during the progress of the building to payment on account at the rate of 5 per cent. on the instalments paid to the builder, or otherwise to half the commission, on the signing of the contract, and the remainder by instalments as above.

TRAVELLING.

8. All travelling expenses are to be charged extra.

9. These rules suppose the work to be executed within an easy distance of the architect's office; but if the work be executed at a considerable or inconvenient distance from it, an allowance beyond the 5 per cent. ought to be made for the time occupied in travelling, in addition to the actual expenses.

EXTRA SERVICES.

10. The percentage does not cover professional services in connection with negotiations for site, arrangements respecting party walls, or right of lights, nor services incidental to arrangements consequent upon the failure of builders whilst carrying out work; but all such services are charged for in addition, the basis for charge being the time employed.

ALTERATIONS IN DESIGN.

11. Supposing that the employer, after having agreed to a design, and had the drawings prepared, should have material alterations made, an extra charge may be made according to the time occupied.

12. If the architect should have drawn out the design complete, with plans, elevations, sections, and specification, ready for estimate, the charge is half the usual commission above named.

13. If the architect should have, in addition, procured tenders in accordance with the instruction of his employer, the charge is one-half per cent. extra to the above.

ALTERATIONS OF BUILDINGS.

14. For works in the alteration of premises, the remuneration may be increased according to the time, skill, and trouble involved.

DUTIES OF THE ARCHITECT.

15. All of the following requirements for buildings are included in the ordinary charge of 5 per cent.

Preliminary sketches.

Working drawings and specifications sufficient for an estimate and contract.

Detailed drawings and instructions for execution.

General superintendence of works (exclusive of clerk of works).

Examining and passing the accounts (exclusive of measuring and making out extras and omissions).

16. No additional remuneration is due for making such a rough estimate as may be obtained, for instance, by cubing out the contents. If a detailed estimate be framed, additional remuneration is due from the employer.

17. An architect is bound, under the 5 per cent. charge, to provide one set of drawings and one set of tracings, with duplicate specification; it being understood that the architect is paid for the use only of the drawings and specification, and that they remain the property of the architect.

ESTATES.

18. The charge for taking a plan of an estate, laying it out, and arranging for building upon it, should be regulated by the time, skill, and trouble involved.

19. For actually letting the several plots (in ordinary cases) a sum not exceeding a whole year's ground rent may be charged.

20. For inspecting the buildings during their progress (so far as may be necessary to ensure the conditions being fulfilled) and finally certifying for lease, the charge should be a percentage not exceeding one-half per cent. up to £5,000, and above that by special arrangement.

21. All the above fees to be exclusive of travelling expenses, and time occupied in travelling, as before mentioned.

22. The charge for the above does not include the commission for preparing specification, directing, superintending, and certifying the proper formation of roads, fences, and other works executed at the cost of the employer, nor for putting the plans on the leases.

VALUATIONS, &c.

23. The following definite charges are recognised for valuation of property:—

The charge throughout is 1 per cent. on the first £1,000, and one-half per cent. on the remainder up to £10,000. Below £1,000, and beyond £10,000, by special arrangement. These charges do not include travelling expenses, nor attendance before juries, arbitrators, &c.

24. The charge per day which may be made by architects depends upon their professional position, but the minimum charge is three guineas per day.

25. The charge for estimating dilapidations is 5 per cent. on the estimate, and in no case less than £2 2s.

26. It is not desirable that an architect should supply to builders quantities on which to form tenders for executing his design; but in case of such being done it should be with the concurrence of the employer, and the architect should be paid by him, and not by the builder.

LIVERPOOL ARCHITECTURAL SOCIETY'S EXCURSION.

THE annual excursion of the members of the Liverpool Architectural and Archæological Society took place on Saturday last, the destination of the party on this occasion being Hooton Hall and Church. Mr. J. K. Colling, architect, London, from whose designs the church and the new portions of the hall were erected, was in attendance to exhibit the working drawings and point out the various additions and alterations that had been made. The Church of St. Paul, which was first visited, was inspected with much interest. It is a structure in the Byzantine style of ecclesiastical architecture. As an edifice it is quite unique in its conception, while its execution does credit to Messrs. Holme and Nicol, the contractors for its erection. In form it is purely ecclesiastical, consisting of a nave and chancel, with transepts supported by a lantern at the point of their intersection; the nave being furnished with side aisles, while the chancel, whose eastern termination is a semicircular apse, is surrounded by an ambulatory. The window and door dressings, and the window shafts, are of Stourton stone of a warmish grey colour, and the courses are of a dark red stone from the Hooton quarries, with the exception of a band or two of Stourton running right round the building. The arch stones are alternately of Hooton and Stourton stone, while the external pillar shafts are of Hooton and the capitals of Stourton. The capitals of all the columns in the interior are of Caen stone, richly designed from the flowers, fruit, and foliage of this country. Numerous sculptured monograms and inscriptions enrich the building internally and externally. After visiting the church the excursionists were shown over the mansion of Mr. R. C. Naylor, and greatly admired its new adornments. For these the architect was also Mr. J. K. Colling, of London, while Messrs. Holme and Nicol, of Liverpool, were the contractors. The grand saloon is a magnificent apartment, measuring 80ft. in length by 28ft. wide, correspondingly high in the ceiling and lighted by seven ground glass panels in the arched roof. The ceiling is panelled and enriched by foliage, and at each end are four Corinthian columns of large dimensions, having shafts of polished Peterhead granite. The floor is framed in oak diagonal pattern, and tends to enhance and complete the richness of the general effect. In this gallery are numerous fine pictures, including many rare gems of the painting art. From the picture gallery two or three steps lead to the sculpture gallery, which is on a lower level. It is 200ft. in length, and of the same width as the one just alluded to, while, like it, the ceiling is arched and the floor of tesselated oak. In length it is divided into eleven compartments by projecting columns of different-coloured and highly-polished marble. The ceiling is panelled, and the arches, which, resting on the marble columns, divide it into compartments, are richly ornamented. Light is admitted in a modified degree through ground glass in the ceiling, and this is supplemented by a window in each of the compartments looking out upon an Italian garden. This spacious gallery contains many splendid specimens of works of ancient and modern sculptors. The different suites of apartments in the hall are furnished in the most gorgeous style, while the noble area of conservatory

in front of the principal drawing room might vie in golden glory and rich magnificence with the fabled garden of Hesperides.

The party walked from Hooton to Eastham Ferry, where they had a half-hour's leisure to wander in the wood or through the beautiful gardens and grounds attached to the hotel. The "Richmond of the Mersey" never looked more attractive, and the visit there gave rise to the most pleasurable feelings. At half-past four o'clock a *recherche* dinner was served in the hotel by Mr. William Hilliar, the lessee, to which the company did ample justice. Covers were laid for about sixty gentlemen. Mr. T. J. Kilpin, the president of the society, presided, and Mr. William Hay occupied the vice chair.

The Chairman gave the usual loyal and patriotic toasts, which were duly honoured.

Mr. Joseph Boult proposed "The health of Mr. J. K. Colling," the architect of Hooton Church and the alterations at the hall. The church, especially in the interior, was a very successful work of architecture, and there could not be two feelings with regard to the hall. The additions had been placed in the right positions, and, with regard to the picture and statuary galleries, he did not think the *ensemble* was rivalled in any public or private establishment in the three kingdoms In Liverpool they had a specimen of Mr. Colling's style in the Albany, where there was a splendid adaptation of the rules of architecture to modern requirements.

Mr. Colling returned thanks, and concluded by proposing the toa t of "Prosperity to the Liverpool Architectural and Archæological Society."

Mr. J. A. Picton, whose name was associated with the toast, responded, and in the course of his remarks said tha all architecture was a conventional art, but it was to nature they must look for the elements of beauty. If they worked in stone, brick, or plaster, the natural forms were there, and no man had shown better how to apply these forms to architecture than Mr. Colling, and the profession owed him a debt of gratitude for the manner in which he had pointed out the way. In regard to the association, he was the only man in the room, except his friend Mr. Boult, who was present at its birth, the first meeting having been held in that house, if not in that room, some twenty years ago. It was supposed that everything great and good emanated from London, and that if poor provincials attempted to get up anything they must either sit under the shadow of the metropolis, or follow in its wake, but they were glad to do that, and the answer was, that in provincial societies, although they had the cloth of frieze and not of gold, yet the frieze had its uses as well as the cloth of gold. Through good and evil report the society had come down to the present day, and had done a good and useful work by promoting friendship, goodfellowship, and professional intercourse among its members. Architecture was in a better position now than ever. The wealth and prosperity of the country were increasing, and there was a tendency to expend it in works of art, and to make their public buildings something more than mere shelters from the weather. He rejoiced to see the buildings in their own town showing an advance in art. As a member of the Corporation, he might mention that they were doing something. They were laying out magnificent parks, the premium for the plans of one of which was gained by a member of that society, who was to carry out the scheme at the cost, including the price of the land, of about half a million of money. Another matter which was to be brought before the architectural world was the provision of dwellings for the working classes. No problem was more difficult of solution, nor more required solution, than a plan of providing dwellings convenient and comfortable, without pauperising the working classes, so that they might pay a fair rate of interest and not be almshouses. The great fault of the London schemes—those of Miss Burdett Coutts, Alderman Waterlow, and Mr. Peabody—was that they did not pay a fair rate of interest, and it was a matter of favour and charity to obtain a residence in them, and was subversive of the feeling of independence which every man ought to possess. To encourage people to enter into competition to provide dwellings for the working classes, and to solve the problem to which he had referred, the Corporation were offering a premium for a scheme of dwellings which would provide them cheap and comfortable at a price which would pay a fair rate of interest. Two hundred guineas were offered for the solution of that problem, and he would be happy if it should be solved by a member of the Liverpool Architectural Society. A number of other toasts followed, after which the party returned to Liverpool by one of the Eastham Ferry steamers, one and all highly delighted with the excursion.

STATUE OF MR. COBDEN IN SALFORD.

On Wednesday afternoon Mr. Noble's statue of Cobden was formally unveiled in the Peel Park, Salford. The park already contained four other statues by the same sculptor, one of the Queen, one of the Prince Consort, one of the late Mr. Brotherton, the member for the borough, and one of the statesman after whom the park is named. The Cobden statue has been seen and highly commended by Mrs. Cobden, and by many of Mr. Cobden's most distinguished associates. The figure is colossal, and of the best Campanella marble, so called from its sounding like a bell when struck. It is of remarkably hard and durable quality, and of a pleasing light grey colour. Mr. Cobden is represented in the ordinary dress of an English gentleman. The pedestal is of the finest Aberdeen granite, from the quarry of Messrs. M'Donnell and Field, and is 12ft. high. On the four sides of the plinth are inscribed these four mottoes, embodying Mr. Cobden's own leading principles as a statesman—"Repeal of the Corn Laws," "English and French Treaty of Commerce," "Education and Free Trade," "Peace and Non-Intervention" On the shaft of the pedestal there is the all-sufficient word, "Cobden."

THE PATENT CONCRETE STONE COMPANY'S WORKS AT EAST GREENWICH.

These works, transplanted from Ipswich, have already been described in the Building News. They were formally opened on Friday last, when a large number of influential gentlemen attended, some of whom "assisted" in the ceremony. The visitors were, for the greater part, conveyed from Hungerford in a special steamer, under the direction of Mr. Frederick Ransome, the managing director of the company, and the perfector of this important invention. Amongst them we noticed General Willoughby, C.B., the Hon. Gerald Talbot, Sir P. T. Cautly, K.C.B., Sir H. Montgomery, Sir Arthur Cotton, General Cotton, Colonel Smith, Madras Navigation Company; Professors Donaldson, Ansted, Tuson, R. Kerr; Messrs. G. Godwin, F.R.S., &c., G. A. Barry, Robert Longsden; Dr. Pye Smith, Messrs. Chadwick, Healey, Henry Currey, J. P. Seddon, C. F. Hayward, Thomas Page, C.E., E. C. Woods, C.E., Bryan Donkin, H. O'Hagan, W. H. Holland, R. C. Ransome (Mayor of Ipswich), John Walters, M.P., Zerah Colburn, Dr. Pearson, George Maule, Wallis Nash, &c.

On arrival at the works at about two o'clock, the visitors were conducted by Mr. Ransome to the end of the spacious building farthest removed from the river, at which the process of manufacturing the artificial stone is entered on, and consists of drying the sand or other material of which the body of the intended product is to consist. This process is accomplished in a revolving heated cylinder adjusted on a slope of about 1 in 90 deg. After being dried the sand is shot into air-tight heated cells, from which it is removed as need requires to the manufactory to be sifted, mixed in a pug-mill with the silicate of soda, moulded into either the most massive blocks or the most delicate architectural ornaments, as occasion may require, after which the moulded work is drenched with chloride of calcium, then boiled in the same chemical agent, and, for the two final processes, is subjected to a powerful and copious cold water bath, and then dried, when it is ready for use.

Mr. Ransome gave a lucid and interesting explanation of the *rationale* of his process as he conducted the visitors through the successive stages. After the liberal cold collation provided by the company for their visitors, addresses were delivered by Professors Donaldson and Ansted, Mr. Godwin and others, all of them highly congratulatory, upon the successful culmination of Mr. Ransome's persevering and meritorious labours.

The visitors, about 150 in number, were conveyed back to town by the special steamer engaged for the occasion, and reached Hungerford about eight o'clock, not one dissenting from the opinion which many of them expressed, that their hosts had furnished them with a scientific, intellectual, and social treat of the highest order.

ARCHITECTURE—UNIVERSITY COLLEGE.

On Saturday last, June 22, the presentation of the prizes by Sir John Lubbock took place in the lecture theatre of the college, before a numerous and fashionable audience. We append the list of the successful prizemen in architecture, the Donaldson medallists being Mr. Josiah Rose and Mr. Thomas Batterbury.

Architecture. — Professor T. Hayter Lewis, F.S.A., F.I.B.A.—Fine Art.—Senior class: Donaldson silver medal and certificate, Josiah Rose, of London; second prize and certificate, Alfred Henry Paget, of Leicester; third certificate, R. Lockyer Cox, of London Construction.—Senior class: Donaldson silver medal and certificate, Thomas Batterbury, of Hampstead; second prize and certificate, Josiah Rose, of London; third certificate, R Lockyer Cox, of London; fourth certificate, R. Came. Fine Art.—Junior class: Prize and certificate, Josiah Rose, of London; second certificate, R. Lockyer Cox, of London Construction.—Junior class: Prize and certificate, Josiah Rose, of London; second certificate, R. Lockyer Cox, of London; third certificate, Edward Haslehurst.

We are glad to hear that the learned Professor's classes were very fully attended during the past session. We commend them to the attention of those students who have not been through the course.

COMPETITIONS.

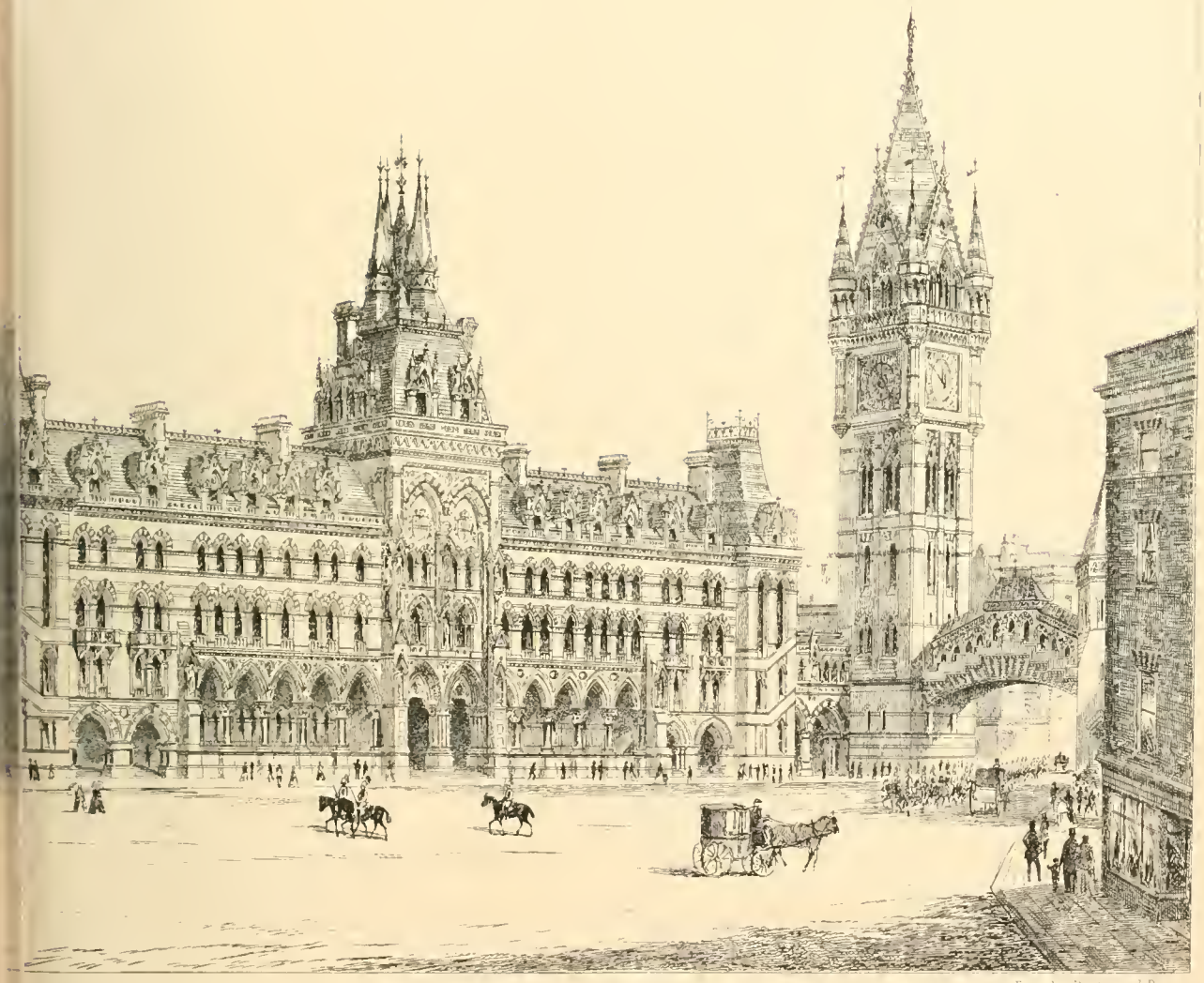
Mr. Street, to whom the plans for the new Bristol Assize Courts had been submitted, sent in his report on Wednesday last. Eleven plans, the production of six architects, were adjudicated upon; and Mr. Street reports that the following plans are, in his opinion, entitled to the premiums of 100, 50, and 25 guineas respectively:—No. 1, the plan bearing the motto "Usui civium decori urbium;" No. 2, motto "Quis;" No. 3, motto "Dos a dos." We understand that No. 1 plan is the production of Messrs. Popes and Biudon; No. 2, that of Messrs. Godwin and Crisp; and No. 3, that of Messrs. Hansom and Son.

Shortly after the destruction of the Nottingham Mechanics' Hall by fire, the trustees and committee offered premiums of £50, £30, and £20 for the three designs which they might consider best adapted for the purposes of a mechanics' institution. Twenty-four sets of drawings were sent in on the 8th inst. The trustees and committee, after several adjournments, again met, and it was decided that each member should write on a slip of paper the motto on the set of plans which he considered entitled to a prize. This having been done it was found that five competitors only had been selected. These were "Dumspiro, Spero," "Hopeful," "Resurgam," "Trefoil," and "Utilitas." A second voting gave a considerable majority in favour of the plans of "Resurgam," and they were accordingly declared entitled to the first premium. To "Trefoil" was awarded the second premium, and to "Hopeful" the third. The names of the successful competitors are—1. Mr. Thomas Simpson; 2. Messrs. Clarke and Son; 3. Mr. R. C. Sutton Some correspondence touching this matter will be found in another column.

On Wednesday evening last the annual dinner meeting of the United Society of Ironmongers was held at the Freemasons' Tavern. Mr. Benham, of Chandos-street, occupied the chair. Amongst the guests of the evening was Mr. Tidd Pratt, who gave an interesting speech, in which he glanced at the history of benefit societies, and showed that the Society of Ironmongers was one of the most prosperous in existence, and that its management must have been marked with great wisdom and prudence. Such an endorsement from so eminent an authority as Mr. Tidd Pratt elevates this society amongst the favoured few. It is, therefore, rather surprising that there are scarcely 200 members, when there must be at least six times that number of assistants connected with the ironmongery trade of the metropolis. The society has nearly £5,000 of funded stock; and, as Mr. Passmore Edwards said at the meeting, it has from the first gradually and invariably marched onwards to prosperity and power.

E. Wimbridge, lith.

Strand Front of Design for



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NATIONAL COMPETITION DRAWINGS—SOUTH KENSINGTON.

TO those who are curious in art matters a visit at this time to the Competition Room of the South Kensington Museum will not be without interest, as the drawings for which the National medals have just been awarded are now on exhibition. The collection, which is of great general merit, consists of drawings sent from the local schools of art throughout the country to compete for the National prizes, the subjects embracing a wide range of art. Space will not permit of an extended notice, and it will be necessary on the present occasion to confine our remarks to the strictly architectural portion of the display. Without wishing to be hard on retiring merit the most careless visitor must observe that the exhibition of architectural subjects is very small, and at the same time largely rewarded. The total number of architectural drawings, including ten or a dozen copies of the same plaster cast, a frieze enriched with fruit and leaves, executed now in chalk, now in sepia, now in oil, is exactly sixty-two, twenty-nine of which are designs for spandrels, diapering, or panels suitable for plasterers' work, for which the Plasterers Company offered prizes. The drawings for which medals or prize books have been awarded number about a score, or very nearly one-third of the total number, so that rising talent can complain of no lack of appreciation at the hands of the authorities at South Kensington, and, unless we greatly err, the South Kensington pupils have even less reason to make a moan than their compeers in the provinces. Be this as it may, there is very high authority for caring for those of one's own house, and it is reasonable to suppose that the South Kensington pupils enjoy advantages for study which can only be obtained in the metropolis; besides which their number is considerable, and somebody *must* have the premiums. The drawings speak for themselves, however, in one particular case, that of the Gold Medallist, Mr. H. K. Gribble, aged twenty, a South Kensington pupil. Including a clever perspective view they are designs for a cathedral, and are of exceptional merit. So great is their merit that it is not easy to believe that a young man twenty years old could have executed them, though we have received assurances of this fact. Of the amount of assistance in the design which Mr. Gribble may have obtained from his seniors it is impossible to judge. The design might be entirely his own, or *vice versâ*, but, as it stands, it is very good, and well worthy of the Gold Medal. We hope to hear more of Mr. Gribble. The National Silver Medal fell to Mr. B. Samoiloff, South Kensington pupil, for a "Small State Railway Station." The exact meaning of the title it is not easy to determine, but Mr. Samoiloff is a foreigner, and excuses must be made. By the coat armour and "scarves and baunerets" about it the building would seem to be a grand ducal station for a mediatised Prince. It is, however, of some merit, but scarcely worthy the Silver Medal. The National Silver Medal has fallen to Miss Anne Baxter, of Oxford, age not given, for a drawing in sepia of a Gothic spandrel. There is always a delicacy about criticising the works of a lady. It is, however, difficult to conceive on what grounds the Silver Medal can have been awarded in this case. Among the copies from the antique the visitor will notice an extraordinary drawing of a Roman *biga*, by Benjamin Weeks, aged twenty, occupation warehouseman. Whatever may be the merits of the work, the authorities awarded the author with a bronze medal. It has no merit beyond mechanical dexterity, but of that it has a very large amount, and is well worthy of a special visit. To cut out such a drawing on tinted paper and to set it on a white mount is a practice which would be thought the authorities at South Kensington would not have permitted. Next to this drawing is some scroll ornament from a cast by J. Teasdale, of Newcastle-on-Tyne, shoemaker by trade, bronze medallist by merit. This is a real work of art. The same may be said of the productions of two other bronze medallists—Richard Frustone, of Dudley, tin-worker, who contributes a copy in oil of the stereotyped fruit and leaf frieze; and J. Blair, of Edinburgh, labourer, who has delicately rendered some vine leaves and grapes. A bronze medal has also been given to Mr. Arthur Foster, aged seventeen, for a drawing from measurement of the Chapter House, Lincoln Cathedral. This work is all very well for a lad of seventeen, and perhaps highly creditable to him, but it is not to efforts like this that the Silver Medal should be adjudged. To Mr. A. Slade, of Reading, aged sixteen, a bronze medal has been given for a design for cemetery chapels. Here, again, it is difficult to believe that any lad of that age could, without great assistance, design such buildings. Mr. M'Carthy, of Cork, aged twenty, sends a clever design for a church, and Mr. A. Reading, of Birmingham, aged sixteen, sends another. A design of some merit, for "A School of Science and Art, Museum, Library, &c.," Torquay, by Mr. H. H. Bridgman, is badly hung, considering its size, and the fact that it is not forced with colour.

Mr. W. L. Bernard, of Bath, has a quaint and picturesque design for a mansion. Miss Ellen Miles, of Lambeth, aged nineteen, obtains a bronze medal for a design for a door to a public library. The valves are supposed to be executed in bronze, but the design is not suitable for so expensive a material. Miss Miles is a "designer on wood," and the habitual designer on wood finds great difficulty in producing a creditable design for the sterner material. The drawing is not without considerable merit, and the doors would look well if carved in wood. The design is thus described :—"A library door, to be executed in bronze, comprising eight compartments, illustrative of the works of eight poets of the Greek, Italian, German, and English schools. An allegorical group of mosaic fills the arch, representing Faith, Philosophy, History, Art, and Morals. On each side of the figure of Faith are the emblems of the four Evangelists, and the dove, as the symbol of divine inspiration, appears above. Morals holds in a chain a tiger, symbolical of the Passions." The whole is clever for so young a lady, but by no means adapted for metal. The ladies seem to have much the best of it throughout the exhibition. Sheffield is represented by Miss J. H. Bagshaw, aged seventeen, who contributes a beautiful acanthus leaf. A leaf and tendril, suitable for architectural ornament, by Miss M. W. Murray, of Limerick, aged nineteen, student in the schools for two years and a half, is very cleverly done and is rewarded; as is also a drawing by Francis Alton, aged nineteen, but which does not possess the same merit. Amongst the drawings from casts, whether in crayon, sepia, or oil, several were deficient in life, being executed in a style that would be perfectly useless for practical purposes. It avails nothing to stipple up a full-sized representation of a plum or a pomegranate; the effect should be given by a few bold strokes in the right places. For every hundred who can finish a drawing with minuteness there are not ten who can produce the true effect with a few vigorous strokes. Drawings should be judged from a moderate distance, and that which then presents the best effect is the best. Those which require a microscopical inspection are seldom worth much. Some of the drawings exhibited bore a strong resemblance to the old-fashioned style of Poonah painting, the delight of boarding schools at the commencement of the present century. The secrets of this art we were never able thoroughly to penetrate, but we have been given to understand that more mechanical dexterity than artistic skill is necessary, and, to tell the truth, we were not very keenly bent on acquiring further information on the subject.

The exhibition of designs for manufactures is interesting, and shows advances on former years. We hope to be able to notice them more fully on another occasion.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

ON Monday evening the annual conversazione took place at the rooms of this institution. The visitors were unusually numerous, the Royal Academy, the Royal Society, the Society of Antiquaries, the Royal Geographical Society, and other distinguished bodies in the world of science and art being well represented. The rooms were adorned by a large and interesting collection of pictures and water-colour drawings contributed by Mr. Tite, Mr. E. Cooke, R.A., Mr. R. P. Spiers, Mr. Burges, Mr. E. Poynter, Mr. John Moore, and others. Among the architectural drawings were some of the irrepressible designs for the new National Gallery, about which the general opinion seemed to be that of Sancho's master when he recommended that unsavoury matters should be let alone. Dr. Salviati was in full force with his glass and mosaics, and some elegant specimens of furniture and cabinet work, designed by Mr. Seddon and Mr. Eastlake, were exhibited by the Art Furniture Company in Garrick-street. Mr. Tite sent amongst others a large oil painting of the interior of St. Paul's Cathedral, and the celebrated "Raising the Maypole." Miss Phillott contributed a copy of an "Annunciation," by Filippo Lippi, and a clever twilight sketch of the village of S. Lo, Gloucestershire. Mr. E. Poynter exhibited some of his watercolour drawings, cottages, and coast scenery in North Devon, and a portion of Eton cloisters. Field Talfourd sent a very clever coast scene in watercolours To Mr. T. Woolmer the Institute was indebted for a small sketch by Holman Hunt, the subject being from Tennyson's "Golden Prime of Good Haroun Alraschid." The depiction of the water is, however, entirely wrong, inasmuch as there is a breeze everywhere excepting where the boat is pursuing her course with flowing sheet and every indication of speed. The sheet-block is also treated in a most unseamanlike way. These things are not the trifles they may at first sight seem to be, the want of a little technical knowledge frequently marring the works of even the best artists. Amongst the furniture exhibited a curious chiffonier by Mr. J. P. Seddon, was particularly noticed. It was, in fact, a sort of cupboard to be fixed against the wall at a convenient height, having a shelf above. The doors of the cupboard, for such it was to all practical purposes, contained representations of Abelard and Heloise, and the shelves were adapted for the display of choice pieces of glass or china. The chief beauty of the piece of furniture was derived from the repose of the composition, only two woods being used, and the usual spotty effect produced by dabs of red or blue paint entirely avoided. Mr. E. W. Cooke, R.A., contributed two water-colour drawings, "Interior of San Marco," and "Catalan Bay, Gibraltar," and Mr. Gilbert Scott exhibited some of his designs for the Law Courts. The band of the Coldstream Guards, under the direction of Mr. F. Godfrey, played at intervals during the evening, and the company did not separate until after midnight.

ARCHAIC INFLUENCES AFFECTING IONIAN ART.

ON the 20th inst. Mr. Hyde Clarke read a paper on this subject at the rooms of the Architectural Union, Conduit-street. The paper was illustrated by new photographs of the rock-cut monuments of Central and Western Asia Minor, and referred chiefly to the recent views of men of science on the early populations of Asia Minor, and the influence exercised on the architecture, arts, and mythology of the early inhabitants and the Greeks. Mr. Clarke referred to the geographical positions of Asia Minor as a route of passage for migrations from the east and the west, its occupation by populations of varied origin, and the distinction between the settled populations of the interior, and the immigrant populations of Phœnicians and Greeks on the coast.

The statement of Herodotus, in his Second Book, as to the conquests of Sesostris in Asia Minor, and the establishment of monuments of his victories there, had led to the general belief for many centuries that the Egyptians had supplied the chief germs of Ionian art. Herodotus circumstantially described the monument near Niufi, in the Smyrna district, which is still in existence; and archæologists and artists have been so impressed with the alleged characteristics as to make their drawings Egyptian and insert hieroglyphic details. Lepsius maintained its Egyptian authenticity, but Carl Ritter and Kiepert were among the first to question this, to call it the Pseudo-Sesostris, and attribute to it an Assyrian type.

By the exertions of himself the monument has been photographed and communicated to the academies and authorities of the learned world, and it is now evident the monument is Assyrian and not Egyptian; and so likewise with regard to the other monuments of the class. The monuments of the West are now connected with those of Boghaz Kene, and Euyuk, depicted by M. Georges Perrot and M. Edmond Guillaume, in the great work now in course of publication by the French Government. Layard and Fergusson do not consider these monuments to be distinctly Assyrian, but as forming a class allied to that type. M. Perrot has proposed for the class the name Lyde-Phrygian, as expressing the two countries of Lydia and Phrygia, in which as yet the monuments are chiefly found. Mr. Clarke terms them Lyde-Assyrian, with the purpose of maintaining the connection of the group with the Assyrian and expressing that distinguishing characteristic.

The ages of these monuments are unsettled. Some, as the Pseudo Sesostris and the Niobe, are undoubtedly of great antiquity, being ancient in the time of the Greeks; but some of those at Boghaz Kene are almost Persian in character. The elimination of the Egyptian element and the substitution of Assyrian in the pages of the history of Ionia is attended with considerable results of the nature already referred to. Fergusson has already pointedly dwelt on the derivation of the Ionic volute and honeysuckle ornament from Mesopotamia, and the progress of discovery now tends in the same direction. The question remains of the ultimate origin of what is termed the Assyrian or Mesopotamian element, and Mr. Clarke refers it to an earlier epoch of civilisation, representing what has been termed the Scythian empire by Professor Rawlinson, but which Mr. Clarke attributes to a great empire held by the Caucaso-Tibetan race.

To the Assyrian or Mesopotamian element Mr. Layard attributes the distinctive characteristics of Ionian art as compared with Hellenic or Doric, in which the extraneous or archaic element is Egyptian. Mr. Clarke considers further that the schools of art of Asia Minor were formed by the barbarian or Iberian element, receiving and propagating this Caucaso-Tibetan or Assyrian influence, while in Hellas, although there had been an Iberian population, as in Italy, this population had been superseded by the Hellenic. Mr. Clarke proposed a new question with regard to the cities alleged to be founded by the Amazons. The names of these cities, he stated, were not only non-Hellenic, but non Iberian, and altogether abnormal. He considered, therefore, they must belong to the pre-Iberian period, perhaps that of the rock-cut monuments. The foregoing gives only a brief sketch of one leading portion of the paper, which embraced a wide range of old and new topics connected with the districts of Ionia and Asia Minor.

After the paper a discussion ensued, in which Mr. Howarth treated of the influence of the Phœnicians and the Iberians, and Mr. R. P. Spiers described the monument near the Nahr el Kelb or Dog River in Syria, the details and treatment of which are not Egyptian, but like the Lyde-Assyrian or Assyrian.

After the public discussion a kind of conversazione was kept up for some time by the art authorities assembled.

ROYAL ARCHÆOLOGICAL SOCIETY.

THE annual conference of this society, which is this year to be held at Hull, commences on Tuesday, July 30, lasting every day up to and inclusive of Tuesday, August 6. On the first-named day the inaugural meeting will be held at the Town-hall, at noon, after which parties will be formed to visit the principal objects of antiquarian interest in and about the town. Among the places to be visited are the parish church of Holy Trinity and St. Mary's Church, Lowgate, two very ancient places of worship, the Grammar-school, the Trinity-house, in which building there is a fine collection of marine curiosities and articles brought by shipmasters from distant countries, also several paintings of ancient sea battles. In the course of the first day there will also be inspected the oldest house in Hull, the King's Head Inn, High street, and Wilberforce House, in the same street. This house derives its name from the fact that the great William Wilberforce, the anti-slavery member of Parliament, was born and reared in it. This day's proceedings will close with the Mayor's soiree, which will take place in the Town hall. On Wednesday meetings of sections will be held at ten o'clock in the forenoon. In the after part of the day there will be excursions to Hedon and Patrington, where there are two fine old churches—the finest in Holderness. At the former place a paper on ancient church architecture will be read by Mr. Street, and at the latter by Mr. Christian. In the evening there will be a conversazione in the Antiquarian Museum, which has been formed for the especial accommodation and entertainment of the members of the institute, curiosities and antiquarian relics having been forwarded by the gentlemen in Hull and the neighbourhood. On Thursday, after the meeting of the sections, there will be an excursion to Beverley, where the fine old Minster will be inspected, and also St. Mary's Church, which is an older structure even than the Minster. On the afternoon of Friday there will be an excursion to the ruins of Thornton Abbey, eight or nine miles from Hull, in North Lincolnshire. Thornton Curtis and Barton will also be visited. In the evening a conversazione will be held in the museum of the Hull Literary and Philosophical Society. On Saturday the excursions will be to Driffield, Dane's Dale, near that town, and Bridlington, where the Priory Church, a very ancient structure, will be inspected. The party will then proceed to the bold promontory of Flamborough Head, where the remainder of the day will be spent. On Monday the churches at Howden, Selby, and Wressel will be visited. At the last-named place there are some fine old ruins. On Tuesday, the last day of the conference, the annual meeting will be held, when the choice of the next place of meeting will be made. In the afternoon there will be excursions to Fulton, Meaux Abbey, Swine, and Skirlaugh. The proceedings will be brought to a close by a dinner at the Hull Town-hall.

ARCHITECTURAL ASSOCIATION.

THE closing meeting of the session of the Architectural Association took place on Friday evening last, the president, Mr. Robert W. Edis, in the chair. After the usual business of the meeting Professor Hayter Lewis gave an able and interesting paper "On Mosaics." The learned Professor entered fully into the description of the various kinds of mosaic decoration, which he illustrated by a number of sketches and drawings from some of the principal Italian churches; and, after referring to what had been done by Messrs. Powell and Dr. Salviati towards reviving the art of mosaic decoration in our own time, concluded by hoping that at no distant period good mosaic work would again be used for the wall decorations of our churches and public buildings. This being the closing meeting of the session 1866 67, the election of officers for the ensuing session took place. The following gentlemen were severally proposed and elected unanimously:—Mr. R. Phené Spiers, A.R.I.B.A., president: Messrs. E. J. Tarver, A.R.I.B.A., and Lacy W. Ridge, A.R.I.B.A., vice-presidents; Messrs. Robert W. Edis, F.R.I.B.A, G. H. Birch, Ernest C. Lee, J. Tavenor Perry, A.R.I.B.A., C. Henman, jun., A.R.I.B.A., L. C. Riddett, R. Herbert Carpenter, A.R.I.B.A., Rowland Plumbe, A.R.I.B.A., Henry Jarvis, jun., A.R.I.B.A., T. H. Watson, A.R.I.B.A., committee; J. Douglass Mathews, A.R.I.B.A., honorary treasurer; Francis Truefitt, honorary solicitor; Messrs. J. A. Bunker and Charles W. Brookes, auditors; L. C. Riddett and W. Frewer, curators and librarians; J. Douglass Mathews, A.R.I.B.A., and J. S. Quilter, A.R.I.B.A., honorary secretaries; and W. Farthing, registrar. The annual dinner of the association took place at the Talbot, Richmond, on the following evening. Between forty and fifty members were present, Mr. Robert W. Edis in the chair.

JAMAICA-STREET, GLASGOW.

(FROM OUR OWN CORRESPONDENT.)

NO street in Glasgow, not even Sauchiehall-street, has more rapidly arisen into an especial importance than has Jamaica-street, and to meet this there has been a corresponding change in the character of its architecture. Houses that had been built merely as residences when Jamaica-street was a *rus in urbe*, and had afterwards been converted into petty business premises with low ceilings and little light, have fallen before the footsteps of "progress," and large shops and warehouses with ceilings 15ft. high, and windows only 3ft. less in width, have arisen in their room. Among these are two buildings of cast iron, neither of which, however, is very successful in design, this arising chiefly from an imperfect perception of the properties of the material. One of the most imposing structures is a building called the "Colosseum," which, while evincing considerable powers of design, is yet large and vulgar in its detail, a vulgarity in no wise lessened by a gaudy polychromatic decoration. One of the first of these warehouses was erected at the corner of Howard-street, and which, with a certain cheerfulness of aspect imposed upon a most substantial composition, is, perhaps, as purpose-like as any of its more pretentious followers. The principal building in the street is one erected about two years ago by Messrs. J. and G. Burns, the extensive shipowners. It is in the Italian style, by an architect who had hitherto been known almost exclusively as a Goth of the Goths—Mr. Honeyman—and sufficiently proves that he is no less at home among the soft and rounded mouldings of the sunny South, than among the hard and angular forms that are perhaps so "telling" and so more fitting in our murky atmosphere. The street floor is, of course, shops, and is little removed from, as Shakspeare's Rosalind phrases it, "the ordinary salework." The three upper floors are each divided into seven bays; the first is of the Ionic order, the columns being three-quarter, and upon a stylobate, and the windows between having moulded semicircular heads springing from impost pilasters; the second is of the Corinthian order, with the windows repeated; and the third is of the character of an attic, having squat lintelled windows, with an impost entablature over recessed pilasters with acanthus capitals. The whole is crowned with an entablature proportioned by the height of the building, and having a modillion cornice. The latest erected, and certainly by no means the least building in the street, immediately adjoins this on the north. It is five stories high above the level of the pavement, and has altogether that decided business look about it which perhaps might be better expressed by "the largest return for the least outlay" than by "the cheap and nasty." It also professes to be in the Italian style; but it is as if the softly rounded and swelling daughter of the old Roman matron had been starved to skin and bone, and then sent to "Caledonia, stern and wild," with not even a solitary scrap of foliage to hide her nakedness. The city of Sanct Mungo is police-ridden by Acts of Parliament anent nuisances against the nose, but there seems to be no remedy at law for offences against the eye.

> Of two such organs, why respect
> The nasal, not the nobler one?

Its shop story is like its neighbours, a composition of iron and glass, surmounted with a signboard with a cornice over; three of the upper stories are divided into seven bays by pilasters with an entablature, and of what, for want of some new nomenclature (and begging pardon of it meanwhile) we must call the "Doric" order, with lintelled windows having an ovolo jamb mould upon their rybats; and the fourth is divided into fourteen, with semicircular arches springing from a series of pilasters, the whole being terminated by a general entablature with a square block cornice. While the *tout ensemble* unfavourably contrasts with that of the alike dignified and elegant building by its side, comparison, if not obtrusive, is unavoidable, by both being designed on the same æsthetic construction.

Not only has much property been rebuilt to meet the great business exigencies of Jamaica-street, but the stone beneath our feet as well as on each side of us has, because of the ceaseless roll of carts and carriages, and the vast increase of pedestrian wayfarers, been recently wholly re-

newed. As the whole breadth of the street was undertaken at once the roadway traffic was completely stopped; and as such an inconvenience should occur as seldom as possible, the master of works seemed to be resolved that the new causeying should want for nothing that might give it permanency. First was laid a thickness of whin metal, and over this was poured a coating of asphalte; then was spread a 2in. layer of sand, and upon this were bedded square dressed blocks of furnace granite, measuring about 10in. × 5in. × 7in. Over the whole was poured liquid lime, which, finding its way into the joints, concreted the mass. The footpaths have been widened by about 2ft., the capacity of the carriage-way being retained, if not increased, by a flatter curve of section. Argyle-street and Trongate—the Oxford-street of Glasgow—are being presently proceeded with in the same way. The permanent improvement will be great; although, meanwhile, much inconvenience is felt by the diversion of the greatest carriage traffic in the city.

THE OIL OF ROSES.

MR. BLUNT, the British vice consul at Adrianople, in his report to the Foreign Office this year, gives an account of the rose fields of the villayet of Adrianople, extending over 12,000 acres or 14,000 acres, and supplying by far the most important source of wealth in the district. This is the season for picking the roses, from the latter part of April to the early part of June; and at sunrise the plains look like a vast garden full of life and fragrance, with hundreds of Bulgarian boys and girls gathering the flowers into baskets and sacks, the air impregnated with the delicious scent, and the scene enlivened by songs, dancing, and music. It is estimated that the rose districts of Adrianople produced in the season of 1866 about 700,000 miscals of attar of roses (the miscal being 1½ drachm), the price averaging rather more than 3s. per miscal. If the weather is cool in spring, and there are copious falls of dew and occasional showers, the crops prosper, and an abundant yield of oil is secured. The season in 1866 was so favourable that eight okes of petals (less than 23lb.), and in some cases seven okes, yielded a miscal of oil. If the weather is very hot and dry, it takes double that quantity of petals. The culture of the rose does not entail much trouble or expense. Land is cheap and moderately taxed. In a favourable season, a donum (40 paces square), well cultivated, will produce 1,000 okes of petals, or 100 miscals of oil, valued at 1,500 piastres; the expenses will be about 540 piastres—management of the land, 55 piastres; tithe, 150 piastres; picking, 75 piastres; extraction, 300 piastres—leaving a nett profit of 960 piastres, or about £8 11s. An average crop generally gives about £5 per donum clear of all expenses. The oil is extracted from the petals by the ordinary process of distillation. The attar is bought up for foreign markets, to which it passes through Constantinople and Smyrna, where it is generally dispatched to undergo the process of adulteration with sandalwood and other oils. It is said that in London the Adrianople attar finds a readier sale when it is adulterated than when it is genuine.

ARCHITECTURAL SOCIETIES.

ARCHITECTURAL EXHIBITION SOCIETY. — On Tuesday evening last, a lecture (in connection with the Architectural Museum) was delivered at the Galleries of the society, 9, Conduit-street, by Mr. Edward A. Freeman, M.A., entitled "Notes in Normandy." After a few introductory remarks by the chairman, Mr. F. H. Dickinson, the lecturer commenced by noticing some striking points of resemblance between English and Norman buildings of early date. Speaking of the ancient Norman Castle, he remarked that it was just a great square keep, and that the Tower of London was the noblest and greatest example to be found. He then gave a rapid account of most of the important church and other buildings in the country. Among the places noticed were those of St. Stephen, at Caen; Bayeux Cathedral, Norrey; St. Nicholas, at Caen; Dol, and many others equally celebrated. He illustrated his remarks by a large number of sketches taken on the spot. In conclusion, he impressed upon his audience the necessity of understanding the political history of a country if they wished thoroughly to master its architecture. He also gave it as his opinion that the parish churches and cathedrals of England contrasted most favourably with those of any other country.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The closing meeting of the ninth session of this Association was held last week, Mr. William Beattie, president, in the chair. The Secretary and Treasurer read their annual reports, from which it appeared that the Association is in a very flourishing condition. The president then delivered his valedictory address. After a brief review of the incidents of the year, and an allusion to the rapidity with which events follow one another nowadays, the subject of measuring was more particularly taken up. The great discrepancy between the mode of measuring practised in various parts of the country, and by different measurers, were described, and the necessity for some general and uniform system based upon equitable principles was pointed out. The present difference among surveyors was ascribed to the fact that measuring is at present in a sort of transition state between the old system of allowances and more modern usages. Office-bearers for the ensuing year were elected afterwards.

OXFORD ARCHITECTURAL AND HISTORICAL SOCIETY.—The annual meeting of this society was held in the large Lecture-room of the New Museum, on Wednesday, June 19, at 2.30 p.m. The President of Trinity College was elected President of the Society, and some new rules, which were submitted to the meeting, were unanimously carried. The junior secretary read the report of the society for the past year. The meetings had not been so numerous as usual. Mr. J. H. Parker, who had just returned from Rome, gave a lecture upon the Catacombs. He had been able to employ the magnesium light with success in several of the chambers, and to represent therefore accurately, by means of photography, the varied forms and figures which appeared in the painting and decoration. He laid especial stress upon the late date to which some of the Catacombs owed their decorations, because, after they had ceased to be used as burial places, they were a constant resort of pilgrims down to the eighth and ninth centuries, and at these periods many of the paintings were renewed. In some of the earliest the construction of brickwork of the first century was visible, made in the sandpit roads, which were, therefore, of earlier date. Some were as late as the fifth century, and even in those which are of the earliest dates, it often happens that later interments had taken place, from the fact of the vaults belonging to families, and so used from generation to generation. After the lecture there was some discussion on the question of the vestments as exhibited in the photographs, which were handed round. The attendance was numerous, and a vote of thanks to the lecturer was carried by acclamation.

Literature.

The Sewage Question. By FREDERICK CHARLES KREPP. London: Longmans and Co. 1867.

THIS book contains a great deal of valuable information on the sewage question. It purports to be a review of all systems and methods hitherto employed in various countries for draining cities and utilising sewage. It cannot, however, be regarded as an unbiassed authority, as it carries with it unmistakable evidence of having been written to order. The great object of the book is not to show the absolute necessity of purifying towns and fertilizing land, and to fairly analyse all methods hitherto adopted or suggested to secure the desired object, but to magnify the pneumatic system of Captain Liernur—a system which is yet untried, at all events in this country. Captain Liernur has evidently paid much attention to this question, and his method is an ingenious one, to say the least of it; but, we fear, it is much too expensive and complicated even if practical. The best thing for the inventor is not to write elaborate essays, or get them written for him, on the worthlessness of all sewage systems which have been tried, and then to show the vast advantages of his own system over all others, but, if possible, to demonstrate its practicability. A single fact would be worth a dozen eloquent volumes. Larger volumes than the one before us have been written on other magnificent theories which have turned out absolute failures. Possibly it may be the same with this. At all events we must wait for the testimony of facts before we can write dogmatically on the matter. The writer is not satisfied even with building up Captain Liernur's plan on the ruins "of all the systems and methods hitherto employed in the various countries," but he unnecessarily magnifies a professional contemporary, which is not only the youngest, but notoriously a partisan journal, and is, therefore, almost powerless for good. The author of the book is, however, entitled to considerable credit, as he has given in a comparatively small compass a great deal of valuable information.

Ure's Dictionary of Arts, Manufactures, and Mines. Sixth Edition. Edited by Professor HUNT, F.R.S. London: Longmans, Green, and Co.

THIS dictionary has long taken its position amongst the established authorities of the age. It assisted to make the reputation of the late Dr. Ure, who must have bestowed on it immense labour. The edition now before us includes the most reliable information on recent discoveries and applications of science, including those relating to aniline dyes, paraffine oils, coal-cutting machines, &c. There is, however, very little about spectrum analysis, a discovery which has attained amazing development since the fifth edition of the work was published. We must not forget, however, that the work is devoted to arts, manufactures, and mines, and does not profess to be an encyclopædia of the physical sciences. The editor says that great care has been taken in correcting these volumes; the original articles have been in nearly every instance submitted to their authors, and in many instances subjected to rearrangement. The latest authorities have been consulted on each subject, and thus, it is hoped, the best information secured. The work, which is in three volumes, is illustrated by nearly 2,000 engravings on wood; and bearing the name of Longmans and Co., it is, as might have been expected, excellently printed on good paper. There is scarcely a British manufacture of any importance which is not treated in an exhaustive manner in its pages.

The Post Office and the Electric Telegraph. Jackson, Walford, and Hodder, Paternoster-row. 1867.

THIS is a reprint, in the form of a shilling pamphlet, of a very able article which appeared in the last number of the "British Quarterly Review." The writer argues in detail in favour of combining the postal and telegraphic operations of the country, or, in other words, in favour of a State telegraphic service, and he bases his argument on the following grounds:—There would be a large extension of the field of telegraphic operations; a large extension of facilities in the principal towns already supplied with the telegraph; an extension of the hours during which operations may be carried on; facilities would be given for the transmission of money orders by telegraph, and lastly, and most important of all, the proposed scheme, it is confidently believed, would lead to the establishment of a low and uniform tariff for messages, irrespective of distance—a tariff, namely, not to exceed one shilling for a message of twenty words. The notion is not new, the same plan having been advocated by some of the most eminent of our social reformers for several years past. The Post Office has been the most successful, and satisfactory of all the great Governmental departments since the introduction of Sir Rowland Hill's wonderful scheme. Were our telegraph system placed under the same control the benefit to the public would be hardly less enormous. There can be no doubt, we think, that it will eventually come to this—and the sooner the better.

The Gossiping Guide to Jersey. By J. BERTRAND PAYNE, F.R.G.S. Adams and Francis, 59, Fleet-street. New Edition.

AN admirable guide to a charming place. A very common failing of the literary cicerone is the exaggerated language which he employs to describe places and objects which his particular predilections lead to suppose are unequalled anywhere else under the sun; generally speaking, all his geese are swans. Mr. Payne shows no such prejudice. A Jerseyman himself, he knows the tight little island thoroughly, and describes it thoroughly, with a pleasant and instructive pen. It was the opinion of Sir B. Brodie that "if you want health for the body, rest for the mind, sea bathing, pure air, splendid scenery, and all God's gifts which go to make a terrestrial paradise, then go to Jersey." Those who may never hope to visit that beautiful portion of the British dominions may read the "Gossiping Guide" with profit and

pleasure. They will find it a cheap and really entertaining shilling's worth.

The Tourist's Assistant: A Popular Guide to Watering Places in England and Wales. By FRANK FOSTER. John Snow and Co., Paternoster-row. 1867.

WE cannot say much in favour of the literary merits of Mr. Frank Foster's performance. The work is for the most part made up of extracts from local handbooks, strung together here and there by a few eccentric and uninteresting remarks. We are bound to say that the extracts are the more useful and important portions of, and indeed form the book. The compiler, as it appears to us, has accomplished his task with very little trouble to himself, the credit being in proportion.

Building Intelligence.

CHURCHES AND CHAPELS.

The parish church of Dinedor, Hereford, is being rebuilt from designs by Mr. F. R. Kempson, architect, Hereford. The style is thirteenth century, about the time, it is supposed, the old church was erected. The work is being carried out by Mr. J. Stone, of Fownhope, and the cost will be about £700.

The Methodists in America intend to build a large monumental church in Washington, to cost 200,000 dollars. Pews will be set apart for the President and his cabinet, the judges of the courts, and the generals of the army, &c.

The Swedenborgians are erecting a place of worship at Camberwell, at a cost of £2,000.

EDINBURGH.—A new church (All Saints) has been opened in Brougham street, as a chapel of ease to St. John's Episcopal Church. It is provided with sittings for 600 persons, and has cost about £4,000.

MATLOCK BRIDGE.—The intended alterations at the Wesleyan Chapel and schools here are to be proceeded with at once. The whole of the internal fittings will be of pitch pine and red deal. The present flat ceiling will be removed and the roof timbers exposed. Mr. H. Shepard, of Matlock Bath, is the architect, and Messrs. Brown and Co., of Matlock Bridge, the contractors for the whole of the work.

NORTH LONDON.—The Congregationalists have just erected a new church in the Junction-road. The edifice is in the Decorated Gothic style, and will accommodate 700 persons; a gallery for some 250 more persons can easily be added if necessary. The total cost of the church thus far, including the site, a large school room for 400 to 500 children, lecture room, &c., will be about £6,000.

NOTTINGHAM.—A new chapel for the Swedenborgians was last week opened for public worship in Bluecoat street, Nottingham. It is a brick and stone structure of Early Pointed character, with open timbered roof, and stalls of stained deal, and will seat upwards of 200. Mr. James Acton is the builder, and the works have been carried out, from the designs of Mr. John Smith Norris, architect, at a cost (exclusive of the site) of about £1,100.

WIRKSWORTH.—It has been determined to restore the parish church of this place, and from the report of Mr. Gilbert Scott, a most interesting fabric it is. The earlier portions of the church were erected in the thirteenth century. Mr. Scott estimates that the restoration will cost from £6,500 to £7,500, according to the degree in which his suggestions are carried out. £3,000 have been raised towards the object, and in all probability the required sum will be obtained.

BUILDINGS.

A new school has been opened at the very ancient village of Wall, the Elocetum of the Romans, near Lichfield. The architect is Mr. Joseph Potter, of that town.

Baron Ferdinand de Rothschild, whose young wife died in childbirth a few months ago, has determined to found a lying-in hospital to her memory. The projected building is estimated to cost £10,000, and the site, which will be on the east side of Southwark Bridge-road, is expected to cost as much more.

An excellent site on the Mandale-road, has been purchased for a cemetery for South Stockton (on Tees). The committee has selected Mr. G. G. Hoskins, of Darlington, as their architect for the chapels and lodges, &c.

On Tuesday last, a new Temperance Hall and Reading-room, erected from the designs of Mr. G. Hoskins, architect, Darlington, were formally opened at Seaton, Carew. The style of the building is Early English. The founder is Edward Backhouse, Esq., banker, of Sunderland, who gave the site, and has subscribed nearly the whole of the cost.

At a public meeting at Bristol a few days ago, the plans of Mr. G. E. Street for the restoration and building of a new nave to the Bristol Cathedral, were adopted, and measures were taken for collecting the requisite funds. The sum of £13,000 has been subscribed towards the object.

BRIGHTON.—A portion of the Royal Pavilion Estate of the Brighton Corporation, viz., the dome of the northern property, has recently been converted into a concert hall. The dome, which is of vast height, is 80ft. diameter, but the widest diameter of the room, which is circular, is more than 120ft. Daylight is obtained from the panels of the dome, which are beautifully glazed with stained glass, and the room is at other times lighted by an immense central chandelier and numerous bracket lights round the gallery. An orchestra is provided for 400 performers, and the room is capable of seating upwards of 4,000 persons. An immense organ is to be placed in the rear of the orchestra. The style adopted for decoration is Moorish, very freely treated. The contractors are Mr. F. Dury for decorations, Messrs. Cheesman for carpenter's work, and Messrs. Greene and Niner for gas fittings and chandelier. Mr. J. C. Lockwood is the borough surveyor, and Mr. C. H. Rew is the clerk of works. A concert was recently given to test the acoustic properties of the room, which were found to be good.

CHESTER.—The foundation stone of the Catholic Apostolic Church, in Upper Northgate-street, was laid on the 17th inst. The style of the architecture is Early Gothic, and the material red brick and stone, with bands of blue bricks. The roof, will be open timbered throughout, that to nave in single spans with curved ribs to the trusses. The architect is Mr. Oliver Ayliffe, of King street Manchester, and the contractor Mr. Thomas Hughes, of the Northgate. The present contract is for the nave and entrances only.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the EDITOR, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—T. G.—H. O.—C. J. R.—A. W.—E. W. P.—J. G.—H. C.—W. S.—S. P.—R. H. D.—G. S.—J. F.—F. W.—J. W. B.—H. S.—B. H. E.—J. M.—R. F. E.—O. A.—T. T. B.—J. C.—R. C. S.—J. H.—E. W. G.

Correspondence.

THE NEW LAW COURTS.

To the Editor of the BUILDING NEWS.

SIR,—Your article on the Courts of Justice competition so pointedly refers to myself that I have no alternative but to ask you kindly to allow me a portion of your valuable space in order that I may make clear that which at present appears to be somewhat obscure. I was *not* the writer of the reviews which appeared in the *Westminster Gazette*, but, as you infer, they were written by a friend of mine, who probably drew many of his criticisms from my own remarks.

It was only after Mr. Burges, in company with "Philocalus," had visited and publicly attacked my church at Peckham that I came to the front, and in the columns of the *Standard* critically assailed Mr. Burges's ill-digested designs for the Law Courts, which aimed at giving us a *mélange* of dungeon keeps, sham machicolated towers, cathedral clerestories, and fifty other glaring inconsistencies, all most wretchedly assorted—if the purpose of the building is to be taken into consideration.

Of all the competitors the only two who honestly aimed at conceiving a design and truthfully interpreting to the best of their abilities the requirements submitted to their consideration were Messrs. Street and Waterhouse. None of the others either had an objective point or sought to find any. One gentleman endeavoured to bring together all the beauties he could possibly collect from the most celebrated works of Northern Italy; but his efforts were effectually marred by a considerable dash of all the worst faults that are to be found in the new Foreign Offices. Another based his conceptions on the most unfitting, heavy, and positively ugly Lombardic style of architecture, which was imported into Germany in the twelfth century. Another, again, seems to have had no ideas at all, and has delineated something on paper merely for the sake of putting in an appearance, which something, by-the-bye, has the misfortune of being a negation of all that is true, beautiful, or appropriate. A fourth has evidently run to seed, and appears to put all his work in the skies, for most of his productions which do not turn out towers run into spires, and very miserable spires too. In fact, this is more or less a general failing, as the majority seem to have designed their buildings for celestial, rather than terrestrial courts of law, so overheaded and, in comparison, underbodied, are their general outlines. Another one, who I willingly believe made desperate efforts to break through the *chevaux de frise* of difficulties with which he had to contend, eventually lost heart and took refuge behind the existing and solid defence of an ancient cathedral, where, if he was not positively in force, he hoped at all events to induce an admiring public and an applauding press to believe that he was so. A sixth, from whom great things were expected, and whose drawings contain much that is deserving of admiration, and are almost the only ones worthy of the occasion, has given us a Strand front which may be best compared to a house of cards, so featureless are his masses, so attenuated and slicy are his towers. Another has produced the most finished, and, to the casual observer, the most noble and beautiful architectural detail elevation of the day; but this very drawing demonstrates nothing beyond the fact that the compiler is as ignorant of what would be the effect and result of his design as he is of the purpose for which he has designed it. It is the same with the rest. There is nothing new that is good, nothing old that is appropriate. Critically the designs have been already dissected.

These remarks are not made at random, and I humbly submit that they do not in any way overstate the case. As far as the plans and arrangements are concerned, the designs evidently demonstrate much careful thought and considerable merit; but in spite of this fact, one cannot help coming to the conclusion that the state of architecture in England at the present time is not only not progressive and unsatisfactory, but is actually retrogressive in comparison to what it was fifteen or twenty years back. Then, the architects of the revival had not lost sight of their landmarks, but followed a principle, which demonstrated that they possessed and understood the grammar of their art.

You allude in your article to the assistance which my father rendered to the late Sir Charles Barry, in carrying out the Houses of Parliament; and you mention it as having been "dovetailed into the review." I have no objection to the allusion, but I have great objections to the insinuation that advantage has been taken of the opportunity by the *Westminster Gazette* critic to smuggle this important fact edgeways into public notice. Dovetailing is quite unnecessary when the fact exists that the art architect of the most complete edifice in the world died in my father. The plan of the Parliament House was solely Sir Charles Barry's; the elevation and all details wholly my father's. All that has been done since his decease—

viz., the wretched finish to the Victoria Tower, the lamentable north wing, and the Vandalism now in course of perpetration between Westminster Bridge and the main building—demonstrate more clearly than words that the master mind is gone. I knew Sir Charles Barry intimately, and could not be otherwise than impressed with the unsparing and conscientious pains with which he examined and digested all that my father proposed, and I always had the highest admiration for his knowledge of classical architecture; but neither by education nor feeling was he what I unwillingly term a *Gothic* architect. I have no hesitation in asserting that all work done in the Houses of Parliament apart from my father's designs is as devoid of feeling as the stone in which it is chiselled. You will be pleased to understand that there is nothing equivocal about any portion of this letter. It is intended to be explicit, and I trust that it is so.—I am, &c., E. WELBY PUGIN.

Scarisbrick Hall, June, 1867.

GENIUS ADVERTISING.

SIR,—I have to-day received a circular from a couple of gentlemen who have just established an office in the Adelphi, the proposals in which are so remarkable that it is worth while to put them on record.

As they send their circular to me I presume I am not wrong in supposing that they mean it for an architect's use; and it is in this light that I have understood it.

This firm, then, "beg to intimate" that they are prepared to execute "in the best manner" every description of architectural work, Italian or Gothic, and either from drawings, rough sketches—(what on earth are the rough sketches architects' assistants are for ever referring to in their advertisements?)—'general instructions, or otherwise." They will colour drawings, put figures only into drawings—the usual competition men and women and prancing horses, I suppose—make details, and even, if they ever find an architect who makes his own drawings, will trace them for him!

Is it possible for them to offer anything more lavishly liberal? Remember, too, that it is all to be "in the best manner." What need, then, have architects any longer to bother themselves about making their own drawings? Here is a firm ready to do anything in any style, and certainly better than any of us can venture to hope that we do our work. For who ever supposes their own work to be in the "best manner," except those who are too ignorant to know anything? Seriously, if there is in our profession a demand for such services as these gentlemen offer, then our practice seems to be wofully in need of change. And at any rate those amongst us who do make their own drawings and designs may well be excused if they feel somewhat indignant at the insinuations to the contrary contained in Messrs. —— and ——'s liberal offers.

Do, I beseech you, in the interests of our art, protest against such an abominable travestie of it as these advertising gentlemen propose for our adoption. Let them set to work and compete for everything on their own account. They know how to do everything in the best manner, and are sure, of course, to succeed; and then, instead of bolstering up what they evidently consider a very rotten profession, they will have the pleasure of reaping all the advantages of the practical skill and genius which they so loudly advertise!—I am, &c.,

GEORGE EDMUND STREET.

51, Russell-square, W.C., June 20.

MR. BURGES AND THE "ECCLESIOLOGIST."

SIR,—Will you allow me to correct the following misprints which occur in your extracts from my lecture, "Why we have so little Art in our Churches"? It is only fair to say that the said misprints occur in the *Ecclesiologist*. "It is absurd to expect the architect of the present day, who is *amply* paid by a small percentage." It should of course be "who is simply paid." "The little village church would remain very *snug*, as it was in the time of our ancestors." It should be *very muck*.

I venture also to ask you to allow me most distinctly to contradict the following assertion:—"Mr. Burges seems to use the argument of public prayer, not from any fervent religious feeling on the matter, but simply because it would lead to our churches being constantly open, and 'this would result in an improvement in stained glass.'"—I am, &c.,

W. BURGES.

15, Buckingham-street, Strand, June 26.

NOTTINGHAM MECHANICS' HALL COMPETITION.

SIR,—The competition for the Mechanics' Hall, at Nottingham, is decided, and the local architect connected with the administration of the institution has, of course, been successful. There were only one or two designs of any merit sent from any architect out of Nottingham, it being previously felt by the profession that there would probably be a preconcerted arrangement to give the work to the gentleman who has obtained the first premium. Under such circumstances it is scarcely necessary to point out that a competition of this kind is of no use, as, although perfect fairness may be intended, no person who has attained a position in the profession will throw away his time upon a competition which has such suspicious circumstances attending it. The drawings are on exhibition, and I have been over to examine them. The successful design (Mr. Simpson's) is in the Italian style, nearly covering the entire area of site, which is 203ft. by 106ft., the greater portion of the structure is about 60ft. high, the whole being faced with ashlar stone. It is elaborately treated both on the exterior and interior. It is estimated by its author to cost not more than the amount allowed, viz., £8,000, this sum including architect's commission, heating and lighting apparatus, &c., complete. The other two premiated designs are by Nottingham men, but are not quite so elaborate and extensive as the first design, but if carried out properly must be considered far above the mark with respect to cost. The really clever designs, viz., those which possessing merits as compositions are brought within the cost, and are therefore feasible, have, of course, gained no place in the competition, and, in addition to this, have been tremendously derided by one of the local papers, which is edited by the honorary secretary of the Institution, who, with the usual blindness of unprofessional men in these cases, does not seem to understand that if one competitor starts with the intention to design a building which shall cost, (say) £15,000, his design, if he has common ability, must necessarily be far superior both in arrangement and appearance to the design of a competitor who aims at designing a plain and economical building for £8,000. With regard to the estimates of the cost of the different designs, the anomalies are most amusing. The premiated design, which in elaboration is equal to the Grosvenor Hotel, and is shown faced with ashlar stone, is estimated, as I have before mentioned, at £8,000. Several of the other designs, which cover less space of ground, and which are comparatively plain and have brick walls, are estimated at about £9,000. As none of the designs cover a smaller area than 18,000 superficial feet it will be easy to decide which of these estimates is the nearest to the truth.

Mr. Simpson's arrangement of the hall is most peculiar. Instead of endeavouring to obtain as much room as possible on the ground floor (which would be most natural, as from here the best view of the platform can be obtained, and a good area would be provided for soirées, &c.), he has obtruded corridor with class-rooms on both sides on to the floor of hall, and extended his galleries on each side over same. The appearance from the galleries is that of a huge square space up in roof with a small well hole in the middle, containing the ground floor of hall and the orchestra. The absurdity of placing class rooms which ought to be attached to the other part of building containing library, &c., and which ought to be quiet under the galleries of a concert room is manifestly absurd.

It is not my intention to question further the good arrangement of this design, as my intention is more particularly, without throwing the slightest breath of suspicion upon the committee, to show them the imbecility of inviting competition drawings under the condition that their execution shall cost about £8,000, when at the same time they are prepared to receive designs which any person acquainted with building would at once dismiss as being impracticable for anything like this amount. Many of the competitors in this case are undoubtedly equal to Mr. Simpson as designers, but through their own rectitude and a belief that the instructions of the committee were formed to be adhered to, show to poor advantage by the side of their showy competitor.—I am, &c.,

A CONSCIENTIOUS COMPETITOR.

SIR,—The first premium is awarded to an "architect and builder" of the town and a member of the committee.—I am, &c.,

CAUGHT NAPPING.

A CORRECTION.

SIR,—In the BUILDING NEWS of last week, I notice with much surprise, at the foot of your illustration of Mr. Keeling's church, "R. W. Edis, dect." May I beg that you will kindly correct this mistake by allowing me to state that I have had nothing whatever to do with the illustration in question; for although an advocate for sketching ancient examples, I do not in any way advocate, and certainly do not myself indulge, as the signature to your illustration would seem to suggest, in sketching or lithographing modern work. The insertion of this letter in your next will oblige.—I am, &c., ROBERT W. EDIS.

4, Osnaburgh-terrace, Regent's Park, N.W., June 24.

[The mistake complained of, which we much regret, was committed by the lithographers. It was, however, detected and rectified before many copies were printed.—ED. B.N.]

Intercommunication.

QUESTIONS.

[441.]—EARTH CLOSETS.—I should like to know how Moule's earth closets are made, and whether they have been found to answer. J. E.

[442.]—RUSTED INSTRUMENTS.—Would you kindly inform me which is the best way to clean metal instruments that are very rusty? W. J. B.

[443.]—DRAINING VILLA LAND.—What would be the best system of drainage for villa land of about eighty houses, having no easement except to a brook, the water of which must not be polluted? EDWARD.

[444.]—FRETWORK MACHINE.—Can you inform me through your paper where I can purchase a small machine for fretwork cutting, to be worked with the foot, and its probable cost? GEORGE GARRETT.

[445.]—VENTILATION.—I have a workshop about 15ft. high and open at the top, containing smiths' and other fires, which has given me much trouble to ventilate, although it is furnished with a ventilator of the usual construction of the whole length of the roof. I have put in open skylights on the roof and opened holes in the side walls, but they have proved ineffectual. I should be glad of any suggestion from any of your readers on the subject. T. G.

[446.]—CAST-IRON *versus* WROUGHT-IRON BEAMS.—It is necessary that I should use some iron girders for a work now in progress. Would you oblige me by recommending what I should use, cast or wrought-iron girders? A BUILDER.

["A Builder" should be more concise in his question. He should have said what kind of works he is erecting and the length and character of the beams required. As a rule cast-iron is of uncertain strength from the nature of its constitution. The very best materials and workmanship cannot prevent weak parts. Cast iron is liable to fracture by impact in a trifling degree to what it might have borne safely as dead weight. Besides, proving castings sometimes aggravat s imperfections by extending them. Castings may most safely be used when they do not admit of concussive action, or vibration under any shock that may reach them.]

[447.]—SURVEYORS' CLAIMS.—Can any of your readers advise me in the following matter? An architect and surveyor is employed to lay out an estate for building, that it may realise a stated sum. He is desired to send in his terms in writing, which he does:—five per cent. on the amount the plots shall realise, and the usual commission on any works that may be executed thereon for which he may furnish drawings. His terms are (verbally) accepted in presence of a third party, and he is told to prepare plans, &c. The plans are made, approved by the local board, and lithographed, and the proprietor commences laying down the main drains and making the roads. A few plots of land having been sold a row of houses is commenced (two by the land owner), when, without any reason, the architect is informed that his services will not be required further. In addition to the plans, working drawings, and specifications for the row of houses, he also prepared drawings and specifications for sundry alterations to existing

property on the estate. I therefore desire to know:—1. Can he claim five per cent. on the minimum amount the land was to realise? 2. Can he claim the full commission on the works executed from his plans, though not under his supervision, and if not what part of the commission can he claim? The work of taking levels, preparing plans and sections, and getting them passed by the board, has occupied the greater part of eighteen months, and it seems hard to be thrown over just as the affair is ready for work.
A CONSTANT READER.

[448.]—IMPERMEABLE CEMENT.—Can any of your readers inform me how I can make a cement that is impermeable to water? M. M.

[449.]—ENGRAVING ON GLASS.—Being anxious to see what I can do in the way of engraving on glass, I should feel greatly obliged to any correspondent who would inform me through your columns, the easiest way I should go about it. B. N. G.

[450.]—ST. MARY'S, REDCLIFFE, BRISTOL.—On my visit to Bristol some few days since, my attention was called to the restoration of St. Mary's Redcliffe. There appears to be some addition being made to the S.W. buttress of the tower at the western façade. Can any of your correspondents at Bristol testify to such being the case?
AN ARCHÆOLOGIST.

[451.]—AUTOMATIC BLACKSMITHS.—It has often occurred to me that the work of the blacksmith might in many instances be made less laborious than it is, by the application of mechanical assistance. I know there are steam hammers in use in abundance; but they are not quite the thing I mean, and they are dependent on the proximity of steam boilers. Is there no plan of enlisting some other force—in a small way—to save the bone and muscle of the village smith? Could not unskilled labour, for instance, keep a hammer in constant motion by means of a crank or other agency, and the skilled worker direct its strikings to useful purpose? We endeavour to economise physical exertion in other directions, why not in this?
LONGFELLOW, JUN.

[452.]—CONTOUR LINES.—In conducting the ordnance survey of Great Britain it is said that the great accuracy admittedly attained, has arisen from the employment of "contour lines." What are these exactly, and how are they obtained, may I ask? TYRO.

[453.]—TIMBER.—Can any of your readers inform me as to the best rules of judging of the probable durability and the strength of timber? A few hints on this point from a practised hand would not, perhaps, be without advantage to others than PLANE TREE.

[454.]—PILLARS AND STRUTS.—Will you or some of the intelligent subscribers to "Intercommunication," advise me upon the points of difference and relative merits of cast and wrought-iron pillars and struts? I should be glad of such information as would guide me in the employment of the one or the other of these adjuncts to building operations. A BRICKLAYER.

[455.]—PILES AND PILE DRIVING.—May I venture to ask, as one anxious for practical knowledge, how to calculate the pitch and strength of screw piles necessary for sustaining any particular work, and how to get at the weight which each screw-blade will sustain? BONITO.

[456.]—ROCK BASINS.—Is there any exact or highly-probable theory as to the origin of the numerous "rock basins" which exists in various parts of the country? Are they natural or artificial? DRUID.

[457.]—ROYAL ACADEMY.—I have been anxiously waiting for an answer to "X. Y. Z.'s" question (No. 375), but none has yet appeared. Can no one tell us what is necessary to become a Royal Academy student? I should also feel obliged if you could inform me how it is possible to gain admission as a student of the Royal Institute of British Architects, as I see no mention of students made in their charter. R. A.

[458.]—ARCHITECTURAL CONGRESS.—I shall feel much obliged if you will kindly inform me whether it has been arranged, as was sometime ago announced, that an architectural congress is to be held in Paris next month. If it is to be held will you kindly say where information can likely be obtained about it.—J. DICK PEDDIE, Chambers, 3, South Charlotte-street, Edinburgh, June.

[The Société Centrale des Architectes, of Paris, did intend to hold a series of meetings at which they would have liked foreigners to attend, but it has not been definitely arranged, and as far as we in England know nothing has come of it. Our correspondent may apply to honorary secretary for foreign correspondence of the Royal Institute of British Architects.]

[459.]—ARCHITECTS' PUPILS AND HOLIDAYS.—Is an architect's pupil entitled to any holidays? The reason I ask is, because I, an articled pupil to a Liverpool architect, have been articled three years, and have had only five days' holiday during that time (three days of which I took without asking, and got severely lectured for it). There are many other pupils in Liverpool in the same "plight" as myself, kept at the board from 9 to 6, and if they take an hour, get preached to on the "impropriety of breaking their articles." The Liverpool Architectural Society refuses to deal with the question, because most of the members treat their pupils as above.
A SUFFERER FROM WANT OF HOLIDAYS.

REPLIES.

[432.]—AIR VESSELS FOR PUMPS.—There is no doubt whatever on my mind about the value of air vessels placed, discriminatingly, on the delivery pipes of pumps, and of vacuum chambers on the suction pipes. They not only prevent clashings and concussion, but positively economise power. Pumps so furnished work easier, in all senses of the word, than those without them. The air vessel for the rising main of a pump should have a capacity equal to about three or four times that of the pump itself. In this case the water compresses the air in the vessel, and the reaction of the air forces the water steadily forward or upward. I place even more reliance on the vacuum chamber on suction pipes, than on the air-vessel as described, for the prevention of concussion. It (the vacuum chamber) should be attached as near to the pump as possible, and need only be composed of a piece of pipe, of the same size as the suction, closed at the upper end and standing vertically upon it. This chamber need not be more than 2ft. or 3ft. in height, and it is especially efficacious when the suction pipe is carried along horizontally for any distance. The action of the vacuum chamber is, to my thinking, briefly as follows:—The water or other fluid attains a momentum due to its velocity, and is suddenly arrested when the bucket ceases to move upwards. The force acquired by the fluid, instead of doing mischief, expends itself harmlessly in the chamber. AQUEDUCT.

[433.]—PRESERVATION OF IRON.—"Pluvius" has mooted some points on this matter which are fraught with interest to many. The rapid deterioration of wrought iron when exposed to the weather is, unfortunately, a phenomenon well known to most of us. How to prevent its occurrence is understood by few. Constantly applied coatings of paint and other nostrums have effects of a certain useful kind, but they only partially overcome the evil. Some time since, a Mr. Thompson patented a plan for covering the surfaces of iron and other perishable metals with thin coatings of metal of a comparatively imperishable kind—as for example, gold, silver, platinum, or copper. In order to accomplish this the iron to be protected was first coated with iron, in the form of solution. This was accomplished by connecting the article to be operated upon to the negative pole of a battery and then immersing in the solution. It may be stated that the article had first to be washed with hydrochloric acid, and rinsed with water Having coated the article with metal of the same kind as itself, and thus insured that no crevice, cranny, or fissure was left for the attacks of the enemy—moisture, it was again operated upon chemically. After being washed in a cold, and nearly saturated solution of ferro-cyanide of potassium, it was transferred to a second bath in which was the solution of the indestructible metal to constitute its final covering. There is no doubt the plan was excellent, whilst it is not so costly in practice as might be imagined. S. R. N.

[434.]—WATERCLOSETS.—I think that waterclosets could be built in an improved style, and perhaps at less expense than in general. Thus:—1. Lay the slates some 2in. apart, for better ventilation, instead of close side by side. 2. Have no ceiling to help to enclose the poisonous gases, which generally discolour it and the walls (if rendered). These being done will cheapen the construction, if not materially, enough to pay for a sanitary pan and trap over the cesspool. Don't neglect limewash, its cost is very trifling. T. G. L.

[435.]—WHY NOT GET PURE METAL?—This question might be replied to on what is said to be the Scottish principle, that of asking another, viz., Where are we to get it? With regard to iron there is, as "Charcoal" suggests in your last, much apparent mystery about the smelting of iron ores and the production of pure metal. My own opinion is that much remains to be done in clearing away this mystery, which is more feigned than real. The roasting of the ores, if properly managed, should free them from all traces of sulphur, and smelting is a simple process. To accomplish this latter they (the ores) must be submitted for three days to the action of carbonising gases. By this time it is prepared to meet the oxygen of the blast, and is in such an impressionable state that anything almost may be done with it. Upon the quantity and character of the fuel employed at this juncture—the smelting point—the nature of the metal to be produced will largely depend. In order to obtain good foundry iron an extra supply of coke is needed. The more coke used, indeed, the softer will be the resulting iron. If hard metal be wanted the fuel must be diminished in quantity. In short if proper care be taken in respect to the fuel employed in smelting, and there be a judicious admixture of chemistry and practical knowledge on the part of the operator, every variety of iron, good, bad, and indifferent, hard or soft, brittle or tough, may be obtained from the same furnace and the same ores. The differences consist solely in the amount of oxygen displaced or the amount of carbon introduced, and these depend again upon the fuel and the care employed.
IRONSTONE.

[439.]—GAS ENGINES.—I shall be very happy to furnish any of your numerous readers with full particulars of Hugon's patent gas engine, the only one to be depended upon.
JOSEPH HETHERINGTON, 42, Ardwick Green, Manchester.

[439.]—The Lenoir gas engine is now being manufactured and sold by the company established for that purpose, having offices at 92, Cannon-street. I shall be happy to forward full particulars and show the inquirer several engines that have been working for more than two years.
ARTHUR KINDER, Secretary, 92, Cannon-street, London, June 27.

WAGES MOVEMENT.

The brickmakers of Reading struck for an increase of pay about a fortnight ago, and after staying out of work about a week, they last week returned to their employment at the old scale of payment, viz., 4s. 6d. per 1,000.

ENGLISH AND AMERICAN MECHANICS.—The *New York Times* says:—Without a reference to the marketing prices in England it would be difficult to understand how even skilled mechanics manage to make both ends meet in procuring the means of subsistence. But the English common labourer of the class that usually run their chances in the towns is the worst off. He may sometimes, under favouring circumstances, make as much as 14s a week; but the average is under 10s., or 2 dollars 50 cents in gold. Out of this he has of course to board himself, and generally a growing family besides. Here the street scavengers have not unfrequently turned up their noses at 2 dollars a day; and that sort of notion of recompense runs through all the gradations of unskilled workmen among us that we can think of, not excepting the coloured population. The British workman, however, has his compensation. If he earn 9 dollars a week, only one-sixth of his wages need go to house rent for really good accommodation. Here, on the other hand, his rental could barely be kept down to 250 dollars; which would at least run away with one full quarter of the best American mechanic's wages—supposing him to work every day in the year. Then, as to the great staple of life, the four-pound loaf, good weight, still sells in most parts of England for from 6d. to 7d. sterling. Here, rich and poor alike have to pay 10 cents for a loaf which measures and weighs little more than an old-fashioned breakfast-roll. It certainly fails, ordinarily, to reach 1lb., so that the difference in that item alone may be reckoned at 75 per cent. in favour of the foreigner. Take potatoes. These can be bought in the British markets to-day at 5 dollars for a quarter of a ton, or 1 dollar for 100lbs. The difference in the price of meat is not so great since the cattle plague made its appearance in Great Britain, but good mutton can still be had there by the carcase a 6d a pound. The comparison (or contrast, as the case might be) could be carried much further, if we took clothing into account. We have, however, said enough to show how the British workman may eke out a living on the wages he gets, if there is only work to be had. His lot is harder than the artisan's or labourer's here, because he is more apt to be crowded out, and if his own peculiar craft fails him he can turn to nothing else—as everyone willing to work may do with us.

WATER SUPPLY AND SANITARY MATTERS.

The president of the East London Water Supply Association writes to say that the East London Waterworks Company have received a letter from the Lords of the Committee of Privy Council for Trade to the effect, that upon consideration of Captain Tyler's report it appears to their lordships that the complaint of the East London Water Supply Association is well founded, and that in pursuance of the 12th Section of the Metropolis Water Supply Act of 1852, they give notice thereof to the East London Waterworks Company, and that after the receipt of such notice the company are, by the 13th section of the same Act, required within a reasonable time to remove the grounds of such complaint. Their lordships also state that they will be glad to be informed by the company of the steps which they propose to take to remove the grounds of the complaint.

STATUES, MEMORIALS, &c.

A bust of the late Mr. Phinn, Q.C., has been presented to the town council of Bath, for which city he was some time one of the representatives in the House of Commons. The bust is the gift of Mr. Phinn's sister

A wealthy citizen of Berlin has applied to the municipality of that town for a site on which to erect a statue to Francis Drake, as the introducer of the potato into Europe, and he offers to subscribe £2,250 towards the statue.

There is no slab or inscription on the grave of Bishop Heber in Trichinopoly Church, or anything to point out its whereabouts, and an effort is being made to raise a sum of money for the erection of a memorial brass over it.

A meeting in aid of the erection of a monument to Sir William Wallace was recently held in New York. It was announced that £2,600 is still needed to finish the national monument at Abbey Craig, and it is proposed that Scotchmen in America shall furnish this sum.

COMPENSATION.

At the Lord Mayor's Court, on Saturday, a special jury in a compensation case, "St. Botolph Parish *v.* the Postmaster General," gave a verdict by consent for £2,640 for some land, &c., in Bath-street, Newgate-street, required for the enlargement of the Post-office.

On Tuesday, Mr. Under-Sheriff James Burchell and a jury were engaged in a compensation case, "Kirkland *v.* the Royal Commissioners," in respect to the business of an architect and surveyor, and for the leasehold interest in premises in Carey-street. The warrant recited that Mr. Kirkland had become bankrupt. The claim was £8,600. It was proved that property in the neighbourhood had greatly increased in value, and in a few years gone up fifty per cent. The jury, after deliberating some time, gave a verdict for £900.

General Items.

Her Majesty has appointed to-morrow for inaugurating the Albert Orphan Asylum, Collingwood Court, Bagshot, Surrey, and also for laying the foundation stone of a dining-hall and chapel.

Three premiums of £100, £50, and £25, respectively are announced for the best three designs for laying out and utilising 200 acres in Hayling Island, Hampshire. It is intended to have a park, to include two cricket grounds, with appropriate buildings for players and visitors, to cost not more than £600, and also an archery ground, sufficiently spacious for archery meetings on a large scale with similar buildings to cost not more than £400. The following novel and extraordinary conditions are attached to the competition:—"No premium will be awarded unless designs are submitted by at least nine competitors, and any or either of the premiums may be withheld should the designs not be considered by the judges as of sufficient merit." Designs must be forwarded on or before July 29 to Mr. H. K. Trigg, surveyor and builder, South Hayling, Havant, Hants, who will furnish all necessary particulars to intending competitors.

A medical contemporary says it has over and over again called atteution to the filthy custom pursued by builders of raising the level of ground wherever they propose to build houses by putting in it all sorts of filth, mud, road scrapings, and other stinking rubbish. We could point to pretentious squares and terraces at the West end built on just the kind of soil which generates fever and ague. Now we may again point to the gradual deterioration of the London soil caused by the excavation of the good natural gravel. When any plot of gravelly ground is let for building purposes, the builder carefully carts away and sells every atom of it, and fills up, so far as need be, with any rubbish that comes to hand. Thus a muddy soil, giving out offensive exhalations under the sun's rays, is substituted for porous gravel, which filters away all moisture and deodorises it as it goes. Slowly, but surely, the same process is going on in Hyde Park. We cannot afford to lose one atom of anything that conduces to purity of air; and we ought to begrudge every load of gravel that is removed from Hyde Park.

"A Friend of Pat" sends us the following:—Many visionary schemes, such as bridging the Channel have been started for giving us a closer connection with France. Could nothing tangible be suggested for bringing us nearer to our neglected sister isle (Ireland), I think that to be a scheme worthy of the first consideration, and might, if it could be effected tend, very much to soften the bitter feeling that exists between the two countries.

The Society of Arts have this year awarded the Albert Gold Medal to Mr. Fothergill Cooke, and Professor Charles Wheatstone, F.R.S, "for their joint labours in the introduction of the electric telegraph."

The model town of Saltaire, in the beautiful valley of the Aire, and which owes its origin to the energy and benevolence of Mr. Titus Salt and his enterprising partners, now numbers 3,500 inhabitants, and there is not a solitary public-house in the place. It contains, however, a splendid Independent church, excellent baths and washhouses, a fine range of shops, and other aids to the religious, moral, and social comfort of the inhabitants. A new Wesleyan chapel is nearly finished, two ranges of shops are in course of erection, as well forty five almshouses, a dispensary, and a school-room to accommodate 750 scholars. We hear that plans have been prepared for a mechanics' institute, and it is hoped that one of the many suitable sites in the neighbourhood will be secured for the formation of a people's park.

Horatio M'Culloch, R.S.A., the head of the Scotch school of landscape painters, died of apoplexy, on Monday evening, at St. Colin Villa, Trinity, Edinburgh. The deceased artist was born in 1805, and was greatly esteemed.

Three new Royal Academicians were elected on Saturday. These are Mr. Sidney Cooper (born 1803), who is well known as a landscape and cattle painter; Mr. Calderon (born 1833), who has earned his celebrity by his historical and *genre* pictures; and Mr. J. H. Robinson (born 1796), engraver.

In New York twenty drinking fountains are to be erected by the Society for the Prevention of Cruelty to Animals. They are of iron, ornamentally designed in three departments—the top for the public, the middle one for horses, and the lower one for dogs.

Two public parks have been opened within the last few days. Mr. M. T. Bass, M.P., for Derby, has just presented a public recreation ground to the inhabitants of that town. The ground consists of six acres, and is situated on the banks of the Derwent, on the east side of the town. Mr. Bass purchased the land from the Corporation of Derby at a cost of £3,000, and has also defrayed the cost of fencing and levelling, making the value of his gift to something like £4,000. Brighton Park, a fine piece of ground recently acquired by the inhabitants of Portobello near Edinburgh, was also publicly inaugurated the other day.

Apropos of Mr. Bright's remarks in the House of Commons on Thursday as to the inconvenient and insufficient accommodation provided for members, Mr. Headlam, we observe has given notice that he will on an early day move for a select committee, to consider whether any alterations could be made in the internal arrangements of the House, so as to afford a greater number of persons to hear and take part in their proceedings." We are glad of this, and trust that the honourable member for Newcastle will be able to carry his motion. It is notoriously the fact that there is no public building in the kingdom on which so much money has been expended or rather lavished with such miserable results, so far, at least, as the internal arrangements of the edifice are concerned. Indeed as Mr. Bright emphatically observed, the House and everything connected with it was an utter disgrace to the civilisation and the architecture of the age. And the justness of the criticism was amply borne out by the cheers which it elicited on every side.

A process for renovating old files, said to answer extremely well, is published in the last number of *Dingler's Polytechnic Journal*. The files are first thoroughly cleansed with a scratch brush and a strong soda solution to remove all grease. They are then laid in a dish, the ends resting on wires so that their whole surface is exposed to the water, of which enough is put in the dish to just cover the files. One-eighth part of strong nitric acid is now added to the water, and mixed by moving the dish about. The files are to remain in this liquid for 25 min. They are then to be rinsed in water, and again scrubbed with the scratch brush, and are afterwards returned to the bath, strengthened by the addition of another eighth part of nitric acid. In this they are to remain 50 min. They are now to be scrubbed once more, and are finally to be placed in the bath, which in addition to the two-eighths of nitric acid has one-sixteenth of its bulk of strong sulphuric acid. They have now only to be washed with water, dipped in milk of lime to remove all traces of acid, rinsed again, and dried. After this treatment the files are said to be as good as new and to have a good colour. Whether old files are worth the trouble and expense of the treatment our readers must determine for themselves. The acid, we may say, might be economised by having three separate baths of the composition given. They might then answer for a large number of files.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

2942 J. G. TONGUE. IMPROVEMENTS IN MACHINERY FOR CUTTING AND HEADING NAILS. (A communication.) Dated November 10, 1866.

This invention relates to cutting and heading nails by machinery without turning or reversing the nail plate to give the requisite taper after each successive cut. The nature of the invention consists, firstly, in the combination of a pair of cutters having in addition to their clipping action an oscillating motion about an axis perpendicular, or nearly so, with their cutting edges, a direct forward feeding device, and a pair of reciprocating headers. Another portion of the invention consists in a novel combination in a nail cutting and heading machine with a straight or direct nail plate feed of cutters, nipper, gripper, and headers, arranged for operation together on a frame or bed, having an oscillating movement about an axis perpendicular or nearly so with the clipping edges of the cutters; and the said invention further consists in a peculiar arrangement of the nipper relatively to the cutters and headers in nail cutting and heading machines, and operating to turn the cut blank at or about the middle of its length on to its "flat" prior to its being gripped for heading; also in so operating headers on opposite sides of the feed as that, by giving them, in addition to their heading action, a united oscillating movement in a crosswise direction relatively to the feed, the blanks are successively acted upon by the opposite headers alternately. The invention cannot be described in detail without reference to the drawings. *Patent completed.*

2949 J. DENLEY. IMPROVEMENTS IN CHIMNEY-TOPS FOR THE PURPOSE OF PREVENTING OR CURING THE DOWN DRAUGHT OF SMOKE. Dated November 10, 1866.

The patentee proposes to place on the top of the ordinary plain chimneypot an open inverted conical cap or hoop of metal or pottery-ware surmounted by another of the same shape, and joined thereto from its edge by vertical wires or slips of metal. On the top of the upper one he places a circular horizontal flat plate or disc, raised by three or more vertical wires or standards from the edge of the hoop, so that, supposing the wind were to blow up the lower hoop or over it, it would force the smoke up to the plate, and thence out from the chimney. He increases the number of these hoops where great draft is required. *Patent completed.*

2950 W. PIDDING. IMPROVEMENTS IN THE MANUFACTURE OF BRICKS, AND IN THE APPLICATION OR USES OF THE SAME. Dated November 12, 1866.

This invention comprises improvements in the manufacture and formation of hollow or cellular bricks of any shape or size from clay or clays used separately or mixed with other matter or material; or from any other plastic earths, compositions, or material mixed or used separately; such bricks being strengthened by internal stays ribs, or cores running entirely or partially through their interior. In some cases the inventor purposes applying the principle of exhausting the air from the material under use, and by this means produces a greater affinity of surface or surfaces. Also in the formation and making of bricks of any shape or size in "moulds" from fusible matters or material and other substances; as also from material or substances, whether used singly or in combination, which are capable of being reduced to a pulp. In these solid or moulded bricks he makes on their uniting surfaces, and outward surfaces where required, indentations for the introduction of a metallic bonding or framing suitable for the various purposes to which he purposes applying them. *Patent abandoned.*

2965 G. WHITEHEAD. IMPROVEMENTS IN CHIMNEY-TOPS OR COWLS. Dated November 13, 1866.

This improved chimney top or cowl is made by preference in two parts, one fitting over the other. The inner portion or part is made by preference of an octagonal shape, but it may be round, square, or of any other shape. For the sake, however, of clearness the patentee describes it as being octagonal, the top being covered with a cap, and made by preference somewhat conical. The outer part, which fits over and rests on the inner, is made of a shape to correspond therewith, and is open at top, terminating in a sort of crown or canopy. Ribs are brought from the top of the cap down the eight corners to half way down, or thereabouts, the top or cowl. In each square formed between the ribs, there are by preference three apertures, preferably square, for the smoke to escape, which can either ascend or descend according as the wind may affect the draught. There are cross pieces from rib to rib, which act as shields to prevent the action of the wind when blowing down affecting the draught. *Patent completed.*

2969 A. SCHOLEY. IMPROVEMENTS IN NAILS OR FASTENINGS. Dated November 13, 1866.

The essential feature of novelty of these nails or fastenings consists in making them three sided, and tapering gradually from the head to the point. Each side, however, in lieu of being flat, is hollowed or grooved the entire length, or any portion thereof, the three corners or angles presenting sharp ridges somewhat after the fashion of a bayonet. In lieu of having a laterally projecting head, this part of the nail or fastening is produced by expanding rather more abruptly the upper end of the nail, so that, when driven, the extreme end only of the nail will be visible. *Patent abandoned.*

2975 W. W. MARSTON. IMPROVEMENTS IN MACHINERY FOR CARVING WOOD, METAL, MARBLE, OR OTHER MATERIAL TO THE SHAPE OF A PATTERN. Dated November 13, 1866.

The object of this invention is to effect the carving of furniture, picture frames, letters, scroll, or relief work, countersunk figures, shapes, or designs in woods, marbles, or metal, or to carve busts, medallions, or other works of art in which a pattern corresponding to the article to be produced is employed. A tracing instrument is used to follow the pattern, and a rapidly revolving tool is used to effect the cutting or carving. The invention relates to a bed for carrying both the pattern and article to be carved, and having an endwise movement at right angles to the plane in which the cutter and tracer move in combination with three or more universally jointed parallel arms connecting at one end to a stationary frame, and at the other end to the head upon which are mounted the cutter and tracer. By this combination of mechanism the tracer can be guided by hand, so as to follow a pattern with the greatest ease and accuracy, because the universally jointed arms move with so little friction, the same movement directing the revolving cutting tool with equal accuracy in effecting the carving. *Patent completed.*

Trade News.

TENDERS.

CLAPHAM.—For the erection of a lecture hall, school, and class rooms at Clapham. Mr. John Tarring, 26, Bucklersbury, E.C., architect. Quantities supplied:—Killby, £2,178; Myers and Sons, £2,050; Elsdon, £2,030; Richards, £2,021; Saunders (accepted), £1,976.

CITY.—For taking down and rebuilding Messrs. Hill, Evans, and Co.'s present warehouses and offices, No. 34, Eastcheap, and rebuilding the same. Old materials of present building to be re-used. Mr. R. L. Roumieu, architect. Quantities by Messrs. Welch and Atkinson:—Wood and Son, £10,170; Lawrence and Co., £9,740; Mansfield and Price, £9,517; Anson, £9,284; Dove Brothers, £8,975; Piper and Wheeler, £8,880; Longmire and Burge, £8,561; Rigby, £8,488; Myers, £8,487; Browne and Robinson, £8,170.

EXETER.—For alterations and decoration of the Wesleyan Mint Chapel. Messrs. R. and W. Best, architects:—Moass and Sons, £785; Stamp, £696; Huxtable, £680; Perlam (accepted), £520.

FLEETWOOD.—For the erection of stables, laundry, and offices at Stockton House, for Mrs. Cox. Mr B. Fletcher, architect:—Stimpson, £1,522 10s.; Walden, £1,450; Hart, £1,350; Fairhall and Weeks, £1,326; Liming (accepted), £1,054.

GLOUCESTER.—For villa, Denmark-road Gloucester, for J. P. Jenkins, Esq. Mr. H. James, architect. Quantities supplied:—Clutterbuck, £1,170; Meredith, £1,142; Sims, £1,115; Cullis (accepted), £1,093.

KINGSTON HILL.—For erecting a residence for Mr. J. Galesworthy. Messrs. Pennington and Bridgen, architects:—Lathey Brothers, £4,753; Martin, £4,287; Perry and Co. (accepted), £4,267.

LONDON.—For alterations at Red Cross-square, Cripplegate. Messrs. John Young and Son, architects:—Knight, £898; Larke, £768; Newman and Mann, £680; Sharman, £655; Ellis, £650; Chessum, £555.

LONDON.—For new buildings, 43, Carter-lane, Doctor's Commons. Messrs. John Young and Son, architects:—Conder, £2,629; Macey, £2,613; Brass, £2,542; Piper and Wheeler, £2,472; Hill and Sons, £2,459; Webb and Sons, £2,345; Ashby and Horner, £2,325; Newman and Mann, £2,295.

LONDON.—For additions to Messrs. Baggallay, Westall, and Spence's warehouse, Love lane, City, E.C. Mr. Herbert Ford, architect:—Henshaw (accepted), £1,304.

NEWCASTLE-UNDER-LYME.—For the erection of chapels and registrar's house at Borough Cemetery. Messrs. Bellamy and Hardy, Lincoln, architects:—Newton, £3,224 15s. 5d.; Gallimore, £3,206 19s. 9d.; Thompson, £2,932 9s. 4d.; Sutton (accepted), £2,790 16s.

PONTRITAS.—For building a villa midway between Hereford and Abergavenny, for Mr. E. T. Husbands. Mr. J. H. Evins, architect:—Foster Brothers, £1,068; Bampfield, £968; Bowers, £760; Maddox, £750; Thomas, £649; Bees, £648; Evans, £625; P and D. Pritchard (accepted), £615.

TAMWORTH.—The tender of Mr. C. Clarson, of Tamworth, for the erection of a new grammar school there, has been selected. The amount is £2,800.

TWICKENHAM.—For alterations and additions to mansion, No. 76A, Marine Parade, Brighton, for W. Budd, Esq., Twickenham Park. Quantities supplied by Mr. Henry W. Broadbridge:—Cheeseman and Co., £3,140; Wells, £2,341; Kemp, £2,300; Jarrett, £2,290; Sawyer, £2,219.

WANTAGE (BERKS).—For boundary walls and conduit to new almshouses. Mr. J. P. Spencer, Wantage, architect:—G. and J. Kent (accepted), £128 17s.; architect's estimate, £132.

WEYMOUTH.—For brick tank and single-lift gasholder, for the Weymouth Gas Company. Mr. Alfred Penny, engineer:—Tank—Coker, £1,335 10s.; Reynolds, £1,064; Williams, £967 10s.; Seaman, £765 10s.; Dodson, £759. Gasholder—Porter, £1,880; Hanna, Dorald, and Co., £1,500; Piggott and Son, £1,440; Horton, £1,430; Coulson and Co., £1,413; Tildesley, £1,128.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

William John Beer, Plumstead, dockyard joiner, July 9, at 11—Frederick Barrell Cawston, Upper Norwood, plumber, July 4, at 11—Thomas James Rattenbury, Barking, builder, July 1, at 1—Francis Freshwater Briggs, St. Ives, Hunts, engineer, July 8, at 2—William Cooper, Caterham, builder, July 8, at 2—Frederick Walter Rowntree, Old Kent Road, plumber, July 10, at 1.

TO SURRENDER IN THE COUNTRY.

Herbert Charles Downward, Ulverston, painter, July 1, at 10—James Eggett, Lynn, Norfolk, blacksmith, July 3, at 11—Henry Metcalfe, Manchester, builder, July 8, at 11—Edward Auberry Oswin, Liverpool, joiner, July 2, at 3—George Rees, Swansea, joiner, July 3, at 2—Charles Watkin, Glamford Briggs, painter, July 4, at 10—John James Coates, Edgbaston, builder, July 12, at 10—George Furnivall Mellor, Bury, joiner, July 9, at 12—Thomas Rushforth, Leeds, plumber, July 11, at 12—Hugh Thomas, Liscard, timber dealer, July 8, at 11—David Rogers Wilson, Rochdale, smith, July 9, at 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

August 2, at 1, C. Garrett, Banstead, railway contractor—July 10, R. Jewell, Roman-road, Barnsbury, builder—July 10, G. Burfield, Lewisham-road, carpenter—July 12, S. Gates, Crawley, builder—July 22, W. H. Sanders, Bloxwich, lockmaker—July 23, J. Smith, Litchurch, engineer—June 19, T. Noble, South Stockton, joiner—July 11, A. Hartley, Scaforth, builder—July 22, W. Carruthers, Liverpool, joiner—July 12, H. J. Ledger, Hulme, builder—July 17, J. O'Connor, Sunderland, ironmonger—July 10, P. M. Rodwell, Thorrington, Essex, blacksmith—July 5, T. Derbyshire, Liverpool, contractor—July 16, F. G. Hall, Chester-st., Kennington, timber dealer—July 17, W. Everitt, Chrisp-street, Poplar, builder—July 17, W. H. Samuel, Bow, builder—July 23, J. Littlechild, Northall, builder—July 19, H. Lacey, Bradford, Yorkshire, sawyer—July 17, T. S. Lawson, Newcastle-upon Tyne, joiner—July 19, R. Jenkins, Soughton, near Northrop, engineer—July 9, T. Hill, Tugby, Leicestershire, blacksmith—July 11, Wm. Austin, Margate, plumber—July 15, J. Jones, Frondeg, Merionethshire, builder—July 19, J. Jackson, Tranmere Park, joiner—July 11, D. M. Landles, Beeston Hall, near Leeds, plasterer.

PARTNERSHIPS DISSOLVED.

The Swansea Iron and Tin-plate Company—Johnson and Co., Peterboro', lime burners Kent and Dain, Southampton, ironmongers—T. and J. Hunter, Millom, Cumberland, contractors—Jefferson and Co., Bradford, Yorkshire, ironfounders—Myers and Clarkson, Idle, stone merchants.

DECLARATION OF DIVIDEND.

W. H. Willcox, Teignmouth, builder, div. 2s. 2d.

DIVIDENDS.

July 8, J. Croudace, Sunderland, timber merchant—July 13, J. and W. Walker, Birkenhead, joiners.

SCOTCH SEQUESTRATIONS.

James Baird, Hangingshaw, near Glasgow, brickmaker, June 27, at 12—George Osborne, Edinburgh, furnishing ironmonger, June 28, at 2—Robert Whitelaw, jun., Neilston, contractor, July 4, at 2.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9	0	£10	10	Archangel, yellow ..	£11	10	£12	10
Quebec, red pine	3	0	4	10	St. Petersburg, yel...	10	10	11	0
,, yellow pine..	2	15	4	0	Finland	8	0	9	0
St. John N.B. yellow	0	0	0	0	Memel.....	0	0	0	0
Quebec Oak, whits ..	5	5	6	0	Gothenburg, yellow	8	10	10	10
,, birch.....	3	10	4	10	,, white	8	0	9	0
,, elm	3	10	5	0	Gefle, yellow.....	9	0	11	0
Dantzic oak	3	10	6	0	Soderhamn	9	0	10	10
,, fir	2	0	3	0	Christiania, per C.,				
Memel fir	3	0	3	10	12 ft. by 3 by 9 in.				
Riga.....	3	0	3	5	yellow	16	0	22	0
Swedish	1	15	2	2	Deck Plank, Dantzic,				
Masts, Quebec red pine	6	0	7	0	per 40 ft. 3 in.	0	15	1	4
,, yellow pine..	5	0	6	0	PUMICE STONE pr ton	5	0	8	0
Lathwood, Dantzic, fm	4	10	5	0	OILS, &c.				
,, St. Petersburg	6	10	7	10	Seal, pale....per tun	38	0	39	0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Sperm body	110	0	112	0
					Cod	40	0	0	0
					Whale, Sth. Sea, pale	40	0	0	0
Quebec, white spruce	14	10	21	10	Olive, Gallipoli.....	62	0	0	0
St. John, white spruce	13	10	15	10	Cocoanut, Cochin, ton	55	0	0	0
Yellow pine, per reduced C.					Palm, fine	40	0	0	0
					Linseed	33	10	0	0
Canada, 1st quality.	17	0	19	10	Rapeseed, Eng. pale..	37	0	0	0
2nd do.....	12	0	13	0	Cottonseed.....	30	10	36	0

METALS.

IRON:—								
Welsh Bars in London .. ..per ton	6	10	0	6	15	0	3	
Nail Rod	7	10	0	8	0	0	2	
Hoops ..... do	8	10	0	9	0	0		
Sheets, Single ..... do	9	15	0	10	0	0		
Stafordshire Bars ..... do	7	10	0	8	10	0		
Bars, in Wales ..... do	5	15	0	6	0	0	3	
Rails ..... do	6	5	0	6	10	0	nett	
Foundry Pigs, at Glasg. No 1 .. do	2	14	0	3	5	6		
Swedish Bars ..... do	10	5	0	11	0	0		
STEEL:—								
Swedish Keg, hammered .....per ton	15	0	0	15	10	0		
Swedish Faggot ..... do	10	10	0	12	10	0		
COPPER:—								
Sheet & Sheathing, & Bolts ....per ton	81	0	0	86	0	0		
Hammered Bottoms ..... do	91	0	0	93	0	0		
Flat Bottoms, not Hammered .. do	86	0	0	89	0	0		
Cake and Tough Ingot ..... do	73	0	0	0	0	0		
Best Selected ..... do	81	0	0	83	0	0		
Fine Foreign ..... do	83	0	0	87	10	0		
Yel. Metal Sheathing & Rods ....per lb	0	0	7¼	0	0	7¾		
TIN:—								
English Block .....per ton	89	0	0	0	0	0	2½	
do Bar ..... do	90		0	0	0	0		
do Refined ..... do	92	0	0	0	0			
Banca ..... do	91	0	0	0	0	0	nett	
Straits ..... do	86	0	0	86	10	0		
LEAD:—								
Pig, English .....per ton	21	15	0	0	0	0	2½	
,, Spanish Soft ..... do	19	10	0	0	0	0		
Shot, Patent ..... do	21	0	0	0	0	0		
Sheet ..... do	21	0	0	0	0	0		
White ..... do	30	0	0	31	10	0		
SPELTER:—								
On the Spot*.....per ton	21	0	0	21	2	6	nett	
ZINC:—								
English Sheet .....per ton	26	10	0	27	0	0	0	
Devaux's V. M. Roofing Zinc .... do	28	0	0	0	0	0	0	
* And 5 per cent. discount if laid upon the new system.								
QUICKSILVER .....per btl	6	17	0	0	0	0		
REGULUS OF ANTIMONY.								
French .....per ton	35	0	0	0	0	0		

STAIRCASE and JOINERY WORKS,
JOHN WALDEN
(Late Shop Foreman to Mr. W. SANDS, retired),
12, MAIDEN LANE, COVENT GARDEN.
Estimates on application.

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GENUINE
SOLID PARQUET FLOORS
Are Greatly Superior to any hitherto Produced, being of Special Construction, Improved Design, Thoroughly Seasoned, and at
PRICES LOWER THAN USUAL.
Specimens at Architectural Museum, 23, Maddox-street, W.
AND AT
Show Rooms, Cambridge Hall, Newman-street, London.

On July 1, will be ready, Part 12, price 2s., of the
MONUMENTA. This work is issuing monthly, in parts at 2s., and contains Designs for Tombs, WALL MONUMENTS, GRAVE CROSSES, HEADSTONES, &c.
London: JAMES HAGGER, 67, Paternoster-row.

ROYAL POLYTECHNIC. — SEE the PARIS EXPOSITION for ONE SHILLING Professor Pepper's LECTURES on the PALAIS DE L'EXPOSITION, daily at 3 and 8, except Wednesday evening. Amongst the other attractions are, the "Wonderful Leotard," the great optical surprise, called "The Effigy of the Dear Defunct," and the musical entertainments of George Buckland Esq.

BILIOUS and LIVER COMPLAINTS, Indigestion, Sick Headache, Loss of Appetite, Drowsiness, Giddiness, Spasms, and all Disorders of the Stomach and Bowels, are quickly removed by that well-known remedy, FRAMPTON'S PILL OF HEALTH. They unite the recommendation of a mild operation with the most successful effect; and where an aperient is required, nothing can be better adapted.
Sold by all Medicine Vendors, at 1s. 1½d. and 2s. 9d. per box or obtained through any Chemist.

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ASSURANCE COMPANY.
Established 1821. No. 11, Lombard-street, London, E.C.
REDUCTION OF FIRE INSURANCE DUTY.
Subscribed Capital, Two Millions.
Total Invested Funds, upwards of £2,750,000.
Total Income, upwards of £320,000.
Notice is Hereby Given that FIRE POLICIES which expire at MIDSUMMER must be renewed within Fifteen Days at this Office, or with the Company's Agents throughout the Kingdom, otherwise they become void.
All Insurances now have the benefit of the REDUCED DUTY of 1s. 6d. per cent.
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Sum Assured.	Age.	Or bonus in addition to the sum assured			Or cash in reduction of the next annual premium.			Or permanent reduction of future annual premium.		
£		£	s.	d.	£	s.	d.	£	s.	d.
1000	43	85	2	0	30	1	8	3	5	3
600	27	38	12	0	10	2	0	0	16	9
500	50	42	16	0	17	8	4	2	5	4
100	44	7	13	0	2	15	6	0	6	1
50	66	7	2	0	3	14	4	0	17	2

A Dividend of 5 per Cent., with a Bonus of 1 per Cent. paid to the Shareholders.
THE NEXT BONUS WILL BE DECLARED IN JULY, 1867.
Claims paid within 14 days after proof of death.
Advances made on Freehold and Leasehold Securities.
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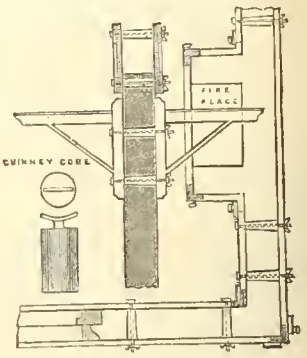
By Her Majesty's Royal Letters Patent
TALL'S
PATENT APPARATUS
FOR
Constructing Walls, Houses, and Other Buildings.



"An ounce of fact is worth a ton of theory."

It is deemed advisable to make known to all interested in building, and to the public in general, that Mr. J. TALL has revived the ancient mode of erecting Walls, Houses, and other buildings in Portland Cement Concrete, by patenting an apparatus and scaffolding for carrying up the walls of houses to any required height.

The apparatus is so constructed that after the house or houses are finished, it can be put together to build walls or other partitions, of any length whatever.

Some of the advantages in the Patentee's mode of building are as follows:—

Firstly.—Half the cost of construction, and ten times the strength of brickwork.

Secondly.—The walls are impervious to wet or damp. The chimney-flues being round and smooth internally, smoky chimneys and defective draught will be effectually prevented.

Thirdly.—By inserting a round core in any part of the wall, a flue can be formed for ventilation at no increase of cost.

Fourthly.—The materials for making the concrete are found in every part of the United Kingdom, viz., hard burnt clay, gravel, stone, crushed slag from furnaces, smith's clinkers, oyster shells, broken glass, crockery, or any hard and durable substance. Where sandstone or any flat stone is to be found, walls can be built even cheaper than concrete, as a labourer can break the stone if too large to go in the apparatus, taking care to fill up all the space between the large stones with the broken fragments about 6in. deep in the apparatus all round; then pour in grout again, another layer, and so on till the apparatus is filled up; thus a solid and cheap wall, and, when stuccoed over, has a nice and neat appearance.

Fifthly.—The walls being of one solid mass sound is completely deadened.

Sixthly.—No bond timber required for joists.

Seventhly.—No spouting or piping is required for carrying off the rain water, and the gutters or water channels are formed of concrete.

Eighthly.—The walls can be increased in thickness every inch, instead of being obliged to be made o 4½, 9, and 13½-in. as in brickwork.

Ninthly.—The walls being nearly smooth, require but one coat of plaster, and thereby a considerabl economy is effected.

A Pamphlet will be forwarded by enclosing fou stamps, giving full information for Licences, &c. most excellent opportunity now presents itself to a enterprising man of business with capital to join th Patentee in Building only, who is refusing order every day. The Patentee is now building at a ne profit of 40 per cent., and cannot build fast enoug to meet one-twentieth the demand.

The gold medal of the Paris Exhibition has ju been awarded to His Imperial Majesty the Emper Napoleon for his concrete houses in Paris.

These houses were all built with the Patente apparatus, a patent for which has been granted France.

New and extensive Premises have just been tak by Mr. J. Tall, in
FALSTAFF YARD, KENT STREET
SOUTHWARK,
Where all letters and orders must be addressed.

THE BUILDING NEWS.

LONDON, FRIDAY, JULY 5, 1867.

THE PARIS EXHIBITION.

ARCHITECTURE.—THE PARC.—SIXTH NOTICE.

HITHERTO we have considered architecture as presented to us by drawings only. There are within the building some few illustrations of the art in execution, but these will chiefly come under our review when we consider the materials of which they are composed, as they are, in general, designed more to illustrate the capability or fitness of the material exhibited than their architectural character. Some few of the screens which divide the products of one nation from another are worthy of a passing glance, and of these we would enumerate those of Russia with its quaint woodwork, of Wurtemburg and Bavaria, of Italy, and of Greece; but these are more of a decorative than an architectural quality, and we shall find but little calling for our attention within the building. Without are numerous edifices of every people, kindred, and tongue, all more or less translated into French, and generally more so than less. These it would be almost useless to describe seriatim, as many of them are mere burlesques on the styles attempted, and not worthy of serious consideration as illustrations of national architecture peculiar to the country whose name they bear. Others there are which have very much merit, and these we shall notice as we pass. Entering, then, by the Grand Porte we find on the right-hand side of the Imperial Avenue a collection of buildings nominally belonging to Great Britain and Ireland, but really belonging to that *imperium in imperio* South Kensington, and representing only its crotchets. Here we have half-timber work of poor character filled in with caricatures in outline and eccentric pargetting of so poor a design that a third-rate architect would scarcely feel flattered by having it attributed to him. The only exceptions to this uniformity of ugliness are a very elegant and well decorated building, in which are conducted the experiments on various systems of electric lighting, and the covering to the boilers which supply steam to various engines in the building. This latter is supported on very well modelled columns of terra-cotta, which cut out against the broad dark shadow of their roof in a highly picturesque and satisfactory manner. Passing these we come to a series of buildings in execrable taste, both as regards their design in art and purport, where the holiest words are handed about without reverence or discrimination, and where the gospel of peace is tortured into a fosterer of religious strife. We are glad to turn away from our polyglot countrymen in this quarter, though in doing so we have to pass a wretched travestie of the temple of Xochicalco, where, in order to harrow our feelings still more, a row of real sculls are placed as an ornament along the temple, and under which, for the small sum of 50 centimes, you may experience the pleasure of passing. How a nation priding itself on its good taste could have admitted either of these exhibitions of its want sorely puzzles us, yet of the two we think that by our countrymen far the worst. The Cercle International in this vicinity is a very poor building, both internally and externally; and, though used for all sorts of purposes, seems to suit none of them. Straus's concerts are drowned by a *perpetuum mobile* of knives and forks, and a reverie of Schumann's is interrupted by reports of champagne; whilst, if we seek to dine *above*, the concert below disconcerts our orders and both are spoiled. Near this we find a collection of *Tunisian* minstrels, stables, and palaces, all of them of sham materials, and nothing genuine in the collection. Nor is a Chinese theatre, supplied with French tumblers and erected from very fancy sketches, any more real, and we are filled with regret that so much money should have been spent in making such a very bad Cremorne. Mr. E. T. Smith would have produced a much more pleasurable thing for half the sum, and have given us quite as good an idea of Eastern art. Near here, too, is found a Roumanian Pavilion, with very tipsy turrets staggering in opposite directions, and decorated externally with a mixture of Chinese and Anglo-Saxon ornament. All this is childish in the extreme, and conveys not one lesson worth learning, nor gives a pleasure. Perhaps, however, these things have already served their purpose—that is, if they are paid for—but, beyond causing the money of other nations to be expended for the well-being of a few French workmen, they are utterly useless. Far better are the works of the kingdom of Egypt, as we suppose we must now begin to call it. Here, though the works are small and scarcely rise above the dignity of architectural modelling, they are very exact and good, and convey to those who really study them an excellent idea of what Egyptian architecture was, as an art. But to the general public these, too, are useless, as the chief sentiments of Egyptian architecture are wanting; there is neither mass to impress nor mystery to impose, and the grandeur of ancient Egypt is reduced to the littleness of her present condition; the small pylon which guards the entrance is outtopped by the hugeness of a modern Cairene café which overlooks it. Still for truthfulness of detail and exactitude of modelling Marriette Bey and his able assistants deserve our praise, and we are glad to have the opportunity of according it to them.

Modern Egypt is represented by a very fair imitation of an okel or café, and the Salamlic or Viceregal Palace. These are worthy of attention as scenic bits of the present state of modern Arabian architecture; the joinery of their lattices and the general *ensemble* of their combinations of light and graceful forms is very pleasing, but for practical lessons they are very useless; in the same category may also be classed the buildings illustrative of Egypt's stepfather, Turkey. Here we have a mosque of small dimensions, with its light graceful minaret, and into which we may enter without the preliminary process of divesting ourselves of our boots, and where we find a very exact internal representation, on a small scale, of the disposition of one of these picturesque and scenic buildings, with a pulpit of truly Protestant height and dignity, and a roof glowing with colour.

We will now take leave of Eastern traditions, and crossing a path, find ourselves in the yet unfinished region of Italy, whose chiefest building is, strangely enough, a Grecian Doric pseudo-temple, with windows in it, effectively decorated in colour, but of very poor design. Far better is a small pavilion, which is decorated with some very beautiful plaques of coloured Faience, many of them of large dimension, and showing to how very architectonic a purpose this branch of decorative art may be applied. It is unfortunate that this little building should have been decorated in imitation of *All'sgraffito;* the real work would have been less costly, and, strangely enough, the only illustration of this truly Florentine and very admirable and effective mode of decorating plastic surfaces is exhibited in the Palace of the Beaux Arts of Switzerland. Near to this is one of the best bits of the whole of the external architecture of the park, nothing more than the base of a chimneystack to some boilers, but of excellent design, and of which we will not say more at present, hoping shortly to give an illustration of it, merely remarking here that there are many wrinkles our architects and engineers may acquire by looking round at the way the bases of the many smokestacks which dot the grounds are arranged. This brings us to the Porte Desaix, and completes one quarter of the parc.

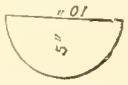
Crossing the three main avenues which give access to the building at this point, we find ourselves in the Boulevard du Sua, and then, by as strange an anomaly as that which placed the buildings of China, Japan, and Tunis, in the Boulevard de l'ouest, we find those of Russia, Norway, and the northern nations of Europe. Truly, French systematisation is here illustrated by paradoxes and contradictions. Very much better, and more truthful, are the buildings in this region, and in point of novelties in timber construction, this is decidedly the most fertile and interesting portion of the Parc. The Russian buildings are all of them excellent, and, though perhaps too ornamented and fantastical as regards bargeboards and gables, are well worthy of examination. The lovers of notching and nicking—and Heavens knows they are numerous enough nowadays in England!—will find enough here to last an average lifetime, but in real truthful carpentry there is very much to be learned. The Russian stables, and the charming little office of the Commissioners, are well worth study, more especially by our colonial friends, who will here see that a log-house may be made a very characteristic and architectural edifice, and the manner in which the rounded pine logs are halved together at the angles is very suggestive. It is strange to encounter here a point of contact between the ancient Lycian architecture, the forefather of Ionian Greek, and the log hut of the western settler; and a few steps further on we find a Tartar tent, which, by simply altering the embroidery of the lappels covering the lacings into armorial bearings, becomes a relic of the middle ages. The temptation to digress into a consideration of the parallel steps all nations take in the march of civilisation is great, but we are obliged to leave it to our readers to follow for themselves, and push onward past the house of Gustavus Vasa, with its shingled walls and grassy top, to M. Sager's Palace of the Fine Arts of Switzerland. Raised on a broad platform, and highly coloured, this building presents an attractive appearance, but the pleasure with which we first approach it is dispelled when, arriving at it, we discover it to be a monument of incongruities. Massive walls support a wooden trellis girder, which carries the roof. Doric columns of large diameter carry light carpentry, and with a general air of seriousness and a grave Greek character of design, we find the frisky little festoons and twisted shields of sixteenth century Flemish work. Virgil, Solis, and Dædalus united with a *soupcon* of Raphael here and there makes as odd a combination of ideas as Switzerland herself presents. May be it is the more appropriate for being thus incongruous, and its very want of unity may be its homogeneity. We are so surrounded by paradoxes that we are almost forced to believe with Pope that, "whatever is, is right." Right or wrong this "discord misunderstood" does not make harmony, and it is only on account of the handiwork of the decoration that we approach closer to it. Here we have a good illustration of *All'sgraffito* work, produced by firstly plastering the wall with a dark cement, and then skimming it over with a light one, and etching through this former with a broad, free line until the latter is exposed. In a country so given to cement as our own we have often wondered that this has not been more adopted. Externally, perhaps, our smoky atmosphere would reduce it all to one dull grimy hue, but for halls, staircases, and public rooms this affords an admirable opportunity for producing a great effect at a small cost, and we recommend those of our profession who have not had an opportunity of studying this kind of work in Italy to examine the illustration of it here afforded. They had better not enter the building, for the pictures are very melancholy, and, unless they seek an hour's quiet repose, it offers no internal at-

tractions. Norway and Denmark present to us some good constructions in wood, and the houses of the latter State, raised above the ground to afford a free ventilation, offer a good suggestion to those who build in damp situations, and the small Tyrolean house occupied as the office of the Austrian Commission is another good illustration of applied carpentry; but the chiefest attraction of that country is its trophy of terra-cotta, to which we shall again revert in considering the works in that material. The annexe of Spain is heavy in the extreme, and contrasts unpleasantly with the light and elegant Arabian-like structure of Portugal; and certainly on ethnological grounds these two structures should be counterchanged. Facing L'Ecole Militaire is an interesting collection of French agricultural buildings, the roofs of which are noteworthy, the tiling of many of them being of a very peculiar description, and the ingenious manner of breaking joint, and protecting these joints from the ingress of wet, is worth the consideration of our tile makers; but of these and other similar inventions we purpose taking notice in our remarks on the building materials exhibited. A, to us, new variety of thatching is also exhibited, it is called Chinese thatching in France; but how it acquired the appellation we have not been able to learn. The straw is cut into lengths of about 18in., laid on in courses, and sewn together with tarred twine, and seems to form a very effectual, as it certainly forms a very pleasing covering. In this quarter of the Parc is situated a marvellous structure as yet erecting by Prussia, of extraordinary Eastern character. Why this style has been by them adopted only Count Bismark knows. Are there Eastern questions looming in the future? Is the King of Italy going to sell his barren title to Jerusalem to the lucky William? Who can say? But certainly we should concieve so astute a nation must have a reason for an expenditure of some 125,000f. in so questionable a style. As for the rest of the buildings in this quarter, they are wooden boxes, forming a grand collection of gigantic tea-chests, and present nothing worthy of remark, so we cross with infinite pleasure the Avenue de l'Europe into the paradise of the Exposition, the Jardin Reservée. For half a franc you can transport yourself from dull material earth into fairy land, and where necromancy certainly must have been at work. A year ago here was but a barren arid gravel plain, level as the desert, and stony as a beach; and now we find undulating lawns, huge shady trees, woods, rocks, and water, and, more wonderful still, rich green verdure. Millions of loads of soil must have been brought, and thousands of workmen have been employed, to have produced this result; and we do not hesitate to say that it would have been impossible for us in England to have effected so great a transformation in so short a time; and as we wander amidst brilliant beds of perfume-spreading flowers, or seek refuge in cool caves, we are lost in wonder at so great and speedy a change, and almost for the first time acknowledge that "they manage these things better in France." This is veritably the triumph of the Exhibition, and its executive here deserve unmitigated praise. Greenhouses by the dozen, of all sorts, shapes, and sizes, invite us to examine the huge tropical palms and ferns, or the quaint, weird, growth of cacti, rendered still more eccentric by grafting one odd form upon an odder one. The almost overpowering perfume of the roses in one, and the voluptuous luxury of orchid growth in another, well-nigh make us forget we are simply mortal architects seeking for instructive lessons rather than our own pleasure, and we are loth to begin to take life seriously again and leave them. The most noticeable feature of the construction of these houses is their generally curvilinear form, and their constant covering with "stores," or blinds, composed of light pieces of wood, about half an inch wide and one quarter thick, painted green. This mitigates at once the heat of the sun by day, and prevents much radiation at night. In other matters, such as heating or ventilation, they do not offer to us much fresh, but we notice a very great economy of material in their construction. As for works of architecture, the Jardin Reservée offers us but few, and two only call for any special remark. These are, firstly, the Pavilion of the Empress, and, secondly, a small pavilion of terra-cotta, by M. Boulangen. The Pavilion de S. M. Impératrice is a small, octangular building, having a slight projection on its alternate faces, giving it a somewhat cruciform figure in plan; its construction is of glazed bricks, of deep blue, light blue, and buff, in alternate courses, and having stone dressings relieved with coloured faience. The frieze and some other parts of these coloured introductions are especially good, and we would particularly commend to the notice of both architects and manufacturers the gutter course; it is well designed and cleverly executed, and is a good illustration of the treatment of this feature in the hands of French architects. We, in England, have too generally an idea that a gutter is a thing to be ashamed of, and strive to conceal it by sinking it in the cymatium, or making a miserable imitation of a stone moulding in cast iron. Here we have it boldly confessed and ably treated, and an additional source of beauty extracted from that which we consider a defect. The cast and beaten leadwork of the dome is very good in design and execution, and we greatly regret the neglect of this most ductile and useful metal in England as a source of ornamentation. Iron, which is more difficult of manipulation and easily corroded, we use largely in places where repair or repainting is almost impossible; but lead, which requires no paint, which does not oxidise, or at least which does not deteriorate by oxidisation, and which is much easier of manufacture, we most unaccountably neglect. The ironwork here used is wisely placed in accessible positions, and the balcony fronts are of most exquisite workmanship.

TIMBER USED IN RAILWAY CONSTRUCTIONS, AND MODES OF PRESERVATION.

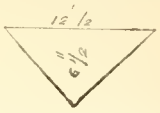
No. I.

WHEN the first passenger railway was made in England (the Manchester and Liverpool), the engineer, Mr. George Stephenson, used large stone blocks in the cuttings, and wood sleepers on the embankments, which plan was also afterwards adopted on the London and Birmingham, and several other railways. It was soon found that the stone blocks shook the carriages very much, and they were gradually all removed, and wood sleepers used throughout the line. The first size of wood sleeper then used was 9ft. long and 10in. by 5in. half round in the section, thus



In 1838, when the line from Manchester to Crewe was made, a larger sleeper was used, 12in. by 6in. half square. These sleepers were cut out of common American white fir, but they were most of them creosoted, and they all remain now as sound as when first laid down. The sleepers on the London and Birmingham were Scotch fir, 9ft. long by 10in. by 5in. half round. These were all prepared with corrosive sublimate (Kyan's patent), and were all taken up rotten within seven years, and many of them at the end of four or five years.

With the exception of the Manchester and Crewe line, and Mr. Brunel's line, all the railways used the 10in. by 5in. half round sleepers until the line to Dover was made, when Mr. Cubitt introduced the triangular sleepers, which were 12½in. by 6½in, thus—



This line, and also the Great Northern, were constructed with these triangular sleepers, and some of the other engineers also tried them on the other lines, but were not satisfied, as there is always a tendency when a load is passing over them of being wedged into the ballast, and after being packed up soon cut through the packing, as may be imagined from their shape. As they decayed they were removed, and that form of sleeper is now abandoned.

Some years ago, several of our engineers made use of large sleepers 12in. by 6in., which were put immediately under the joints of the rails; but this system was found not to answer, and instead thereof they now join the ends of the rails to each other with iron plates called "fishing" plates, and a sleeper 10in. by 5in. half square is placed within 8in. of the end of each rail, but no sleeper is put immediately under the joint. The size of sleeper universally adopted in England now (except Mr. Brunel's line) are 10in. by 5in. half square, and 10in. by 5in. half round. Mr. Brunel's sleepers are longitudinals, supporting the rails throughout, and are 14in. by 7in. and 10in. by 10in. in their section, but the most usual size is 14in. by 7in.

The following different modes of preserving timber were used on different railways in England, viz., solutions of corrosive sublimate or chloride of mercury (Kyan's patent), solution of sulphate of copper (Margary's patent), solution of sulphate of iron and muriate of lime (Payne's patent), all of which have in turn excited the most extravagant hopes; but, the only methods which have stood for any time are Burnett's patent (chloride of zinc), and Bethell's creosoting process.

CREOSOTING.

There are several firms who have extensive timber preserving works, of whom we may mention Messrs. Burt, Boulton, and Haywood, and Mr. John Bethell, both of London, and Messrs. Armstrong and Forster, of Sunderland. We speak of these companies from personal knowledge as having had great experience in their work. No doubt there are other firms equally as able to undertake such contracts and creosote woods properly. Creosote, now so extensively used in preserving wood, is obtained from coal tar, which, when submitted to distillation, is found to consist of 65 parts pitch, 20 of essential oil (creosote), 10 of naphtha, and 5 of ammonia. The preservative properties of creosote appear to be threefold. First, it prevents the absorption of moisture in any form or under any change of temperature; secondly, it is noxious to animal and vegetable life, thereby repelling the attacks of insects and preventing the propagation of fungi; thirdly, it arrests the vegetation or living principle of the tree, after its separation from the root, which is one of the primary causes of dry rot and other species of decay. The method of applying the creosote is to place the timber in an iron cylinder, and by means of a vacuum pump extract the air as completely as possible, then fill the cylinder with creosote, and by means of a force pump the oil is injected at a temperature of 130 deg., and under a pressure of 150lb. per square inch. Timber cannot be considered thoroughly creosoted with less than 10lb. per cubic foot. This is the quantity put into the North-Eastern Railway Company's sleepers, but timber for the River Tyne Commissioners and others has had 12lb. per cubic feet injected. This is seldom exceeded. Creosoting is sometimes done without pressure, or only steeped in creosote, or by brushing it over. This timber, we need

scarcely say, will soon decay. It goes to show the necessity of creosoting being done under the superintendence of an inspector.

The Sunderland firm mentioned have submitted to us a sample of creosoted American yellow pine railway sleeper, cut from the end of a sleeper placed in the ground on the Stockton and Darlington Railway, August, 1841, and removed March 14, 1867. The sleeper itself is in a state of excellent preservation, being only slightly indented by the chairs, and likely to last many more years. The piece forwarded to us is as sound as the first day it was laid in the ground, nearly twenty-six years, a period which would have rendered it useless in one quarter the time if laid down in its natural state.

Now, seeing that the decay of timber is gradual, and goes on from year to year, and the creosoted timber is unchanged after twenty-six years, one cannot put any limit to its duration,* save from mechanical action, such as small based chairs, the careless and injudicious manner in which they are fastened to the sleepers in many cases, and suffered to work loose for long periods, thereby embedding themselves.

Mr. Thomas Summerson, now manager of the Hope-town Foundry, Darlington, and late inspector of the Stockton and Darlington Railway, vouches for the laying down and removing of this sleeper, and further adds, "I believe I may safely say that I have had now as large an experience in permanent way as most men (something like forty years), and have had to do with stone blocks, different kinds of timber laid down in its natural state, cast-iron sleepers—which, by the way, I have seen taken up after being down some seven or eight years half eaten away by the sulphur from the ballast—and do think that properly creosoted transverse sleepers of good quality, chairs with a good base and properly fastened, a double-headed rail, 75lb. or 80lb. per yard, seated on oak cushions, the best and most economical permanent way that has come within my experience."

Mr. Bethell's process has been used on the Lancashire and Yorkshire Railway, Great Northern Railway, London and North Western, Great Eastern and Taff Vale Railways, besides on lines of railway in Belgium, Germany, India, Italy, &c.

Creosoting, too, has proved most effective against marine worms, according to E. H. Von Baumhauer, who was engaged by the Royal Academy of Sciences at Amsterdam to investigate the subject, who proved to the society in a manner incontestible that the *teredo navalis* had never attacked wood that had been thoroughly creosoted.†

It has been stated that creosoting renders timber brittle, but no satisfactory proof has yet been adduced; while, on the other hand, we have the testimony of such gentlemen as Mr. Ure, the engineer to the River Tyne Commissioners, who gives it as his opinion that there is no difference between the strength of creosoted and uncreosoted timber; as for long beams, diagonal stays, &c., he specifies the same sizes in both cases; and further, that in driving some long piles they had driven them so hardly that they took fire at the top, and yet showed no signs of breaking. Mr. Ure, as most engineers know, has had very large experience in pile driving.

At Grimsby, good rectangular Baltic sleepers 9½in. × 4¾in. can be purchased for 2s. 5d. each, and those 10in. × 5in. for 2s. 9d. The great defect of the ordinary Baltic sleeper, cut down the middle, is the splitting from pins; and in practice it is found the Scotch fir sleeper creosoted is the best for wear, as it is tougher than the others, and will stand the resetting of the chairs, and pins may be driven into it two or three times without splitting.*

From the commencement of the establishment of railways in India in 1854 down to the present time, timber sleepers have been supplied from this country, and Messrs. Burt have had a large portion of them pass through their hands. The sleepers latterly used for Indian railways, like those on our own lines, have a sectional area of 50in., and the timber is of superior quality. In these contracts the minimum quantity of creosote generally required to be injected is about 10lb. per cubic foot; but with well seasoned wood it takes up more than that quantity.

Formerly, in winter time, creosoting operations were partially suspended, as it was found that at a temperature below 40 deg. the creosote coagulated to such an extent as to render it almost impossible to force the preservative material into the timber. At present, by raising the temperature to 120 deg., and applying a pressure of 150lb. and maintaining both, so as to keep the timber all the time it is under pressure at an uniform temperature, the process is so effectually carried out that failure is nearly impossible. Mr. Burt states that, after an experience of twenty years, during which time he sent about one million and a half of sleepers to India alone, besides having prepared many thousand loads of timber for other purposes, he could safely assert that the instances of failure had been rare and isolated. In those cases where decay had taken place, it has been found on inquiry to be due to the operation not having been properly performed As a collateral proof that this mode of preserving timber is considered satisfactory, it has lately been more extensively employed than any other method.

Creosoted timber has also been largely used for telegraph poles, mine props, hop poles, gun platforms, and the breakwaters and piers at Holyhead, Portland, Lowestoft, Great Grimsby, Leith, Plymouth, Wisbeach, Southampton, &c., have been built with creosoted timber; and in no case have the *teredo navalis, limnoria terebrans*, or any other marine worms or insects been found to attack these works, as certified to by the engineers in whose charge the several works are placed.

* The late Mr. Brunel expressly stated that, in his opinion, well creosoted timbers would be found in a sound and serviceable condition at the expiration of 40 years.—See 9th vol. "Institution of Civil Engineers' Minutes," pp. 403 and 405.

† See "Sur le Taret et les moyens de preserver le Bois de ses dégâts," par E. H. Von Baumhauer. 1866.

* See Discussion on Price Williams's Paper on Permanent Way, read before Institute of Civil Engineers, March 13, 1866.

THE CONSTRUCTION OF HOSPITALS.†

THE works on hospitals which we possess are not so numerous but that we should be glad of the appearance of a complete treatise on them, more especially when it has been as carefully compiled as the one now before us. True, the subject is not now so novel as it was when Miss Nightingale published her well-known "Notes on Hospitals," and it is wonderful how little our knowledge of the ends to be attained has increased since Tenery and Howard wrote at the end of last century. But if these ends have not increased in number, it is probable that in the case of such cities as the London of to-day, the necessity of attending to the means of attaining them has become more imperative, nor is it to be supposed that in this age of invention these have been neglected. This is quite apparent in reading the pages of the present work, as we shall see as we investigate its contents. The work is divided into two portions, the former treating of the general principles on which hospitals, dispensaries, &c., should be erected and conducted, the latter consisting of short descriptions of existing institutions in this and other countries. The first question discussed by Dr. Oppert is the dimensions to be adopted in erecting new buildings for hospital purposes, whether these should be great or small; but it is evident that in this country, where hospitals are usually supported by voluntary contributions, a great deal must depend on the funds at the disposal of the promoters of the scheme. Suffice it to say, therefore, that the general opinion nowadays is that the size of hospitals should not be very great, for the treatment of both medical and surgical cases, especially of the latter, is likely to be conducted with a greater measure of success where the number of inmates is small than where the patients are numerous. At the same time, it must be distinctly understood that a large hospital, with many patients and plenty of room, is immensely superior to one, however small and airy, where they are crowded together. To one class of hospital coming more and more into vogue, we mean small cottage hospitals, with six or eight beds, intended specially for villages, Dr. Oppert does not allude, although their increasing importance would certainly have warranted a notice. Neither does he refer to the dispute which was carried on some years ago as to the propriety of erecting permanent buildings for hospital purposes at all. It was then, with no small show of reason, contended that, after a certain time, especially in hospitals where a large number of wounded would have to be treated, as in our naval and military hospitals in war time, the whole building would become saturated with the exhalations of putrid sores, rendering it a very hotbed of disease, instead of a haven of rest for those admitted. Certain it is, too, that during the American war the wounded treated in tents recovered better than those treated in huts, and those in huts than those in hospitals. For civil purposes, however, large and solid erections will doubtless continue to be employed. Next as to site, which is the modern bone of contention, should hospitals be erected in town or in the country? is the question. Both have advantages, both have disadvantages. In the first place, patients do not recover so well in town as in the country, but it is highly questionable whether this difference is not more than neutralised by the ready access to the former. Thus, in the case of the London Fever Hospital, which is situated in the north of London, the state of exhaustion in which patients sometimes reach it is fearful, and such as to have a most prejudicial influence on their chances of recovery. Difficulty of access will ever prove an insurmountable barrier to the removal of hospitals to the open grounds around large cities. Nor is this removal so much to be desired nowadays, since establishments are being got up in connection with many institutions for the reception of convalescent patients. Thus to Walton-on-Thames many hospitals send patients likely to be benefited by country air. St. George's Hospital will soon have a magnificent institution at Wimbledon, St. Bartholomew's Hospital is about to erect a similar branch somewhere in the country, and many send patients to the Margate Sea-bathing Infirmary, Eastbourne, and other sea-side resorts. Dr. Oppert recommends that hospitals should not be erected in noisy places. Now this may be all very well as an abstract rule, but where hospitals are entirely dependent on public charity for support, it is a matter of prime necessity that they should occupy a prominent position, one which in London at least is well nigh incompatible with the former rule. To take a single illustration, to what does St. George's Hospital owe its pecuniary success, compared with, let us say, King's College Hospital, save to its admirable position? Everyone who knows Hyde Park Corner knows St. George's Hospital, but how few are aware of the position of King's College Hospital, beyond, it may be, that it is situated somewhere in the vicinity of Lincoln's Inn-fields, and of the few who know this much fewer still could undertake to guide a stranger to the spot. Drainage is one of the most important auxiliaries to hospital salubrity, and ought in all cases to be strictly attended to.

† "Hospitals, Infirmaries, and Dispensaries; their Construction, Interior Arrangement, and Management, with Descriptions of Existing Institutions." By F. OPPERT, M.D., L.R.C.P., Physician to the City Dispensary, &c. London: Churchill and Sons. pp. 218.

In this connection Dr. Oppert speaks of cesspools, but we think that these should in all cases be avoided, for it is difficult to say how greatly they may prejudice the success of the institution, and we have known many cases of fever, of sores assuming an unhealthy character, &c., which could be distinctly traced to their existence. The position of water-closets is equally important. We are of opinion that they should always be erected outside the proper walls of the hospital, and in all cases well supplied with water. One little point in connection with this should never be overlooked, we mean the necessity of making all drains outside the walls of the building, never allowing them to traverse it in any direction, at once securing the patients from any escape of foul air and the workmen a ready access should the drains get out of order.

The plan or shape of a hospital is a matter of considerable importance, and has already been alluded to in these columns; it will now be sufficient to say that as the prime object is the free access of air, all closed or confined courts should be avoided, and each portion of the building, if it consists of more than one division, should be so arranged as to have as much free space as possible on every side. Of the two plans now considered best, the corridor and the pavilion systems, the latter is decidedly the better. It has been objected that it is more costly than any other, but recent experience in the case of the Chorlton Pauper Hospital, erected by Mr. Worthington, shows that the expense has been greatly exaggerated. True, the great French show hospital, the Lariboisière, of which they are justly proud, and which is now being inspected by all the illustrious visitors to Paris, cost as much as £640 a bed, the total expense amounting to nearly £400,000, but it was an experimental institution and money was not spared. Contrast this with the Chorlton Hospital, a most admirable building by the way, which only cost about £64 a bed. Next, as to the shape of the wards, some might consider this a secondary consideration in the plan of a hospital. In reality it is not so. With some buildings—say, churches—elegance is the first concern; in hospitals it is utility, and utility, too, of a peculiar kind—air, light, and general accommodation being the prime objects to be aimed at in their construction. We do not say that an elegant exterior is out of place in a hospital, only that it should not be considered to the exclusion of matters of greater importance. The wards then, we would say, should be lofty and well aired, wide enough to have a row of beds along either wall with a space of 12ft. or 13ft. between them, a door at one end, a fireplace at the other, and windows extending from near the roof to near the floor, one between each bed on either side of the ward. The latter, for the sake of through ventilation, we consider a *sine quâ non*. All superfluous corners and projections should be avoided in planning a ward: they tend to prevent the circulation of air. The warming and the ventilation are after all the chief difficulties to be encountered in constructing a hospital. The means of effecting the latter end are classified into two groups, the (so-called) natural and the artificial, the former comprehending the doors, windows, and fireplaces, the latter any auxiliaries that it may be deemed advisable to adopt. The means of warming are most frequently, in our hospitals, open fireplaces, with in some cases hot air, either free or in pipes, and hot water. In no case should a ward be without a fireplace; it forms one of the best auxiliaries to ventilation which we possess, and the cheering influence of a blazing fire is too well known to require anything beyond a mere allusion. But in most cases something more is requisite, and we should for this purpose recommend hot-water pipes; hot air circulated in the same way is very dangerous, as the pipes are apt to become overheated. Hot air introduced into the ward in volume has a benumbing and stupifying effect, being also far too dry to be breathed by people suffering from inflammatory diseases of the lungs and air passages—in fact, we might say by any sick person. In winter it is better that the air should be slightly elevated in temperature before being admitted into the ward, but that is easily accomplished by making it pass over the hot-water pipes; anything beyond a slight increase of heat we consider prejudicial. It is also advisable that apertures for the ingress of air should be constructed, so that there shall be no excessive draught in one spot, for we have seen instances where, when the ward was crowded, half the patients were labouring under inflammation of the lungs from it having become necessary to keep the windows open even during inclement weather. The fact that such diseases are most numerous in warm weather, when alternations from heat to cold are least attended to, should enforce this precaution.

Dr. Oppert enters into full particulars as to ward furniture and accessories; but there we cannot follow him. Neither do we think that particulars as to the management of hospitals and dispensaries would greatly interest our readers, and these fill up a considerable portion of the former part of the volume. Turning to the second division, we find that Dr. Oppert gives plans and descriptions of most of the hospitals in Great Britain, but the latter are somewhat meagre, while the former we cannot transfer to our pages. Some of the most noticeable are the Blackburn Infirmary, on the mixed corridor and pavilion system, as yet not completed, but which, when finished, promises to be one of the best specimens of provincial hospitals in England. Again, in Bradford, although comparatively speaking a small town, there are two hospitals. One of them, devoted to diseases of the eye and ear, is described as being remarkable for the luxury of its fittings, these being something much superior to what are ordinarily encountered. The Chorlton Union Infirmary, already alluded to, is a most instructive building, and one which should be studied by all engaged in designing new hospitals; it combines the important qualities of cheapness and excellence. The Surrey County Hospital, at Guildford, is also one worthy of notice. It is not large, containing only 52 beds, but it is constructed on the most improved principles, Mr. Lower having been the architect. Everything is in accordance with the most advanced notions of sanitary science—fireproof floors, on Fox and Barrett's principle; lavatories, with Jennings's lift-up basins (by far the best); porcelain baths, by Rufford and Finch; and washing machinery, by Bradford; but, alas! instead of proper drainage it has a cesspool. The Herbert Hospital, at Woolwich, was for a long time the sole representative of the pavilion plan in this country, as it is even now one of the best of them; but when such erections as the new Leeds Infirmary, and what St. Thomas's, opposite the Houses of Parliament, promises to be, are making their appearance, we may hope that it will ere long be surpassed. We cannot follow Dr. Oppert in his account of all the more important English and foreign hospitals; suffice it to say that every page evinces care, and the compilation of such a work, illustrated with so many drawings, must have cost immense labour. Altogether, we are highly pleased with it—as at once the most comprehensive and the most recent English work on the subject. Probably a few additional details as to expenses would have added to its value as a work of reference, if not to its readable character.

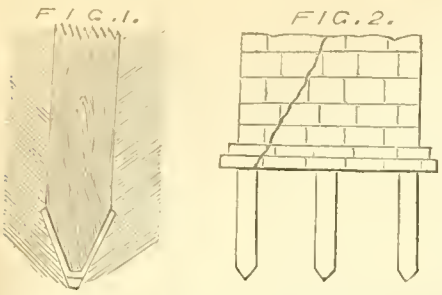
ELEMENTS OF ENGINEERING.

Foundations on Piles.

It is worthy of remark that many of our old bridges, including those over the Thames which settled so much as to permanently derange the whole structure, and render it necessary to replace them by more modern substitutes, were founded upon piles. In fact, that was the only method of foundation known to the early engineers and architects. The value of concrete was but little known and still less appreciated, and the system prevalent in those days was that of driving down by the force of impact timber piles and erecting the superstructure thereon. A well-known instance of this occurred in the building of St. Paul's. At a certain place the excavators came upon a "soft spot," and it was necessary to drive piles to the depth of 40ft. before firm ground could be arrived at. Under the present system all this expense would have been saved by the use of concrete. The foundations of every structure, whether erected in connection with railways or any branch of engineering and architecture, and the manner in which they are built, determine the safety of the superstructure. To trifle with this fundamental part of a building, to be careless in the execution and negligent in the working details, and worse than all, to be guilty of a false economy in the quantity or quality of the materials employed, is a ruinous speculation. A railway cutting may slip, an embankment sink, but such occurrences are comparatively easily repaired and at a moderate expense, but if once the foundations of a viaduct or bridge show signs of failing there is no cure for the evil but to pull it down and erect another in its place. The nature of the ground, the thickness of the various layers or small strata, and the depth of the firm ground ultimately arrived at, are the points to which attention should principally be directed in getting in foundations. There are two methods of piling generally used. The one, and the more ancient, consists in simply forcing down timber piles by repeated blows of an iron block called a monkey; the other, which is but of recent origin, consists in screwing iron piles into the earth by imparting a rotary motion to them by means of levers, which may be arranged in a variety of ways. Both of these methods are valuable and reliable under certain circumstances, but there are undoubted objections to their universal employment which we will examine a little in detail.

The object to be attained in driving down a series or row of piles upon which to erect a pier or abutment is to replace a naturally loose, movable foundation by an artificial one based upon a firm support, and upon which will rest the superstructure. It is, therefore, of the greatest importance that this artificial foundation should be immovably fixed, and that every individual member of it, that is, every separate pile, should penetrate into the solid ground. This last condition, which is the most essential, is one that is frequently not fulfilled. In driving a pile, let us say for the sake of example, through soft muddy earth, it goes down at first with considerable velocity, the effect of each blow being distinctly visible. After a short time the rapidity of descent diminishes more and more, until apparently no effect follows the succeeding blows, and at last the pile refuses to go down any farther. At this point it is commonly supposed that the pile is driven far enough and that solid ground is reached. Often this assumption is false, and serious results have happened from an ignorance of the error. Although the further descent of the pile may be arrested, it does not necessarily follow that a solid foundation is reached; for when a pile is of great length (say 30ft. or 40ft.), the lateral pressure of the surrounding strata in the vicinity of the point is something enormous. Manifestly, therefore, this pressure grips the point and sides of the pile like a vice, and by imparting an apparent immovability to it, produces the same effect as if it had really reached an impenetrable stratum. From the annexed cut it is clear the pile might be wedged up and retained immovable, although there was nothing beneath it, the surrounding lateral pressure having once reached a certain amount being sufficient to keep it fixed. The same cause gives rise to the vibrations which all have observed in piles

when superintending their driving; for the earth becoming more and more compressed at



last exerts its elastic force, and after yielding temporarily to the force of the blow recovers itself, and by its pressure against the pile imparts a vibratory and tremulous motion to it. Sufficient attention has never been bestowed upon one feature belonging to founding on piles which have been got down by driving, and which relates to the different manner in which the weight is brought upon the piles firstly and lastly. The weight which drives them down is sudden, rapid, violent, and conclusive; that which they have permanently to withstand is gradual, slow, gently applied, and uniformly distributed. Now it is a well-recognised mechanical fact, that a weight applied continuously and unremittingly will ultimately produce an effect that ten times the weight applied in the manner described will fail to accomplish. Let us apply this principle to the pile in the above situation. After the superstructure has been finished, which, so far as mere weight is concerned, may be twenty times that of the monkey employed in driving the pile, the continuity of its action begins to make itself felt; the lateral pressures commence to yield little by little, and the piles, together with their superincumbent load, sink slowly but appreciably. These remarks apply with still greater force to a number of piles driven close to one another; as, in consequence of the earth becoming more dense and compact as every succeeding pile is got down, it opposes a much greater resistance to penetration, and there is never the same depth attained with the last half of them as with those first driven.

The danger attending an irregularity in the depth to which a row of piles is driven is that when a settlement takes place, it is also irregular, and is sure to occasion unsightly cracks in the masonry, if it does nothing worse. Fig. 2 represents a portion of a pier founded upon piles, the left-hand corner one of which has sunk, and the result is the crack shown, which continues up throughout the entire height of the pier. If this crack be of such a size as to endanger the safety of the pier the only remedy is to pull it down; but if it be very slight, what is technically termed a "thread," fresh pointing will obliterate the mere appearance of it upon the face of the work. It is not a settlement, provided it be not an absolute sinking, that necessarily exposes a structure to danger of falling, but the irregularity of the settlement that works the evil. In an arch bridge, for example, if both abutments were to sink perfectly uniformly and regularly the result would be simply a lowering of the whole bridge, but if one were to settle and not the other the arch would be in danger of breaking. It is partly for this reason, combined, however, with other considerations equally important, that where the foundations of a proposed bridge are known to be bad, it is usually designed, in railway work at least, as a girder and not an arch, since the partial settlement of one abutment would produce no other effect upon the stability of the bridge than the lowering of one end of the girders, a circumstance of little consequence within certain limits. Not only in England, but in France, Italy, and on the continent generally, numerous failures have occurred from this cause, and in the supposition that because the pile would not drive any farther a solid base was attained. It will probably be remarked that the depth at which a real solid stratum is to be obtained might easily be ascertained by boring previously to commencing the pile driving. To a certain extent this remark is correct; and we regret to say that frequently the borings, which would reveal the true nature of the ground, are either altogether omitted, or conducted in a manner so careless and slovenly, that the results elicited from them are little better than worthless for all practical purposes. On the other hand, it must be admitted that it is very difficult to estimate what the exact character of the ground may be with respect to its solidity or bearing power from even the most accurate and most carefully-conducted borings, and it must, moreover, never be forgotten that all borings are peculiarly local, and that ground which appears hard and consolidated at one spot might and does present a totally opposite character at a distance of only a few feet. A convincing proof of the error of assuming that a solid foundation was obtained at a certain depth was afforded by the total failure of several bridges and viaducts on the Ligne du Midi, in France. These structures were founded upon piles in a soft substratum, driven down to a depth of 40ft., where it was confidently believed a hard bottom was arrived at. After the failure took place borings were made, and it was discovered that solid ground was not reached until a depth of nearly 80ft. had been sounded, thus fully demonstrating the reason of the sinking of the various works along the line. Although, so far, we have confined our attention to clayey and wet soils, yet the difficulty exists in others. To penetrate to any depth by driving into pure sand is a simple impossibility; one might as well attempt to drive a pile into rock. In fine gravel the obstacles are very nearly similar in character and amount; and, as a rule, the difficulty of penetrating gravel by direct impact may be said to vary inversely as the size of the particles. When the principle of impact fails we can, under certain considerations, have recourse to that of rotation, and the system of founding upon screw piles has met with much success, notably so in getting in foundations under water. Perhaps the most extensive scale upon which this principle has been carried out is that of the Bombay and Baroda line in India. The application, however, of this particular method applies chiefly to foundations under water, which we shall treat of at greater length in a subsequent impression.

PATENT OFFICE—NEW LIBRARY.

THE inadequate accommodation for readers and searchers till very lately furnished by a corridor in this building only 7ft. 6in. in width, known as the "sewer," necessitated the erection of some room where daylight should take the place of gaslight, and where every reader should not be compelled to rise to allow the passage of anyone entering or leaving the apartment, as was the case in the "sewer." A new story was therefore added to the building, and the public can now complain of no lack of accommodation or reasonable convenience. Mr. Pennethorne was the architect employed. The library, which was opened about the middle of May, is 40ft. 6in. long and 49ft. wide, including the bays at the sides, which contain the books, and which are about 10ft. in depth; the length is divided into four bays by iron columns supporting circular girders of wrought iron. Although utility rather than ornament has been considered, the room has been inexpensively but tastefully decorated in delicate shades of colour, relieved by a little gilding judiciously applied. On the frieze are seen the names of men eminent in science. Archimedes, Hero, Newton, Paul, Kay, Cort, Lee, Perkins, Franklin, Fulton, Miller, Hulls, Stephenson, Trevithick, Boulton, Watt, Bacon, Harrison, Hook, Graham, Arnold, Earnshaw, Wedgwood, Worcester, Papin, Savery, Newcomen, and Cawley are the men of mark who here find a humble, but not inappropriate sort of Walhalla. In the temple of Invention their names are inscribed where they are read by hundreds emulous of their fame, each seeking, according to his lights, to obtain a similar repute. Above the frieze the room is lighted by clerestory windows of rather a mean appearance, too cheap, in fact, to harmonise with the surroundings, which, however, are by no means gorgeous. The circular girders, and also the purlins, are white, the former relieved by delicate ornamentation in lilac, and also by gilt paterœ, the spandrels being coloured pale olive. The prevailing tint of the ceiling is light pink or salmon colour with stencilled patterns in red. The effect of the whole is good, but the extreme thinness of the side walls gives a somewhat temporary character to the structure. The floor is laid with common red and buff tiles. In addition to the reading room or library, the new story contains several private offices for the principal librarian and assistants, and is, besides, well furnished with accessory accommodation of lavatories, &c. The total cost, we understand, was between £14,000 and £15 000. The public having business at the Patent Office must appreciate the difference between the former inadequate arrangements and the cheerful and convenient apartment now placed at their disposal. In conclusion, we may add that the attendants are most obliging, not only knowing their duties, but, apparently, taking pleasure in performing them.

THE NEW LEEDS INFIRMARY.

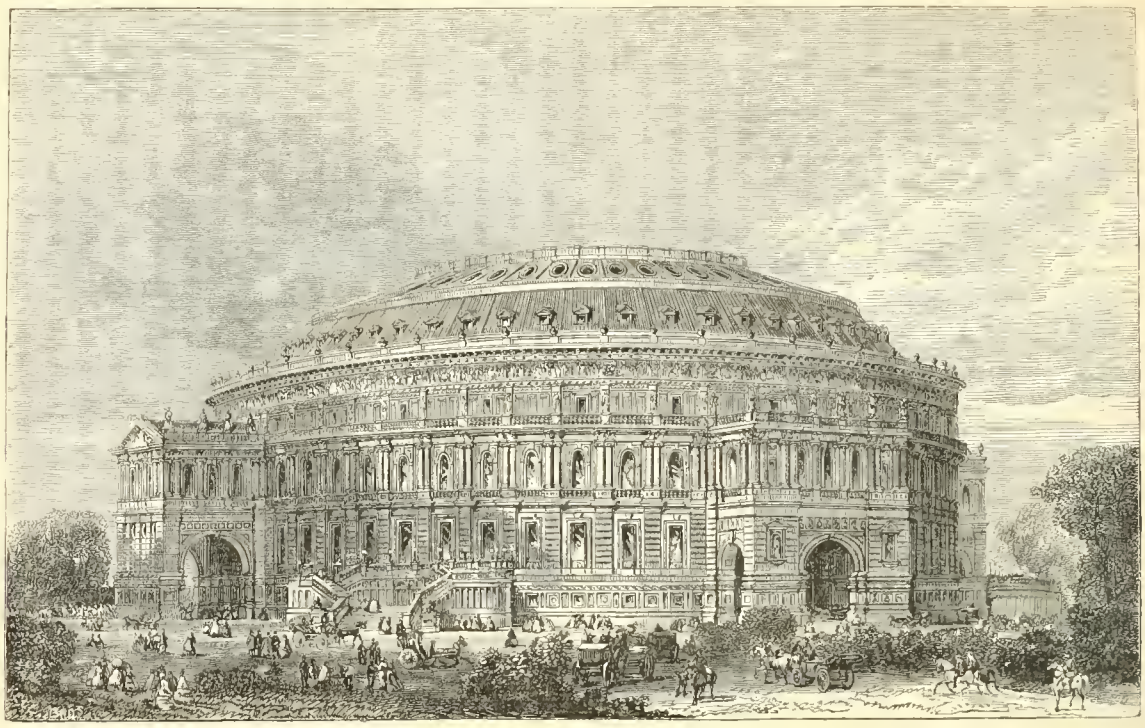
THE new Infirmary of Leeds, which we illustrate this week, is one of the most perfect works of its kind to be found in Europe, and fully sustains the well-earned reputation of Mr. G. Gilbert Scott, R.A., its architect. It was planned on the Pavilion system, after a very careful inspection of the most famous hospitals on the continent, and embodies all the most recent improvements. The pavilions are arranged after the manner of those at the celebrated Lariboisière hospital, excepting as regards their further ends, which differ from those of any existing hospital. The central front, from which the pavilions diverge, is placed in the middle, and from it the pavilions extend towards the front and back, and on the level of the latter. The entrance is in the centre of the southern end, which is the principal front. From the entrance hall a corridor runs back nearly as far as the central court, where it reaches the main staircase, by which the corridor or cloister of that court is reached. This surrounding corridor is repeated, however, on the entrance story, and from it are hydraulic lifts for patients to each pavilion. By this arrangement there is obtained a second ground story below the ground story of the hospital itself, which is devoted to the various departments of management and administration. The proportions and general scheme of works will be seen by reference to our illustrations. We may state that the great central hall is 150ft. long by 65ft. wide, and has a finely designed iron and glass roof; and the galleries are ten in number, varying from 125ft. to 110ft. in length, by 28ft. in width. The material for walling is pressed brick, with stone dressings, &c., where indispensable. The staircases throughout the building are of stone; the ceilings are finished with Parian cement, and the floors are of oak. The foundation stone of the Infirmary was laid in March, 1864; and, as our readers are aware, the National Exhibition of Fine Arts, to take place in Leeds next year, will be held in this building, which is in every way admirably adapted for the purpose. The wards have double open stoves in the centre, the smoke being carried off by ascending flues.

THE HALL OF ARTS AND SCIENCES, SOUTH KENSINGTON.

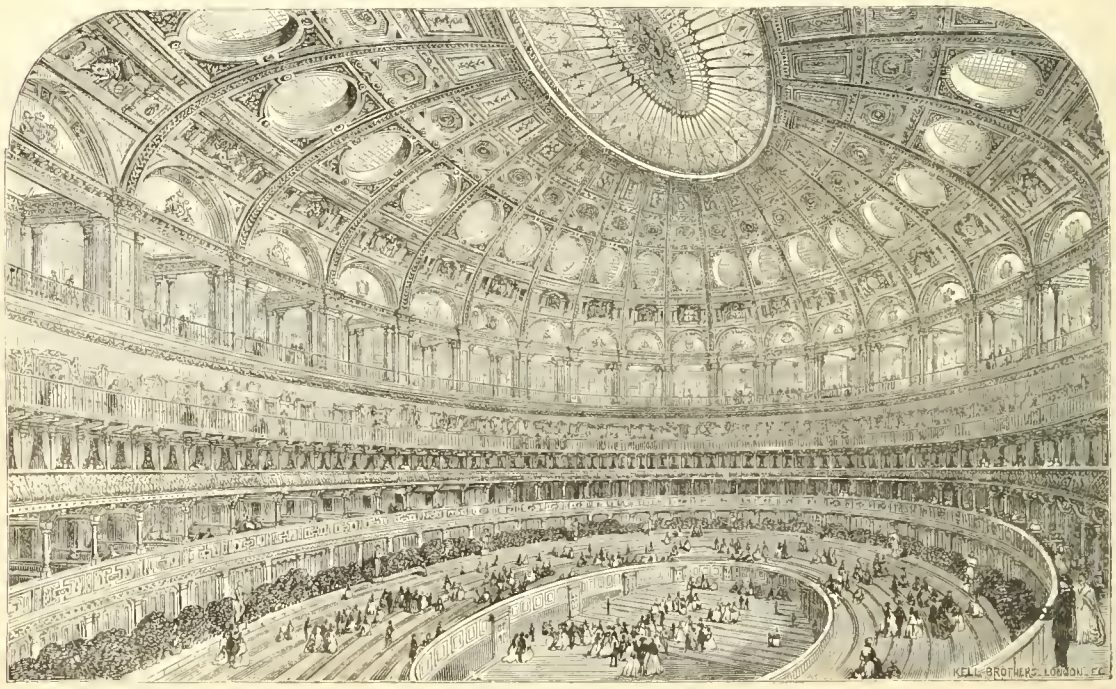
THE illustrations (p. 458) show exterior and interior views of the Hall of Arts and Sciences about to be erected in honour of Prince Albert at South Kensington, which have been officially forwarded to us. The design for the building is by the late Colonel Fowke, who has been assisted by Mr. G. Townroe, artist. As we gave a description of the building on May 24 last, and during the same week the foundation stone was laid by the Queen, there is no necessity to enlarge on it now. There is, however, much to be said about the building, its origin, purposes, and architectural character, and we shall probably soon have to recur to the subject.

In a letter to the *Pall Mall Gazette*, Mr. Dion Boucicault, the well known theatrical manager and dramatic author, writes as follows:—"Having

THE HALL OF ARTS AND SCIENCES, SOUTH KENSINGTON.



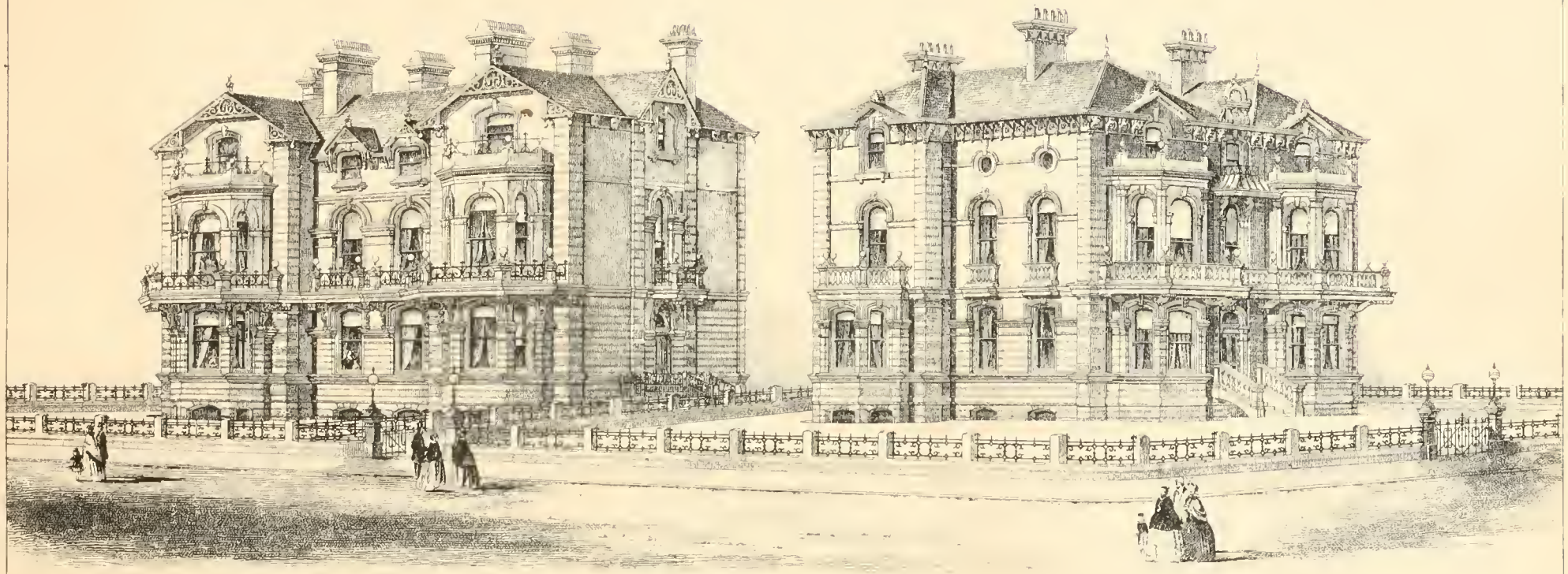
VIEW FROM KENSINGTON ROAD.

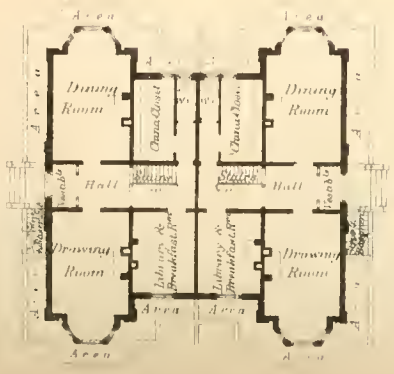


VIEW OF THE INTERIOR.

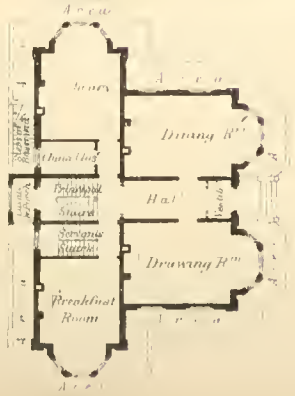
studied with much interest the plans of the Royal Albert Hall, to which I am a subscriber, it appears to me that, however admirably adapted it may be for exhibitions, its proportions must render it unfit for concerts or for public speaking. Some idea of its vast area may be formed by comparing it with other buildings. It will be eleven times the size of Drury-lane Theatre, or eight ties that of Westminster Hall. A church of ordinary dimensions might stand on its floor; its steeple would not reach the ceiling, which is to be 138ft. on the clear in height. The human voice cannot fill such a space. The largest auditorium known is that of the Academy of Music in Philadelphia; it contains about 750,000 cubic feet. A theatre, however, possesses an advantage over every other kind of public hall in this respect; the stage is colder than the front of the house, therefore a draught of air is constantly maintained from the scene towards the audience,—a fact of which the public are very sensible when the curtain is raised, and a rush of cold air is felt coming from the stage. This current carries the actor's voice with it. But with all this aid the auditorium of the Philadelphia theatre was found so vast, that when Mr. Charles Matthews appeared there ten years ago—he was, I think, one of the first to test its acoustic qualities] he told the audience that 'their splendid theatre was only wanting in two things, each actor should be provided with a speaking trumpet, and every spectator should bring a telescope.' But if this were true of that area what will be said of our new hall, which will be six times its size? . . . . . But there is another alarming feature in this enterprise when considered from a managerial point of view. The hall will cost some £200,000, the bulk of which amount is to be raised by the sale in perpetuity of the boxes and stalls. There are 43 grand tier, and 86 second tier boxes. A large portion of these has been already subscribed for; their sale will realise £86,000; it will be necessary to sell 1,000 pit stalls to reach the amount required to meet the cost of building, decoration, and furniture—that is, to realise £186,000. This leaves 300 stalls unsold, these being, of course the worst in the hall.' Now, sir, I approach this place as the manager of a concert—of a magnificent concert of course—and I find that all the grand tier is sold, all the second tier is sold, 1,000 out of 1,300 stalls are gone, and I am offered a few poor seats in the corners of the area, together with two galleries. If I should be demented enough to give my concert under such conditions, how does it fare with me? The boxholders and stallholders are entitled to sell their holdings, so they send all their choice seats to Mr. Mitchell or to Messrs. Chappell, and Bond-street undersells me and oversells me. How, then, is it possible to give any but gratuitous entertainments in a building so constituted? But things for which we pay nothing are usually worth nothing."

SOUTH EAST VIEW





GROUND PLAN.



GROUND PLAN

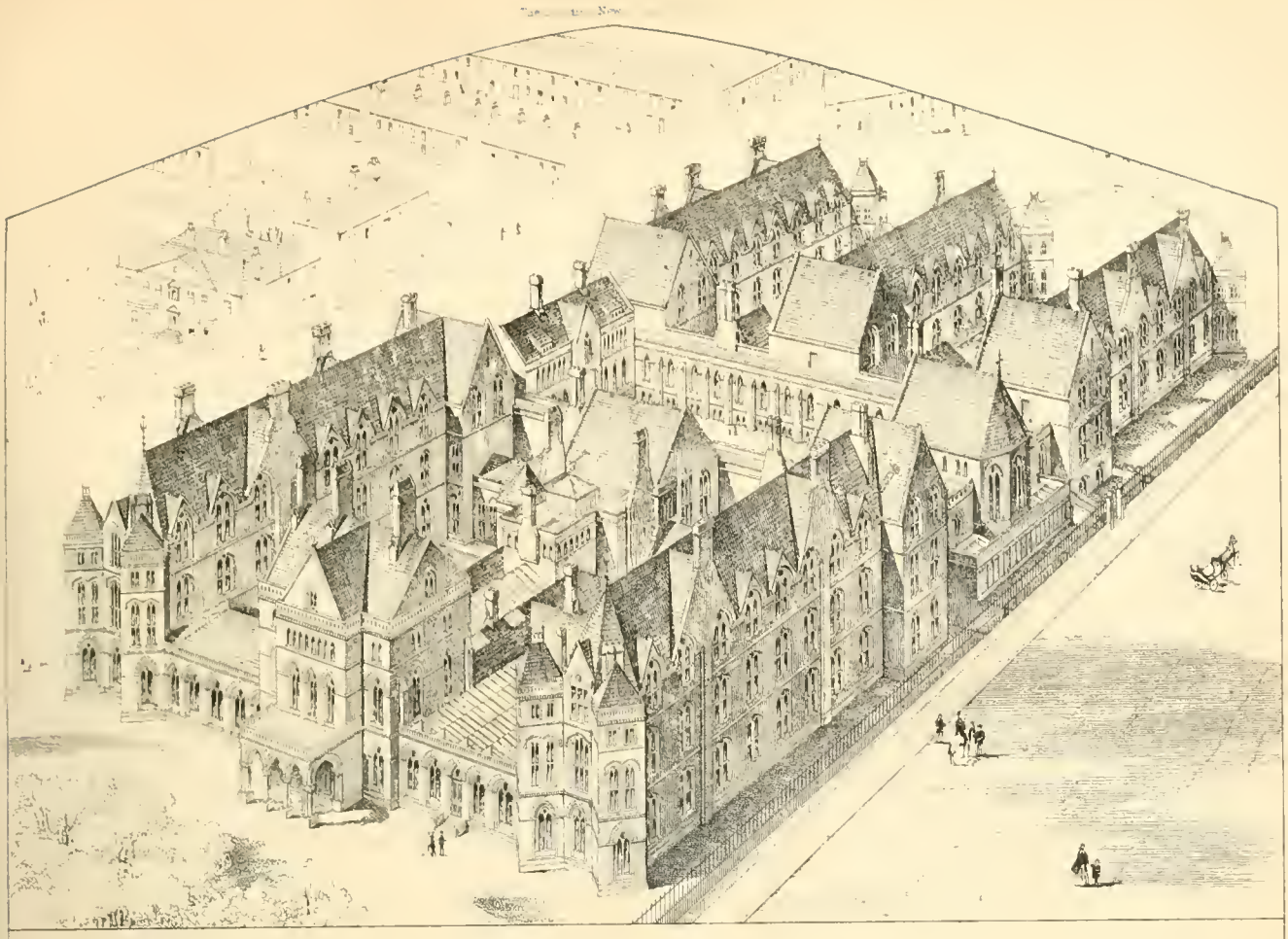
DESIGN FOR

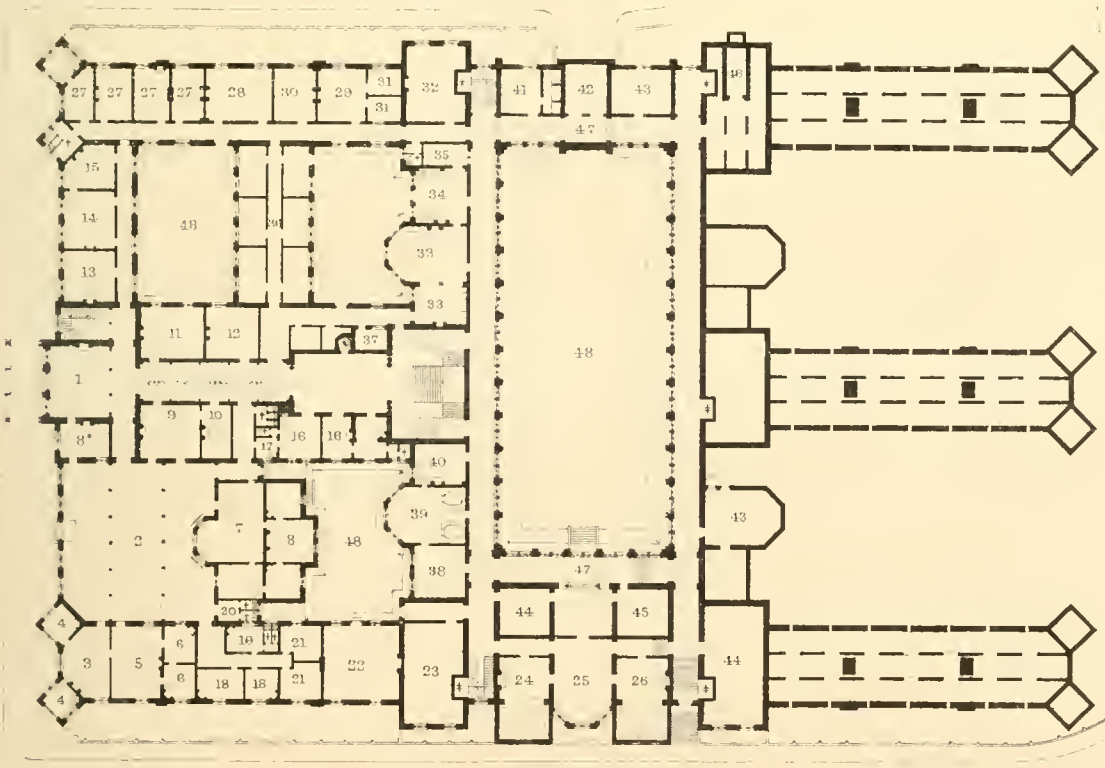
DETACHED AND SEMI-DETACHED VILLAS

Great Yarmouth.

J. S. DODD, ARCHITECT

Scale





GROUND PLAN.

Reference.

1 Entrance Hall 2 Out Patients Waiting Room 3 Physician's Room. 4 Private Room 5 Surgeon's Room 6. Surgeons Private Rm 7. Dispensary. 8 Laboratory with Cellar under 8* Porter's Room 9 Weekly Board Room 10. Secretarys Room 11 Library 12 Students Waiting Room 13 Assistants Sitting Room 14 House Surgeon's Sitting Room. 15 House Surgeons Bed Room. 16 Accident Rooms 17. Nurses Room 18 Dressing Room 19 Womens retiring Room 20. Men's retiring Room. 21 Baths 22 Mattress Room 23 Linen 24 Museum 25 Dead House 26. Post Mortem Room 27 Bed Rooms for Assistants. 28 Common Dining Room 29. Matrons Sitting Room. 30. Matrons Bed Room. 31. Matrons Stores. 32. Servants Hall 33 Kitchen 34 Scullery 35 Stores 36 Pantry & Larders 37 Offices. 38 Flour 39. Bake House 40 Bread. 41. Beer & Wine. 42. Wood 43 Cellars 44. Coals 45 Engine House 46 Ice House 47. Corridor 48 Open Court † Water Closet ‡ Lift

SCALE OF 10 0 10 20 30 40 50 100 150 200 FEET

LEEDS INFIRMARY, — BIRD'S EYE VIEW. — G. G. SCOTT, ARCHT

THE NOTTINGHAM COMPETITION.

A COMPETITION in which the instructions are carefully drawn up, which expresses the problem really to be solved, and which is fairly decided, cannot fail to be advantageous to all parties. It brings a great many minds to bear on the question and would generally result in a satisfactory building; whilst in most cases the unsuccessful architects would be satisfied if they saw themselves fairly beaten and the instructions fully carried out by the successful competitor. But to obtain this result it is essential that the instructions should express exactly what is wanted as to requirements and cost, and that the decision should be made by those who are thoroughly acquainted with architecture and building. Without wishing to run down the taste of committees we most unhesitatingly say that it is impossible for men who have not given such subjects close attention to tell what will be the effect of a building from the drawings, and much less what will be the cost. Unfortunately, the instructions given to competitors do not often express what is wanted, and generally the premiums are awarded and the decisions arrived at by those who are altogether unacquainted with building; and who, perhaps, have friends competing, and who would be naturally pleased if their designs were chosen. The result is that the great body of the architectural profession leave competitions alone, and those only as a rule compete who have what is called "local interest," the number sometimes being made up with pupils, assistants, and journeymen carpenters. Those architects who do compete find it is of no use to send an honest, truthful design showing the best way to meet the instructions, and then comes all the deception of coloured perspectives, deep shadows, &c., giving a totally wrong idea of the intended building. "It is easy to cut it down in the working drawing," the competitor would say to anyone who may ask a question as to the cost. Competitions managed in this way must result in dissatisfaction to the public and to architects; and worse, they almost force the latter to vie with one another in deceiving and telling falsehoods on paper. As to the local interest, when competitors' names are supposed to be altogether unknown, such dishonesty is apparent. The late competition at Nottingham for a new Mechanics' Institute is an instructive example, to which many of the foregoing remarks will apply. The committee issued instructions in April last for a building to contain a large hall, lecture-hall, library, reading-room, class rooms, &c., the sizes of which were all given; the building to be of stone and brick, and not to be stuccoed or cemented, and all to be done for £8,000. The bulk of the building is so great that it is obvious to anyone acquainted with building and who reads the instructions, that it would have to be of the very plainest description. In answer to the advertisement of the committee, four-and-twenty designs were sent in, and in a week or two the local papers declared not only the result but how it was arrived at. "The trustees and committee having met," says the *Nottingham Journal*, "it was decided that each member should write on a slip of paper the motto of the set of plans which he considered entitled to a prize. This having been done it was found that five competitors only had been selected, namely 'Dum Spiro Spero,' 'Hopeful,' 'Resurgam,' 'Trefoil,' and 'Utilitas.' On a second voting taking place the plans of 'Resurgam' had a considerable majority, and they were therefore entitled to the first premium; the second was awarded to 'Trefoil,' and the third to 'Hopeful.'" All five of these competitors are Nottingham gentlemen.

We have just carefully inspected all the drawings sent in. The one to which the first premium is awarded (Mr. Simpson's) is, as he says in his report, "after the style of the library of St. Mark's, at Venice, which has been adopted in some modern buildings." Yes, so it has, in some of the club-houses in Pall Mall, but they did not cube at 3d. a foot, which, we are told on reliable authority, is the basis on which Mr. Simpson has formed his estimate. We are at a loss to know how the porch with its six columns and double row of enriched windows and pilasters, with the ornamental clock tower, together with the large buildings behind, can be constructed for £8,000. Truly they can do things cheaply in Nottingham, except elections. In his plan Mr. Simpson places the great hall in front, with the class rooms on either side, and the lecture room, library, &c., or mechanics' institute proper, behind. We should think the arrangement of the class rooms rather scattered and inconvenient, and also object to the small space afforded on the ground floor of the hall compared with the galleries, which are carried over the class rooms on each side. The gallery of a hall, too, forms a very noisy ceiling to a class room.

The second premiated design (Messrs. Clarke and Son) is also a Venetian palace—the same richness and disregard of cost, but no tower. This would, perhaps, cube at 3½d.

The third premiated design is Mr. Sutton's. The perspective view shows a colonnade in front of four columns, the whole height of the building, the rest being comparatively plain, and, as the author tells us that these columns are to be left for some future effort, there might, perhaps, be a possibility of carrying out this design for something like the money. The interior looks very good, but here, again, we are afraid of the cost. Perhaps, however, the ceiling is to be made in carton pierre, which we were once gravely told by an architect was cheaper the more ornamental it was made.

With regard to the unpremiated designs there are several which must be thrown on one side as mere rubbish, as they are bad in drawing, bad in design, and exhibit no trace of thought. The mediæval school is represented by two or three designs which look like pupils' work. One has two huge chimney stacks for predominating features in the front elevation, with a porch between; another a colossal tower, which looks like a feeble imitation of Mr. Street, at St. James the Less, Westminster; and a third a tower borrowed from Northern Germany in the centre of a gable, which is very ugly. These plans are more like a joke than a real attempt to grapple with the difficulties presented. The elevation by "Quis Cantabis," though hardly quite suitable to the purpose, show some good feeling. "Fidelity" has sent in two very nicely coloured perspectives, but unfortunately there is none of the appearance of a mechanics' institution about them. The exterior looks more like a Roman Catholic church, and the interior (which is heavy and ugly) partakes of the same ecclesiastical character. It would be needless and tiresome to go through all the merits and demerits of the other designs, but taking them altogether we cannot regard the competition as satisfactory. Some of those who have been thrown out have evidently lost their chance through their honest endeavour to carry out the instructions of the committee, and we have yet to see in what manner the design chosen will be carried out for £8,000, or anything like that sum. We cannot wonder at the decision of the committee. They are assured by a respectable builder's estimate in each case procured by the competing architect that it can be carried out, and they, of course, choose what they consider the best design.

TRADES' UNIONS' COMMISSION.

ACCORDING to Mr. Mault, whose evidence we continue, among the rules of the Manchester bricklayers' trade that have been agreed to between masters and men under the influence of pressure is one against the use of moulded bricks on any work—having the intention of giving work to the bricklayers to cut the brick instead of its being moulded while in a soft state. As regarded the two-hand rule among bricklayers, he confessed that in his own business he never met with any case in which the rule was actually in force, though he had often heard bricklayers speak about it. Since the evidence was published of one or two of the witnesses he had been informed by a gentleman at Ashton that he, just to test the rule, asked one of his bricklayers to use both his hands, and the man at once told him that he could not, because if he did he would be fined by his club. A man in the employment of a contractor near Warrington was fined 10s. two years ago for using two hands to set a brick. He mentioned that merely to show that there is in some parts of the country an opinion among the men themselves that such a rule exists, and that consequently, so far as it goes, it prevents the men from working as they otherwise would. In some cases this was the proper way of working. For instance, in thick work, after the two faces have been got up, and the whole of the inside has to be simply filled in, if a barrow of mortar were tipped down and spread about and the men were to pick up bricks as fast as they could with both hands, and rub them well in, the work would be just as well done; in fact, witness thought better done than if they were to put them in one by one. The same thing applied to grouted work also. Another point under the same head was that in many parts of the country the labourers have a "very foolish" trade rule, that bricks shall not be taken to any work in anything except a hod; that however easy it might be to wheel the bricks in a wheelbarrow, the bricks shall not be packed in a barrow. A case of this kind caused a strike at Birmingham. A master was doing some heavy work at the canal side; he put some planks across from the boat and set some labourers to wheel the bricks from the boat right down to the place where they were to be used, but the labourers struck against it, and insisted that the bricks must all be unloaded in the ordinary way and stacked on the canal side, and then carried by hod down to the works.

Witness's next point was, that the unions, being secret, irresponsible organisations, their actions are characterised by all the evils usually, and almost inevitably, accompanying the exercise of secret irresponsible power. In the first place, they levy illegal fines upon both masters and workmen. As regards the latter, witness remarked that their own rules openly showed that fines were imposed. As to the masters, several cases were mentioned where masters have been fined in various sums for employing a joiner, instead of a bricklayer, to cut some brickwork, and such like. Again, the Bricklayers' Union fined a labourer who was seen to wedge up a lintel with some pieces of slate, and afterwards point the same, the entire operation occupying not more than five minutes. They, as masters, had an impression that there is an unwritten law among trades' unionists, as well as a written law, but, of course, they had no proof that it was so. Referring to another subject, he stated that a very common way of interfering with non union men was by injuring, or purloining, or hiding, their tools. It was a mode of persuasion resorted to to induce a man to join the union, or to leave work where he is employed. Mr. Mault's next point was that trades' unions outlaw men, by putting them into a black ist, or otherwise preventing them from obtaining a living. Many of the societies have a rule forbidding their members to work with expelled members, as, for example, the Derby plasterers, who impose a fine in such a case. He had no doubt that the black list published by the Masons' Union, contained the names of nearly 3,000 men, who, as far as the Masons' Society is concerned, are to be prevented from earning their living until they have purged themselves of the offence for which they were put into that document, and the purging usually consists in the payment of a fine. Some of the names in the list have been in every edition of it published since 1841. So that these men have actually been struggling ever since to obtain a subsistence for themselves against what witness termed the persecution of the society. He denied that the list published by the Masters' Union was a black list. It differed in several respects from the men's list. All that the masters bound themselves to was not to employ those men who have struck against masters in the same town, or in an adjoining town, in reference to any question, but immediately that the strike is over the lists are at once done away with. By going to any other dis-

trict where the Masters' Union did not exist, the men who were on the list would of course be free to get employment. Witness's next point was that trades' unions what they call "shelve" masters, and otherwise injure their trade. The word "shelve" is intended to mean putting the master upon the shelf, and preventing him from carrying on his work. The "shelving" amounts to this, "that no unionist shall work for a particular master, and at the same time the work is picqueted, and non-unionists are kept off from it as much as possible." Numerous cases were given by way of illustration, and it was stated that other witnesses would be able to give specific facts of ruin caused to masters by being "shelved." Witness had repeatedly heard master builders express their opinion, that on account of the way in which trades' unions domineer over people who ought to be masters, the trade was not worth carrying on; that the whole of the profits of the trade were absorbed in the vain endeavour to carry on work in a proper manner.

DESIGN FOR DETACHED AND SEMI-DETACHED VILLAS.

THE corporation of Great Yarmouth a short time since invited competitions for terraces and villas. We have devoted one page of our illustrations this week to designs for detached and semi-detached villas, the premiums for which were awarded to Mr. J. S. Dodd, of Reading. The detached villa faces the sea. The north and south fronts are alike, each room commands a good view of the sea. The semi-detached villas have similar elevations, north and south; each room also has a good view of the sea. The entrances are placed at the ends, for privacy and to make the best of the frontage. The cost of the villas is £1,500 for the detached, and £900 each for the semi-detached. The walls to be built of brick, mouldings, and compo; the roofs to be covered with slates. We hope to give illustrations of the terraces, for which Mr. Bottle received the first premium this day fortnight.

CANADIAN ARCHITECTS.

IT affords us pleasure to note that out of three premiums of one thousand dollars each, offered for the best architectural designs for the proposed state capital of Albany, two have been awarded to Canadian architects—the highly favoured gentlemen being Augustus Laver, Esq., the architect for the Departmental buildings, and Thomas Fuller, Esq., the architect for the Parliament buildings, Ottawa. This speaks well for the liberality of our neighbours across the border, who, sufficiently freed from the frequent prejudice against British productions, and also the undue pressure sometimes brought to bear in such cases by competitors and their friends, have placed in the highest position the well-merited works of art submitted to the commissioners for selection by Messrs. Laver and Fuller. If we remember correctly, this last success of Mr. Laver will make the third legislative building obtained by him in open competition, viz., Ottawa, Sidney (Australia), and Albany. The nominal cost estimated for the latter building is freely spoken of as from twelve to fifteen millions of dollars. An appropriation was made during the last sitting of the State legislature for the commencement of this vast structure, which it is stated will equal, if not exceed, in grandeur of effect and architectural beauty, any building ever erected in this continent.—*The Canadian Freeman*, June 6.

THE CONSERVATIVE LAND SOCIETY.

THE fifty-ninth quarterly report of the executive committee, read at the meeting of the members held at the offices on Tuesday, the 2nd inst., states that the receipts for the Midsummer quarter were £28,391, and for the three quarters £87,038, the grand total to Midsummer being £1,070,659. The total withdrawals since the formation of the society (1852) to Midsummer, 1867, are £302,066. The total sale of land for the same period is £518,508. The reserve fund to Midsummer, 1867, is £13,348. The following estates have been allotted:—Malvern Link (West Worcestershire), and the South London estate, Putney, No. 5 (East Surrey). The next allotment will be on July 26, when the second portion of the East London estate (Forest Gate) will be offered. The proximity to the station and to Wanstead flats of this building property, and its adaptation for houses to suit all classes of the community, have rendered the East London estate a popular locality, as meeting the constantly increasing demand for dwelling-houses in the eastern suburbs. The report concludes by reminding the buyers of land that as July 20 will be the last day for sending in claims for county votes it is requested that the purchasers on the society's estates in twenty-six counties, if not already on the register for their respective counties, will communicate with the solicitor, in order that the freehold franchise may be secured to them, and each property duly registered, the allottees of the Conservative Land Society having this advantage—their electoral privileges are supported in the registration courts free of charge. Amongst those present at the meeting were Viscount Ranelagh (Chairman), Colonel Brownlow Knox, M.P., Hon. and Rev. W. Talbot, Colonel Meyrick, J. C. Cobbold, Esq., M.P., J. Goodson, Esq., M.P., Messrs. H. W. Currie, T. K. Holmes, C. E. Newcomen, N. Winstanley, J. Wylson, H. Smith, P. Edsall, W. Rentmore, J. H. Thomson, — Cross, — Chappell, &c., &c., &c.

PURE WATER.

THE facts brought to light by the observations and researches of our most eminent medical authorities furnish conclusive proof of the necessity of filtering the water we use for drinking and for other domestic purposes. Professor Hannon, of Brussels, has lately shown that the spores of some species of fresh water algæ, at the period of their fructification, are capable of producing intermittent fever; and it is a fact fully established by chemical science that other diseases to which the human frame is liable have their origin in the vegetable organisms which abound in water. The tenacity of these spores is said to be so great that even the temperature of boiling water is insufficient to destroy their vitality. The only really effective disinfectant and purifier is filtration; and it is generally acknowledged that the carbon filter manufactured by the Silicated Carbon Filter Company, Battersea, is the best for the purpose. Mere straining of water through animal charcoal is not sufficient to stop the accumulation of vegetable matter, but the principle of the Silicated Carbon Filter is the employment of a porous slab cemented into a filtering vessel, an arrangement which effectually prevents the passage of any extraneous matter. The main service filter can be adapted to the supply pipe of a brewery, distillery, or manufactory of any description, and thus purify all the water before it enters the building. These filters are the only ones used in the General Post Office, by the Admiralty, and by the Metropolitan Free Drinking Fountains' Association.

PROPOSED ENLARGEMENT OF THE HOUSE OF COMMONS' CHAMBER.

REGINALD PALGRAVE has written a letter on the present limited capacity of the House of Commons, and pointed out how difficult it is to increase its size. He says there are only two ways of doing it, either by extending on the west side, the side parallel to Westminster Hall, or on the north end, behind the peoples' chair. He then shows the many difficulties in the way of either of these plans, and goes on to say:—"The most satisfactory way, I venture to suggest, is that the Commons should return to their ancient place of meeting, the site of St. Stephen's Chapel; the entrance-hall that bears the saint's name, and now serves as a passage. The attractive features of the scheme shall first be briefly indicated. Historic associations, noblest among England's reminiscences, belong to the former site of the House of Commons. This site also offers not less certain advantages in the shape of material convenience, and an opportunity for obtaining a suitable amount of exterual grandeur. The assembly-room of the House of Commons is at present entirely submerged in the palace. This would not be the case if the chamber occupied the area of St. Stephen's Hall. A porch and lobby, devoted to public use, at the western end, would project into Old Palace-yard. This might be a structure both of utility and dignity; it would make conspicuous upon the outer façade one of the main objects of the building—namely, the meeting place of the House of Commons. The public lobby would communicate also directly, as in former times, with Westminster Hall, and the plan on which this palace is arranged seems to lend itself to the adoption of St. Stephen's Hall as the Commons' Chamber. The cloisters that flank the northern side of St. Stephen's Hall compose picturesque galleries, ready for use, as waiting rooms and means of access to the members. The great octagonal hall in the centre of the palace would then touch the eastern end of the chamber, and might serve, without alteration, as the members' lobby; around, might be grouped the journal, and other offices, and it is easy to point out the many purposes to which the present Commons' chamber might be converted. It might be adapted into audience rooms for the members, and into a general reading-room for the reception of the parliamentary papers, debates, and works of common reference; newspaper perusal or letter writing might take place here, much to the relief of the overcrowded library. Difficulties, undoubtedly, would attend this transposition of the Commons' chamber; the expense would be heavy. Another means of access to the committee-rooms and to the House of Lords must be found; and last, not least, in width the hall must be increased, by, perhaps, 30ft.; and this extension is possible only on the south side, into a court now devoted to the Parliamentary system of furnaces and boilers. The narrowness of St. Stephen's Hall is the main structural difficulty. This might, in a measure, be obviated by adoption of division lobbies across each end of the chamber. But I must not make longer a letter kindly permitted to be long. The idea of the return of the House of Commons to its ancient site in the Palace at Westminster may seem fanciful. But I think that I have suggested sufficient motives for such an idea, as, at least, may justify the fancy." The Select Committee on the arrangement of the House of Commons met on Tuesday, and examined Mr. Barry, architect of the New Palace of Westminster. The *Owl* says that suggestions for enlarging the interior of the chamber were offered by Lord Elcho and Mr. Lanyon, and Mr. Barry was instructed to consider how far they could be made practicable, and to report to the Committee at its next meeting, which will be in about ten days. It is proposed to make the House oval instead of square; to place the Treasury bench and the front Opposition bench in the middle of the chamber; to set back the Speaker's chair; and to throw into the body of the chamber the seats now reserved for peers and distinguished "strangers."

ROYAL INSTITUTE OF THE ARCHITECTS OF IRELAND.

THE closing meeting of the session 1866-7 was held on Thursday evening week, when there was a goodly attendance of members and friends, amongst whom were:—Fellows: J. H. Owen, M.A., T. Drew, S. Symes, J. E. Rogers, J. M'Curdy, W. J. Welland, J. J. M'Carthy, R.H., W. Fogerty, F. Franklin, F. V. Clarendon, E. T. Owen, C. Geoghegan, C. D. Astley. Students: W. M'D. Bermingham, W. Sterling, R. S. Swan, C. H. Brien, assistant secretary. Associates: E. P. Gribbon, B. T. Patterson, T. Earley, W. Doolin, W. Telford. Members of Association for Architectural Study: G. C. Henderson, J. S. Robinson, W. Mooney, W. Daniell, W. Turner.

Mr. Parke Neville, C.E., M.R.I.A., occupied the chair. The following gentlemen were balloted for, and the scrutineers announced them duly elected:—As Fellows: Mr. Joseph Maguire, 116, Grafton-street, Dublin; and Mr. Francis Stirratt, 3, Donegall-place buildings, Belfast. As Associate: Mr. Robert Tyndall Pope, 13, South Frederick-street, Dublin. A touching congratulatory address was then read and presented to J. H. Owen, Esq., M.A., honorary secretary of the Royal Institute of Architects in Ireland, for the admirable manner in which he had built up the interests of the society. Mr. Owen replied in an equally touching speech. We in England beg to congratulate both the honorary secretary and the Irish Institute on their progress, and heartily wish them a long continuance of the same.

A correspondent suggests that a very superior glue may be made by dissolving three parts of india-rubber in thirty-four parts of naphtha. Heat and agitation will be required to readily effect the solution. When the rubber is completely dissolved add sixty-four parts of finely powdered shellac, which must also be heated in the mixture until all is dissolved. This mixture may be obtained in sheets like glue, by pouring it, when hot, upon plates of metal where it will harden. When required for use it may be simply heated in a pot till soft. Two pieces of wood or leather joined together with this glue can scarcely be sundered without a fracture or tearing of the parts.

PARIS INTERNATIONAL EXHIBITION.

THE list of awards made to British exhibitors comprises 88 gold medals, 325 silver medals, 400 bronze medals, and 270 honourable mentions. The following, among other names, appear in the list:—

GOLD MEDALS.

GROUP 1.—FINE ARTS.

Class 4—Grand prize, A. Waterhouse.

GROUP 2.

Class 8—Application of drawing and modelling to the common arts: Gold medal, Department of Science and Art, South Kensington.

Class 12—Mathematical instruments and apparatus for teaching science: Gold medals, Dallmeyer, T. Ross, R. and J. Beck, and Chance Brothers.

GROUP 3.

Classes 14 and 15—Fancy furniture, upholstery, and decoration work: Gold medals, Wright and Mansfield, and Owen Jones, decorative architect.

Class 17—Porcelain, earthenware, and other fancy pottery: Gold medals, Minton and Co. and W. Copeland and Sons.

Class 18—Carpets, tapestry, and other stuffs for furniture: Gold medals, British India, J. Templeton, and Brinton and Lewis.

Class 24—Apparatus and processes for heating and lighting: Gold medal, Winfield and Co.

GROUP 6.

Class 53—Machines and apparatus in general: Gold medal, Merryweather and Sons.

Class 54—Machine tools: Grand prize, Whitworth and Co.; Gold medals, Sharp, Stewart, and Co. and Shepherd, Hill, and Co.

Class 63—Railway apparatus: Gold medals, Kitson and Co., R. Stephenson and Co., and Saxby and Farmer.

Class 64—Telegraphic apparatus and processes: Grand prize, Anglo-American and Transatlantic Cable Company; Gold medals, W. Hooper and W. T. Henley.

Class 65—Civil engineering, public works, and architecture; Gold medals, Chance Brothers, Minton and Co.

SILVER MEDALS.

Class 8—Application of drawing and modelling to the common arts: Lord Romilly, Society of Arts, J. S. and A. B. Wyon.

Class 12—Mathematical instruments and apparatus for teaching science: Elliott, Ladd.

Classes 14 and 15—Furniture and upholstery and decorative work: Dyer and Watts, Gillow, Holland, Trollope.

Class 16—Flint and other glass, stained glass: Dobson, Hardman, Powell.

Class 17—Porcelain, earthenware, and other fancy pottery: Brownfield, Doulton, Wedgwood.

Class 18—Carpets, tapestry, and furniture stuffs: Ackroyd, Henderson, Lapworth, Leather Cloth Company, Morton, Nairn, Patent Woollen Cloth, Wilkinson, Willis.

Class 19—Paperhangings: Cuthbertson.

Class 24—Apparatus and processes for heating and lighting: Benham, Bowser.

Class 37—Portable arms: Greener, Lang, Reilly, Small Arms Company, Whitworth.

Class 38—Travelling and camp equipages: Cave, Wilkes.

Class 52—Prime movers, boilers, and engines specially adapted to the requirements of the Exhibition: B. Donkin, Walker Fox, Galloway, Hargreaves Hicks, Porter.

Class 53—Machines and apparatus in general: Marshall Carrett, Donkin, Eades, Glover and Co., S. Glover, Gwynne, C. Lloyd, Pooley and Sons, Reading Company, Shand and Mason, Tangye, Weston.

Class 54—Machine tools: D. Davies, De Bergen, Walker, Tannett, Thwaites and Carbutt, Worssam.

Class 65—Civil engineering, public works, and architecture: Blanchard, Blashfield, Chubb, C. V. Cole, J. Cliff and Son, Doulton, Hobbs, Jennings, Maw and Co., Peake, Pulham, White Brothers.

BRONZE MEDALS.

Class 8—Application of drawing and modelling to the Common Arts: Aldridge (Kensington Museum), Marcus, Ward, Thomas Martin, N. K. Newman, Ortner and Houle, Rooke, Sparkes.

Class 9—Photographic proofs and apparatus: Blanchard, Briggs, N.K., Cherrill, Joubert, Macfarlane, Mayall, Meagher, T. Ross, Tod, Vernon Heath, White, Wortly.

Classes 14 and 15—Furniture, upholstery, and decorative work: Bettridge, Clayton and Bell, Cole, Coleman, Heal, Hunter, Ingledew, Jackson (Rathbone-place), Lamb, Macdonald, Peyton, Rowley, Taylor, Wedgwood, Wertheimer, Wyatt.

Class 16—Flint and other glass, stained glass: Aire and Calder, Edmundson, J. Green, Heaton, Pellatt, Ward and Hughes.

Class 17—Porcelain, earthenware, and other fancy pottery: Gray, Jones, Pinder, Price, Primavesi.

Class 18—Carpets, tapestry, and furniture stuffs: Britannia Rubber Company, Deed, Firth, Humphries Kohntamm, Southwell, Harry Tayler, Templeton, Treloar, Woodward and Grosvenor, Palmer Woodward.

Class 19—Paperhangings: W. Cooke, Jeffrey, Marsden, I. Woollams, J. Woollams.

Class 24—Apparatus and processes for heating and lighting:—Adams, Brown and Green, Leoni, Philp, Solomon, Musgrave, Woodcock.

Class 52—Prime movers, boilers, and engines specially adapted to the requirements of the Exhibition: Appleby, Stewart Sharp.

Class 53—Machines and apparatus in general: Baines, N. Jeffries, Electro Magnetic Company, Gas Meter Company, J. Green and Son, Kennedy, Marshall, Sons, and Co., Paul, Royal Life Protection Society, Sugg, West and Gregson, Williamson, North Moor Foundry Company.

Class 54—Machine tools: Bass, Clayton, Massey, Neilson, Charles Powis, Powis and James, Robinson (Rochdale), Whitehead (Preston).

Class 63—Railway apparatus: A. Gordon, Livesay, Reece, Spencer (Newcastle).

Class 65—Civil engineering, public works, and architecture: Brooke, Chatwood, Clark's Blinds, Colthurst, Eassie, Gilchan, Gotto, Greaves, Macdonald, Norman, F. Ranome, A. Robinson, Sissons and White, Welch Slate Company.

Class 93—Examples of dwellings characterised by cheapness, combined with the conditions necessary for health and comfort: Lord Digby.

A correspondent is angry with the Art Jury—or rather a section of it—for the manner in which it has meted out its awards. He writes—"Of the twenty-six judges, twelve were Frenchmen, and no less than eight were artists, who were also competitors for the prizes. Is it surprising that thirty-two out of sixty-seven medals were given to Frenchmen; that eight of these—four grand medals and four first medals—were voted to the very artists who composed part of the jury? In our country the law prohibits a man from being a judge in his own case, interpreting the instinctive sense of all persons of delicate and honourable feeling; but Messieurs Meissonnier, Gerôme, Rousseau, Cabanel, Fromentin, Bida, Français and Pils do not seem to be actuated by any such scruples. They boldly declare that they are themselves the best painters in the world; vote themselves half of the grand medals, and distribute half of the others to their colleagues. In my opinion, not one of the French artists who received medals of honour is fit to be ranked in the highest class. They have all very great technical skill, I admit; they are all masters of manipulation; and some of them have an exquisite feeling for colour; but not one of them has exhibited a first-class picture—that is, a picture combining the essential qualities of a great work." Possibly our lively neighbours have a strong belief in the proverb about Heaven helping those that help themselves.

Building Intelligence.

CHURCHES AND CHAPELS.

A new Wesleyan Chapel has just been erected at Cannock, Staffordshire, at a cost of £1,200. It is from the designs of Mr. S. Johnson, architect, Wolverhampton, and is in the Gothic style. The builders are Messrs. Reynolds and Peake, of Cannock.

The contract for the restoration of the venerable Church of St. Lawrence, Reading, has been taken by Mr. Lovatt, builder, Wolverhampton, and the work will be proceeded with immediately. The architect is Mr. Joseph Morris, of Friar-street, Reading.

The foundation stone of St. John the Baptist at Enderby, Leicester, was laid last week. Mr. Edward Birchall, of Leeds, is the architect, and Mr. J. Firn, Leicester, the contractor. The new church is to cost between £3,000 and £4,000. The stone to be principally used is granite, from the quarries on the estate of Mr. C. Brook, of Enderby Hall.

The Church of St. James, at Fynone, near Swansea, was last week consecrated by the Bishop of St. David. The church is in the Decorated English style, and the materials used in the construction are native stone for the walling, and freestone both inside and out for all the dressed work. The architect is Mr. Thomas Nicholson, F.I.B.A., and the contractors Messrs. Thomas, Watkins, and Jenkins, builders, of Swansea.

A new Congregational Chapel is in course of erection at Small Heath, Birmingham. The architect is Mr. W. F. Poulton, of Reading, the builder Mr. Charles Jones, Belmout-row. The total cost, including land, will be £3,000.

The chancel roof and the floor and seats of the beautiful church of St. Andrew, at Clifton Campville, Tamworth, have been recently restored under the direction of Mr. Street, architect. The work was executed by Mr. Lilley, of Ashby, and Mr. Radford, of Haunton.

The Church of St. Mary Bredin has been rebuilt from designs by Mr. F. Waller, architect, London. The church is in the Early English style, viz., built of flint with Bath stone dressings in the form of parallelogram. It will seat about 600 persons, and has cost £4,000. Messrs. Gaskin and Godden were the builders.

The lease of Surrey Chapel being about to expire, a strong effort is being made to save the building, which was founded by the Rev. Rowland Hill, from extinction, and to raise £30,000 to enlarge and perpetuate the institutions connected with the chapel. Some £8,000 have been collected.

NEWCASTLE-UNDER-LYNE.—At a meeting of the Burial Board, held on Wednesday week, the tenders for the erection of chapels, &c., on the cemetery ground, were opened and examined. There were four tenders, the amounts being as follow, dropping the odd shillings and pence:—Mr. Newton, Newcastle, £3,228; Mr. Gallimore, Newcastle, £3,214; Mr. Sutton, Newcastle, £2.795; Mr. Thompson, Louth, £2,717. Mr. Sutton's tender was accepted. The contract comprises two chapels in one building, with passage between, and spire; also house for registrar, entrance gates with walling complete, from the designs of Messrs. Bellamy and Hardy, Lincoln. These works have been delayed for a good while in consequence of the unsettled state of things in the building trade, parties being unwilling to offer tenders until lately.

SALISBURY.—On Thursday last the old parish church was re-consecrated by the Bishop of Salisbury after having undergone alterations of a very extensive character. The work has been executed by Mr. R. Futcher, of Fisherton, under the direction of Mr. G. P. Scott, the cost being about £4,500.

SLINGSBY.—The ancient Norman church in the village of Slingsby, Yorkshire, is being taken down with the intention to rebuild it on an enlarged area. The contractors for the work are Mr. Bailey, mason, Mr. John Brown, joiner, and Messrs. Hodgson, plumbers, all of York. In making the excavations a stone coffin has been raised, and in the interior, with the remains, was discovered a very ancient gold ring. In the centre is a shield or circle, which appears to have been filled in with white enamel, and on which rests worked in gold a representation of a death's head and cross bones. The enamel has perished, but the gold is as perfect as on the day it left the hands of the goldsmith. On either side or shoulder there has been purple enamel, which is still distinctly observable.

WAKEFIELD.—The work of restoring the parish church has now been going on for years, and is gradually proceeding towards completion. A memorial window to the Maude family will soon be ready to receive stained glass, which is being made by Hardman, of Birmingham. Mr. S. Ruddock is superintending the carving of the croquets on the battlements on the east side, and he is also to execute in alabaster and Caen stone a reredos. This will consist of three slabs of alabaster, on which will be represented "the agony," "the scourging," and "the mocking" of the Lord and these will be framed in a Gothic framework of Caen stone, on each pillar of which will be shields representing the emblems of the Crucifixion. Mr. Kelt, from Mr. Scott's office, has been examining the old screen and the stalls with a view to their restoration and completion. At least £1,000 will be needed for the purpose.

BUILDINGS.

The old market house, Dundalk, is about undergoing a thorough renovation at the expense of the Earl of Roden. The cost, it is said, will be £600.

A Masonic Hall is being built at Larne, near Belfast, of which Mr. William Kelly, of Belfast, is the architect, and Messrs. Dixon and Sons, of Larne, the contractors. The main walls of the building are to be of whinstone, white pointed, the dressings of white sandstone from Cookstown and Scrabo quarries. The contractors estimate is £426.

The contract for the new townhall buildings at Grantham, which we announced as being let to Messrs. Simpson and Lynam, of Nottingham, has been given up by that firm, and the estimate of Mr. William Wartnaby, builder, Grantham, has been accepted for the work.

BRADFORD.—It is proposed to erect a Tradesmen's Home at Manningham Bradford. There are thirty houses included in the plan, and the design is Gothic. The central group consists of eighteen dwellings, with a reading room in the centre, and the twelve other houses are placed in detached wings at either extremity. There will be a lawn in front and flower gardens to each of the houses. The design has been prepared by Messrs. Milnes and France, architects, Bradford.

COLLINGWOOD COURT.—The contract for the building of the new dining-hall and chapel of the Albert Asylum here, the foundation stone of which was laid by the Queen on Saturday, has been given to Mr. William Higgs. The estimate is £3,000. The asylum itself, which was opened in 1864, was a private mansion. It was purchased, together with an estate of 200 acres, by a number of gentlemen for £8,000, as a memorial institution to the late Prince Consort. It gives a home and trade to about 160 children of both sexes.

LIVERPOOL.—A very extensive building known as the New Caxton Buildings has been erected for Messrs. George Philip and Son, wholesale stationers, by Messrs. W. and J. Hay, architects, Liverpool. The edifice is constructed mainly of red brick, with Portland stone dressings.

NEW RESIDENCE FOR HER MAJESTY.—The Queen is at present having a somewhat extensive occasional residence built on the south-west end of Loch Maick, at Balmoral. Her Majesty frequently drives to the vicinity of the Loch, and when visiting the more distant places on that side of Loch Magar, has had sometimes to stay overnight at "the Hut," where the accommodation is limited. To obviate this inconvenience is the purpose of the building now in course of construction. It will

be large enough to accommodate her Majesty and a limited suite for a night, and will take two seasons to build. Its isolated position may be imagined when it is known that it is about seven miles from the nearest farmhouse, and nearly four miles from the nearest habitable dwelling.

THE NEW STANDARD THEATRE.—The foundation stone of a new theatre upon the site of the Standard Theatre, burnt on October 28, 1866, took place yesterday afternoon. Mr. John Douglass has since then purchased the freeholds of some adjoining property, and thus obtains room enough to build a theatre larger than any one in London, excepting Her Majesty's. The main building is 149ft. long and 90ft. wide. The extreme height of the auditorium part is 84ft., and that of the stage 94ft., to give room for drawing up the scenery, which will not any of it be used from the sides. The stage from the footlights to the back is 61ft., and the widest part of the horse-shoe is 56ft. The lower part of the house will be the usual pit and stalls, but the other part of the house will differ from any theatre yet seen in London. It will have three tiers of boxes in the form of balconies supported upon iron brackets bolted into iron pillars, not seen from the front of the house. These run up to the gallery at the back of the boxes, and so support it. Each tier of the boxes will be fitted with cushioned chairs. There will be 92 private boxes. All the passages and staircases are of stone, with iron rails. The outlets are numerous, and the auditorium is lighted by five sun burners above a ground-class ceiling painted in oil. Mr. Douglass opens the theatre in November.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the EDITOR, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty four Words.

RECEIVED.—R. W. E.—S. F. P.—R. T.—D. R. W.—J. H.—J. P.—H. and P.—"All work and no pay."—W. R. K.—J. W.—E. W. P.—J. L.—J. N.—H. and Son.—C. J. P.—S. W.—J. W. P.—R. C.—R. G.—S. M.—M. C. W.—G. F.—F. R.—J. S. D.—J. H.—P. T.—T. C. H.—B. L. B.—W. E. L.—R. W. E.—W. F.

R. G.—We have not a photograph of the Stafford Bank.

"An Architectural Student" will find the information on prizes, medals, &c., from time to time in the BUILDING NEWS.

"Triangular Lodge."—We have received two sketches of this singular structure, and one of them will shortly appear in our pages.

Correspondence.

GENIUS ADVERTISING.

To the Editor of the BUILDING NEWS.

SIR,—The curious circular referred to by Mr. Street in his letter of the 20th ult., which appears in your current number, certainly gives much food for reflection as to the present position of the architectural profession, which is certainly more important than the "future prospects" discoursed upon in a recent lecture by another of your correspondents. Mr. Street is probably not aware of the extent to which the practice is carried of men who, though utterly ignorant of even the rudiments of their business, so far as to be quite incapable of drawing out or designing the simplest building, but yet having, perhaps, a "good connection" or an "insinuating address" manage to get a great share of work. Now, these pretenders of course employ their poorer brethren (perhaps of the class so much derided by Mr. Burges who have married early and must earn a living), and the consequence is that the designer having no responsibility and his employer no taste, we are burdened by the wretched tawdry abortions which cumber our streets.

Of course, when Mr. Street exhibits a new design we all of us know that it has sprung direct from his brain to the tip of his pencil, and that nothing like it was ever built before; he can, therefore, dispense with those rough sketches about the existence of which he seems to be so incredulous, and our popular architects show such individuality in the work they produce that no person familiar with them would question the fact that St. Alban's, Holborn, is Mr. Butterfield's design (up to last week I should have said Westminster Palace by Sir C. Barry, but must now suspend that opinion for a time), that the new designs for altering Bristol Cathedral are Mr. Street's; but I challenge all who have any real knowledge of the subject to deny that some such dialogue may be frequently heard as—

"Have you seen Mr. Blank's new church?"

"Oh, yes! Young So and So did it for him. Blank has so much business to attend to now that he has quite given up designing his own buildings."

I have been led to make these remarks, Mr. Editor, because I think it would be wrong to ignore the fact that these enterprising gentlemen of the circular are only complying with the absolute law of demand and supply. Let Mr. Street and the other men in high places of the profession concoct some scheme (and carry it out) which shall prevent "incompetents" from practising; there will then be more chance for those who have learned how to design and build, but who have not the knack to lecture or bully themselves into notoriety, and then these Adelphi heroes will find their occupation gone.—I am, &c.,

VERITAS.

NOTTINGHAM MECHANICS' INSTITUTION.

SIR,—I hope this evidence of the confidence which may generally be placed in committees who invite designs from and issue instructions to architects, will be made public, and that some one will furnish us with the names of these honourable gentlemen who state in their instructions that "strict regard will be had to the amount proposed to be expended," and select a design which requires no extraordinary amount of common sense to see will cost twice the sum they propose. Before the designs were sent in I wrote to the committee, declining to compete, and stating that it was impossible to carry out their instructions for less than £15,000, which I proved by a careful estimate. This the honorary secretaries promised to bring before the committee, but I have heard nothing further. I may have been wrong in my calculations, and as it is stated Mr. Simpson is a builder as well as an architect, possibly he may be willing to undertake the work for £8,000, in which case I congratulate the committee on their acquisition of an architect and builder in one, with the hope that they will discover their mistake before they ask architects to compete again.—I am, &c.,

JOHN S. QUILTER.

3, Harley-road, West Brompton, S.W., July 3.

IRON ROOFS.

SIR,—When mathematical formulæ are published for the guidance of students and practical men, particularly in journals of great circulation and influence, it seems desirable that errors which may have escaped notice before publication, should subsequently be pointed out. I wish, therefore, to make a few observations on your valuable article, No. 2, on Iron Roofs, at page 140 of the current volume. In the fourth line from the bottom of the first column I read, "and two-thirds to d;" it should be, "and two thirds to h." This typographical error will probably occasion little difficulty, but that in the bottom line of the same column is more serious. It stands thus:—"On eh a strain $= \frac{W}{2} \cdot \frac{2}{3} \cdot \frac{L}{d} = \frac{WL}{3d}$." Here it is assumed that the strain on eh is double that on ed. The load sustained by the former is no doubt twice that sustained by the latter, but as the angle eAg is considerably less than the angle ehg, the strain upon eh is not double that on ed. It might be expressed thus:— $\frac{W}{2} \cdot \frac{2}{3} \cdot \frac{L^1}{d^1} = \frac{WL^1}{3d^1}$, wherein L = length of the strut eh, and d^1 = length of the suspending rod eg. In treating of the strains upon the main tie in the second column, those on the parts Ag and gh are given, and then follow the words, "and between the junction of the bar de with its corresponding element on the side of the truss not under consideration." In this I apprehend "the bar de" should be read "the bar he," and the formulæ for the strain should follow the word "consideration;" it has, however, been altogether omitted. It might stand thus:— $\frac{5WS}{6d} - \frac{WS}{6d} = \frac{2WS}{3d}$ = strain at central point of tie, wherein $\frac{WS}{6d}$ expresses the horizontal strain due to $\frac{W}{3}$ transmitted through eh, which is equal to that due to $\frac{W}{6}$ through dg in consequence of the angle ehg having a sine equal to twice the sine of the angle dgf.—I am, &c.,

EDWARD SWANSBOROUGH.

6, Great James street, Bedford-row, July 1.

The annual meeting and dinner of the Bristol Master Builders' Association took place last week, when about forty members sat down under the chairmanship of Mr. W. Baker, president of the association. Mr. Joseph Foster officiated as vice-chairman. The annual report read was of a very favourable character.

Intercommunication.

QUESTIONS.

[460.]—BATH STONE.—In some large buildings recently erected of Box ground stone I have noticed, where the stones are a great depth on the face, a dark yellow bed in many of them. Should this be guarded against in the cutting, or will it stand the weather equally well with other parts of the same stone? And where stones are the depth of (say) 2ft. 6in. on the face is it easy to have them without this dark coloured streak?—INEXPERIENCE.

[461.]—ANCIENT ART.—Subscribers, and those who wish to support the "Intercommunication" columns of the BUILDING NEWS, could add materially to the interest of the journal by sending in hand sketches of some ancient bits of architecture—remnants of the glories of the past. I mean those who live near those treasures in Bristol, Coventry, Devonshire, Somersetshire, Northamptonshire, &c.—ONE WHO WILL JOIN.

[462.]—COLOURING PERSPECTIVES.—For two years I have been trying (after my day's work) to learn perspective drawing. After colouring them over and over they have a very dull non effective appearance, even after pasting them on a Bristol cardboard. I shall feel thankful to be informed, first, how I can retain the brilliancy. Second, If sepia drawing should be outlined with same, or Indian ink. Third, where I could buy coloured perspective drawings to assist me in shading, and the way of forming clouds, trees, foliage, &c.—ONCE A HOD BOY.

[463.]—CHURCHES WITH THATCHED ROOFS.—Can any of your readers inform me through your "Intercommunication" column of any churches with thatched roofs? There is one at Little Melton, Norfolk, which is a very ancient one, with an open thatched roof. I would ask if such an instance is not unique?—INQUIRER.

[464.]—SOUTH KENSINGTON PRIZES.—In your last week's number you have an article on the National Competition drawings, South Kensington. Will you or one of your correspondents be kind enough to let me know what I must do to try for and obtain one or more of the prizes, and where I can obtain a list of the prizes for next year.—LUDOVICUS.

[465.]—RETAINING DRAWINGS.—You will confer a favour on me individually and upon the profession indirectly, if you will kindly state in your next impression whether an architect is bound to give up his plans and specification to his client on the completion of a building, in order to entitle him to his 5 per cent. Perhaps you would also be kind enough to mention any cases that you are aware of, bearing on the question. I have been looking every week for an answer to query 407 in your number for June 7, but none has appeared up to the present. I am engaged in a case where my clients (a public body) refuse to pay the amount of the balance due to me until I hand over the plans and specification to them, which I have declined to do. The works have been completed, and I have certified for the amount of the builder's account.—J. E. ROGERS, F.R.I.A.I.

[Our correspondent will find his question answered in last week's number of the BUILDING NEWS in "Professional practice and charges of architects." Rule 17, as put forth by the Institute, says, "An architect is bound, under the 5 per cent charge, to provide one set of drawings and one set of tracings with duplicate specifications; it being understood that the architect is paid for the use of the drawings and specification, and that they remain the property of the architect." We cannot call to mind any legal decision on the point, and should be glad if any correspondent would do so if he can.]

[466.]—SURVEYORS' CHARGES.—Kindly inform me through your valuable "Intercommunication" the usual charge for taking out quantities for builders to estimate from. Also the usual charge for measuring of extra work.—SURVEYOR.

[467.]—DISSOLVING SHELLAC.—May I ask through the BUILDING NEWS what is the best ingredient for dissolving white shellac?—J. EDWARDS, Cranbrook, Kent.

[468.]—ROOFS.—I did not clearly understand the formulæ in the elementary engineering papers on calculation for a roof. The roof was (say) 40ft. span with a rise of 4ft. from the tie rod and covered with the ordinary slates. Will some one oblige me?—GEO. E. WALTERS.

[469.]—KILNS.—Can any of your readers inform me the newest and most suitable method of erecting a kiln for drying feathers or articles of a like nature?—J. J.

[470.]—RETAINING WALLS.—In an article on "Retaining Walls," which appeared in your journal of April 26, you state the area of the triangle ABE (fig. 2) to be equal to $\frac{H^2 \times \tan 2\frac{1}{2}\theta}{2}$. Could you oblige by informing me how this expression was obtained?—J. J.

[471.]—GOTHIC ARCHES.—Can you or any of your correspondents inform me where I can obtain a book that will teach me the method of striking Gothic and other arches used in masonry, and the price of same.—FREESTONE.

[472]—COST OF WORKS.—Will any of your readers kindly inform me of the comparative values of the following items from actual experience in the execution of different works. For every £100 worth of work done how much was expended in—labour (man and horse), material and transport, plant, superintendence, interest on capital sunk during progress of work, profit. I am aware that these proportions differ widely according to the nature of the work, also as to the accessibility of materials, &c., but I think if those of your readers who kindly contribute their experience would mention these particulars the subject would be found one of general interest in the profession and worthy of discussion in your columns.—INTERESTED READER, Weymouth, May 29.

[473.]—GABLE OR PARTY WALLS.—Will you kindly oblige by giving us an answer to the following query, namely, A the freeholder sold to B the leaseholder a house on lease for 96 years. A, having vacant ground adjoining the house, is about to build and claims the right to the use of the wall—stating that the wall is already his, and that the granting of the lease only constitutes a tenancy for a long term and does not invalidate his right to use the wall in erecting another house. B denies the right of A, and puts in a claim for half the value of the wall. This question has been asked of the editor of the *Builder*; his answer was, "The right of the wall depends on the conveyance;" from which I gather no information. I am advised to write to you as more likely to get an intelligible answer.—A SUBSCRIBER.

[475.]—ARCHITECTS' PUPILS.—In the case of an architect leaving his pupils to instruct themselves, and only looking in about once or twice a week, he being in fair practice, and expecting them to do all the work in a proper and correct manner, can the pupils obtain redress or release from their indentures?—ONE OF THEM.

REPLIES.

[441.]—MOULE'S EARTH CLOSET.—This closet is generally made in the shape of a sick chair fit to be placed in any room or corridor. The seat is perforated and has a good stout bucket placed under it. The back of the chair is hollow and filled with perfectly dried and fine pulverised earth. A valve acts so that when the sitter uses the chair a quantity of the earth is discharged. The closet is supplied by the Moule Earth Closet Company.

[442.]—RUSTED INSTRUMENTS.—"W. J. B." does not mention of what metal, or of what particular character the instruments are. Supposing that he alludes to steel instruments, he may be assured that if they are very rusty, that is if the rust has eaten into them, it will not be possible to remove the stain of the rust without the aid of acids or the grindstone. I have cleaned rusty instruments by first removing the actual rust or red oxide by sandpaper or oil and emery powder, the thickness of the rust determining whether the coarser or finer operation is necessary. In "setting" and cleaning mathematical instruments which have got rusty, by the use of oil and emery, there is always a dark brown stain left on the spots when the rust has eaten in. As a good example take the blades of a pair of skates which have been carelessly thrown in some cupboard after the frost is over, to lie there until the re-appearance of winter. By the use of the methods I have mentioned the rust can be effectually removed, but to obliterate the stains and to make the blades take a polish they must be ground, which not only accomplishes this result but also "sets" the edges and make them fit for skating.—ONE WHO KEEPS HIS OWN INSTRUMENTS IN ORDER.

[443.]—DRAINING VILLA LAND.—The plan which appears to me feasible in the instance given by your correspondent is one I have followed myself. Although the brook cannot be used as a common sewer, yet clear water may be run into it, and the plan I should adopt is as follows:—Either one large or several smaller cesspools should be built, into which the sewage of the houses should be conducted. The solid matter and the particles held in mechanical suspension would settle down to the bottom and the clear liquid might be run off by an overflow pipe into the brook. Moreover, if desirable, means might be devised by which this water, before it became quite clear, could be rendered subservient for the purposes of irrigation. This is, however, a point which would require professional assistance.—C. E.

[444.]—FRETWORK MACHINE.—"George Garrett" will find a small machine for fretwork cutting at Gunningham's, 480, New Oxford-street, where he can get all particulars as to use and price. Gunningham's patent fretwork cutting machines are the best I know of.—ANDREW MUIR, Britannia Works, Sherborne-street, Strangeways, Manchester, July 1.

[445.]—VENTILATION.—Would you allow me to inform "T. G." that I am afraid he is labouring under the mistake of supposing that plenty of air necessarily means plenty of ventilation, whereas there may be a great deal of air and no ventilation, and also good ventilation with but a moderate supply of air. If, as I suspect, his workshop is closely surrounded by buildings much loftier than itself, he has no alternative but to carry up his flues higher. The fact is, that in the above case the air cannot get away and is perfectly hemmed in and rendered stagnant.—VENTILATOR.

[448.]—IMPERMEABLE CEMENT.—To make a waterproof cement, one part of red lead may be mixed with five parts of ground lime, the same proportion of clean sharp sand, together with some boiled oil, or whiting may be used with equal advantage instead of the lime, provided nearly double the quantity of sand be employed.—CEMENT.

[448.]—A good cement can be made of two parts of cement (Roman or Portland), one part of ground coal, and one part and a half of slaked lime. This mixture is said to form a very hard solid cement, which will be quite impervious to moisture. The colour must necessarily be very sombre, but this will be no objection to its use for internal work, nor a majority of the cases in which such a cement is required.—J. R. C.

[449.]—ENGRAVING ON GLASS.—Etching or engraving on glass is a peculiar application of chemistry to a practical purpose. It depends altogether upon the facility with which the silica in glass is attacked by the vapour of hydrofluoric acid, and the method of going to work may be thus explained. Take a plate of glass and cover it carefully with a coating of wax, technically called etching ground; then trace with a fine-pointed instrument the design to be engraved, and the plate is ready. Now procure a shallow basin of sheet lead and put in it a little powdered fluorspar (fluoride of calcium), and pour upon it a sufficient quantity of sulphuric acid to form a kind of paste. Place the plate of glass with the waxed side downwards over the basin, and apply a gentle heat. The vapour of hydrofluoric acid becomes rapidly disengaged and a few minutes suffice for it to bite into or etch the lines traced upon the plate and which are not protected by the coating of wax. The plate may be cleaned by the application of a little warm oil and the operation is completed. It is, of course, only practice that will render the operator perfect in the manipulation and in understanding how the depths of the lines can be varied at pleasure according to the time allowed to the process. When some lines are required deeper than others the way to proceed is to remove the plate, cover over those lines that have been sufficiently etched and subject the remainder to a second corrosion. When the experiment is successful the lines are very clear and distinct.—L. P. D.

[452.]—CONTOUR LINES.—There can be no doubt about the value of contour lines in all surveys where great exactitude is required. They are, as the name implies, intended to furnish far more precise information of the irregularities of the surface of the ground than can be given by means of levels written in in figures. Perhaps a contour line may be best described for the information of "Tyro" as a horizontal section of the earth's surface in any given direction. Contour lines cross each other at right angles, and thus form squares; the size of these latter being governed by the scale to which the plans are to be drawn. The closest contour lines are made in forming town plottings for drainage and other purposes; these are of 6ft. or 8ft. pitch. Sir Henry James and his assistants, in the Ordnance Survey, have carried the system of contouring to the highest degree of perfection, and deserve all praise. THEODOLITE.

[453.]—TIMBER.—"Plane Tree" ought to know something about timber, but perhaps the plain of his observation is limited to "stuff" of the same grain as himself. Pardon the jest. At any rate his question is practical, and if he has access to such authorities as Nicholson, Tredgold, Rankine, and others, "Plane Tree" will find that much attention has been devoted by those eminent men to the subject. In actually judging of the fitness of timber for particular purposes, and of its probable durability when so applied, experience is far and away the best teacher. Without that to guide him the timber buyer will make many grievous mistakes. General instructions may be given to some extent, because there are characteristics common to all timber. That which has grown the slowest will, as a rule, last the longest, and as a horsedealer can tell the age of an animal by his teeth, so can a timber purchaser reckon by not less certain means the age of a tree. The width of the annual rings are the biographers of trees; they tell its history truthfully, narrow rings betokening slow growth, and *vice versa*. Dense woods are more durable than those of coarse grain, and dark coloured timber is stronger than light. Woolliness in cutting is a bad sign, and the freshly cut surface should not be chalky in appearance, but shining and firm. Palpable blemishes and defects of course will be seen and avoided. I am not aware that more can be said unless "Plane Tree" would like to know more.—HEART OF OAK.

[454.]—PILLARS AND STRUTS.—Hodgkinson's experiments on the relative strength of cast and wrought iron, together with those of Rennie, all of which are published, give the most perfect information on this subject. Upon the length of the pillars or struts to be used much depends in judging between the employment of cast or wrought iron. Short columns of hollow cast iron answer well for supports in many instances, but in others, where more length is needed, I should say to "Bricklayer" look out for sound forgings of wrought iron.—G. F. A.

[455.]—PILES AND PILE DRIVING.—Without further data than that afforded by "Bonito" in your last it is difficult to advise. Screw piles are only available under certain conditions, and the work they will have to perform when in their places depends upon those conditions. They are very serviceable for jetties, piers, lighthouses, &c., and with particular kinds of subsoil. If your correspondent will state the facts more closely in regard to the information for which he asks he shall have a closer reply from—PILE SHOE.

[457.]—ROYAL ACADEMY.—Let "R. A." call at or write to the Royal Academy, where he can get a paper entitled "Instructions for the Admission of Students," and which will give him all the information he requires. I do not believe there are such things as students to the Royal Institute, it is only intended for the senior members of the profession; but there is the Architectural Association, 9, Conduit-street, formed for students, with many useful and instructive classes, &c. Write the secretary.—ADELPHI.

[459.]—ARCHITECTS' PUPILS AND HOLIDAYS.—I should recommend "A Sufferer from Want of Holidays" to refer to his articles, as I hope they contain something with reference to holidays. If not, I most certainly pity him, and can see nothing to be done, but for him and his fellow-sufferers to go out on "strike," and not return until they can get some arrangement made whereby they have secured to them at least three or four weeks' holiday a year. Before going to this extreme, however, recommend a quiet remonstrance. I am not articled, but in my agreement it is stated that I am to have "all reasonable holidays," so that when I ask it has to be proved an unreasonable request before it can be refused. I am afraid that the Liverpool architects would find not quite such a lamb as they appear to require in this child, who signs himself ADELPHI.

[459.]—I see in the "Intercommunication" of your last week's impression, a letter from an articled pupil in this town, who complains that he is never allowed any holidays and that many other pupils here are in the same plight; and concludes with the assertion that "the Liverpool Architectural Society refuses to deal with the question, because most of the members treat their pupils as above." As persons unacquainted with our society might suppose this statement to be true, if allowed to pass uncontradicted, I wish to observe that the leading members of the Liverpool Architectural Society are, to my knowledge, in the habit of allowing their pupils a fortnights' holiday annually; and that the Society cannot have refused to deal with the subject, inasmuch as it has never been officially brought before them; though if it had been, I am unable to see upon what grounds a public body could interfere with what is in fact merely a matter of private arrangement between master and pupil.—H. H. STATHAM, Jun., Honorary Secretary to the Liverpool Architectural Society.

WAGES MOVEMENT.

In Arbroath the wages of masons, which were a few weeks ago, raised from 5½d. to 5¾d. per hour, were last week further advanced to 5¾d. per hour.

BRISTOL.—The masons engaged at the New Orphan Houses, Ashley Down, struck work on Saturday. The Masons' Society, about a fortnight ago, expressed their intention by advertisement of not allowing in future any "pointing" work to be done by other than masons. The masters have had a meeting at which they adopted a resolution to the effect that they resist the demand for the following reasons:—"That it is entirely at variance with the custom of the trade in this city from time immemorial, that it would greatly increase the cost of the work, and, further, that it is in opposition to the rules which the Masons' Society has laid down, and which provide that six months' notice shall be given previous to any alteration." The employers have expressed their willingness to submit the matter in dispute to arbitration.

STAINED GLASS.

The memory of the late Captain Peploe, of Garnstone Castle, Herefordshire, is to be perpetuated by the erection of a stained glass window in Weobley Church, by Heaton, Butler, and Bayne, of London. The tenantry are bearing the expense. The deceased was a direct descendant of Colonel Birch, the celebrated general under Cromwell, who lies buried in Weobley Church.

BISHOPSNYMPTON.—Messrs. E. and S. Beer, of the Stained Glass Works, Exeter, have just fixed a four-light memorial window in the parish church. In the four divisions are represented "The lifting of the brazen serpent in the wilderness," and the "Crucifixion of our blessed Lord."

LEGAL INTELLIGENCE.

A LIGHT AND AIR CASE.—In the Court of Queen's Bench, on the 20th ult., another of these fast increasing cases, so troublesome to the London architect, came before the Lord Chief Justice and a jury.—Plaintiff (Boyce) complained of obstruction of light and air to a window in rear of the premises, No. 76, Lisson-grove, N.W., by reason of an erection made by the defendant (Hall) in the rear of No. 77, and it was urged that this obstruction interfered with the carrying on of the business of a pawnbroker at his (plaintiff's) premises. Defendant contended that there was no appreciable damage to the window in question.—The surveyors who gave evidence in the case were, for the plaintiff, Messrs. Arthur Ashpitel and G. B. Williams; for the defendant, Professor Kerr, Messrs. Philip Wilkinson, S. Bannister, and L. C. Riddett. There was also much technical or trade evidence from various pawnbrokers.—The Lord Chief Justice told the jury that it was for them to say whether any "substantial damage" to the plaintiff's premises had been proved.—Verdict for the defendant.

THE SMOKE PREVENTION ACT.—The manager of the Inns of Court Hotel Company, Holborn, appeared at Bow-street on Wednesday, to answer a summons preferred against him for neglecting to comply with the provisions of this Act. Mr. Campbell Sleigh attended for the defence, and urged that every means had been taken to remedy the alleged evil with respect to the only furnace in use at the hotel, and he called Mr. May, practical engineer, and other witnesses to prove that the alterations made had been effectual, except, perhaps, occasionally when fresh fuel is applied, and that there was really no smoke to complain of. Mr. Sandersen, C.E., on behalf of the prosecution, stated that the alterations were not in accordance with suggestions which he had made, but that a "patent" had been applied which in some hundreds of cases within his experience had never been of the slightest use. The real remedy was very simple, and would effect a saving in the cost of fuel which would amply compensate for its application. If the defendant still persisted in refusing to employ it the whole neighbourhood would be enveloped in a cloud of smoke. The assertion of one of the witnesses that "there must be always smoke when fresh fuel was put on" was perfectly fallacious. Mr. Vaughan said he was not satisfied that all reasonable and possible effort had been made to prevent the nuisance, and, as this was the second complaint against the defendants he should impose a penalty of £10.

General Items.

The following are the names of gentlemen who were elected members of the Royal Institution on July 1st last, W. Pole, Esq., F.R.S., Vice-President, in the chair:—John Andrew Baumbach, Esq., Louis J. Crossley, and Joseph Ince, Esq., F.L.S.

In the great fire which broke out in the works of Messrs. Myers, the builders, of Lambeth, a large quantity of partly finished carpenter's work, in course of preparation for the approaching spectacle in Guildhall, in honour of the Sultan, was entirely destroyed. The destruction of property altogether through this casualty is estimated at nearly £100,000.

A correspondent writing from Crete says:—It is two centuries since the Venetians were driven from this colony by the Turks. During that time everything has gone to ruin. A population of a million has dwindled to less than three hundred thousand, trade has been stifled, and the value of property deprecated. There are Venetian villages and Venetian castles still to be seen in Crete, but the villas are roofless and the castles are crumbling into heaps of stone. So it is with churches and drinking fountains, with gardens and well-built villages.

A morning paper states that the Board of Works has charged itself with the functions hitherto undertaken by the Society for the Protection of Life from Fire, engaging all the men who were in its service, and acquiring the whole of the fire-escapes, stations, and plant.

Within the past month upwards of one hundred houses in Picket-place, Foregate, St. Clement's Danes, and the adjacent courts have been pulled down, and the materials removed to clear the site for the New Law Courts. Already nearly the whole of the ground in the rear of the Strand has been stripped of its houses. As many as two hundred more have yet to be razed, including those on the west side of Bell-yard, two in Fleet-street, the whole of those on the south side of Carey-street, and in New Boswell-court, and Clement's-lane.

Our readers will be glad to learn that the American Institute of Architects, in New York, is busy making a collection of photographs and designs illustrative of the progress of art and architecture in that country, which is intended for presentation to their brethren of the Royal Institute of British Architects. The compliment is a graceful and substantial one, and no doubt will be duly appreciated.

The *Western Daily Press* announces that Mr. F. J. Brean, of Bristol, has just patented an invention for printing in gold and silver upon glass, which our contemporary thinks "is likely to effect a revolution in this beautiful art."

The new design for the University of London, though not free from faults, is generally accepted as a decided improvement on Mr. Pennethorns' former effort. It has received the approval of Mr. Layard and others, who so stoutly objected to the first design, and unless some special exception is taken to the new elevation, the building we understand will be at once proceeded with. The design is in the Classic style.

Not in the city only but everywhere in and around the metropolis does land keep increasing enormously in value. A plot of land near Lancaster-gate, Bayswater, purchased a few years since for £1,600, was sold the other day in lots which realised the sum of £21,980.

The drawings for the proposed contract No. 3 of the Thames Embankment north are now completed. They comprise the formation of a viaduct from the eastern end of Inner Temple Gardens to Blackfriars Bridge, and will complete the line of embankment between Westminster and Blackfriars-bridges. This contract will embrace the formation of the roadway for its own length, but the roadway along the whole length of the embankment cannot be completed until after the construction of the Metropolitan District Railway, which for a considerable distance will be formed beneath its surface.

The Metropolitan Board of Works in December last voted the sum of £20,000 to be expended in local improvements during the year 1867, but the amount voted away already exceeds £40,000, and it is therefore now proposed to borrow the sum of £100,000 in order to meet the numerous applications coming in from all parts of the metropolis for contributions to improvements.

The American Theatre in Philadelphia was destroyed by fire on the evening of June 19. The audience and players were got out in safety, but eleven persons, mostly firemen, were killed, and nine injured by falling walls. A few days before twenty-eight persons were killed by a steam boiler explosion in the same city.

The *Western Morning News* says a very useful invention has been introduced to the public, known as Lile's patent safety fire-box stove, or fire extinguishing grate. It is intended to prevent the risk of houses or premises being set on fire at night by half-extinguished coals or smouldering embers, and not the least of its recommendations is that it can be fitted to any stove or grate at a very small cost. It acts upon the principle of a candle extinguisher, and effects a great saving in fuel, entirely preventing the smoke and unpleasant gases which arise when fires are extinguished in the ordinary manner. In addition to these recommendations, the fire-box also possesses the important quality of promoting cleanliness, the arrangement admitting of the cinders and ashes being removed without disturbing the fire, or causing a particle of dust to arise.

Another Gainsborough has been purchased for the National Gallery. It is the portrait of Orpin, parish clerk of Stratford-on-Avon. The price is £325.

Mr. Morris Moore is not the man to let his light shine under a bushel. He has once more stepped before the public to vindicate the claims of Raphael's Apollo and Marsyas, which excited considerable controversy some years since. Mr. Moore has sent us from Rome a long correspondence he has had with Joseph Severn, the English Consul at Rome, and with the Earl of Derby. Because Mr. Severn entertains a doubt as to the authenticity of the picture, and dares to express it, Mr. Moore boils over with indignation, and throws a shower of epithets at the head of the consul. Good wine needs no bush, and hard words do not carry conviction; if the picture be Raphael's, all the consuls in the word cannot make it otherwise.

A new process for the preservation of meat, poultry, fish, and other varieties of animal food, has been introduced by Messrs. Medlock and Bailey, Chemical Works, Wolverhampton. It consists of a bisulphate of lime solution, and is said by the patentee and the manufacturers to answer its purpose completely, without in any way impairing the quality of the meat.

Elaborate preparations are being made to render the approaching Civic entertainment to the Sultan at Guildhall worthy of the occasion. A stately reception saloon is in course of erection in the open space in front of the hall and leading to it, from a design by Mr. Horace Jones, the City architect, and in other respects, the hall itself is being adapted and adorned. The saloon will be 100ft. long by about 60ft. wide, and be disposed in two floors, with a handsome façade, and verandah towards King-street, Cheapside. The upper floor will be approached by four easy flights of stairs at each corner of the building, and supported on rows of Ionic columns. It is intended to be used as a supper room on the occasion, and will be of a size sufficient to accommodate 600 guests. The whole of the approaches to it will be ornamented with fountains, statuettes, and choice flowers. At the eastern end of the Guildhall a dais is being constructed, 50ft. wide by 36ft. deep, on the centre of which will be a throne, with three canopied seats—one for the Sultan, another for the Prince of Wales, and the third for the Viceroy of Egypt.

The names of the following public thoroughfares have been altered by order of the Metropolitan Board of Works—Wellington-terrace, St. John's-wood, to be incorporated with Wellington-road; and Elgin-villas with Upper Park-road. Queen's-road, Bermondsey, to be called Alscot-street, and the subsidiary names in Upper Grange-road and Drummond-street, Bermondsey, to be abolished. In the parish of St. George's in-the-east—Marman-street to be called Umberston-street, Patriot street to be called Morgan-street, and Marmaduke-street to be called Laugdale-street. The Board lately abolished the name of one of the many "York-streets" in the metropolis, that near Kingsland road, there being several in the N.E. postal district; and at the suggestion of the vestry of Shoreditch gave it the name of "Hows-street," in honour of one of their representatives at the Metropolitan Board. The owners and occupiers of property in the street are strongly opposed to the alteration, and have asked for the old name to be restored. The Board declines to accede to the request, for the reasons that the old name was found inconvenient by the Post Office authorities, and the vestry suggested the new name, which appears to the Board to be unobjectionable.

We are being constantly reminded that this is an age of daring enterprises and bold projects. The latest great notion comes to us from the other side of the Atlantic. Brother Jonathan proposes to connect by a bridge, New York with Long Island. It will, of course, be of gigantic proportions, so as not to interfere with navigation—namely, 130ft. in height. Though the plans are as yet incomplete, we are told that a company has been formed with a capital of two million dollars, in shares of two hundred dollars each, and it would appear that the legislature has sanctioned the scheme, and there seems every likelihood that it will be proceeded with. The projectors hope to make the thing pay by charging a toll for pedestrians and vehicles, the nett proceeds of which shall not exceed 15 per cent. per annum on the amount invested. At present the passenger traffic between the two places daily is something enormous, Long Island being the favourite out-of-town residence with New York city men.

A magnificent painting by Van Dyke, representing St. Cecilia, has just been brought to light in restoring the old Church of Cachlevoch, between Beele and Bersel in Belgium.

Trade News.

As we expected to hear, the gold medal has been awarded to Messrs Clark and Co., for the excellence of their steel revolving shutters at the Paris Exhibition.

TENDERS.

BATTERSEA.—For new factory and offices at Battersea, for Messrs. Moser and Son. Mr. J. D. Hayton, architect:—Brass, £6,260; Gammon, £6,120; Rider and Son, £5,928; Aviss and Son, £5,746; Adamson and Son, £5,700; Downs, £5,590; Hart, £6,368; Coleman, £5,229.

BRIGHTON.—For alterations and additions to Mansion, No. 76 A, Marine Parade, for Mr. W. Budd, Twickenham Park. Quantities supplied by Mr. Henry W. Broadbridge:—Chessman and Co., £3,140; Wills, £2,341; Kemp, £2,300; Jarrett, £2,290; Sawyer, £2,219.

BRIGHTON.—For proposed North Aisle, Holy Trinity Church, Hove, Brighton:—J. W. Sawyer, £1,372; G. Cheeseman and Co., £1,350; J. Parsons, £11,53; B. E. Nightingale, 1,124.

BIDEFORD.—For alterations and additions to a house at Bideford, for the Rev. E. A. Vincent. Mr. Edwin Dolby, architect:—First portion—Ching and West, £265; Howard (accepted), £242.

BUCKS.—For new roofs, reseating and restoring the nave and aisles of the parish church of Edlesborough, Bucks. Mr. Withers, architect:—Robinson, £1,943 16s. 4d.; Chappell, £1,935.

CARDIGANSHIRE.—For the rebuilding on same site the parish church, Lampeter-pont-Stephen, Cardiganshire. Mr. Withers, architect:—T. Roberts, £3,357 5s. 8d.; James and Co., £3,073; E. and L. Thomas £2,950; J. and D. Jones, £2,655; Davies and James, £2,638.

HERTFORD.—For two pairs of semi-detached residences. Mr. Arthur Eve s, architect. Quantities supplied by Messrs. Pain and Clarke:—Grover, £5,687; Gill, £5,300; Webb and Son, £5,253; Andrews, £5,124; Tongue, £5,000; Foster, £4,794; Warne, £4,724.

HOLLOWAY.—For publichouse at Upper Holloway, Mr. M. C. W. Horne, architect:—W. Marshall, £1,825; J. Harding, £1,757; W. P. Taylor, £1,748 18s. 10d.; J. Furnell, £1,694 12s. 5d.; W. Shurmur, £1,665; B. C. Ravenscroft, £1,639; A. R. Lamble, £1,623; Langmead and Co., £1,588; W. Warne, £1,552; Nihlett and Son, £1,547 10s.; C. O. Robson, £1,544; Blackmore and Morley, £1,542; B. E. Nightingale, £1,478; W. Cressell (accepted), £1,408; E. Steddy, £1,400.

HORNSEY.—For Alexandra Orphanage for Infants, Hornsey Rise. W. G. Habershon and Pite, 38, Bloomsbury-square, architects;—Williams and Son—cottages, £5,781; schools, £3,026; central buildings, £6,557; earthwork, &c., £2,206; total, £17,570. Patman and Fotheringham—cottages, £5,742; schools, £3,040; central buildings, £6,389; earthwork, &c., £2,206; total, £17,377. Cowland—cottages, £5,193; schools, £2,953; central buildings, £6,272; earthwork, &c., £2,520; total, £16,945. Forrest—cottages, £5,043; schools, £3,048; central buildings, £6,267; earthwork, &c., £2,204; total, £16,562. Carter and Sons—cottages, £5,140; schools, £2,850; central buildings, £6,250; earthwork, &c., £2,200; total, £16,440. Rider and Son—cottages, £5,260; schools, £2,770; central buildings, £6,040; earthwork, &c., £2,210; total, £16,280. Manley and Rogers—cottages, £4,820; schools, £2,735; central buildings, £6,215; earthwork, &c., £2,205; total, £15,975. Moreland and Burton—cottages, £4 420; schools, £2,486; central buildings, £5,500; earthwork, &c., £2,300; total, £14,706. Southcott and Widgery—cottages, £4,327; schools, £2,436; central buildings, £5,360; earthwork, &c., £2 208; total, £14,332.

KENT.—For Kent County Lunatic Asylum, building for 400 inmates. Quantities by Mr. George Ruck and Mr. Thomas Ladds. Mr. Martin Bulmer, architect. The accepted tenders are—Mr. Anscomb for contract No. 1; Mr. Butchard for contract No. 2; Mr. Hyles for contract No. 3.

NAMES.	Contract No. 1—Builder's Work.	Contract No. 2—Smith & Founder.	Contract No. 3—Plumber & Glazier.	Contract Nos. 1, 2 & 3—The whole of the work.
J. S. Anscomb, Maidstone	35,300 0 0	1,800 0 0	4,290 0 0	41,000 0 0
P. Stiff, Dover	35,418 0 0	—	—	41,168 0 0
Naylar and Son, Rochester	35,737 0 0	—	4,439 0 0	—
J. Chappell, Steyning	36,437 0 0	—	—	42,491 0 0
Wallis and Clements, Maidstone	37,497 0 0	—	—	—
Henshaw, London	37,820 0 0	1,665 0 0	4,271 0 0	43,756 0 0
W. Vaughan, Maidstone	38,450 0 0	—	—	—
O. Punnett, Tonbridge	42,240 4 0	—	—	—
P. Horsman, Wolverhampton	—	—	—	46,000 0 0
Butchard, Gravesend	—	1,544 0	—	—
Drury and Biggleston, Canterbury	—	1,610 0 0	—	—
J. S. Norton, London	—	1,629 0 0	—	—
W. Shrubsole, Maidstone	—	1,640 0 0	—	—
Spencelargh, Chatham	—	1,644 0 0	—	—
Goddard and Son, Nottingham	—	1,653 0 0	—	—
Jukes, Coulson, and Co., London	—	1,658 0 0	—	—
Garrett and Co., Maidstone	—	1,727 0 0	—	—
Weeks and Son, Maidstone	—	1,749 0 0	—	—
Smyth and Co., Dover	—	1,750 0 0	4,044 0 0	—
Hollingsworth, Strood	—	1,800 0 0	—	—
Harrop and Somerville, Birmingham	—	2,000 0 0	—	—
J. Hyles, Maidstrone	—	—	3,493 9 0	—
A. N. Pryer, Maidstone	—	—	3,788 0 0	—
W. Alldridge, Rochester	—	—	4,345 3 5	—
J. Foord, Chatham	—	—	4,405 0 0	—
Cruttenden and Son, Maidstone	—	—	4,900 0 0	—

THE BUILDING NEWS.

LONDON, FRIDAY, JULY 12, 1867.

ZINC.

ZINC is produced in considerable quantities in this country. Our exports, both of wrought and unwrought zinc, have largely increased of late years. Thus we find that in 1851 they only reached 23,038 cwt.; but in three years they increased to nearly three times that number of hundredweights. Year by year our exports increased, until we find that in 1863 they reached the highest point, viz., 106,141 cwt. Since that year they have declined, yet in 1865 they were four times as large as in 1850. The value of zinc exported from the United Kingdom during the last few years may thus be stated:—

1850	£25,338
1851	25,483
1852	33,665
1853	97,328
1854	89,673
1855	69,986

From this year the value largely increased, as will be seen from the following table:—

1856	£93,395
1857	98,392
1858	110,869
1859	122,900

During the succeeding years it fluctuated, and declined in 1865, when it was only £94,964. We find that during the year 1855, there were obtained from the mines of Cornwall, Wales, Cumberland, and the Isle of Man, not less than 5,000 tons of zinc ore, in the form of sulphuret of zinc, or "black jack," as it is termed, and "calamine," a carbonate of zinc, which was valued at £17,000. "Calamine" is very abundant in England, and is to be found principally in the Mendip Hills, and parts of Somersetshire; at Holywell, Flintshire; at Castleton, Derbyshire; and in Cumberland.

The specific gravity of zinc is about 7,000. It is a crystalline, easily-fusible metal, of a bluish-white colour. The smelting occupies about twelve hours. The carbonate of zinc is calcined, by which it loses about 20 per cent. of its quantity; it is afterwards ground in a mill, and mixed with powdered coal, to assist in smelting; the mixture is then placed in crucibles, and these are put in furnaces. The metal is drawn out and run into metal moulds. After this, it is sent into the rolling-house, and is again melted and recast in a metal mould to produce ingots of the size and weight required. The second melting ensures proper purity. The metal is not malleable when cold, but it can, though not easily, be broken by the hammer. It may be rolled into plates or sheets at 300 deg.

This metal has been largely employed for pipes, for galvanic batteries, for the electric telegraph, as a substitute for whitelead, as a constituent of brass and German silver, and, last, and most important of all, for roofing purposes. For roofing, zinc has not, in this country at least, been much favoured. It has been too readily believed that the destruction of zinc roofs is certain and inevitable, from atmospheric causes. Indeed, Dr. Pettenkoffer, in a report addressed to the Bavarian Commission of Railway a few years ago, condemned the use of zinc entirely on this ground. He showed that a zinc roof in the course of 27 years is oxidised to the extent of 8·381 grammes, or about 130 grains per square foot, nearly one-half of which, he said, is removed by water condensed from the atmosphere. He also declared that a coating of oxide could never completely protect the subjacent metal from further oxidation. Mr. James Edmeston, whose connection with the Vieille Montagne Zinc Mining Company led him to not only make inquiries in this country, but also to do the same abroad, gives very good reasons for the failures which have been made in zinc roofing. The majority of cases where zinc for roofing purposes has failed in England he attributes to two important causes. First, impurity in the metal, or from contact with iron; as the result of these defects, the zinc shows signs of crumbling to pieces, black spots appearing, supposed to be the result of the action of the acids found in our London atmosphere; holes, and wearing out of the metal in a short time. Then, secondly, the evils arising from bad construction, which he thus enumerates, "cracking in places, soldered joints parting, drips or joints failing in flats, tendency to buckle, and to have an untidy appearance in consequence, and general unsoundness of the work."

Mr. Edmeston made inquiries into the failures abroad; and one of them he discovered to be the contact of iron where "a little confined damp" existed, which, though not so understood, is nevertheless as damaging as if the zinc contained iron. Iron nails, he tells us, are commonly used for boarding under the zinc, and if a nail head is in contact and there is damp, in three months a hole will be eaten through the zinc. It is, therefore, always desirable to adopt the plan that has been carried out in the best roofs on the continent, viz., to use zinc nails for the boarding, and to galvanise all iron work that it may be found necessary to use. Or "where iron nails are used for boarding they have small heads, and are hammered well into the wood so as to be buried, and a little cement or stopping is frequently rubbed in over them." Thus used the nails rarely injure the zinc; and as zinc nails are not only dearer than iron ones, and as they require far more care in their employment, they are, in some places at least, more frequently used. It is found to be desirable to avoid any unnecessary contact with lead. "Impure zinc being brittle will crack when turned up against the rolls, or it will break off entirely, and the builder who saves something in first cost is quite likely to lose more in the end from waste."

The defects arising from imperfect construction are due to ignorance. The great thing to be borne in mind is to permit perfect freedom to the sheets, and not to confine them anywhere, and to separate as much as possible the lengths of guttering and any other portions of a roof requiring to be made in long pieces. "Eaves gutters," remarks Mr. Edmeston, "should be made in short lengths, bent in the direction of the way in which the sheet has been rolled and soldered; the solder put between the sheets, and one sheet lapping over the other; they must not, of course, be screwed to the rafters' feet," a practice which, it appears, causes constant failure in the joints of the iron eaves gutters. "Wherever a down pipe comes there should be a stopped end in the gutter, and the gutter should never be continued longer than possible in one piece; where it is laid behind a parapet, as in all the new and magnificent buildings in Paris, a separate piece of flashing will disconnect it wholly from the sheeting on the roof."

Zinc should never be used of less weight than No. 13 gauge, which weighs 20oz. per foot; No. 14 weighs 22oz.; No. 15, which should be used for flats, roofs, and gutters, weighs 24oz.; and No. 16, 26oz. Mr. Edmeston considers No. 14 ample for London. It should be remembered that oak boarding will spoil the zinc, and that fir should be dry. The boards should be laid with an aperture of ½in. between each board; if they are damp decay will occur on the under side of the zinc as on the top of it. "In forming laps care must be taken to prevent the water from ascending by capillary attraction; there must either be space enough to prevent the drops thus rising, or the end of one sheet must touch altogether, and that of the other be kept well away." This is not only the best mode, but is least liable to afford opportunities for —to use a tailor's phrase—"slop-work." A report presented to the Academy of Sciences in Paris says:—"It appears from actual experiment that the oxidation proceeds for about four years, gradually diminishing after the first three months, and that it then hardens into a protecting coat of a dark grey colour, preserving the metal beneath from any further deterioration. . . . . It becomes evident that as a sheet of zinc loses little or nothing of its weight or thickness, and as its surface remains hard and polished, like enamel, it may be fairly deduced that the following years are not likely to occasion any alteration; and, therefore, that zinc will be placed in the same condition as bronze, which is protected by its *pattine* for ages." We may add that the precautions thus set forth have been adopted by a committee appointed by the Central Society of Architects in Paris.

Mr. James W. Tyler gives us the method which he adopts in laying zinc; and as many roofs are spoilt for want of knowledge and care, it will be well to attend to Mr. Tyler's advice. He says:—"After getting good falls and drips I lay every sheet of zinc perfectly free from contraction and expansion, and in such a manner that, in the event of alteration or cuttings in roofs, the sheets, 8ft. by 3ft., can be taken up and relaid without injury to the metal." He lays none but Devaux's pure Vieille Montagne zinc; and says he refuses the work unless the proper thickness is allowed, viz., No. 13 as the minimum; and 14, 15, and 16, as the best gauges he prefers to employ. "Good zinc thus laid" he considers to be "quite as lasting as lead, if the woodwork is arranged according to directions given." The roof of the Victoria Station, Pimlico, was laid by Mr. Tyler; also the Strand Music Hall, Langham Bazaar, Malta Yard, and the large roof, Holyhead Harbour.

Zinc is, it is well known, largely obtained from Prussia; and we find that nearly 4,500,000 cwt. of zinc were obtained in 1857. In the seven large smelting establishments in Belgium and Prussia, belonging to the Vieille Montagne Company, there are 230 furnaces. Fifteen years ago the quantity of zinc used for roofing was not more than 5,000 tons. Now it appears 23,000 tons of sheet zinc are annually made by this company. For ship sheathing 3,500 tons are produced, although fifteen years ago zinc was not employed at all for this purpose. Stamped ornaments in zinc date only from 1852; now there are 1,500 tons produced for this object. For ships' sheathing zinc must necessarily be altogether free from impurity or it will soon decay. But there can be no question about the usefulness of this metal for building purposes; and the fact that it is coming into still greater use and is becoming better known and appreciated is evidence that its reputation is increasing. With care in purchasing and laying there is but little doubt that it will turn out well. In Paris it has been used for nearly every roof formed for some years. The new markets, constructed of iron in 1856, have been covered by it, and excepting in one place where the workmen were careless, the whole of the zinc is in capital condition. In Germany zinc for roofing is largely used, and the work is generally remarkable for solidity and closeness.

THE PARIS EXHIBITION.

ARCHITECTURE.—THE PARC.—SEVENTH NOTICE.

OUTSIDE the Jardin Reservée and between it and the Exhibition building are various annexes belonging to Belgium and the Netherlands, with a few of the omnipresent France. Few of these have any architectural significance, the most important being the annexe for the beaux arts of Belgium. Behind this is a small Anveroise hut, for it is little more, and near it some Belgian workmen's houses—*hotel cubique*, as we heard some French *ouvriers* call it. Of these

and the other workmen's houses exhibited we may at once say that they offer nothing to our notice worthy of imitation; the rooms are generally badly arranged, frequently having the entrances both back and front opening directly into them, and often with the old box bedstead which we have discarded, and which must be looked for as an archæological curiosity in some of our north country agricultural buildings. Perhaps these Belgian houses are as good as any, and these are not nearly equal to our ordinary model cottage. The most ambitious type of this class is the *Metairie Hollandaise*, situated in this quarter, which is supposed to present to us a Dutch farmhouse "all in its Sunday best." The traditional cleanliness here, however, arises, not from industry, but from want of use, and an English farmer would vehemently scorn many of its arrangements. A wide passage holds the cheese presses, dairy implements, and through draughts; on one side is the cow-house, and on the other a sitting-room, having two box beds and a cheese cupboard between them, suggestive of savoury smells more powerful than pleasant; and, despite the charming little Dutchwoman, with her brilliant headdress and still more brilliant smile, we would rather live in a Hampshire homestead than herd with a Dutchman and his cows. The circular building for the machines and manufactured iron of Belgium has a roof worthy of notice, but there is nothing else in this portion of the Parc architecturally noteworthy, excepting always some admirable wrought-iron gates and railing by M. Roy, forming a portion of the enclosure of the garden, and to which we shall again revert when speaking of this portion of the exhibited works in metal. We are now at the Porte Rappe, as it is generically called, the most frequented of all the entrances, which in reality consists of two other portes, those of St. Dominique and La Bourdonnaye, which we have before described. Crossing these we are in the quarter of the Parc especially devoted to the products of France, and where we have everything, from a theatre to a church, and from the sumptuous pavilion of the Emperor, to the narrow ambulance and the hospital tent of the wounded soldier. The first building which attracts our notice is the Châlet of the Imperial Commission, a building of wood framing and very red brick. The framing is excessive and more for show than use; and the bricks,—"Well," an American friend exclaims, "Them air bricks! most as good as my country's, not like your'n, a kind o' cross twixt Castile soap and a Bologny sassage;" but unfortunately these are rouged, for French bricks generally are not very much better than our own, only rather smaller in size, and such as are exhibited here better made, but exhibitions of this kind do not as a rule offer average samples. The church built for the exposition of articles of religious art is a brick one of poor quality, and is a mixture of all kinds and conditions of material, and can scarcely be looked upon as a serious attempt at religious architecture. It is apsidal, with mere chapels surrounding its chevet, and two larger ones at its western end. Round the exterior are built in its surbase some effectively modelled "stations." Internally the building is very disappointing, though some few of its contents are noteworthy, especially the pavements in terra-cotta of MM. Villeroy and Boch, of Mettlach, in Prussia, and M. Boulenger, of Auneuil, whose beautiful work in the reserved garden we have before referred to. Both these are of excellent quality, and we shall have further occasion to revert to the works of these gentlemen. The pavements in coloured cements are worthy of notice, and M. Bonet, of Rouen, and M. Chauvet, of Orleans, exhibit very excellent specimens, good in design and colour, and seemingly of great durability. A very elaborately worked altar, with super altar and retable in white marble, is exhibited by M. Jacquemin, of Metz, and another in Senlis stone, by M. Greber, of Beauvais, of better design; but by far the finest is that of M. Poussielgue-Rusand, the hardman of Paris. It is in bronze, cast, and chased with exquisite care, and its retable is enriched with very beautiful enamels. As for the others, they are chiefly shams, such as we should stigmatise as "Brummagem" in England—cast iron painted to look like stone, terra-cotta gilt to look like metal. We abhor them, nor do the dear little chubby babies modelled in wax, or the exquisitely ornamented vestments of pink satin of the B. V. M., appeal to our feelings on religious art. Shams anywhere are bad enough, but bad shams like these offered to the holiest of usages, are worse than errors in taste—they amount to lies. Surely man's gifts here should be the best fruits of his labour, each an individual offering, and not manufactured by the gross, and with a mixture of horror and disgust we leave the building, reserving its other contents for review under their specific heads. Near here is an interesting exhibition of *bétons agglomérés*, by MM. Coignet and Son, very worthy of great attention, but which, as they really belong to building materials rather than to architecture as an art, we shall revert to in an immediate number. The photographic room of the contractor for this *specialité* is worthy of remark, if it is only to see how great are the hopes of its builder, and offers a pleasant lounge. The eastern kiosk of the Emperor is very rich and very poor, enormous labour and little art. The inlaying of the steps with cement offers us a new idea, its interior is marvellously and luxuriously fitted up with more than Eastern luxury and with all the delicacies of this wonderful season. France could have given a better *motif* for its design without seeking to translate one from Algeria, and scarce a page in her voluminous art history could be turned over without providing a more fitting suggestion for her Emperor's halting place.

Of the aquaria, of the horticulture and arboriculture, of the hundreds of things of interest we cannot stay to speak, but in a small building near the Pavilion of the Empress, is a collection of drawings for landscape gardening, by many of the landscape architects of France, which are worthy of notice. Some of them are particularly cleverly drawn, and we would specially commend the works of M. Georges Ammont; his drawings are many of them exquisite. Our friend M. Duvillers here exhibits a photograph of his plan for the Sefton Park, at Liverpool, and another remarkably like it at St. Brisson. A much better illustration of M. Duvillers' ability will be found on the other side of the Parc, in an annexe containing building materials. It is the laying out of the Isle of Sursenes de Puteaux, for Baron Rothschild, and is much more worthy of study. In this said annexe are several other designs for the same class of work, but in all we find the same tendency to twisting—a straight line or a broad open vista is a thing to be dreaded; and of the inconvenience and confusion arising from this excessive involution no further illustration is needed than the laying out of this Parc itself. Many and many a weary step have we had to retrace from this cause, and many and many a malediction, "not loud, but deep," has this circular impediment to circulation called forth in our hearing. But we must extricate ourselves from it as best we can, and bidding adieu to the Jardin Reservée and its contents, we must reserve those of the remainder of the Parc for our next number.

TREATISE ON ARCHITECTURE.*

As announced in the preface, "The proprietors of the *Encyclopædia Britannica* having been advised that the treatises on architecture and the arts connected with it in that work, if published in a separate volume, would be useful to those engaged in the building trade," have selected the most useful information from the works of those whom they consider the best writers on the various subjects, for the purpose of combining them in one volume. Brief sketches of the antecedents of these writers are given in the preface, which are almost unnecessary, as we would rather judge the book itself, irrespective of such recommendations; nevertheless, they are useful as general information. In these days the alliance is so intimate between architecture and general engineering construction that a book of this kind is a boon, and although many—in fact, most—of the rules and examples given have been in general use for some years, we here and there find cropping out new adaptations for the purposes set forth. Of course architecture occupies the primary portion, and the various gradations and qualities of the art are briefly touched upon, the history of styles being dealt with tersely enough for the purpose, and we do not get too much of it, thereby avoiding the common fault of writers of what are professedly termed practical works on this subject. A wider field, however, is embraced, for with Greek and Roman we have Egyptian and Jewish architecture, with arrangements and dimensions of temples and other prominent buildings useful in point of comparison, and yet not wearying the reader with verbose detail. A new element also in a work of this kind occurs in the instance of ancient American examples, in which a peculiar kind of arched vault is illustrated, and then, passing from the Greek and Roman styles to the first and second periods of Pointed architecture, the writers give us essays on the elements of beauty, on the principles, composition, &c., of architecture, which, unfortunately for the symmetry of arrangement, seem to strike in abruptly on the general outline of description, and could, perhaps, be better disposed of elsewhere. While giving us the principles upon which a town should be laid out, and the buildings arranged so as to get effect, admit proper drainage, and render future building operations more easy, the writer seems to have lost sight of the fact that so many circumstances, monetary and otherwise, as also the difficulty of obtaining property in a place like London, which he sites as an example, must operate very much against his laid-out rules for the guidance of architects and builders. Where large tracts of building property can be obtained, and the whole laid out to order, then the excellent recommendations will apply. Glancing at the modern strides of London and modern French architecture, sentiment in design is dealt with in a style which savours strongly of peculiarity. The new Houses of Parliament come in for a fair share of criticism, but why the Venetian style may not be used for the purposes of a parliamentary assembly, and what deteriorating effect this can have on the quality of our senate, we are at a loss to conceive. If the Venetians committed strange barbarities we are not obliged to associate similar ideas with our own people owing to a similar style of architecture being found convenient enough for our purposes.

We pass on to architectural acoustics, to which more than ordinary attention should be paid by the architect, but which are too often neglected. How often do we find that in our churches, theatres, and other public buildings every arrangement may be ably carried out, with the grand exception of the acoustic properties. It is too late when an edifice is completed to attempt remedying such defects, and we must to the fullest extent endorse the advice of Sir William Chambers, that the true architect should also be a master of the sciences which contribute to perfect the building under his hands. The writer observes "there can be no doubt that a proper proportion of dimensions has much to do with the acoustic properties of a room." We think it has most to do with them, for no matter

* "Treatise on Architecture, including the Arts of Construction, Building, Stone Masonry, Arch, Carpentry, Roof, Joinery, and Strength of Materials." Edited by Arthur Ashpitel, F.S.A., F.R.I.B.A., &c. Edinburgh: Adam and Charles Black. 1867.

what the cubical area of a room, the form of construction and the manner of arranging seats for hearers will distribute the sound in such a manner that the speaker with a distinct (not necessarily a stentorian) voice may be heard by each and all alike. The horseshoe form with flattened dome is generally considered the best. Thin boarding boxed, too, is generally admitted by those accustomed to theatrical buildings to give the proper resonance, provided the voice comes into immediate contact, and no audience intervene. Gothic churches cannot vie in acoustic advantages with those in the Byzantine style, principally, as the writer remarks, on account of the columniation. Many excellent treatises and articles on this subject are quoted, and a list furnished which may be serviceable to the student. A useful glossary (which we may suggest would have been found more useful for reference if placed at the commencement of the treatise) follows. Construction is noticed generally, but when we come to building we have a description of what is chiefly understood by the term, and the practical experience of a writer who knows what work is and how it ought to be done is at once evident. We are now getting fairly into the practical portion of the book, and with stone masonry we are inducted into the qualities of the various kinds of stone, which, however, are stereotyped descriptions, and mortars and cements —all useful. The resolution of forces, with a little algebraical redundance, with the tables of crushing and other strains, reproduced from other authors, with specimens of retaining walls, resistance, &c., and the methods of taking out quantities, setting out work, &c., constitute the bulk of this portion, concise and complete as it is. Mr. Mitchell's valuable invention the screw pile, used so largely in piers and lighthouses, and the very excellent mode of plate piling used by Mr. Page in the Westminster Bridge, are instanced, with details. The arch, which, once thoroughly understood by mason or bricklayer, is the key of all knowledge of construction, is widely treated, but necessarily is a reprint nearly of valuable treatises long since published. So with carpentry, but in that on roofs more scope is afforded for much new and valuable matter. We allude more particularly to the iron roofs exemplified, though we could have wished for more examples, those given, however, being excellent, as serving to illustrate the advantages derived from the lightness and strength imparted by the introduction of wrought iron. Steel having taken a prominent place in the construction of roofs recently, may have suggested itself to the editor, but the purposes of the work may have been considered to be fully realised without its introduction.

Perhaps the most useful and interesting department of the building art is joinery, and it is one requiring a special apprenticeship, to be understood sufficiently to properly qualify the superintendent or clerk of works. This section is not so prolific in examples as we could wish. A little good staircase practice is given, and a few directions for glueing, bending, &c.—processes which are better taught in actual practice than by the aid of book lore.

In the strength of materials, "a circumstance to be attended to in every construction requiring strength" is touched upon. In treating of the succession of strains, the writer alludes to the disintegration of particles in the set caused by the tensile strain. This is true, and might act as a warning to those who put an extreme load on material intended to resist any similar load that may be brought upon it, but which material has been weakened by the experiment to such an extent as to be unequal to the strain it was originally calculated to bear. A second application of the load would be fatal. The doctrine of cohesion varies the effect, but the principle remains the same. In allusion to metals, the writer observes that by a "thousand circumstances unknown to us" they differ materially, and by a "curious and inexplicable fact" the cohesion of an iron bar is greatly increased by drawing it through a smooth hole in a steel plate; but this is explainable by the fact that the closer the particles are squeezed together the denser does the section become, and the cohesion itself must operate largely in resistance to the tensile strain. This section of the work is the most important, perhaps, because the most useful. Generally architects and builders content themselves with arbitrary rules, sometimes establishing them for their own practice from experiments hastily conducted under different circumstances, so that condensed data such as are furnished in this work, accompanied by analogous examples without the usual algebraical complications, will tend to simplify studies in this direction. In it we notice the writer's severity on the theory of Euler on the strain on columns, but a purely mathematical theory (and of this no greater proof could be afforded than the elaborate experiments on the form of tube for the Britannia Bridge, by Professor Hodgkinson and Messrs. Fairbairn and Stephenson) will not hold water in the face of absolute experiment, and the difference, not only in the kind but quality, of material is so great that, though the principle may be well established by mathematical analysis, the mode of its application alters the case entirely. This "Strength of Materials" is a careful digest of the leading authorities on the subject, and, taking up the best information and tables, brings down to practical reasoning all that has been written of any value. The only fault that we find is, it is not extensive enough, and in being limited to two examples only of cast and wrought-iron beams, leaving out the lattice, as also the modes of junction, &c., where columns are used, now of such general use in all building operations, we are disposed to think is treating such an all-important subject too abruptly. The impression produced on us by a perusal of this work is, that while striving to bring within such a moderate compass a wide range of subject, and while presenting to the reader a great deal of stereotyped, intermixed with much new and practical information, it bears evidence of discrimination and care, and being unpretentious, will more readily be adopted. But, at the same time, the difficulty of condensing so much in one volume is apparent, and subjects demanding more attention are necessarily passed too quickly by, and the "Strength of Materials" is one of them.

The editor, as stated, "besides revising the different treatises, and introducing improvements and additions where necessary, has availed himself of the late discoveries in the East to supplement the articles on Egyptian, Jewish, and Assyrian architecture, and to add a chapter on Chinese and Indian architecture."

Most of the plates furnished are excellent in arrangement and quality. They are fifty-five in number, and illustrate the Romanesque, Arabic, and Pointed styles of architecture. Many of them have never been published before. All of them, inclusive of the mouldings and orders, and very useful details of masonry and carpentry, with diagrams of statics and dynamics, reflect great credit on draughtsman and engraver, every detail being minutely shown, and each plate being complete in itself. No expense has been spared by the enterprising publishers, and we can highly commend the work to our standard architectural librarians.

GOSSIP FROM GLASGOW.

(FROM OUR OWN CORRESPONDENT.)

NOTWITHSTANDING that alike architects and tradesmen complain of "little doing," there are several buildings of more or less public character being presently proceeded with. Operations have been commenced for the new University, a building on which Glasgow architects will likely keep their wide-awake eye, from equally "the local habitation and the name" of its author. A good deal has been said by both the profession and the public about so important a public work being designed in London; and the high reputation enjoyed by Mr. Scott will invest anything from him with a peculiar interest. The building, from designs by Mr. Burnet, of the principal branch office of the Clydesdale Banking Company, is about being completed. The new local head-office of the Bank of Scotland, designed by Mr. Rochead, is having completed its second story windows; and the new office for the Glasgow Gas Company, by Mr. Melvin, is in the same stage of progress. Old buildings are being taken down that a theatre and a circus may be erected on their sites; and two music-halls, one of them of very large capacity, rapidly approach completion. Apparently, local architects are not readily to be found for places of public entertainment. The new theatre has been sent to Mr. Pott, of Sunderland, as was also the interior of its predecessor. This predecessor was designed by Mr. Spence, of Glasgow, for the late John Henry Alexander, proprietor and manager, and its interior, until spoiled by Mr. Edmund Glover's rubbishy rococo, was universally admired. The interior was burned out a few years ago, and the old shell was not very artistically refilled by Mr. Pott. But the rolling stock interest is alike omnipotent and tyrannic. If it shows little respect to churches, it will show still less to theatres, and the old Temple of Thespis in Dunlop-street is to be dilapidated and desecrated before the smoking altar of the Union Railway. For the circus—the first stone, lime, and permanent building of the kind in Glasgow—an architect could be found no nearer than Hull, Mr. J. T. Robinson. For one of the music-halls the veteran Mr. Black was originally employed, as was most natural, he having been the architect for a similar house belonging to the same proprietor, and advertised by said proprietor himself as one of the best in the city. From some unknown cause, after the work had made some progress, the proprietor dispensed with Mr. Black's services, and gave his commission to Messrs. Clarke and Bell, in this case, however, Glasgow architects as well as Mr. Black. From music to mutton may be a descent, but it is a necessary one; and accordingly, Messrs. Clarke and Bell are no less busy with slaughter-houses for the city than a music-hall for Mr. Baylis. The asylum of the Deaf and Dumb Institution, designed by Messrs. Salmon, Son, and Ritchie, is now roofed, and is about as prominent a feature in the landscape seen from the south-side park, as will be the University in that seen from the west-end. Of course, there is a difference in size, but their positions are relatively the same. For another of the "public institutions," the Govan Parish Poor-house, designed by Mr. James Thomson, the schedules are issued. The emulation of the several religious sects has in Glasgow, especially since 1842, always done much to keep the mortar-tub in operation; and although the city since then has been almost wholly rechurched, new extensions and missions are continually on the move. A Roman Catholic chapel, from the pencil of Mr. Goldie, is about to be erected almost within the shadow of our venerable cathedral; Mr. Angus Kennedy has designed a church to be built on Paisley-road for the United Presbyterians; estimates for a mission-church in connection with the Kirk of Scotland, and designed by Messrs. Clarke and Bell, have just been received—the mason work coming to about £2,000; and a building for the Barony Free Church, by Mr. Honeyman, is just about being completed. It will form a feature in a situation architecturally and otherwise interesting, being on the west side of the irregular quadrangle which has the Royal Infirmary (by the Adelphi Adamses) with Mossman's fine statue of the late Lord Provost Lumsden in front on the north, and on the east the cathedral and the barony church of the Kirk of Scotland, which, "with order, taste, and symmetry unblest," withal rudely fanciful, possesses a borrowed interest from being the preaching place of one of Scotland's most popular divines, Dr. Norman MacLeod, the editor of *Good Words*. The Doctor is a chaplain in a volunteer corps, as well as a chaplain-in-ordinary to the Queen, and in his former capacity he is reported to have told the citizen-soldiers to be in no hurry in repulsing invaders, until at least they had burnt the Barony kirk, as it seemed to be the only way in which to get quit of a building so hideously ugly. Your English readers may be surprised why so popular a clergyman does not readily get a more becoming church. The reason is simply that the present one is the property of neither the city nor the congregation, as are most others, but of "heritors"

—landed proprietors that the wisdom of John Knox burthened with the duty and expense of upholding such externals of religion as churches, manses (parsonage-houses), and ministers' stipends, and also schools and schoolmasters' dwellings and salaries. No part of Glasgow is more assiduously visited by strangers than is this quadrangle and its neighbourhood, for, besides the objects instanced, there are the picturesque Necropolis on the other side of the Molendinar and the modern gallery of stained-glass pictures in the Cathedral. Perhaps few would go so far from their ease in their inn in George-square solely to see the largest chimney-stalk in the world (St. Rollode); it is, nevertheless, there for the looking at.

A wooden bridge is being thrown across the Clyde to accommodate the traffic, while a bridge at foot of Saltmarket is being taken down and rebuilt. The Clyde at Glasgow is spanned by five bridges, all of which, even the one about to be taken down, have been put across within living men's memory. Two are suspension-bridges for foot-passengers only, and other two, of granite, are remarkably handsome structures, very wide in the roadway and of easy inclination. The Union Railway, which, "like a wounded snake, drags its slow length along," is busy casting its bridge across the river, and it certainly promises to be no adornment. Railways have done nothing whatever to beautify, but much to mar the appearance of Glasgow. The Glasgow Improvement Act, that gives most extensive powers for pulling down and building up, forming new streets and diverting old ones, has, as yet, done little practically, except levying a sixpence upon every pound of rental. The accomplishment of its great object will do much to ameliorate Glasgow physically, morally, and socially. Consequent upon the anticipated wholesale demolition of the smaller sort of houses, joint-stock companies are being formed for "better houses for the working-classes," and "every man his own landlord."

Some of our architects are busy with large works in the country. Mr. Burnet is just completing a large mansion-house for one of our merchant princes on a most beautiful and commanding situation on the western shore of Lochlomond, and is commencing another in the same neighbourhood for the Honourable James Lumsden, Lord Provost of Glasgow. Cameron House, also on the western shore of Lochlomond, and designed by Mr. Spence for Mr. Smollet, a collateral relative of *Roderick Random*, is just almost finished. Mr. Burnet has recently completed another large mansion-house, at Cardross, near Dunbarton Castle. This mansion is for Mr. Burns, one of the eminent firm of shipowners. Mr. Honeyman is putting a large addition to Helenslee, Dumbarton, the residence of Peter Denny, the well known shipbuilder, while Mr. Rochead is getting along with the Wallace Monument, as well as the up-hill (it is to be feared in more senses than one) nature of the work permits.

The removal term in Glasgow is the 28th of May, and since then house-painters have had a busy time of it. It is also about this time that shop fronts get their annual coating. Two styles are this season signally dominant—the one being the pilaster, having its lower third painted one colour and the upper two-thirds another, the line of junction being stencilled with a horizontal ornamentation, commonly of a Greeky character, and by the trade called "*a-la-Grecq;*" the other being a dark green, as if a wholesale job lot of this peculiar pigment had found its way to Glasgow and been distributed among the decorators "at an alarming sacrifice"—*of taste*. Four-tenths of the shop fronts are painted in the one style and four-tenths in the other, the remaining two being independent. Novelty will always command imitation, albeit sometimes ignorant and unprincipled, and the former dominating style is doubtless due to the influence that is being exercised so largely upon architecture and decorative art in Glasgow by Mr. Alexander Thomson; the prevalence of the other style I cannot account for otherwise than as above.

The "Post-office Glasgow Directory" for 1867-8, newly published, directs to the business chambers of exactly sixty architects, which, were there no remembrance of the ranks whence some of them have been recruited, would be a goodly sign of a city wherein the most recently received doctrine is, "The sole test of ability is success." If it was the wise and witty and the no less large-hearted canon of St. Paul's who said, "Everybody thinks that he can drive a gig, manage a farm, or edit a newspaper," he would certainly have added, "or be an architect," supposing, of course, that at the time he was from under the dome of St. Paul's Cathedral.

Eighteen months ago a plot of ground in Jamaica-street, measuring 50ft. of frontage and 120ft. of depth, was sold at an average of £15 per square yard; and a two windowed shop of 16ft. frontage and extending about 110ft. back, was let a few months ago at £300 per annum.

The schedules, or, as I believe you call them, bills of quantities, for the mason, bricklayer, carpenter and joiner, slater, plumber, and plasterer works of the Govan parish new poor-house are now ready to be issued. A charge is to be made for them to the parties estimating, a practice which, if not new or unknown, is at least uncommon to Glasgow contractors.

Designs for the Govan parish new poor-house were sought for from a select competition some months ago, and after a deal of poor-rate eloquence about the propriety or non-propriety of building for posterity, about cost, convenience, and more debatable et-ceteras than I can specify, the result was another competition, but limited to the two that had apparently given the most satisfaction in the former—Messrs. Haig and Low, and Mr. J. Thomson; Mr. Thomson coming in winner. I do not know whether Poor-law guardians read Shakspeare or not—it would perhaps be better for both themselves and the poor if some of them did—but those to whom have been committed the care of having built a new poor-house for Govan seem to have taken a hint from the bard's "Lord Bardolph":—

> When we mean to build
> We first survey the plot, then draw the model;
> And when we see the figure of the house,
> Then must we rate the cost of the erection;
> Which if we find outweighs ability,
> What do we then, but draw anew the model
> In fewer offices?

The new poor-house promises to be one of the chief contracts of the season.

PLATE GIRDERS.—No. 5.

THE rivets on each side of a joint must be equal to the nett section of the plate taken through the line of rivet holes, as the plates may tear through either side of the joining line. In article No. 4, page 422, the girder taken for example had flanges made up of plates 15in. by ⅜in. thick. The section will therefore be—

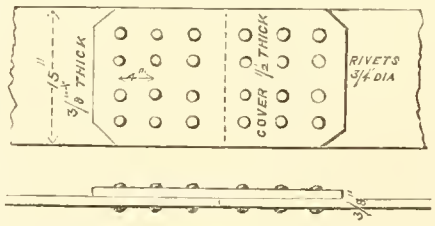
$$15 \times \cdot 375 = 5\cdot 625\text{in.}$$
deduct for 4 rivet holes 1·125in.

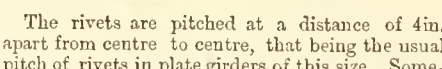
4·5in. nett section.

We must then have rivet area on each side a joint in one of these flange plates to equal this nett section; and to arrive at this, suppose the wrapper or cover plate over the joint to be ½in. thick, and the number of rivets each side joint to be twelve in number: it will then stand thus—12 rivets × thickness of cover × diameter of rivet; or,

$$12 \times \cdot 5 \times \cdot 75 = 4\cdot 5\text{in.},$$

exactly the nett section of the plate broken through, or where joint occurs. The following diagram perhaps will explain better.





The rivets are pitched at a distance of 4in. apart from centre to centre, that being the usual pitch of rivets in plate girders of this size. Sometimes, to get the wrappers of shorter length, and thus save weight, rivets are placed nearer together, say 3in. from centre to centre.

After the draughtsman has completed his drawing and placed all necessary working dimensions thereon, he draws up his specification, which, as far as relates to wrought-iron work, runs as follows:—

SPECIFICATION FOR THE ERECTION OF WROUGHT-IRON PLATE GIRDER BRIDGE.

1. The information contained in the following specification comprises necessary particulars to admit of a tender for the erection and completion of a wrought-iron plate girder bridge at (here the name of the place is inserted).

2. The works must be carried out to agree with the accompanying drawings and this specification, to the satisfaction of the engineer, who shall have power to reject any material or workmanship that is not satisfactory.

3. Before commencing the work, all templates made as a guide for punching or drilling the holes of the various parts shall be submitted to the engineer.

4. The engineer shall have power to modify or alter drawings, and any increase or diminution in the weight of iron used shall be paid for or deducted according to the schedule price given below.

5. The contractor shall hand over to the company the whole of the iron work, &c., fixed complete in place, in all respects ready for the traffic to commence running over it, and shall keep it in thorough repair for the period of nine months after handing it over to the said company.

6. The whole of the wrought iron shall be of the best description; the plates for the girders to be exact in size as shown on the plans; the holes in the plates to correspond or match with each other. The riveting to be done red-hot, and the ends of all plates planed so as to abut truly against each other.

7. All riveting done in a true and workmanlike manner, the rivets to be made of the very best scrap-iron, and be capable of bearing a tensile strain of twenty tons per circular inch, and to be countersunk where shown on plans.

8. No drifting of rivet holes will be allowed, but all holes not corresponding with each other must be rimered out.

9. The whole of the ironwork when complete and fixed in place, shall be painted with three coats of paint. The first and second coats while wet must be sprinkled with fine white sharp sand; and the third coat to be of a colour sanctioned by the engineer to the line.

10. Payments will be made (state here the terms, retaining 5 per cent. of the whole contract until nine months after completion of contract, as a guarantee of the work being done satisfactorily).

11. The contractor shall, at the desire of the engineer, subject the girders or any of the plates separately to such tests as he thinks desirable, the cost attending same to be paid by the contractor.

12. The company do not bind themselves to accept the lowest or any tender, and the work must be finished ready for use in (name the time) from the date of signing this contract under a penalty of (so much per week) until it is complete.

13. All the plates to be of the best Staffordshire plate-iron or other approved quality, capable of bearing a tensile strain of fully twenty tons per square inch of sectional area, and all plates not bearing this test will be rejected.

14. The transverse girders to be cranked, as shown on plans, at ends of bottom flange so as to form a flush line with the bottom flange of main girders.

15. The contractor shall be held responsible for all damage or claims arising from delays or obstructions to the highway, and must obtain the consent and approval of the parish surveyor before erecting any staging he may require in the construction and fixing in place of the girders.

16. Tenders, sealed and endorsed "Tender for the Construction of, and Erecting a Plate iron Girder Bridge of 27ft. span) as per Drawings, sheets Nos. 1, 2, and 3) over London-road," must be sent to the secretary at his office not later than 12 o'clock on Thursday, 1st August next.

SCHEDULE OF PRICES FOR ADDITIONS AND DEDUCTIONS.

	£	s.	d.
Wrought iron in plates, L or T-iron, with all contingencies, including workmen's time.....at per ton.			
Bolts and nuts .....at per cwt.			

"FOR MAN AND BEAST."

THOUGH "The Metropolitan Drinking Fountain and Cattle Trough Association" may not boast of a very euphonious name, it is one of the most practically useful societies that have sprung up within recent years. The report presented to the eighth annual meeting of this association, which was held in Willis's-rooms, under the presidency of Lord Wharncliffe, on Tuesday,

contains some unusually interesting figures, showing the really great blessings which the continually-extending operations of the society are conferring alike on man and beast. The more important items in the report may be summarised as follows :—The association has now large troughs for horses, oxen, and sheep at Highgate-hill, Maida-hill, Kilburn, Roehampton, Stratford, Barking-road, Plaistow, Haverstock-hill, Battersea-rise, Tottenham court-road, Cumberland-market, and Camden-broadway. It is the intention of the committee that every fountain in London shall have a dog trough attached to it, and that every available sight for a cattle trough shall be occupied as funds are provided. In undertaking to do this, a largely increased and continually increasing annual charge is laid upon the society. No less than fifteen new fountains have been erected, and thirteen, which had been erected by private benevolence, and which for want of the necessary supervision had fallen into such a state of dilapidation as to be worse than useless, have been taken over, re-erected, supplied with water, and are now permanently under the supervision of the society. The total number which are under the care of the association is one hundred and ten. All of these are visited and cleaned at least twice a week by the agents of the society, who unstop pipes, replace cups, and do any repairs that may be required, so that none of them are at any time left without water or cups. Between three and four hundred thousand thirsty wayfarers are supposed to drink at these fountains every day; nor are the benefits to be derived from them confined to even this vast multitude, for to great numbers of the resident poor the fountains are also an inestimable boon. The annual subscriptions for the year amounted to £546, and the donations to £1,241, besides the munificent contribution of £1,080, which was received just before the last annual meeting, from a lady in the country. After having made full provision for the efficient working of existing structures, the whole of the remainder of this sum has been expended in the erection of new fountains and troughs. Notification had been received from the executors of the late Mr. W. J. Hall, of Trinity-square, that a legacy of £1,000 has been bequeathed to the society by that gentleman for the erection of fountains. In 1862, the Royal Society for the Prevention of Cruelty to Animals made a grant of £100 for dog troughs, and the committee have lately received an intimation from the same society that they have decided to make another grant towards the erection of cattle troughs. It is also gratifying to know that in 1863 the committee received a letter from New York, soliciting advice and information respecting the erection of fountains in that city, and twenty fountains with troughs for cattle and dogs, on the plan of those of the association, are now in course of erection there. In the words of the report, at no previous period in its history have the affairs of the association been in so satisfactory a state.

STRENGTH OF BEAMS.

IT is well known, says Mr. Ashpite', in his "Treatise on Architecture," that the transverse strength of a beam is directly as the breadth and as the square of the depth, and inversely as the length; and the variation of the results of some experiments from this law can only have depended on accidental circumstances. If we wish to find the number of hundredweights that will break a beam of oak supported at both ends, supposing them to be placed exactly on the middle, we may multiply the square of the depth in inches by 100 times the breadth, and divide by the length; and we may venture in practice to load a beam with at least an eighth as much as this, or, in case of necessity, even a fourth. And if the load be distributed equally throughout the length of the beam, it will support twice as much; but for a beam of fir the strength is somewhat less than for oak. A cylinder will bear the same curvature as the circumscribing prism, and it may be shown that its strength, as well as its stiffness, is to that of the prism as one-fourth of its bulk is to one-third of the bulk of the prism. The strength of a beam supported at its extremities may be doubled by firmly fixing the ends where it is practicable, and we have already seen that the stiffness is quadrupled; but the resilience remains unaltered, since the resistance is doubled, and the space through which it acts is reduced to a half. It is therefore obviously of importance to consider the nature of the resistance that is required from the fabric which we are constructing. A floor, considered alone, requires to be strong; but in connection with a ceiling, its stiffness requires more particular attention, in order that the ceiling may remain free from cracks. A coach spring requires resilience for resisting the relative motions of the carriage, and we obtain this kind of strength as effectually by combining a number of separate plates, as if we united them into a single mass, while we avoid the stiffness which would render the changes of motion inconveniently abrupt.

In all calculations respecting stiffness, it is necessary to be acquainted with the modulus of elasticity, which may be found for a variety of substances in the annexed table :—

HEIGHT OF THE MODULUS OF ELASTICITY IN THOUSANDS OF FEET.

Iron and steel ...	10,000	Fir wood	10,000
Copper	5,700	Elm	8,000
Brass...	5,000	Beech	8,000
Silver	3,240	Oak	5,060
Tin	2,250	Box	5,050
Crown glass ...	9,800	Ice	850

LINCOLNSHIRE DIOCESAN ARCHITECTURAL SOCIETY.

THE annual gathering of this Society took place at Grantham last week, under the presidency of the Bishop of Lincoln. The proceedings began by Divine service in the nave of the Church of St. Wolfran. Immediately afterwards the Venerable Archdeacon Trollope proceeded to the western approach to the fabric, and pointed out, in minute detail, the beauties of the tower and spire. He then proceeded to the east end of the roofless chancel, and referred at considerable length to the architectural features of the interior. The Church of St. Wolfran has for some time been undergoing an extensive restoration. In July, 1865, the tender for the work of Mr. G. E. Hall, of Nottingham, was accepted, at £9,588. The magnificent edifice is very simple in its plan, consisting of a nave and chancel, with aisles to each, a north vestry, north porch, south porch, and an engaged tower at the west end, the latter opening to the nave and aisles by three very fine arches. The oldest portions of the fabric are transitional, from the Norman to the Early English style, and probably date about 1190, according to the opinion of Mr. G. G. Scott. The pillars of this date, he says, are particularly beautiful, consisting of four attached and four detached shafts, the latter connected with the former by moulded bands at half their height. Early in the thirteenth century the nave was lengthened 60ft. The next work in succession of time is that which gives the church its leading characteristics, and on which its celebrity depends, for it includes the magnificent steeple, the whole of the west front, the greater part of the north, and one bay of the south side of the church—work of the latter part of the thirteenth and the early part of the fourteenth century. The excursionists then started and visited the churches at Harlaxton and Denton. Proceeding on their journey, they arrived at Belvoir Castle, and were shown over that magnificent seat. The prominent features of the north-east front are Norman. This front looks upon the site of St. Mary's Priory, in whose consecrated ground were deposited the remains of the founder, Robert de Todeni, and his successors, William de Albini I., II., and IV. The grand entrance is of Decorated character, but previous to the fire no such entrance existed. South-west front: The chapel is Perpendicular. There are many works of art here, including eight pieces of Gobelins tapestry, illustrating the adventures of "Dom. Quichotte," from designs painted by Coypel, who died in 1737; busts by Nollekens, and Venus couchante, and head of a nun purchased in Italy. Here are many family portraits and pictures by some of the following masters, viz., Rubens, Reynolds, Teniers, Gerard Dow, Claude Lorraine, Gaspar Poussin, Guido, Murillo, Van Dyck, Hans Holbein, Veronese, Correggio, Ostade, Durer, Rembrandt, &c. In the chapel is an altar-piece, "The Holy Family," by Murillo, which is insured for the sum of 3,000 guineas. The great charm of the Green or Assembling room are the Seven Sacraments, by N. Poussin. They cost £3,000. Woolsthorpe, Maston, Sedgebrooke, and Barrowby churches were next examined in succession. The church of St. John, at Maston, we may mention, is in much need of restoration. All the sacred edifices were described by Archdeacon Trollope. The excursionists returned to Grantham in the evening, and held a meeting in the Exchange Hall, the Bishop of Lincoln presiding. Archdeacon Trollope, secretary of the society, read a paper on "The Proper Treatment of Stained Glass Windows in Churches," in which he described the incongruous manner adopted in many noble edifices, notably Lincoln Minster, of treating this method of adornment. So ridiculous did they appear in many instances, and so utterly out of all harmony, that they reminded him of the progress of the railway enterprise in this country, where the absence of proper control by Government in directing their formation had led to enormous useless expenditure and a very imperfect system. The example at Lincoln might, however, serve as a warning to two of the finest churches in the diocese, Grantham and St. Mary's, Nottingham, which were admirably adapted for being adorned by its windows in an artistic and rational manner. The Rev. B. Street read a paper on "The Ancient Buildings of Grantham," in which he described the various objects interesting to the antiquarian and those who feel a pride in the early history of the town, as the Abbey House, the earliest mentioned building in the town, in the garden of which a relic of the ancient residence was still preserved, the ancient church and monastery on St. Peter's-hill, Queen Eleanor's Cross in the same locality, and the associations connected with the neighbourhood of the present parish church. Excursions were made next day to the following churches:—Manthorpe, Belton, Syston, Barkston, Honington, Carlton, Normanton, Caythorpe, Hough, Hougham, Marston, Great Gonerby.

NATIONAL FINE ART EXHIBITIONS.

WE have more than once drawn attention to the forthcoming National Exhibition of Works of Art to be held at Leeds. Mr. J. B. Waring, the General Manager and Chief Commissioner of the Exhibition, has recently issued his first report to the Executive Committee. From this able and interesting document we make the following extracts:—In order, says Mr. Waring, fully to appreciate the great importance of the proposed Exhibition at Leeds in 1868, it is well not to regard that alone, but to consider what has been effected in the past, and what may be, and ought to be, the result of such an Exhibition in the future. If we compare the advantages which the people of Europe generally enjoy, as regards public and local Galleries of Art, we cannot fail to observe with regret our own deficiencies in this respect. It is a real and serious subject of reproach to this country that, whilst every town of any importance in the neighbouring land of France, for example, possesses a public gallery of art, in which painting, sculpture, engraving, and works of ancient ornamental industry are more or less well illustrated and arranged, Great Britain is still unable to boast of any similar advantages, any such marks of, and aids to, artistic education among the nation. It is true that of late years museums, of an archæological character principally, have been generally established, and that the Government Department of Science and Art has set in motion a "travelling" collection of works, principally of a decorative nature, relating to manufacture; but, as regards the fine arts of painting and sbulpture, it is not too much to say that, with the exception of a few of the chief cities in the kingdom,—and in these, even as yet but very imperfectly—no such desirable means of recreation, no such powerful aid to instruction of mind and refinement of feeling, exists at all in this country. On the other hand, if we look at France, we find that the town of Boulogne, only thirty miles distant from our shores, and numbering barely 30,000 inhabitants, possesses, besides a fine public library of about 40,000 volumes, and numerous most valuable illuminated manuscripts, an excellent picture gallery, as well as a good collection of ancient and modern sculpture, and works of decorative art. Dijon, another departmental town of about 30,000 inhabitants, possesses a public gallery and museum, containing nearly 500 paintings by the old masters, which serve to illustrate the great schools of France, Germany, Italy, and Holland, besides very valuable examples of Mediæval and Renaissance art. Lyons, one of the greatest manufacturing cities of France, boasts of a gallery of paintings by the ancient masters, amongst which we observe the celebrated names of Pietro Perugino, Palma Vecchio, the Carracci, Pousin, Spagnoletto, Rubens, Teniers, &c, works which

cannot fail to have exercised a beneficial effect on the local School of Design, which has served to raise throughout the world the artistic character of the Lyons manufacturers' productions. Besides this, nearly every town possesses some paintings by great artists who belong by family or by birth to the place: thus, the student of art who wishes to obtain a just idea of what the Vernet family were must visit the Avignon Gallery, in which is preserved a complete series of works by various members of the family, who originally belonged to that city. The importance and value of such public galleries of art, from an educational point of view, cannot, I think, be over-estimated; and it is to be remembered that such galleries, even in France—the land *par excellence* of Governmental action—are due almost entirely to municipal or local grants, and to the liberality of private persons who have bequeathed valuable collections of art to their native towns, mainly with a view to the recreation and improvement of their poorer and less fortunate fellow-citizens. "There can be no doubt," remarks a writer in the *Dublin University Magazine*, upon the Manchester "Art Treasures Exhibition" of 1857, "that the continent has a great advantage over us in these matters. In our land the best treasures are locked up from the great masses of our people; not from the poor alone, but from the entire middle class of society. . . . Is there no spell by which the doors of all these treasure-houses may be opened, if it be only for a time, and their affluent riches poured out into some depository where the whole nation may see them, and the national mind be instructed?" In the present instance, Mr. Waring says he looks forward with confidence to an actual and permanent result from the successful conclusion of what may justly be regarded as a work of national importance; and that, spurred on by the example placed before them, incited by the liberality and public spirit evinced by the owners of such valuable and beautiful works of art, the various municipalities of the land, with Leeds first on the list, will seriously and earnestly set to work to establish local public galleries of art, in which painting and sculpture shall hold the most prominent places, where also a gallery of County Worthies shall be formed, and which cannot fail to be of the very greatest use in the education the instruction, and recreation of the entire population of these islands. As regards the present Exhibition, it is a most encouraging circumstance that no sooner was the scheme mooted by the members of the building committee of the new Infirmary than it was warmly received by their fellow-citizens, and their proposal was so heartily adopted that in less than a month's time a guarantee fund of £110,000 was raised; thus affording the most indisputable proof that the Exhibition, so far as its promoters were concerned, should be no merely local gathering, but, so far as their public spirit and liberality could ensure, it should be worthy of the great county of which Leeds is the commercial centre, and deserve the support of the whole nation.

ARUNDEL SOCIETY.

MR. LAYARD, M.P., in the absence of Lord Elcho, took the chair at the last annual meeting of this society. In opening the proceedings he dwelt on the favourable aspect of the report. The number of members under the recent reconstruction is likely, in the course of the year, to be doubled, and the annual receipts have now reached upwards of £5,000. This growth in resources has enabled the society to extend the sphere of its operations. In the course of the present year two series of publications will be issued, in place of one, to the first and second class of subscribers respectively. These will include chromo-lithographs from frescoes by Raphael, Ghirlandaio, and Razzi. Mr. Layard has kindly undertaken to write for the society a descriptive notice of the Brancacci Chapel, which will be distributed among the members, with the closing illustration of that rich repository of mural decorations. It is anticipated that this critical notice may settle certain historic questions as to the authorship of the frescoes, which have long been subject of doubt. The balance sheet of the society shows that the arrangement made with the Department of Science and Art for the sale of photographs has lately been brought into successful operation. Among the most important works now in course of execution are chromo-lithographic reproductions of Van Eyck's celebrated picture, "The Adoration of the Lamb," together with the accessory side panels, or painted doors. Also specimen drawings have been made by Signor Mariannecci, of Michael Angelo's "Prophets" and "Sibyls" in the Sistine Chapel. In these and other copies Signor Mariannecci has been directed by the council to transcribe more literally than heretofore, the ancient frescoes in their actual state of decay. This instruction was given in consequence of the dissatisfaction expressed by many of the members at the modern aspect imparted to professed facsimiles of ancient works. The project, of which we gave notice some weeks since, to reproduce in chromo-lithography a selection from the sepulchral monuments of the middle ages, is in course of being carried in to effect. As examples of the successful combination of architecture, sculpture, and pictorial or other surface enrichments, the sepulchral monuments of Italy are deemed to be unrivalled. Accordingly the council of the Arundel Society have engaged Professor Snauth, of Stuttgard, to make careful copies in colours or monochrome, of two valuable monuments in the Church of San Giovanni e Paolo, Venice. A favourable specimen of the Professor's work, together with other interesting drawings recently executed, may be seen in the society's rooms, Old Bond-street. In the prosecution of these important undertakings the society will obtain valuable assistance through the accession of Mr. Street to the council.

OUR ILLUSTRATIONS.

OUR illustrations this week consist of a double page lithographic drawing of a portion of the Strand front of Mr. Scott's design for the new Law Courts, which we noticed analytically in the BUILDING NEWS, No. 630; designs for a cabinet and bookcase, by Mr. B. Talbert. We have noticed that gentleman's work on mediæval furniture in another part of to-day's impression. No doubt many of our readers will remember that when we offered £5 5s. some years ago for the best heading for the BUILDING NEWS, and for which nearly 150 competitors tried their hand, Mr. Talbert won the prize.

We also give this week, the first of a series of sketches of the "Early Architecture of France," by Mr. W. J. Willcox, architect. The series will embrace perspective views of the exteriors and interiors of many of the finest churches in France, besides an assemblage of striking detail, remarkable for its excellence in design. These embrace altar ornaments, arcading, apses, base mouldings, capitals and bases, corbels, chapels, doorways, groining, ironwork, mouldings, panels, piscinæ, porches, spandrels, and spandrel ornaments, stringcourses, towers and spires, windows, and various other features, which will be found, it is believed, to contain examples alike interesting to the professional man and the student. The sketches will be drawn on stone by Mr. Edward Wimbridge, and when finished they will be found to be a valuable supplement to the well-known works of Mr. Nesfield and Mr. Norman Shaw.

OFFICIAL WISDOM.

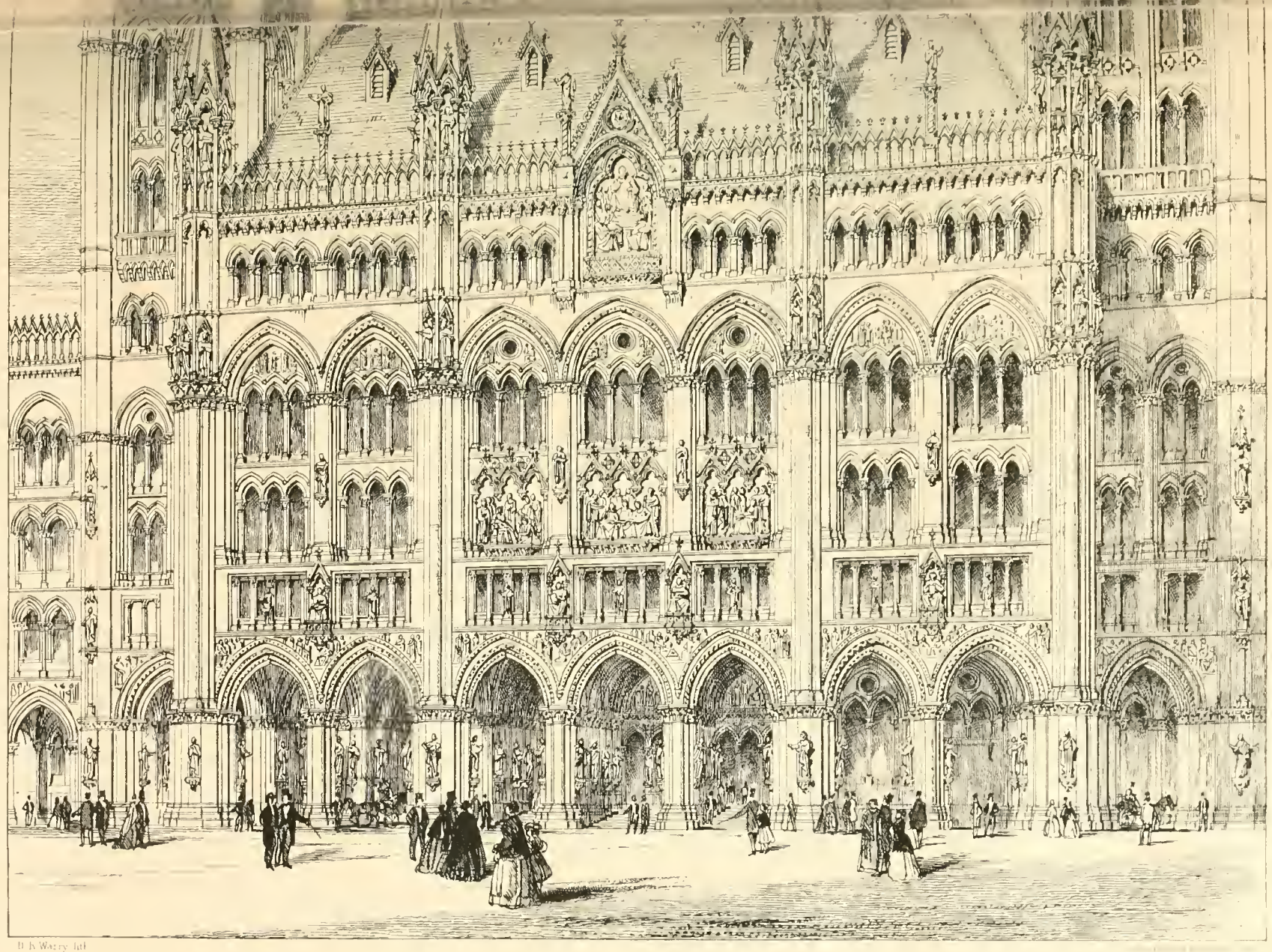
THOUGH the monthly report issued by Dr. Whitmore, the medical officer for Marylebone, is short, it always contains some useful information or valuable suggestions. Had it not been for that officer's prompt action a short time since, in all probability, a fatal epidemic would have broken out in Marylebone. "On a very recent occasion," said he,—"I had the opportunity of observing how greatly sickness and diarrhœa are produced by the offensive effluvia arising from large accumulations of manure. About a fortnight ago, an outbreak of cattle plague occurred in Malthouse Mews, Lisson Grove: adjoining to this is Carlisle Mews, and in these two places at the time of the outbreak, there were 60 cows, and from 80 to 90 horses. These places were promptly declared to be an infected district, as directed by the orders of the Privy Council, and a 'Cordon Sanitaire,' so to speak, was placed round it, policemen stationed at the different outlets prevented the removal of all manure, offal, fodder, hay, straw, and everything that might be supposed to convey infection, and the result was that in a very short time immense heaps of manure had accumulated. After the interval of a few days, sickness and diarrhœa broke out amongst the inhabitants, and in order to ascertain the extent to which it existed, I caused a careful house to house inspection to be made. It was found that 149 men, women, and children, resided in these mews, and that 61 were suffering from sickness and diarrhœa. It was not until after an interval of twelve days, and the expenditure of much time and trouble, that I was enabled to get the manure removed; had it been delayed for a few days longer, I have reason to believe that fatal consequences would have ensued. The regulations issued by the Privy Council in regard to the cattle plague are very stringent, especially so, in preventing the removal of any matter or thing from a district which has been declared to be infected. It is expressly provided that all infected manure shall be first disinfected, and afterwards destroyed, no reference whatever being made to its removal; and even with regard to the manure of horses or cattle not infected, the difficulty of dispesing of it, if contained within the infected circle, is very considerable. Every person will readily allow, that with a disease so intensely contagious and destructive as this, the strongest measures of precaution are necessary, provided always that in the application of them the public health is not endangered. In the case here referred to, a large number of persons were for nearly a fortnight, subject to a nuisance so intolerable and nauseating, as to render it impossible for many of them to take food in their own houses, and who were positively compelled to take their meals in some neighbouring street, where the horrible effluvia from the decomposing animal excreta had not penetrated."

Dr. Whitmore asks, and very naturally, that increased facilities be given to the local authorities for removing manure, offal, &c. We are not, like many, ardent admirers of all the municipal regulations of Paris; but we do say, that such a delay occasioned by red tapeism, as the one just mentioned, could not have taken place in that city.

ENGLISH ARTISANS AT PARIS.

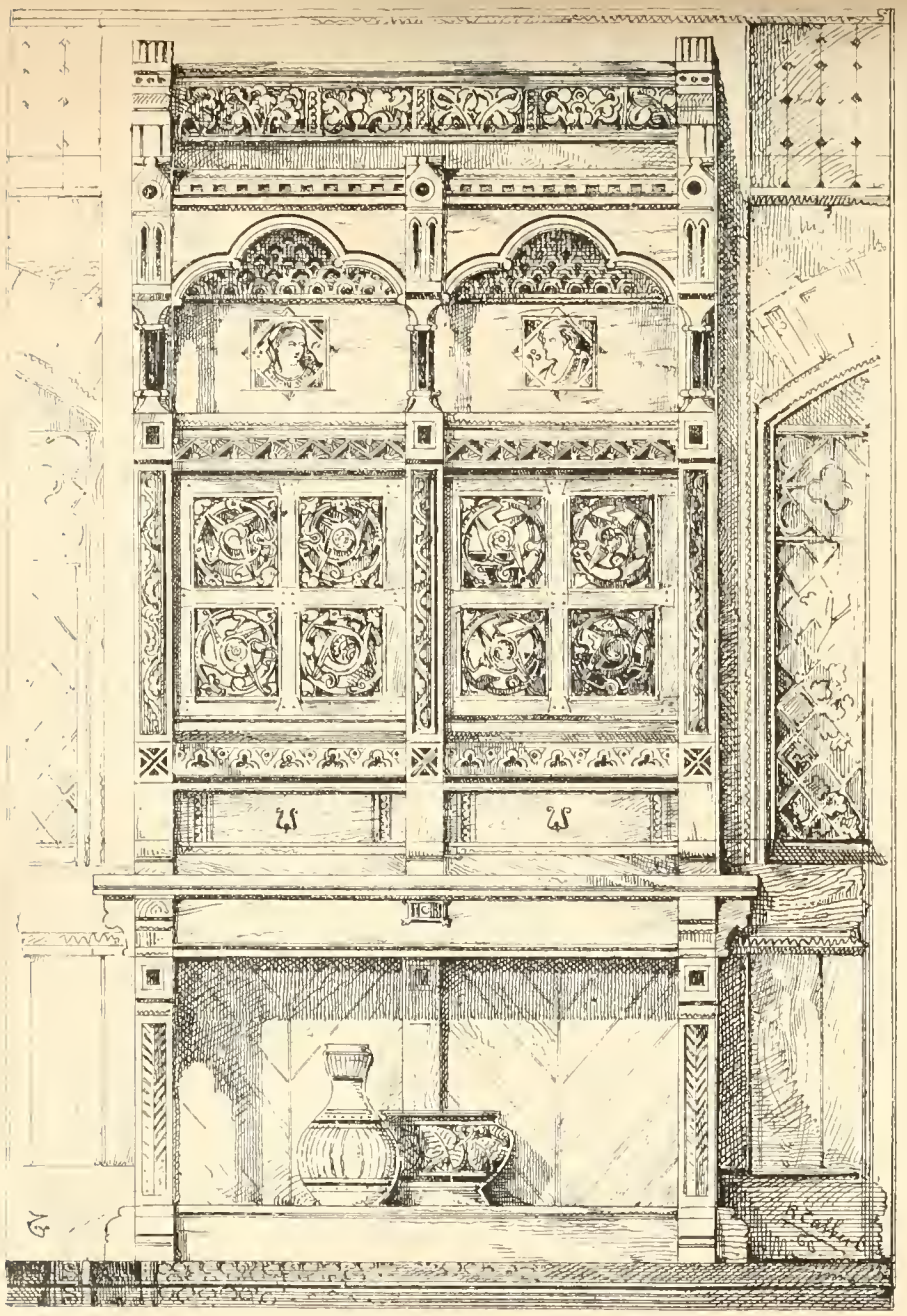
A LAUDABLE effort is set on foot by the Paris Excursion Committee of the Working Men's Club and Institute Union to turn to good account the visits of the large bodies of English workmen whom they are sending to the French capital. The French authorities have been induced by the exertions of Mr. A. H. Layard, M.P., to open specially to these excursionists several most valuable institutions, as well as to give every aid in acquiring information. A prize fund is also established by the committee for awards to the authors of the best reports on certain specified branches of industry, including articles in stone, iron, wood, clay, glass, gold and silver, bronze, leather, paper, textile manufacture, machinery, printing, books, &c. Towards this fund a grant of £250 has just been made by the Science and Art Department. The committee has issued a list of conditions in connection with the reports, which may be had at the offices, 150, Strand. Intending excursionists are advised to provide themselves with a note book before going to Paris, and to record therein, day by day, every novelty in articles and processes of manufacture that comes under their notice, and especially any improvements connected with their respective trades. The questions which each competitor should ask himself before writing his report are:—In what respect (if any) is continental workmanship superior to English?—Has machinery been adopted, and, if so, with what advantages?—And where continental workmen successfully compete with English industry is it due to superior manipulative skill, or to the adoption of some labour saving process, and more efficient machinery? The reports must be sent in to the secretary of the prize fund within six weeks from the date of the writer's return from Paris.

In the House of Commons on Tuesday, Mr. Locke (in the absence of Mr. Layard), asked the First Commissioner of Works whether the revised elevation for the façade of the London University, to be erected in Burlington Gardens, now exhibited in the library, would be adopted. Lord J. Manners said that the elevation had been for some time in the library. Some alterations had been made in the details in accordance with the views of the hon. member for Bath (Mr. Tite.) He had not heard, either in public or private, any hostile criticism of the design, and he presumed he might consider that it met with the approbation of the Building Committee. He should therefore instruct Mr. Pennethorne to carry it into effect.

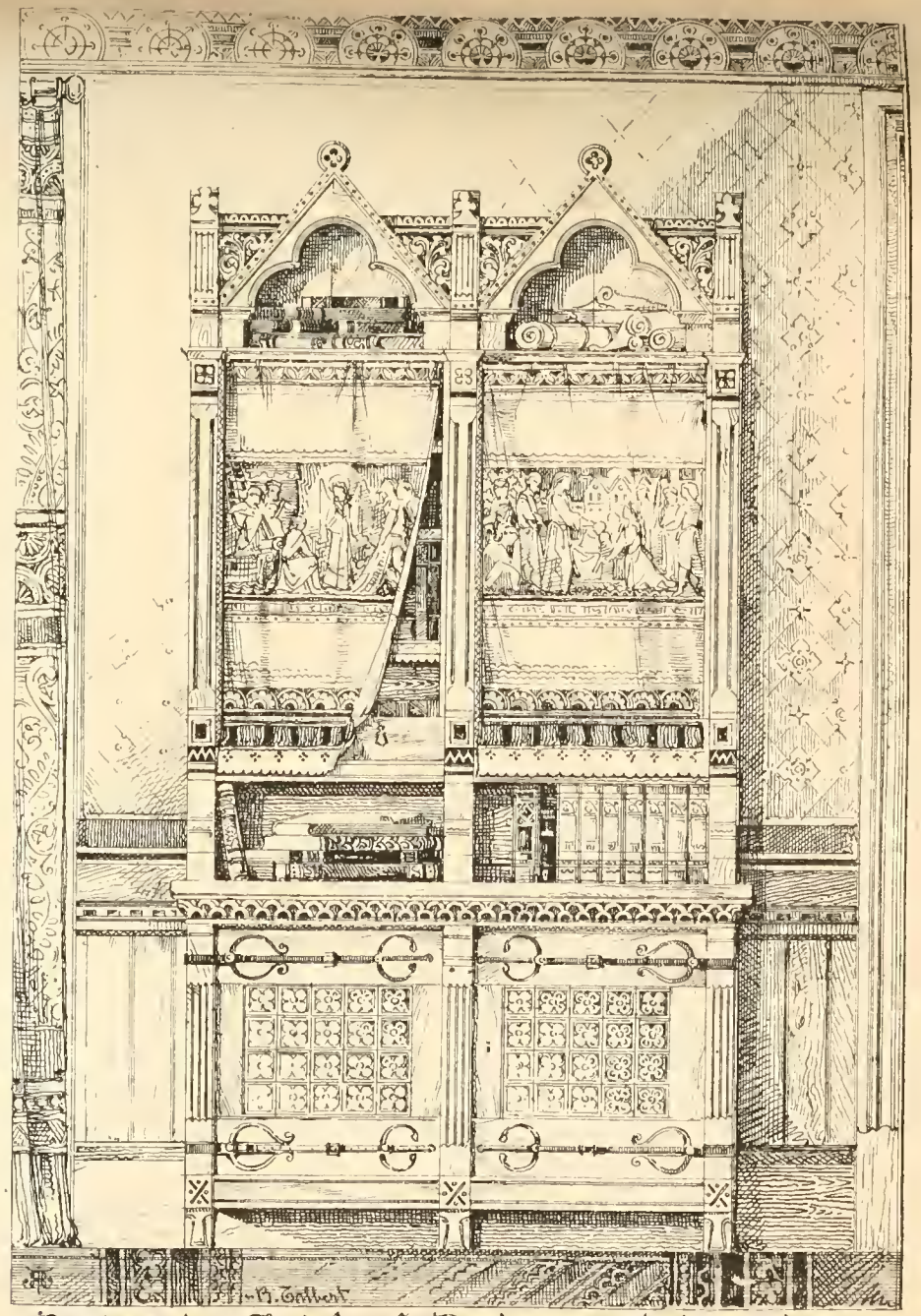


D. R. Warry lith

Design for New Law Courts. Portion of Strand Front. C. G. SCOTT, ARCHT



Design : for : Cabinet B. Talbert : Archt

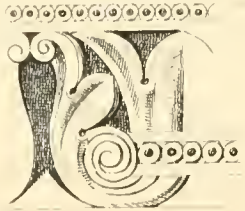


Design : for : Scriptural-Bookcase Oak : & : Inlaid

Beauvais

Church of St. Etienne

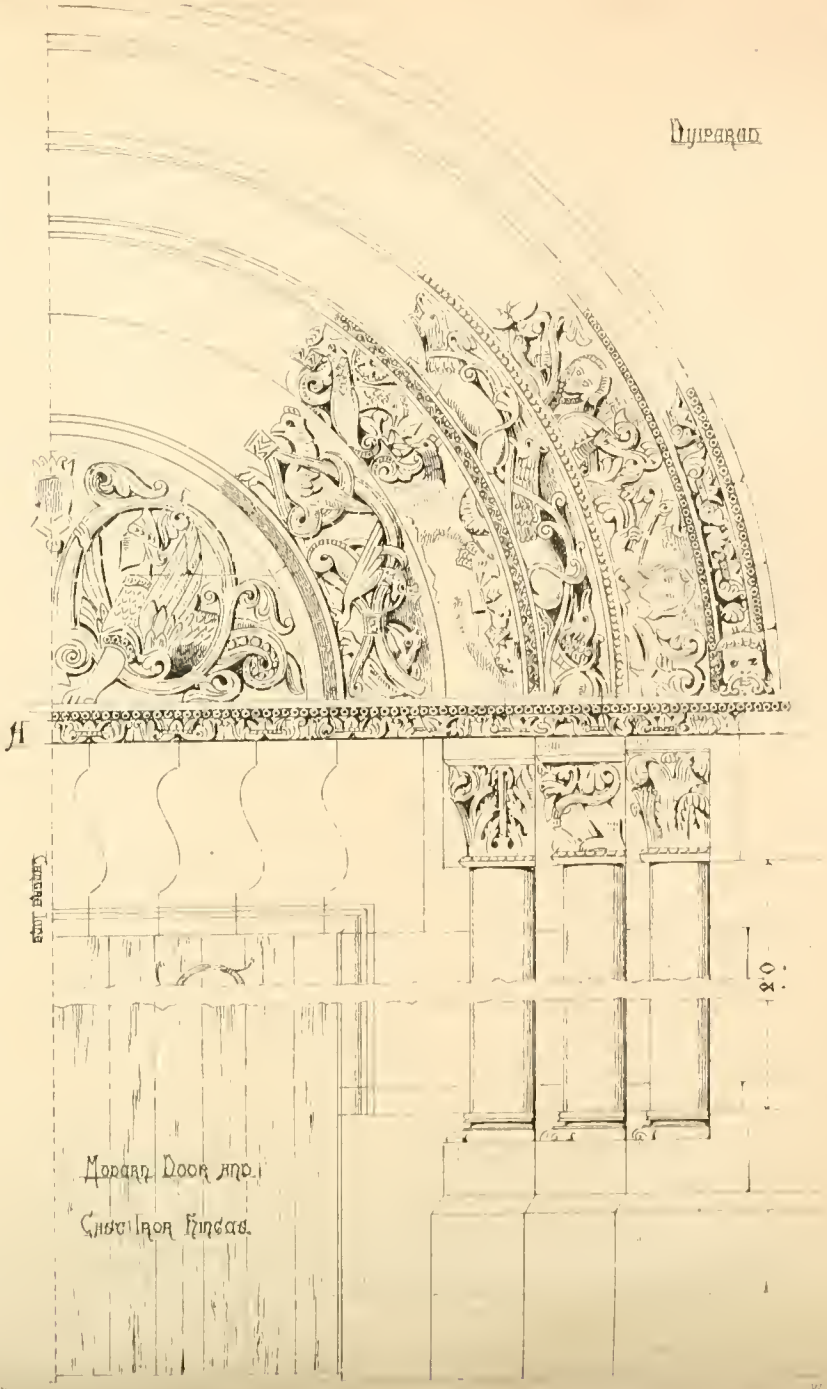
Detail at A



North Doorway

It has been well restored in places but the original designs carefully copied for all the new work.

Scale 2 Feet to an Inch



Printed by Whiteman & Bass

MEDIÆVAL FURNITURE.*

IT is curious to note through how many phases of signification the word "Gothic," as applied to the arts of design, has passed. There is little doubt that it was first used as a term of reproach. It next became popularly identified with all that was picturesque and romantic in architecture. It afterwards degenerated into the mere watchword of an æsthetic clique; and there is too much reason to fear that in consequence of what has of late years passed under its name we are now beginning to be rather ashamed of it. Nevertheless, the word, in its best sense, is a good word, and it is not because we find it daily misapplied by the ignorant to those wretched travesties of mediæval architecture which are rising up around us and on every side that we should forget that the style has many able representatives even in our own time, to say nothing of times past, when Gothic art had a glory of its own—a glory from which the mistakes of our own day can never fairly dissociate it.

Let us confess that we opened Mr. Talbert's book with some misgivings. And though in many instances of his design we have been agreeably surprised by the fertility of his invention and the appreciation of sound, honest workmanship which is embodied in his taste, we cannot, after fairly examining it, resist the conviction that if a reform is to be effected in the manufacture and appearance of our household furniture (and that such a reform is needed there can be little doubt), many important conditions, not only of artistic but of practical import, must be kept in view, which would seem to have been overlooked by the author of this volume. It is generally admitted that extravagance of form and complexity of detail are to be avoided in the design of objects which are intended for ordinary domestic use; and even under circumstances which lead to an opposite conclusion, care should be taken not to multiply ornament for the mere sake of elaboration. The metal work on the central compartment of Mr. Talbert's sideboard (plate 1) is an instance of extraordinary intemperance in design; and a similar fault may occasionally be perceived in the disposal of his inlaid decoration. The same example, together with some others, bears evidence of a tendency to treat woodwork like stone; and though this is a solecism which has more or less prevailed in better ages of art than the present, we must remember that it found an apology then which it can never find again. In such ages the habits of life were rude and simple. The interior of a modern cottage presents many points of comfort, and even of luxury, compared with the rush-strewn chambers in which our ancestors dined and slept. In applying, therefore, what Mr. Talbert calls "Gothic forms" to the design of modern furniture, due regard should be paid not only to the actual requirements of life in the nineteenth century, but also to the essential modification which such forms must undergo before they can with propriety be adapted to many objects which were never used at all in the middle ages.

On this point, indeed, Mr. Talbert himself observes in the preface to his work:—"Though there are few examples of the later period of Gothic furniture, it is impossible to find precedents for domestic woodwork of the earlier periods. The few examples that remain may serve to point out the path to be taken, but demand a certain amount of invention before they could either fulfil the purpose or give the comforts now necessary to us. To those who desire a repetition of fifteenth century work it is easy to obtain furniture corresponding with the style of that period; but it is most difficult to procure that which will be more in keeping with the purer and earlier styles. I have endeavoured by this series of designs and sketches from existing work to be of help to those who are interested in supplying this want; and as each modern Gothic mansion has its own peculiarities requiring a distinct treatment, I consider that the principal use of the work is that it may be of a suggestive nature."

The truth is that in the present day we do not want *monumental* furniture, *i.e.*, furniture of which the features are derived from the rood screens and church stalls of a bygone age. If we would replace by honest design and manufacture the gimcrack and shapeless abominations which are now made under the names of cabinet work and upholstery, we must work in the spirit rather than in the letter of mediæval art. And this is undoubtedly a difficult task to accomplish. For, so long have the public been accustomed to recognise a certain sense of luxury and false elegance in the sheen of French polish, veneered tables, and in the twists and curves of a drawing-room "suite" (as the Tottenham Court-road shopkeepers are sure to call it), that a plain but well-made article of solid wood, designed on "true principles," will seem commonplace to ninety-nine people out of a hundred, compared with the fashionable appointments of a modern house. To meet this apparent deficiency of "elegance," designers of Mr. Talbert's school are too apt to indulge their fancies in quaint combinations of colour and material, elaborate carving and metal work, rich tapestries, &c., all very delightful to contemplate, but representing in their aggregate value an amount of cost at which the British householder would stand aghast. John Bull's taste is not easily reformed at any time, but if it can be only reformed by doubling and trebling his upholsterer's bill, he will find in that fact a strong argument in favour of his present convictions. Many of Mr. Talbert's designs are novel and picturesque in character. The bed and sofas, especially the one sketched on plate 10, ingeniously combine the new doctrine of his taste with every possible requirement of modern luxury. There are, also, some good specimens of cabinets and bookcases, two of which we engrave in our issue of this week.

The text contains some sensible remarks on the subject of drawing-room furniture:—

"The drawing-room is not easy to deal with. There has been little attention paid to the subject, and the requirements are directly opposed to what is generally considered the spirit of Gothic design. Massiveness for the dining-room and hall seems right, but for the ladies' room lightness and grace ought to be aimed at, and to get these without an expression of feebleness or wanton curvature is a difficulty. The framing of the woodwork being light, leaves little scope for characteristic treatment. But a good opportunity exists in the design and arrangement of textile fabrics, which form an important part in the appointments of a modern drawing-room. Perhaps manufacturers will some day see the necessity of using small diapers or geometrical patterns for their furniture stuffs, instead of the everlasting *fleurs-de-lis* and flowering sinuosities now accepted as Gothic."

We have much pleasure in recommending Mr. Talbert's book to our readers' attention. His designs do not, perhaps, represent the most refined development of mediæval art, but no better ones, so far as we know, have yet been published; and considering the efforts which are now being made to encourage the revival of good taste in all branches of manufacture, we can only be thankful for any step which is taken to promote so excellent an object.

As specimens of Mr. Talbert's work we give on another page a design for a cabinet and a design for a bookcase.

* "Gothic Forms applied to Furniture, Metal-work, &c., for Interior Purposes." Illustrated with thirty pages of geometrical and perspective sketches. By B. J. TALBERT, architect. Published by S. Birbeck, bookseller, Birmingham.

Mr. William Hawes, Vice-President of the Society of Arts, has been unanimously elected Chairman of the Council for the current year.

INSTITUTION OF CIVIL ENGINEERS.

THE Council of the Institution of Civil Engineers have awarded the following premiums for papers read at the meetings during the past session:—1. A. Telford medal, and a Telford premium, in books, to James T. Chance, M.A., Assoc. Inst. C.E., for his paper "On Optical Apparatus Used in Lighthouses." 2. A Telford medal, and a Telford premium, in books to Edward Byrne, M. Inst. C.E., for his paper "Experiments on the Removal of Organic and Inorganic Substances in Water." 3. A Telford medal, to George Biddell Airy, Astronomer Royal, Hon. M. Inst. C.E., for his paper "On the Use of the Suspension Bridge with Stiffened Roadway for Railway and other Bridges of Great Span." *4. A Watt medal to Colonel Sir William Thomas Denison, K.C.B., R.E., Assoc. Inst. C.E., for his paper on "The Suez Canal." 5. A Watt medal, and a Telford premium, in books, to John Bourne, for his paper on "Ships of War." *6. A Telford premium, in books, to Captain Henry Whatley Tyler, Assoc. Inst. C. E., for his paper "On the Working of Steep Gradients and sharp Curves on Railways." *7. A Telford premium, in books, to William Henry Preece, Assoc. Inst. C.E., for his paper "On the Best Means of Communicating between the Passengers, Guards, and Drivers of Trains in Motion." *8. A Telford premium, in books, to William Alexander Brooks, M. Inst. C.E., for his paper on "The River Tyne." 9. The Manby premium, in books, to Charles Douglas Fox, M. Inst., C.E., for his paper "On Light Railways in Norway, India, and Queensland."

PASSIVE STRENGTH OF MATERIALS.

STIFFNESS, or the power of resisting flexure, is measured by the force required to produce a given minute change of form. For beams similarly fixed, it is directly proportional to the breadth and the cube of the depth, and inversely to the cube of the length. Thus a beam or bar two yards long will be equally stiff with a beam one yard, provided that it be twice as deep or eight times as broad. If the ends of a beam can be firmly fixed by continuing them to a sufficient distance and keeping them down by a proper pressure, the stiffness will be four times as great as if the ends were simply supported. A hollow substance, of given weight and length, has its stiffness nearly proportional to the square of the diameter; and hence arises the great utility of tubes when stiffness is required, this property being still more increased by the expansion of the substance than the ultimate strength. It is obvious that there are a multiplicity of cases in carpentry where stiffness is of more importance than any other property, since the utility as well as beauty of the fabric might often be destroyed by too great a flexibility of the materials.

If we wish to find how much a beam of fir will sink when it is loaded in the middle, we may multiply the cube of the length in inches by the given weight in pounds, and divide by the cube of the depth, and by ten million times the breadth; but, on account of the unequal texture of the wood, we must expect to find the bending somewhat greater than this in practice, besides that a large weight will often produce an alteration, or permanent settling, which will be added to it; a beam of oak will also sink a little more than a beam of fir with the same weight.

With respect to torsion, the stiffness of a cylindrical body varies directly as the fourth power of the diameter, and inversely in the simple proportion of the length; it does not appear to be changed by the action of any force tending to lengthen or to compress the cylinder; and it may very possibly bear some simple relation to the force of cohesion, which has not yet been fully ascertained; but it appears that, in an experiment of Mr. Cavendish, the resistance of a cylinder of copper to a twisting force, acting at its surface, was about 1-100th of the resistance that the same cylinder would have opposed to direct extension or compression.

Alteration is often an intermediate step between a temporary change and a complete fracture. There are many substances which, after bending to a certain extent, are no longer capable of resuming their original form; and in such cases it generally happens that the alteration may be increased without limit, until complete fracture takes place, by the continued operation of the same force which has begun it, or by a force a

* Have previously received Telford medals.

little greater. Those substances which are the most capable of this change are called ductile; and the most remarkable are gold and a spider's web. When a substance has undergone an alteration by means of its ductility, its stiffness, in resisting small changes on either side, remains little or not at all altered. Thus, if the stiffness of a spider's web, in resisting torsion, were sufficient at the commencement of an experiment to cause it to recover itself, after being twisted in an angle of ten degrees, it would return ten degrees, and not more, after having been twisted round a thousand times. The ductility of all substances capable of being annealed is greatly modified by the effects of heat. Hard steel, for example, is incomparably less subject to alteration than soft, although in some cases more liable to fracture: so that the degree of hardness requires to be proportioned to the uses for which each instrument is intended; although it was proved by Coulomb, and has since been confirmed by other observers, that the primitive stiffness of steel in resisting small flexures is neither increased nor diminished by any variation in its temper.

The strength of a body is measured by the force required completely to overcome the corpuscular powers concerned in the aggregation of its particles, and it is jointly proportional to the primitive stiffness and to the toughness of the substance, that is, to the degree in which it is capable of a change of form without permanent alteration. It becomes, however, of importance in some cases to consider the measure of another kind of strength, which has sometimes been called resilience, or the power of resisting a body in motion, and which is proportional to the strength and the toughness conjointly, that is, to the stiffness and the square of the toughness. Thus, if we double the length of a given beam, we reduce its absolute strength to one-half, and its stiffness to one-eighth; but since the toughness, or the space through which it will continue to resist, is quadrupled, the resilience will be doubled, and it would require a double weight to fall from the same height, or the same weight to fall from a double height, in order to overcome its whole resistance. If we wish to determine the resilience of a body from an experiment on its strength, we must measure the distance through which it recedes or is bent previously to its fracture; and it may be shown that a weight which is capable of breaking it by pressure, would also break it by impulse if it moved with the velocity acquired by falling from a height equal to half the deflection. Thus, if a beam or bar were broken by a weight of 100lb., after being bent six inches without alteration, it would also be broken by a weight of 100lb. falling from a height of three inches, or moving in a horizontal direction with a velocity of four feet in a second, or by a weight of one pound falling from a height of 300in. This substitution of velocity for quantity of matter has, however, one limit, beyond which the velocity must prevail over the resistance, without regard to the quantity of matter; and this limit is derived from the time required for the successive propagation of the pressure through the different parts of the substance, in order that they may participate in the resistance. Thus, if a weight fell on the end of a bar or column with a velocity of 100ft. in a second, and the substance could only be compressed 1-200th of its length without being crushed, it is obvious that the pressure must be propagated through the substance with a velocity of 20,000 feet in a second, in order that it might resist the stroke; and, in general, a substance will be crushed or penetrated by a velocity exceeding that which is acquired by a body falling from a height, which is to half that of the modulus of elasticity of the substance, as the square of the greatest possible change of length is to the whole length. From the consideration of the effect of rigidity in lessening the resilience of bodies, we may understand how a diamond, which is capable of resisting an enormous pressure, may be crushed with a blow of a small hammer, moving with a moderate velocity. It is remarkable that, for the same substance in different forms, the resilience is in most cases simply proportional to the bulk or weight, while almost every other kind of resistance is capable of infinite variation by change of form only.—*From Treatise on Architecture, by Arthur Ashpitel, Esq.*

Among the recipients of silver medals at the Paris Exhibition, may be mentioned Mr. Thos. Peake, proprietor of the tileries, Tunstall, for tiles.

COMPETITIONS.

GATESHEAD TOWNHALL.—The Townhall Committee of the Gateshead Council met at the Temporary Townhall, Queen's Head, High-street. After a very careful inspection of the seven sets of competitive plans for the new hall, they decided on recommending Mr. Thomas Oliver's to the council as the most suitable in every respect; Messrs. Austin and Johnson's, and Mr. John Johnston's, coming next in order of merit.

NEW BOARD OF WORKS' OFFICES, POPLAR.—This Board met on Tuesday, 2nd inst., when the committee of the whole Board appointed for that purpose reported that of the forty-three designs submitted they had selected ten, and suggested that some eminent and impartial architect should be appointed to examine the ten selected plans, and report as to their practicability and probable cost. This suggestion was adopted, and it was referred back to the committee to appoint an architect.

Building Intelligence.

CHURCHES AND CHAPELS.

St. James's Church, Sutton, Hull, has just been restored, at a cost of over £2,000. Mr. R. G. Smith, of Hull, was the architect, and Messrs. Simpson and Malone, of the same place, were the contractors.

The reopening of the parish church of North Aston took place last week. The restoration of the edifice has been effected under the direction of Mr. G. G. Scott, at the sole cost of Mr. Foster Melliar, of North Aston House.

Christ Church Cathedral, Montreal, was consecrated on the 18th ult. It is situated in St. Catherine-street, and has been built to supply the place of the old cathedral in Notre Dame-street, which was destroyed by fire in 1856.

The opening of new St. Paul's Episcopal Church, Aberdeen, took place last week. The church is in the Decorated Gothic style, from designs by Mr. J. R. M'Kenzie, architect, Aberdeen. The length is 100ft. by 50ft. wide. It is seated to hold 800 persons, and has cost £4,000. The builder was Mr. Stewart.

A new chapel for the Methodist New Connexion has been commenced at Dalehall, Burslem. It is in the Italian style. The architects are Messrs. Scrivener and Son, of Hanley, and the builder is Mr. Bowden, of Burslem.

A new peal of twelve bells has been hung in the Church of St. Mary le Tower, Ipswich. A number of changes were rung upon them for the first time on Sunday, at the conclusion of evening service, by a party of ringers from St. Bride's and St. Pancras, London. This is the only peal of twelve bells in Suffolk.

The foundation stone of a new chapel for the Wesleyan Methodists, at Old Swan, Liverpool, was laid on Monday. The chapel will be in the Gothic style, freely treated, the exterior of red stone shoddy work, with tooled dressings. It will contain 479 sittings, and will cost upwards of £2,000. The architects are Messrs. Green and Parslow, of Dale-street, Liverpool, the contractor being Mr. John Westmoreland, of Islington.

The new Church of St. James, Fynone, Swansea, was consecrated and opened by the Bishop of St. David's, on June 21. The building has been erected from the designs and under the superintendence of Mr. Nicholson, Hereford, the architect to the Church Building Society in that diocese. The contractors for the work were Messrs. Thomas, Watkins, and Jenkins, builders, Swansea. The church is in the Decorated style of English architecture. The plan comprises a nave with north and south transepts, chancel, north and south chancel chapels, a vestry, a porch, and a tower and spire to be added hereafter. The extreme length is 120ft, and the extreme width 75ft. The accommodation is for 600 persons. The aisles are separated from the nave by five arches on each side, standing upon columns with carved capitals. A wide and lofty arch separates the nave from the chancel. The west front, the transepts, and the chancel are filled with large windows of geometrical tracery, that in the chancel being of five lights, and those in the transepts of four lights each. A series of three-light windows decorates the aisles. All the windows are glazed with thick cathedral tinted glass. The roofs are open timbered, of an interlacing pattern, and are stained and varnished. Godwin's tiles are used for the floors throughout, plain in the body of the church, and ornamental in the chancel. The reredos is composed of enriched tile work. The seats are open, stained, and varnished. The chancel is stalled and is well elevated above the nave. The materials used in the construction are native stone for the walling, and freestone both inside and out for the dressed work.

CHURCH OF ST. PETER AND ST. EDWARD, PALACE-STREET.—A new tabernacle and throne has recently been erected in this church, Mr. Bentley, of Southampton-street, Strand, being the architect, and Mr. Peter Cooke, of Kennington, the mason. The tabernacle stands in advance of the face of the throne, and is flanked by buttresses, diapered and panelled on the face, and slightly projecting at right angles to the sides and front. Between the two on the latter face is attached a rich moulding, the inner members of which form the frame of the painted and gilded door, and the outer arch over a sculptured composition, in traceried panels, representing our Lord in majesty between two angels incensing. A pediment crocketed at the upper part, with a pelican in her piety, for a finial, and a battlemented capping terminate this portion of the design. The throne is a grand groined canopy supported on four piers, two standing free and two attached to the east wall of the sanctuary, and rising from the super-altar level. On the front and side of the detached piers, buttresses are arranged with carved brackets, supporting angels holding the sacred symbols and monograms; and on the inner angles of each pier are thin clustered columns, trefoil in section, having moulded bases and caps. In the midst of the angels, and in the rear of the pelican, is the pedestal for the remonstrance. At the sides of the canopy, above the richly moulded and cusped arches, are gablets dying against traceried and turreted pinnacles, and enriched with graceful and continuous crocketing, and carved finials. Behind the gablets rises the shaft of the spirelet, gradually changing from square to octagon on plan, the cardinal faces being panelled, and the angles having pinnacles similar to those of the canopy. A deep brattishing of a fleur-de-lis pattern, below a battlemented cornice, forms the base of the spiral termination; and a cross of simple outline, with a carved annulet and foliated horns, complete the design. The style is an adaptation of the Early English. The height from the level of the sanctuary floor to the top of the cross is 27ft. The sanctuary also has been cleaned and decorated. The upper part is coloured buff, and the lower part, which forms a deep dado, Tyrian purple, which is finished by a continuous guilloche, enclosing alternately lions and doves in dark umber, and an under string of pateræ and I.H.S.'s in black. The ornament was executed, from full-sized drawings prepared by the architect, by Mr. Fisher.

KENSINGTON.—St. Peter's new Church, Onslow Gardens, South Kensington, was consecrated on Saturday last by the Lord Bishop of London. It is in the Decorated style, seating 1,500 persons, and contains a nave, chancel, two transepts, and side aisles, with tower and spire, nearly 160ft. high. The foundation stone was laid on July 21, 1866, by Mrs. Freake. The building was erected by Mr. C. J. Freake (the founder and patron), the Right Honourable and Rev. F. C. E. Byng having the appointment. Mr. J. Brown acted as clerk of works and general foreman for Mr. Freake.

READING.—INTERESTING DISCOVERY.—We have further on notified the intended restoration of St. Lawrence Church, at this place. The work has since been begun, and Mr. Joseph Morris, the architect, has come upon a very interesting relic in course of his inspection of the edifice. In the north wall he found a piece of marble showing out between the broken plaster where the pews had been taken down, which turns out to be a fine specimen of ancient carving:—"It measures 24in. in width by 17in. in height, and, although very much mutilated, is a relic of great beauty and interest. The subject is "the adoration of the Magi." The Virgin Mary occupies the right hand of the group, and is represented in a recumbent posture, with the infant Saviour in her lap; St. Joseph is sitting in a chair on the left of the panel; one of the Magi is making obeisance and presenting his gift to our Lord, whilst the other two stand in the background with their offerings in their hands. A seventh figure occupies the position at the right of the Virgin, with the hand upon her shoulder, and this is probably intended to represent St. John; the group is cut out of a solid block, the top of which forms a triple canopy. It

is difficult to say of what architectural feature the relic forms a part, but the position in which it was found has evidently no relation to its original destiny. The panel has been removed, to prevent its being injured, and will be replaced in some suitable part of the church. I am unable to define precisely the date of the work, but it is probably at least 400 years old."

READING.—The entire restoration of the beautiful old Church of St. Lawrence in this town is contemplated, and the works have been since commenced under the superintendence of Mr. Joseph Morris, architect, of Reading. The church is a fine specimen of Perpendicular architecture; the proportions of the tower are remarkably good, and from its advantageous position at the top of Friar-street and facing the market-place, is the most attractive architectural feature of the town. The stonework of the tower is much decayed and its restoration will cost about £1,000. It is expected that at least £4,000 will be needed properly to carry out the whole work of restoration, but, as the committee has only a little more than half that amount yet promised, the work to the tower has not yet been commenced; it is expected that the works will occupy about one year. A curious piece of sculpture, representing the Adoration of the Maji, has been found embedded in the north wall. The contract is taken by Mr. Henry Lovatt, of Wolverhampton, who is now engaged upon the new station at Reading.

SALISBURY CATHEDRAL.—The capstone of this cathedral spire, immediately under the vane, having been discovered to be in a very decayed state, workmen are now engaged in its repair. At so lofty an altitude, upwards of 400ft., a work of this sort is not an easy matter, and it has, therefore, become necessary, in order to enable them to do it effectually, to surround that part of the spire near the weather door with a strong platform, from which a series of five others have been erected at certain distances above one another, the last being at the summit. The ascent from the weather door to the top is accomplished on the outside by means of about twenty-nine iron handles firmly fixed in the spire. Surrounded by scaffolding on the extreme top, the spire now presents a very curious appearance.

SHEBBURN NEW TOWN.—The corner stone of a new school chapel (Wesleyan Methodist), was laid here on Monday. The building is designed in the Gothic style of architecture, and will be built of brick, with stone facings. The architect is Mr. T. A. Page, of South Shields.

BUILDINGS.

A new harbour of about seven acres in extent, and with upwards of 450 yards of sea wall, is in course of construction at Anstruther, Fife, Scotland. The cost will be about £50,000. The engineers are Messrs. Stevenson, of Edinburgh, Mr. Morrison being the contractor, and Mr. Gray clerk of the works.

The trustees of the Peabody Fund are about to erect a block of buildings in Brewer's Green, Westminster, which will necessitate further improvements in the same quarter. There is a condition that 10ft. of the site along the whole front be thrown into the public footway.

EDINBURGH.—The foundation stone of the new city poorhouse, at Craiglockhart, about two miles from Edinburgh, was laid last week. The new buildings will cover, with their enclosed airing courts, an area of sixteen acres. They consist of three distinct buildings, the main poorhouse in the centre, the infirmary to the east, and the lunatic asylum to the west. There is a frontage to the south of 1,200ft. The style adopted is the Scotch. The whole is treated in a plain and simple way, without expensive or ornamental details. At the centre of the main poorhouse a corbelled tower, octagonal in form, rises to the height of 105ft.; and a picturesque and varied outline is given to the long fronts by numerous bold projections, finishing with crow-stepped gables. The main poorhouse is designed upon what is called the block system, now in general use for all new infirmaries and hospitals, and its adoption in the case of lunatic asylums has been frequently advocated. The pavilions or blocks for the patients are all two stories in height, and each contains only one ward on each floor. The wards for the ordinary patients are 60ft. by 22ft., and those for the fever patients 86ft. by 23ft. They are lighted and ventilated upon both sides, and at the ends by a series of large windows. The lavatories, baths, and waterclosets are placed at the extreme ends of the pavilions, upon the external angles—a position which ensures their thorough ventilation, and, as they are cut off by lobbies, prevents any chance of effluvium finding its way into the wards. Upon each side of the central corridor are placed the day-rooms and dormitories for the various classes of paupers. These are 35ft. long by 18ft. wide, and 12ft. ceilings, giving in the dormitories a cubic air space on the average of nearly 500ft. per bed. The total number of paupers accommodated in the whole establishment is 1,150. The poorhouse will be built of blue Craiglockhart stone, with dressings, &c., from Redhall Quarry. The present contract is for £35,000, in addition to which about £2,000 is required for roads, &c. Messrs. George Beattie and Son, Edinburgh, are the architects. The contractors are Mr. Robert Hutchison, for the mason work; Messrs. Kemp, Murray, and Nicolson, for the joiner work. The whole is to be completed for occupation by April 1, 1869.

THE ALEXANDRA ORPHANAGE.—On Saturday the ceremony of laying the first stone of new buildings to be erected in connection with this institution at Hornsey Rise, was performed by the Duchess of Sutherland, in the absence of the Princess of Wales. These houses will be connected by a covered way with the central building, so that the infants in every change of weather will be well protected. In winter it will be enclosed, and to each house there will be a distinct playground. Messrs. W. G. Habershon and Pite, the architects.

THE LONDON COLLEGE.—On Wednesday, the Prince of Wales inaugurated the London College of the International Education Society. The College, which is situated in Spring Grove, near Hounslow, is designed in the thirteenth century style. It is built of yellow brick, with bands and patterns of red. The dressings are of Bath stone. The principal entrance is in the centre, and over it will rise a lofty tower, covered with a pyramidal roof with rich parapets and angle pinnacles, a bay-window of two stories being carried up above the entrance doorway. The ground floor is devoted to class-rooms, reception-rooms, &c. The dining-hall, with corridor at side, connects the front building with the offices. The first floor is devoted to the secretary's room, library, upper part of dining halls and school-room. The second and third floors are devoted to the boys' dormitories, each dormitory being distinct and separated by a partition 7ft. high from the other. The portion of the building just completed was contracted for by Messrs. Holland and Hannen, Duke-street, Bloomsbury, and has cost £15,000, Messrs. Norton and Masey, 24, Old Bond-street, being the architects. The exterior of the building is ornamented with medallions of Homer, Aristotle, Cicero, and Dante. Accommodation is provided for 150 boys.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the EDITOR, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—A. J. D. C.—J. A. H.—R. C.—H. T.—J. R.—J. A.—H. C.—E. W. G.—W. Bros.—M. H and Co.—J. W. H.—C. L. E.—J. C.—P. T.—J. R.—J. J. B.—T. N.—L. and N.—J. W.—J. N. G.—R. T.—W. H. L.—A. H.—H. and P.—D. and E.—A. Z.—P. J. F.—R. P.—W. H.—T. P.—W. M.—J. W.—W. W. (Bath.)—J. H. T.—W. W. (London.)—J. T. D.—W. K.

J. W. H.—The perspective of residence with plans, of which Mr. W. Wilkinson is architect, will appear.

IGNORAMUS must follow his own inclination about joining the rifle corps.

H. LOVEGROVE.—The Institute of British Architects have no students.

Correspondence.

MR. STREET AND ADVERTISING DRAUGHTSMEN.

To the Editor of the BUILDING NEWS.

SIR,—I had expected that the gentlemen in the "Adelphi," referred to in Mr. Street's letter in a late number of your paper, would have themselves replied to his attack; as they have not done so, I venture, being an architectural draughtsman myself, not ashamed to confess that I get my living in a manner somewhat similar to these "gibbeted" unfortunates, to protest against a great deal of Mr. Street's epistle. To commence, then, as regards "Genius Advertising" (I do not know if the heading be his or no),* it strikes me that it is not these gentlemen only (I do not know who they may be) that advertise their genius. You cannot walk about the streets without seeing the greatest geniuses of the day pretty publicly and continuously advertised; the greatest authors, the greatest artists, the greatest musicians of the day, all advertise themselves and their works somewhat constantly—nay, I am not sure that Mr. Street's own letter may not be considered as a very pretty advertisement of his own originality and purity. It is, no doubt, a very debasing thing to try and introduce oneself to public notice with a view to earning a living, but it is scarcely confined to the authors of this circular. I cannot but think a great deal of Mr. Street's virtuous indignation is uncalled for. He is, no doubt, as we all know, a fine draughtsman; but I fancy even he can scarcely execute with his own hand all his own drawings, perspective, geometrical, detail, &c., and copy and trace them likewise. Well, if he does not, I presume he employs some one else to do part of this work for him; and whether it be done under his directions on the boards of an office in Russell square, or in the Adelphi, or by underlings—in fact, in his own house or elsewhere—does not appear to me to make any vast difference. Why, then, should it be such a wicked thing either for these gentlemen to offer to trace his drawings? I suppose he does have drawings traced occasionally, and some one must do it. To leave Mr. Street and his very exceptional abilities out of the question—there are many architects in the profession, perhaps as honest and conscientious men as himself, whose staff of assistants, though sufficient for their general need, does not suffice for times of extraordinary pressure. Wherein, then, exists the dreadful harm of their enlisting the services of those who are simply extra assistants *pro tem.*? Mr. Street wonders that the firm in question do not compete for everything on their own account, because, as they profess to do everything in "the best manner," they would be sure to succeed; but this, though very well as a sneer, is, as Mr. Street must be aware, totally unfair. Firstly, competing is a very expensive matter, and the probability is that they could not afford to do anything of the kind; and secondly, if their drawings and designs really were "in the best manner" it would probably avail them little, in most competitions, unless they had "friends at court." Does Mr. Street think really that competitions are always decided on their merits? If he does I think he stands alone in that innocent delusion. It appears also to be one of the crimes in this circular that the gentlemen offer to put in figures to perspectives, and that these figures should be men and women. Really every architect who can draw his own architecture is not able to draw figures; and what they should be if not men and women I am at a loss to conjecture—perhaps mediæval angels of doubtful gender. As regards prancing horses, of course I have not a word to say for such ill-educated quadrupeds, though I have seen real horses prance ere this in front of real buildings, but not in Utopia, I confess. But, it may be said, this circular naturally offers to design as well as to draw; no doubt it is far from a right thing that architects should have their buildings, or parts of them, designed for them; but after all it is better that an incompetent man should employ some one to assist him than that he should inflict upon the public monstrosities of ugliness. I fancy also there are some members of the profession, not unknown to fame, who would be puzzled to find time wherein to design, not to speak of drawing, all that bears their name, and who must often stop at the rough sketches whose existence puzzles Mr. Street. I suppose his designs spring Minerva-like armed at all points from his brain. I am afraid that architecture, like everything else, must be more or less of a business as well as an art in a practical world, and, like every other profession, parts of it must be confided to underlings. There is no exception that I know to this rule; and I do not believe it ever was or will be otherwise; though certainly it has often struck me, in perusing your columns, that some architects would have more time to give to their works if they spent less of it in abusing their own profession and each other.—I am, &c.,

A DRAUGHTSMAN.

* Mr. Street did not supply the heading.

THE GREAT INDIAN PENINSULAR RAILWAY.

SIR,—I am just come from India, and beg to send you a few jottings from my journal. The above line runs for upwards of one hundred miles through the Nizam's dominions. It leaves Sholapoor and proceeds by Koolburga, Nagnnully, Shabad, Mortoor, Cognee, Rahoor, Haikattee, Nulwar, Kunully, Yedegar, Monegall, Chitteepillie, Indapoor, Kunapoor, Lydapoor, Chaingointa, Goodablla, Kistna, and joins the Madras line at Roichore.

There are some heavy works on this section, including the two great viaducts over the Cognee and Kistna rivers, the latter being about two miles in length. The piers are of limestone, with iron tops. These rivers, when swollen by the rains, become dangerous and rapid currents.

There are stations at every fifteen miles apart. The jungle land through which the line passes is rich, and produces, when brought into cultivation, cotton, oil, rice, wheat, cholum, tobacco, &c. The benefits which this line will confer on the handsome and lightly clad native population of these dominions are incalculable. The value of the cotton raised in the district is enormous, but the people have no means of transit, except the backs of the bullocks and the hard heads of the females.

It requires no great gift of prophecy to predict that when this line is finished the traveller will be relieved of the dak, the punkahwalla, the chetah, the musqueto, and other helps, by the way, to unpleasant thoughts.—I am, &c.,

PIERSE ARTHUR.

NEW TOWNHALL, MANCHESTER.

SIR,—The authorities in this matter having evinced such a strong disposition to ensure a proper management of the forthcoming competition, I take the liberty of suggesting, or rather referring to a suggestion which I think has already appeared in your pages. In the very satisfactory circular issued by the committee (May 8), competitors were informed that the preliminary designs should not be exhibited; and that no competitor should be allowed to see them. In suggesting a further precaution against good points in one design becoming known to the author of another, I do not by any means wish to imply that a member of the committee or body which may be appointed to examine the designs would deliberately afford such information with the intention of doing an injustice; but that, as such a length of time must elapse before the drawings for the final competition can be prepared, opportunities might occur where such information could be given in the most innocent and simple manner. To ensure, therefore, that there shall be at least a reasonable resemblance between the preliminary and the complete designs, I would propose that the selected designs before being returned to their respective authors, should receive the signature of the mayor and the seal of the corporation; and that it should be a condition in the final competition that these preliminary drawings should accompany the complete designs and be exhibited with them. This, with an assurance that properly qualified and disinterested professional advice shall be called in to aid the committee in their primary selection, would, I think, constitute the arrangements for this competition quite a model of uprightness and worthy of imitation in time to come.—Yours, &c.,

X. Y.

AN OBSTRUCTIVE.

SIR,—The following choice specimen of churchwarden's English would be amusing were it not persisted in from a spirit of vexatious and objectless opposition, for the clergyman in question has raised the full amount required without having had recourse to a rate, and the works, which are simply the reseating and furnishing the interior, are under the superintendence of Mr. Seddon, as architect, and few further improvements are contemplated beyond the substitution of benches for the snug high pews in which the "Esquire" and his retainers are now able to shelter themselves from the observation of the rest of the parishioners. —I am, &c.,

J. J.

TO THE LANDHOLDERS AND GENERAL BODY OF PARISHIONERS OF THE PARISH OF LLANTRISSENT, IN THE COUNTY OF MONMOUTH.

I, Robert Bateman, Esq., of Bertholey House, as churchwarden of this parish, wish to bring before the notice of the landholders and general body of parishioners that it is contemplated, and the desire of the Rev. C. F. Walkey, the present incumbent, to endeavour to raise the sum of £300, by levying a rate of 2s. on the acre, for repairs in this church and other improvements which I, as churchwarden, consider would be quite unnecessary in its present state of preservation, as the internal part requires no such great outlay, is in good and sound repair, and is in every way sufficient for the service of the church, with the exception of the tower and some other parts externally that could be repaired as funds fall in so as to cause no great demand or outlay, and which it would be my endeavour to meet by voluntary subscription, the general support of the parishioners, and other sources; and also that I further think it requisite to bring before their notice, and for their general comfort, also for the protection of the interior of the church, that a stove should be provided, to be erected in whatever position, by general consent, should most have the desired effect and meet the wishes of all. I, therefore, have reason to hope that this statement, that I have thought it requisite to place before them, may receive general support, so as to prevent that excess of outlay that the Rev. C. F. Walkey contemplates, and which I in my duty as churchwarden at present consider quite uncalled for.

Dated December 19, 1866.

IRON ROOFS.

SIR,—In your article No. 3 on Iron Roofs, at p. 220 there are, as it seems to me, some omissions and inaccuracies which greatly detract from its usefulness. The strains upon the rafter AB are surely incomplete until that produced by W^{I} at its foot is taken into account; whilst those upon the tie would likewise be deficient until the effect of this omitted strain is also noted. The total load $= w \times \overline{AB}$ upon the rafter will evidently produce a strain in the direction of its length $= \frac{w \times \overline{AB}}{\text{sin. } i}$, and the struts and suspending rods, however they may distribute the strains upon the upper part of the rafter, cannot diminish the stress at its foot, which is therefore $= \frac{w \times \overline{AB}}{\text{sin. } i}$. Again, the maximum effect upon the tie bar will clearly $= (w \times \overline{AB}) . \text{cotan} : i$. Consequently in the summary of the strains these ought to be found, and they were rightly taken into account in your article No. 2, p. 140; but on referring to the corresponding portion No. 3 in the second column of p. 220, the maximum strain at the foot of the rafter is not noticed, and the strains apportioned to the parts of the main tie are altogether erroneous. The latter might be thus expressed:

Strain on $Aq = (w \times \overline{AB}) . \text{cotan} : i$.
do. on gh = the strain last obtained less the horizontal thrust produced by dg, that is

$$(\overline{w \times AB} \times \text{cotan} : i) - \left(\frac{W^{II}}{2} \times \text{cotan} : i\right) = \left(\overline{w \times AB} - \frac{W^{II}}{2}\right) \cdot \text{cotan} : i.$$

And the strain on the tie between the foot of the strut eh and the corresponding strut on the other side of the truss would be

$$\left(\overline{w \times AB} - \frac{W^{II}}{2}\right) \cdot \text{cotan} : i - \left(W^{III} + \frac{W^{II}}{2}\right) \frac{Aq}{Ah} \text{ cotan} : m.$$

I am, &c.,

E. S.

E. W. PUGIN.

SIR,—Pray, now that Mr. Pugin has removed his mask, and avowed himself the instigator of the Reviews in the *Westminster Gazette*, may I ask what importance can be attached to the opinion of the author of the wretched design for a church at Liverpool, now on exhibition at the Royal Academy. It has all the pretence, the weakness, and exaggeration of Mr. Bassett Keeling's work without his spasmodic originality. Alas! that such men should be allowed to build churches at all! At any rate, before they take up the profession of critic let them learn some modesty and take heed of the proverb, "Physician, heal thyself."—I am, &c.,

THE TAIL-TIP OF ONE OF THE COMPETITORS FOR THE LAW COURTS, BECOMING SMALL BY DEGREES AND BEAUTIFULLY LESS, THROUGH VEXATION AT THE INANITY OF THE CRITICISMS THAT HAVE APPEARED ON THE SUBJECT.

RATING OF INSTITUTIONS.

SIR,—You will perhaps recollect that some months ago a movement was set on foot by the council of this institute to obtain exemption from the assessment of institutions like ours to the Inhabited House Duty, except for those portions actually occupied as dwellings. I have now the pleasure of informing you that the Lords of the Treasury have, on the recommendation of the Board of Inland Revenue, issued an authority for the limitation of the assessment of public buildings devoted to the culture of science, literature, and art, to such portion of the building beneficially occupied as a dwelling, when such portion is of the annual value of £20 or more.—I am, &c.,

EDWIN SMITH, Secretary.

Birmingham and Midland Institute, July 2.

NATIONAL ART PRIZES.

SIR,—A few weeks ago, in one of your numbers, you gave a description of the architectural drawings forwarded by the students of the National Art Training Schools, and in consequence of my design winning the gold medal, the account you gave of it was longer than that of the others. In your description you appear to have doubted it being entirely my work, fancying I must have been assisted by my seniors.

I must now inform you that I alone am the author of it, and in executing the five sheets of drawing I spent nearly every evening for five months; and being a perfect stranger in the city of London, heaven and the world knows the amount of assistance that may be expected from seniors, especially in the architectural profession.—I am, &c.,

H. A. K. GRIBBLE.

We lately alluded to a bold engineering attempt to construct a tunnel under the Chicago River, and we are sorry now to record that the attempt has failed. About a fortnight since, the works, including masonry, timber, &c., fell in with a crash, involving immense loss to the contractors. Fortunately no lives were lost.

Intercommunication.

QUESTIONS.

[476.]—VEGETATION ON STONE ASHLARING.—May I ask what chemical (or other) process will kill the vegetation and at the same time clean the face of stone ashlaring to exterior walls?—S. W. T.

[477.]—BRASS ORNAMENTS.—Can any of your readers kindly inform me how I can "semiloin" small brass ornaments?—JAS. FOULGER.

[478.]—ARCHITECTURAL STUDENTS.—I propose attending the architectural course of lectures at either the London University or King's College. Would some one kindly inform me which is the better university for me to attend?—X. X.

[479.]—OVERTIME.—Can you inform me whether an architect can keep his pupils till 8, 9, and 10 o'clock at night at the Board? Can the pupil demand payment for overtime when he pays no premium, and if so at what rate? Has the master any power over him if he refuses to work after the business hours of the office, say 10 till 4.—T-SQUARE.

[480.]—LETTERS ON PLANKS, DEALS, &c.—Will some of your talented correspondents be kind enough to give me the full particulars of the meaning of the letters painted on the ends of planks, deals, and battens; or inform me where such information can be got?—H. W.

[481.]—ACCOUNT OF MATERIALS.—Will you be kind enough to inform me whether I am compelled to furnish a gentleman with a detailed account of all materials used and work done in the erection of a new house and offices or not, after being applied to build the house and make my charge—that is to say, must I give him the amount of account on every particular?—A BUILDER.

[482.]—FILTERS IN PUMPS.—Is it possible, and by what means, to filter spring water in the well before pumping out the same for use and drinking purposes?—J. W.

[483.]—BLACK ASH MORTAR.—What is the best manner for making black ash mortar for red brick facing work that will set hard and be equal to Dorking lime mortar of the best quality?—JOHN WADE.

[484.]—ARCHITECTS' COMMISSION.—Is an architect compelled to give up the contract drawings and specification before he can legally recover his commission? Has the question been contested at law? and if so, what was the result? My client's lawyer has demanded them and resists payment unless I give up designs and specification. —QUIZ.

REPLIES.

[434.]—WATERCLOSETS.—There is no doubt that well-constructed waterclosets are of vital consequence in all town habitations. I am not certain that due attention has been paid to their construction, however, even in the best-regulated dwellings. Although in this country more consideration has been devoted to what may be termed household sanitation than in any other, there yet remains a wide margin for improvement in the same direction. The introduction of the watercloset was a great step towards the promotion of comfort and of health, but like all inventions of a mechanical nature the apparatus itself demands some care in its management. That kind of closet which is usually adopted in houses of the better class is fitted with a pan at its base. Doubly trapped by copper pans, one at the bottom of the receiver and another at the head of soil pipe, and with a constantly charged water cistern above, this arrangement is not bad. Still it is, as "N" observes, not unfrequently attended by olfactory annoyance. In what are known as second-rate houses there are generally two waterclosets, one upper and one lower. These communicate with each other, as a rule, by means of the soil-pipe, whilst the upper and lower cisterns for flushing them with water are also connected. The service pipes from the cisterns to the closet basins are fed by means of valves in water-boxes fitted with air-pipes. Now nothing short of an abundant flow of water will keep the pipes and traps from fouling, and there is nothing to prevent foul air finding its way under the pan at the back of the closet up into the cisterns. These cisterns serve also for culinary and domestic use generally. Is it wonderful that "internal complaints" are rife in families, and especially in epidemic seasons? When in good working order waterclosets thus arranged are not free from disadvantages. The disadvantages are exaggerated by negligence or carelessness. The traps and conducting pipes then cease to act, foul air escapes through the sinks and water pipes into the nursery or bed-rooms, the water in the cisterns is poisoned, and thus health and comfort are sacrificed. It would be a valuable improvement to make the cisterns for domestic use and those for feeding waterclosets quite separate and independent of each other. Then, with ordinary care the nuisance objected to so justly by "N" would be destroyed.

RESERVOIR.

[449.]—In reply to "B. A. G." in your "Intercommunication," allow me to inform him that the use of liquid hydrofluoric acid for engraving on glass is now very extensive. Difficulties, however, have been experienced in getting a good dull ground appearance with the liquid acid. In practice the engravers here prefer to use acid which has already acted on glass, and which, therefore, has silica and alkali in solution. In France, it appears, compounds of hydrofluoric acid and alkaline fluorides ready prepared have been used with much success. MM. Tessié de Motay and Marechal employ hydrofluates of fluoride of potassium and sodium, and hydrofluate of ammonia has also come into use. With all these alkaline compounds M. Kessler shows that the dull surface is given by the deposition on the glass of minute granular crystals of an insoluble alkaline fluo-silicate. Recently M. Kessler has proposed to use a solution of hydrofluate of ammonia as an ink to write upon bottles, &c. Such a solution has the advantage over hydrofluoric acid of being nearly inodorous,

and it may be used with either steel or quill pens. The suggestion of M. Kessler is not new: it was made by Berzelius many years ago, but has been forgotten.—W. G. P.

[451.]—AUTOMATIC BLACKSMITHS.—The late Mr. George Rennie fitted up, some years ago, at the smithy in Woolwich Dockyard, several machines for raising and dropping hammers in rapid succession, and the contrivance was known as the Mechanical Hercules. This was superseded by the steam hammer of Mr. Nasmyth, and on a smaller scale by the Ryder forging machine used at the Enfield small arms factory. All of these, however, require steam power for putting them in action, and would scarcely be available for the village blacksmith. Perhaps a modification of a plan of forging and shaping iron mechanically invented a year or two ago by a Mr. Arrowsmith (I think of Bilston, in Staffordshire), might with a little ingenuity be effected, and so realise your correspondent's idea. Mr. Arrowsmith simply mounted on bearings raised above a thick cast-iron bedplate a shaft of wrought iron. On one end of the shaft was a pulley, and on the other a flywheel for equalising speed, &c. On the centre of the shaft was fixed a cam, which as it revolved acted upon the end of a lever working on a pivot, and the other extremity of which had attached to it a hammer head. By these means the hammer was raised and released at every revolution of the shaft. In order to increase the momentum of the hammer—and thus, in fact, to represent the muscle of the smith—a spiral spring and buffer was placed below the end of that end of the lever upon which the cam acted. In order to modulate the strokes of the hammer in accordance with the nature of the work in hand, the shaft was placed between "flippers" governed by a treadle under the control of the operator. The force of the blows was thus augmented or diminished at will. When the hammer was not wanted to be in action it was readily disengaged by means of a catch which held it suspended above the forging. The shaft might be driven by means of a crank handle and the strong arms of a sturdy labourer, by the power of a horse, that of a donkey, or, better still, by a small water-wheel where that could be conveniently applied and fed. I see no reason why some such plan as this might not be adopted generally in forges, and thus the blacksmiths be released from the heavy physical strain upon the muscles of his "brawny arm" when wielding the weighty "sledge." Another notion which crosses my mind is that of making the smith's hammer a pneumatic tool, and enlisting the atmosphere itself into the service of the village Vulcan; but possibly you may allow me time to turn it over, and spare some other day to develope it in your columns.—J. NEWTON, Royal Mint.

[452.]—CONTOUR LINES.—Contour lines are lines traversing all the points on the ground that are at a given constant height above the datum level, or they may be otherwise described as a horizontal section of the earth's surface, or the outline of an imaginary sheet of water covering the ground up to a certain given elevation. On the Ordnance Survey maps they are drawn at each 25ft. of height up to 100ft., and certain of these, called "principal contour lines," are determined with greater precision than the others, and are at every 50ft. of elevation in the flatter parts of the country, and at every 100ft. in the more hilly parts; they are obtained by levelling from bench marks at the above heights, and points are marked by pegs or otherwise on the ridge and valley lines, and at as many other intermediate places as may be necessary. The points are then surveyed and plotted, and give a series of points in the contour lines, and the courses of these lines between the points so found is sketched upon the plan on the ground. The datum level is the "approximate meanwater at Liverpool."—A. D. J. C.

[454.]—PILLARS AND STRUTS.—Cast iron is the better material for pillars with fixed ends, when the length does not exceed about 25 times the diameter; wrought iron when it exceeds this, but in either material if this length is exceeded failure will ensue by cross breaking.—A. D. J. C.

[456.]—ROCK BASINS.—"Druid" inquires if there is any probable cause as to the origin of rock basins. This question took my attention on seeing them in this part of the country. I enclose copies of two letters I sent to the *Todmorden Advertiser*, which resulted in an interesting correspondence by a gentleman signing himself "S.;" also a discussion on the subject I had the honour to open. I regret that I have not copies of the letters by "S," but in justice to him I must say the information furnished led me to abandon the Druidical theory. As to the probable cause of these sinkings it is to my mind still an open question.—WM. GLOVER, Clerk of Works, Dobroyd Castle, Todmorden.

[456.]—The question as to the formation of these very curious vestiges of the long long past is one of a somewhat archæological nature. It is not the less, however, of much present interest to some, at least, of your readers, as I think. The county of Cornwall is most remarkable for these formations, although they exist elsewhere. The idea is not now generally entertained that rock basins are the work of men's hands at all. Perhaps the once celebrated Dr. Borlase was the most ingenious as well as the most persistent upholder of the artificial theory in respect of rock basins. He claimed for them a Druidical origin, and in some cases traced in their neighbourhood remains of the sacred groves in which the mysterious orgies of the Druids themselves were performed. Geologists have destroyed the Doctor's fanciful notions, and have observed that the true nature of these basins may be discovered by inspecting the rocks themselves. On examination they will almost invariably be found to contain distinct grains of quartz and fragments of the other constituents of granite. The alternate action of air and water decomposes the surface of this material; and once water effects a lodgment in a cavity of the rock that cavity certainly, though insensibly, becomes larger. The sides as they waste retain naturally an even and rounded or basin-like form, and hence the key to the mystery of rock basins.—ANTI-DRUID.

[463.]—CHURCHES WITH THATCHED ROOFS.—"Inquirer" will find a thatched church roof at Pakefield, a village on the coast of Suffolk, about three miles from Lowestoft.—DOT.

[463.]—"Inquirer" is informed that several churches are so covered in the same county, while in the adjoining county of Suffolk there are instances at Saxted, Troston, the chancel of Wattisfield Church, &c.—J. D. W.

[464.]—SOUTH KENSINGTON PRIZES.—"Ludovicus," to compete, must be a student of the Kensington or the Local Schools of Art, and must execute his drawing under the inspection of the master, who has to certify the same being the work of the student. Every master will be served with a notice as to when the drawings are to be forwarded to the museum—about the month of March is generally the time. Since the alteration in 1866, the prizes awarded are gold, silver, and bronze medals, books, &c., awarded according to the merit of the drawing. The above description of prizes will be given annually until further notice.—H. K. GRIBBLE.

[465.]—RETAINING DRAWINGS.—In the BUILDING NEWS last year (July 6, 1866), there is a decision as to the ownership of plans:—"County Court, Liverpool; Mr. J. K. Blair, Judge. Robert Esdaile, Hartford House, Fairfield, sued Thomas Mercer, architect, 40, Church-street, for the detenue of certain plans, &c., of which defendant had been the architect. Defendant pleaded the custom. Mr. Woadley, architect, confirmed the custom. Had been in practice 28 years; always retained the original plans. They are simply a guide to the architect in his proceedings; the builder is entitled to copies. Verdict for defendant, with costs." Another case mentioned in the BUILDING NEWS last year was referred to arbitration. A country surveyor retired on a pension, taking away all his plans; these were demanded. He pleaded custom. The decision was in his favour; a sum of money being paid for copies of all the plans. The locality and date I cannot call to mind.—A. Z.

[473.]—GABLE OR PARTY WALLS.—It does not necessarily follow that because A the freeholder leased to B a house for 96 years that he leased the whole of the structure which would be necessary to the house. I think it will be found that what was really leased by A. B. was "all that piece or parcel of land or ground" with the messuage, house, erections, and buildings thereon; it is, therefore, clear that if the boundary of the land leased occupied that position which is the centre of the wall in question, A only leased with the land half the wall, retaining the full right and use of the other half and the land on which it stands. Usually, and in a well-drawn lease the dimensions of the parcel of land demised are given and very frequently a ground plan showing the walls, whereof only those parts are coloured which are intended to be leased. If your correspondent has these he can decide the question for himself, always bearing in mind that B has no legal ownership in any part of a wall which stands on land not leased to him. He may, under some circumstances, have certain defined rights, as under the Building Act, but no ownership, and under no circumstances any claim to be paid for the use of a wall unless it stands wholly and entirely on his land, in which case he has the right of preventing the adjoining owner, in the erection of his new building, making use of the wall, and he can compel him to erect a separate and distinct wall unless the matter is mutually arranged. In the absence of dimensions or plan on the lease I am of opinion that if at the time of the erection of the house, it was intended that the wall in dispute should form a party wall then B has no claim, but if it was erected as an external wall (say like the flank wall of a detached villa) then B has a right to half the cost of erecting the wall to the extent to which A uses it. It will be a simple matter to determine whether the wall was intended to divide two houses or to be an outer wall, the finish of the jointing of the brickwork, the quality of the bricks, and the presence or absence of toothing, chasing, and other indications.—A. H.

[473.]—"Look at the Conveyance" is a proper reply; no doubt you will there find a plan or the dimensions of the plot. This will decide whether the whole of the wall or only half was included.—A.Z.

WAGES MOVEMENT.

The joiners' strike at Dewsbury has come to an end, the masters having consented to shorten the week's work by half an hour, and the men relinquishing a portion of their demands.

In Scotland the law affecting strikes is being put in force with rigour. A Scotch sheriff has sentenced two members of an Amalgamated Sho-makers' Society to seven days' imprisonment for molesting and obstructing a non-society man, "by intimating to his employers that unless he contributed to the fund he must be dismissed, otherwise the rest of the workmen, members of an association, would leave their employment." The prosecution took place under the 6th Geo. IV., cap. 127 (an Act to Repeal the Combination Laws).

At present there seems no prospect of the masons' strike in Bristol coming to a termination. The proposal of the masters to refer the matter in dispute to arbitration has not been accepted.

WATER SUPPLY AND SANITARY MATTERS.

At a meeting of the Ilfracombe Local Board last week, the tender of Mr. Crokam to construct the reservoir for £2,720 was accepted.

BIDEFORD.—At a public meeting held here last week, Mr. Humber, C.E., gave an outline of the proposed plan of supplying the town with water. He proposed that the supply should be constant, and the mains charged night and day. From a carefully prepared estimate he was enabled to state that the whole of the works, including reservoirs, mains, stopcocks, and hydrants, together with engineering and other expenses, could be completed for an amount and under circumstances most favourable for the company, and a responsible contractor was prepared to undertake the necessary work for a sum below his estimate. It was resolved to form a company in order to carry out Mr. Humber's plan.

YORK.—Considerable works have been for some time in progress to meet the increasing wants of the population. Among other works in course of construction is a new filter bed from plans designed by Mr. Hornsey, land agent, York. It is circular in form, 160ft. in diameter, and 12ft. deep, built of brick, and will hold 1,500,000 gallons of water, doubling the present filtering capabilities of the company. The foundation-stone was laid on Thursday last. Mr. John Keswick is the contractor.

STATUES, MEMORIALS, ETC.

A monument is about to be erected within the grounds of Hamilton Palace to the memory of the late Duke of Hamilton. The building is to cost £1,500, and the architects are Messrs. Wilson and Thomson, of Glasgow.

Engelbert Kompfer, the celebrated German traveller of the seventeenth century, has had a monument erected to his memory in Lemgo, his birthplace. It consists of a column 20ft. high, and ornamented with Gothic arches and pinnacles.

A memorial tablet of beautiful design, the work of Mr. R. Palgrave, enclosing a cast in "Wedgwood ware" of Mr. Woolner's medallion of the late eminent botanist, Sir W. Jackson Hooker, is about to be erected near his grave in Kew Church.

M. Lequesne, a French sculptor, has just received a commission to execute a statue of the Virgin Mary nine metres, or very nearly 30ft. high, for the bell tower of the sanctuary of Notre Dame de la Garde, at Marseilles. There is to be a staircase within the statue leading into the head itself, and the eyes, which will serve as windows, through which to view the prospect around, will measure 10in.

STATUE OF PEACE.—M. Faustin Glavany, secretary in the Turkish diplomatic service, and deputed by the Sultan to represent his Government at the Archæological Congress of Antwerp, has just published a project for a commemorative monument to be erected at the entrance of the canal of the Isthmus of Suez. This monument, which the author proposes to call the Temple of Peace, is to be in the form of a pyramid, as characteristic of Egyptian architecture. On the apex of the pyramid is to be a statue of Peace, bearing in one hand a flambeau, and in the other an olive branch, and on the four sides of the pyramid and its base, inscriptions in Coptic, Hebrew, Greek, Arab, Latin, French, Assyrian cuneiform character, and Turkish, with sixteen escutcheons, bearing the names of maritime nations or their sovereigns.

LEGAL INTELLIGENCE.

BRICKKILNS.—A suit (Evans *v.* Smith), to restrain the continuance of a nuisance arising from the burning of bricks within 112 yards of a dwelling-house, was recently heard before Vice-Chancellor Wood. After hearing the evidence, that judge observed that whatever might have been the case formerly, when there was considerable conflict of opinion as to whether the smoke and vapour arising from brick burning were to be considered as prejudicial to health and comfort, it was now clearly settled that the fumes of a brick-kiln, if they reached dwelling-houses, were a nuisance to the inhabitants, which the Court of Chancery would restrain without requiring any scientific evidence upon the subject.

BREACH OF BUILDING BYE-LAWS.—From a case of considerable importance which came before the Wakefield magistrates this week, it appeared that a Mr. Harrand in October last deposited plans and obtained the consent of the borough surveyor to erect two dwelling-houses in Albion-street; and it was alleged that he had, contrary to the building bye-laws, altered these houses after he began to build, whereby he had rendered himself liable to a penalty of £5. One of the bye-laws made it necessary that every habitable room should be 8ft. high. Mr. Harrand showed on his plan cellars 7ft. high, and it had been found on an inspection made by the borough surveyor, that these places were only 6ft. 9in. high, and they had been further altered by opening doors out of them, and also making area-steps. The defence was that the scope of the general acts was only to secure that there should be due ventilation and drainage, and the alterations prohibited were only such as, by interfering with the general plan of building, would interfere with drainage and ventilation. Throwing out a door would not interfere with these things; in fact, it would give additional facilities for ventilation, and such an alteration could be made. These places when completed would be 7ft. high, and they were not intended for living rooms, but simply as washhouses, and the door would be a great convenience. The Bench nevertheless held that there had been a breach of the bye-laws, but they would only inflict the mitigated penalty of 5s. and costs.

CASES UNDER METROPOLITAN BUILDINGS' ACT.—MARYLEBONE POLICE-COURT.—On Thursday, the 4th inst., Thomas Williamson, of St. John's Wood-terrace, was summoned before Mr. Mansfield, for that he, being the builder engaged in doing certain works at 15, Henry-street, had neglected to give to Mr. Alexander Peebles, district surveyor of the northern division of St. Marylebone, two days' notice before commencing such

work, as required by sec. 38. The surveyor stated when he discovered the work upon the 19th ult. the ground beneath the house had been excavated to the depth of about 1ft. One party, and the external walls, which are 14in. thick at the base, and 2ft. 3in. at the lowest course of footings, had been underpinned with work only 9in. in thickness, and but 2¼in. of that was under the walls. Section 9 placed any work affecting the construction of an external or party wall under his supervision. He at once sent a notice to amend, which was complied with. Mr. Payne, upon behalf of the defendant, admitted the work had been done as described, but contended that this was a work done for the purpose of necessary repair, not requiring a notice, for it did not affect the construction of the walls until Mr. Peebles required it to be underpinned the whole thickness. The magistrate was of opinion that it did affect the construction of the walls. Mr. Peebles pointed out that every building shall be enclosed with walls of a minimum thickness; the part added was insufficient, and indicated the other clauses of the act affecting work of this nature. Section 12 required walls to be constructed of such substances and of such thickness, and in such a manner, as are mentioned in first schedule annexed hereto. First schedule preliminary clause 1 required every building shall be enclosed with walls constructed of brick, stone, or other hard or incombustible substance. Clause 2, no part of any wall shall overhang any part underneath it. Clause 4, the thickness of every wall shall be minimum in thickness; and clause 8 required footings; the work when found had none. He made no complaint of the work as amended. Mr. Payne submitted even were it a work of which notice should have been given, his client had erred unintentionally; and that also this was a case of emergency provided for by section 44, for the drainage works and removal of the soil were ordered by the sanitary inspector, who caused its removal from below the walls, and immediately his client heard the surveyor had called he wrote him a letter explaining the mistake. The sanitary inspector's notice was dated the 11th ult; surveyor's notice to amend, 19th ult.; and defendant's letter, 21st. Defendant ordered to pay 12s. costs.

Charles Thomas, of York-place, High-street, was summoned for a similar offence at 49, Cochrane terrace. Upon the 25th ult. Mr. Peebles, discovering two story posts had been removed and brick ones substituted, immediately sent a memorandum to defendant reminding him of the omission to give notice and requesting one; not receiving a reply, these proceedings were taken. The work affected the construction of an external wall, and by section 9 was subject to supervision; in addition, section 15 contained requirements for bressummer and story posts, placing them under special survey. Defendant's clerk appeared and stated it was "a necessary repair; did not require notice, as it was merely a temporary repair, and he would give notice when the other alteration commenced; and that sometimes their customers gave their own notices. The surveyor stated, of the works which came under his notice about 30 per cent. were discoveries, which rendered it more difficult for him to discharge his duty; and he was afraid he would require to trouble the court frequently. Mr. Mansfield said the district surveyor was a public officer, responsible for the safety of the buildings, and should have notice of works. Defendant was ordered to pay 12s. costs.

General Items.

At the Chester Quarter Sessions on Monday last, the plans of Mr. Robert Griffiths, of Stafford, for the new county asylum to be erected near Macclesfield, were approved of by the court.

A bill which has passed the House of Commons, and is now before the House of Lords, provides that after six months from the passing of the bill, railway companies shall, in every passenger train travelling more than 15 miles without stoping, provide in every compartment means of communication between the passengers and guard, and shall also provide means of communication between the guard and the driver. A penalty not exceeding £5 is imposed on a company making default in the matter, and on passengers wantonly or mischievously setting in motion the means of communication.

Mr. J. P. Seddon wishes us to insert the following:—Will you kindly correct an error which occurred in your kindly and favourable notice of the furniture designed and exhibited by me at the conversazione at the Institute of Architects. They were manufactured by Mr. L. Collmann, of 70, Grosvenor-street, and not by the Art Furniture Company. For Mr. Collmann, with whom my brother is connected, and for them alone, I have undertaken to design such furniture.

Very frequently a suggestion comes from the new world worthy of adoption in the old world. The last one of the kind to which we would draw attention is, that of several liberal-minded citizens of Chicago, having insured the firemen of that city against accident. On May 4 last, three of the firemen were killed, and several others injured at a large fire. The families of the deceased received 7,500 dollars, and the injured men receive weekly wages.

The Mill Bridge at Stratford-on-Avon—a very ancient structure—was partially destroyed some time ago, and on Monday last the first stone of a new bridge was laid. The first mention of the old bridge in the records of the Corporation is in April, 1419, when a collection was ordered to be made for it. On March 13, 1673, it was ordered to be rebuilt, one William Bradford agreeing to do so for the moderate sum of £40. The present bridge apparently dates 1599, but it most probably is much older.

The Paris Excursion Committee of the Working Men's Club and Institute Union, have, it appears, been so successful in their operations that the applications made to them now greatly exceed the numbers for whom they can provide. Further arrangements are, however, in progress with the railway authorities, and, during August, there will be two excursions instead of only one each week.

One of the wooden mitres carved by Grinling Gibbons over a prebend's stall in the Cathedral Church of Canterbury, happening to become loose, Jesse White, the surveyor of that edifice, inquired of the Dean whether he should make it fast, "for perhaps," said Jesse, "it may fall on your reverence's head." "Well, Jesse," said the humorous Cantab, "suppose it does fall, I don't know that a mitre falling on my head would hurt it."

The death of Mr. James, F.S.A., of Nether Edge, a well-known Yorkshire antiquary, is recorded. He was the author of a "History of Bradford," and the article on "Yorkshire," in the "Encyclopædia Britannica," as well as other useful works.

Some workmen were last week engaged making excavations in Victoria Park, Wavertree, when they came upon a large urn containing calcined bones. Several other urns (which unfortunately were destroyed), were found, also more bones, and an arrowhead and part of a knife, both of flint. The urns, which were found 18ft. below the sod, are composed of sun-burnt clay, and belong to the ancient British flint age, about 3,000 years ago.

The half yearly meeting of the Association of Foremen Engineers took place at the London Coffee-house on Saturday last, Mr. Joseph Newton in the chair. The report, which was quite satisfactory, showed the gradual and increasing strength of the society. On account of the great dulness of the engineering trades there had been a heavier demand than usual on the funds of the society for unemployed members. After the report was considered, Mr. Wm. Naylor read a paper on "The Construction of Steam Engine Boilers."

A correspondent sends us the following:—A portion of the estate, situate at Norbury-hill, near Streatham and Croydon, and formerly belonging to the ancient family of Hallowell Carew, was sold a few years ago for £400 per acre. Since then the owners have laid out about £75 per acre in making roads and sewers, the total outlay being about £475 per acre. A portion of this land was put up to auction a short time ago, and realised at the rate of £2,000 per acre.

During the past week the prospectus of the Nottingham Patent Brick Company (Limited) has been issued. The capital is proposed to be £50,000, in 5,000 shares of £10 each. Amongst the directors are some men of standing, and Messrs. Burgass and Gripper, brickmakers, Nottingham, are appointed managing directors. The office is to be No. 4, Thurland-street, Nottingham.

Mr. A. B. Boulton, of 39, King William-street, City, says, in reference to the article on the Preservation of Timber, in our last number, that the process of creosoting referred to Professor Baumhauer, was prepared by him at the works of his firm at Rotherhithe, as will be found by reference to the third, fourth, fifth, and sixth annual reports of the Dutch Commission, published at Amsterdam. He also says, he should be happy to furnish information as to the experience of engineers on the Continent, both as to creosoting and the application of the sulphate of copper to the preservation of timber.

The reduced amount of organic matter found in the water supplied to the parish of Marylebone, during the month of June by the two Thames Companies, is, to some extent, attributable to the dry weather, but it shows also the great care taken in the process of filtration, and the efficiency of the means employed. At no period within recollection has the water supplied to this parish been better or purer than it is now, and in the anticipation of a possible return of cholera during the autumn, a knowledge of this fact must assuredly be both gratifying and reassuring.

We hear that the possessors of art treasures are responding to the appeal made to them by the Council of the Fine Arts Exhibition to be held in Leeds next year. After the Fine Arts Exhibition in Manchester, great complaints arose that the art treasures were not taken sufficient care of, and that the frames were in many instances damaged. We are not therefore surprised that many people should raise objections, and say they cannot comply with the frequent applications they receive for the loan of their pictures, &c. Such applications are received not merely for national exhibitions, such as the one to be held in Leeds, but for local purposes. We hope, however, that the benevolent object in view, namely, funds for the splendid infirmary we illustrated last week, will overcome all scruples, and induce proprietors to send treasures in an ungrudging spirit.

In concluding a course of lectures on coal gas, Dr. Frankland made a statement concerning the illuminating power of the gas supplied to London as compared with that supplied to other cities and towns in Europe. Representing the London gas by 12, those of Berlin and Birmingham are 15, Manchester and Liverpool are 22, Inverness is 25, Edinburgh, Glasgow, and Greenock are 28, Paisley and Hawicke are 30, and Aberdeen 35. From this it appears that the illuminating power of London gas is the lowest of all, and that in some towns and cities in Scotland the gas gives twice as much light as in London. A question of health as well as economy is involved, for the more the Londoner tries to increase his light, the more does he contaminate his atmosphere. Dr. Frankland says that London gas was better sixteen years ago than at present; the new system of purification used by the companies leaves the gas weak and deleterious, and he warns them to amend their practice. If consumers would only bear in mind that low-priced gas is not necessarily cheap gas, we might soon, he thinks, have a gas of not less illuminating power than twenty candles per 5 cubic feet per hour, below which quality no gas is fit for domestic use.

The employment of petroleum as a substitute for coal in the generation of steam has been officially tried with great success in the United States. It would appear that petroleum is quicker in its action, occupies less room than coal, and is more economical. The fire can be kindled and extinguished with nearly the same ease as lighting and extinguishing a gasburner. The furnaces of an American vessel, originally built for burning coal, were fitted at comparatively small expense with burners to which the petroleum was led by pipes from the tanks on deck. The burners, by their own heat, turn the petroleum in the pipes into gas, and in this form it is burnt. The flames produced are intensely hot, and the petroleum burnt on the trip produced as much steam as twenty times its bulk in coals—a great saving of room in ocean voyages. The dangerous properties of the petroleum appear to be the only drawback to its use in this way. The supply of petroleum is now so much greater than the demand that even with three-fourths of the wells in the producing regions abandoned, it can be bought for 2d. a gallon.

The new Trades' Union Bill of the Home Secretary proposes to enact that on the application of the chairman of the Trades' Unions' Commission, the Secretary of State may direct that the Trades' Union Commission Act of the present session shall extend to any place in respect of which such application has been made; and the Commissioners may conduct at such place an inquiry of the same description as has been authorised in the case of Sheffield.

There is now on view at the Burlington Fine Arts Club, 177, Piccadilly, a very interesting exhibition, consisting of a collection of drawings and of Rembrandts, which all who have a taste for rare and rich specimens of art should see. There are five copies of the famous 100 guilder shown, side by side. We may also mention the "Deposition," "Christ Healing the Sick," "The Crucifixion," "Christ before Pilate," and many others. The Burlington Fine Arts Club, says the *Daily News*, is rendering very important service to art in forming collections like this of Rembrandt's etchings and drawings. The idea of such exhibitions is of course borrowed from those which have been on several occasions so well carried out upon a wider scale, but it is one that admits, as in this instance, of more completeness of illustration, and a more deliberate and quiet appreciation than is to be obtained generally in large exhibitions. The Burlington Club is not to be confused with the "Fine Arts Club"—a society which has a similar purpose in view, but which provides for the social converse of amateurs by appointed meetings at the private houses of the members. The Fine Arts Club is in some sense the parent society, for it was established some ten years ago, while the Burlington, though numbering nearly as many members, many of whom belong to both clubs, has only, we believe, been in existence about two years. The Fine Arts Club was received by Mr. Gladstone on Tuesday evening last, when a most interesting collection of works of art was, as usual, formed for the occasion by Mr. Chaffers, especially in porcelain and the various other forms of ceramics in which the eminent ex-Chancellor of the Exchequer is so distinguished a connoisseur. The meeting was altogether one of the most brilliant reunions of the season, and was pronounced amongst the most interesting that have ever been held by the society.

MEETING FOR THE WEEK.

MON. — Aeronautical Society. — General Meeting of Members, 3.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

2979 C. M. BATHIAS. AN IMPROVED APPARATUS FOR REGISTERING THE SPEED OF MACHINERY, OR THE DISTANCE TRAVELLED BY VEHICLES. Dated November 14, 1866.

This invention consists in the combination of three discs without springs, the working of which enables one of ascertaining in an indefinite manner by augmenting the discs by a series of three discs the rotary or rectilinear motion of all sorts of machines or vehicles. The first disc, cut in the form of a Maltese cross, has ten concave sides, on which are inscribed the numbering figures. The second carries ten teeth, which catch in the preceding; and the third carries a single tooth on its circumference, the radius of which is equal to the concavity of the sides of the first disc. The second and third discs are solidly jointed together, their thickness being the same as that of the first disc. The first disc is shipped on to an axle, and the two others on another axle at a convenient distance, so as to allow the first disc to catch in with the two others. Disc No. 1, in one revolution, bears along at the same time disc No. 2, and, consequently, disc No. 3, which is connected to it; but when disc No. 1 has checked off the ten numbering figures, it carries disc No. 3, which has but one tooth, and has only travelled round one-tenth of a single figure of disc No. 1, of the second series of three discs, and so on. The application of this combination to a vehicle takes place by means of discs bearing ratchets or unequal sides, so calculated that the sum of their revolutions correspond with that of the wheels of the vehicle, the circumference of which has been previously measured. *Patent completed.*

2988 J. C MORRELL. IMPROVEMENTS IN THE CONSTRUCTION OF DRY CLOSETS, AND IN APPARATUS FOR PREPARING MANURE. Dated November 14, 1866.

For the purposes of this invention the seat of a closet is hinged or movable, in such manner that, on a person sitting thereon, the seat will be depressed, and by means of a connecting rod attached thereto, and to one end of a lever, motion will be communicated to such lever, and it, by its other end, will, by another connecting rod attached thereto, and to one end of a cranked lever, give motion to a ram or forcer within a chamber at the bottom of a hopper, and by such means move back the ram or forcer so as to permit the chamber or space previously occupied by the ram or forcer to become filled with earth or other suitable dry deodorising matter. The ram or forcer is also acted on by a spring or weight, by which, when the seat is again allowed to rise, the forcer or ram will be moved quickly, and drive before it the deodorising earth or matters over the fresh deposit which has been received into a suitable movable pail or vessel below the opening in the seat. The excrement is afterwards removed to a drying house, constructed with several drying floors, steam or hot water pipes being arranged below the said floors for imparting the requisite heat Mechanical means are employed for mixing the material under operation. *Patent abandoned.*

3374 G. F. AND J. STIDOLPH AND J. R. MORLEY. IMPROVEMENTS IN SHOP FITTINGS, APPLICABLE ALSO TO BOOK SHELVES AND OTHER ARTICLES OF FURNITURE. Dated November 22, 1866.

In fitting up shop windows, in place of employing a number of stationary shelves, as is now common, the patentees employ shelves which are hung at each end upon chains or bands, and these chains or bands are endless, and at the top and bottom pass around pulleys. The shelves are so hung that their weight always keeps them horizontal, so that the whole set of trays when loaded may be moved around the pulleys without any fear of disarranging the articles on the shelves. This arrangement admits of the articles to be displayed being arranged on the shelves at the back of the window, and then when the shelves are loaded they may be brought to the front. Similarly by drawing the arrangement of shelves round the pulleys any shelf, may be brought to the back, and any article may readily be taken out of the window. *Patent completed.*

Trade News.

TENDERS.

ABERDEEN.—The contracts for the erection of the new Free West Church have been taken as under:—Mason work (exclusive of materials of house to be removed)—Mr. Greig, £4,930; carpenter work—Simpson and Gall, £1,700; slater work—Mr. Currie; £199 10s.; plasterer work—Mr. Morrison, £174 9s. 8d.; plumber work—Mr. Thomson, £150. Total, £7,153 19s. 8d.

BLYTHE VILLE.—For villa residence, for Mr. J. Newton. Mr. J Burrell, architect:—Juskip, £611; Collis and Hudson, £595; Newbon, £560; Spicer (accepted), £390.

CITY.—For No. 110, Cannon-street, E.C. Mr. Philip B. Lee, architect:—Bywaters, £7,843.

COVENTRY.—For alteration of premises in Smithford-street, for Mr. John Dell. Mr. William Langley, architect:—Wilson, £589; Knowles, foreman to Mr. Marriot, £515; Worwood, £510; Ensor, £547; Hallam and Co., £480; Cole, £437; Liggins (accepted), £430.

CLAPHAM.—For six miles of brick and pipe sewers, ventilators, gulleys, and side entrances, and other works in the parish of Clapham, for the Board of Works for the Wandsworth district. Mr. W. R. Lacey, engineer. Quantities supplied by Mr. D. W. Young:—Engineer's estimate, £23,850; Pickering and Co., £34,593; Stiff, £34,000; Pearson, £31,400; King and Co., £29,795; Morton and Sons, £28,474; Hill and Keddell, £26,245; Wainwright, £25,800; Morris, £25,000; Hiscox, £25,000; Avis and Son, £24,950; Hubbard, £24,350; Blackmore, £24,344; Dickinson and Co., £23,513; Trowsdale, £23,000; Wigmore, £23,000 Thackrah, £22,900; Harvey, £22,797; Robinson (accepted), £21,200.

FINSBURY.—For alterations and additions to Finsbury Chapel. Mr. Wallen Dixon, architect:—

Names	1st Contract.	2nd Contract.	Total.
	£	£	£
Heeps	259	1,737	1,996
Richards	222	1,742	1,964
Anley	216	1,735	1,951
Tarrant	196	1,734	1,930
Mann	183	1,677	1,860
Crockett	189	1,661	1,850
Garrud	227	1,600	1,827
Gordon	166	1,590	1,756
Ebbage	203	1,551	1,754
Nightingale	172	1,492	1,664
Eaton and Chapman	169	1,485	1,654
Staines & Son (accepted)	179	1,418	1,597
Gribble	235	1,350	1,586

HACKNEY.—For alterations and repairs at the Wesleyan Chapel, Richmond-road, Hackney. Mr. J. Tarring, 26, Bucklersbury, E.C., architect. No quantities supplied:—Mann, £620; Saunders, £602; Killby, £560; Roberts, £502; Hill and Sons (accepted), £500.

HAMPSTEAD.—For alterations and additions to villa at Hampstead, for J. Sangster, Esq. Mr. Wallen Dixon, architect:—Guy, £179; Mann, £167, additional works (accepted), £38 = £205.

HERTFORD.—For new sick wards, Hatfield Union. Mr. John Sargeant, surveyor. Quantities supplied:—J. T. Colling, New Barnet, £1,289 17s. 6d; J. Webb, Hatfield, £1,215 15s. 6d.; C. Chapman, Hatfield, £1,072 5s. 9d.; B. Dunham, Hatfield, £1,060 12s. 10d.; J. and W. Stringer, New Barnet, £907 5s. 3d.; W. A. Webb, St. Albans (accepted), £850.

LONGTON.—For two cottage residences at Cookshill, for Joseph Draycott, Esq. (exclusive of plumbing, glazing, and painting). Mr. J. Burrell, architect:—Collis and Hudson (accepted), £620.

NOTTING HILL.—For taking down two villas in Clarendon road and erecting a tavern and two houses with shops and stable in the rear. Messrs. Bird and Walters, architects:—M'Lachlan, £4,198; Bishop, £4,145; E. Brown, £4,083; Williams and Son, £4,027; Cowland, £3,990; Newman and Mann, £3,986; Manley and Rogers, £3,917; Kelly Brothers (accepted), £3, 891.

SOUTHWARK.—For new warehouses Southwark-street, S.E., for Messrs. Peter Lawson and Son. Mr. John Wimble, architect:—Colls and Son, £8,870; Adamson and Sons, £8,554; Ramsey, £8,466; Browne and Robinson, £8,383; Piper and Wheeler, £8,318; Myers and Son, £8,270; Newman and Mann, £8,246; Killby, £7,440.

STREATHAM.—For new Magdalen Hospital. Mr. Henry Currey, architect:—Holland and Hannen, £29,198; Lawrence and Sons, £28,987; Lucas Brothers, £28,774; Simms and Marten, £28,731; Myers and Son, £28,730; Gammon, £28,375; Piper and Wheeler, £28,227; King and Sons, £28,090; Trollope and Sons, £26,920; Henshaw, £26,631; Hill and Keddell, £26,481; Downs, £26,323; Higgs, £26,128; Hart, £25,990; Perry, £24,667.

WESTMINSTER.—For proposed Albert-buildings, Victoria-street, Westminster, for Mr. John Caslenduck. Mr. Philip B. Lee, architect:—Bywaters, £10,000.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

William Cooke, Chippenham-terrace, Harrow-road, subcontractor on public works, July 22, at 1—T. George, Compton-mews, Brunswick-square, smith, July 22, at 12—Sir Samuel Morton Peto, Edward Ladd Betts, and Thomas Russell Crampton, Great George-street, Westminster, contractors for constructing public works, July 24, at 11—George Lambert, Ipswich, builder, July 25, at 11—Daniel Mackenzie, York-place, Howard-road, Stoke Newington, plumber—George White, Dunstable, builder, July 23, at 2.

TO SURRENDER IN THE COUNTRY.

William and Ephraim Atkinson, Dewsbury, builders, July 18—Emmerson Boothroyd, Hanley, builder, July 20—Alfred Cutler, Manchester, ironfounder, July 16—Matthew Conyers Hardy, Newcastle-upon Tyne, agents for timber merchants, July 20—James Daniel Mudge, Upchurch, Sittingbourne, journeyman wheelwright, July 20 John Eaton Gray, Tweededale, Staffordshire, ironfounder, July 22, at 11—Robert Hayes, Cullompton, labourer, July 20, at 11—John Moore, jun., Blackburn, joiner, July 23, at 11—Joseph Hill Weddell, Newcastle-upon-Tyne, house agent, July 24, at 12—J. Mutlow Williams, Bassalleg, near Newport, land surveyor, July 19.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

Oct. 5, J. Worm, Ireland-yard, Doctor's-Commons, builder—July 25, J. E. Gillett, Albert-road, Dalston, journeyman metal chaser.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9 0	£10 10		Archangel, yellow ..	£11 10	£12 10	
Quebec, red pine	3 0	4 10		St. Petersburg, yel..	10 10	11 0	
" yellow pine..	2 15	4 0		Finland	8 0	9 0	
St. John N.B. yellow	0 0	0 0		Memel.....	0 0	0 0	
Quebec Oak, white ..	5 5	6 0		Gothenburg, yellow	8 10	10 10	
" birch.....	3 10	4 10		" white	8 0	9 0	
" elm	3 10	5 0		Oefle, yellow.....	9 0	11 0	
Dantzic oak	3 10	6 0		Soderham	9 0	10 10	
" fir	2 0	3 0		Christiania, per C.,			
Memel fir	3 0	3 10		12 ft. by 3 by 9 in.			
Riga.....	3 0	3 5		yellow	16 0	22 0	
Swedish	1 15	2 2		Deck Plank, Dantzic,			
Masts, Quebec red pine	6 0	7 0		per 40 ft. 3 in.	0 15	1 4	
" yellow pine..	5 0	6 0		PUMICE STONE pr ton	5 0	8 0	
Lathwood, Dantzic, fm	4 10	5 0		OILS, &c.			
" St. Petersburg	6 10	7 10		Seal, pale....per tun	39 0	0 0	
Deals, pr C., 12 ft. by 3				Sperm body	110 0	0 0	
by 9 in., duty 2s per				Cod	39 0	0 0	
load, drawback 2s.				Whale, Sth. Sea, pale	40 0	0 0	
Quebec, white spruce	14 10	21 10		Olive, Gallipoli.....	63 0	0 0	
St. John, white spruce	13 10	15 10		Cocoanut, Cochin, ton	54 0	56 0	
Yellow pine, per reduced C.				Palm, fine	40 0	40 0	
				Linseed	39 0	39 5	
Canada, 1st quality.	17 0	19 10		Rapeseed, Eng. pale..	39 10	0 0	
2nd do.....	12 0	13 0		Cottonseed.....	30 10	36 0	

METALS.

IRON:—				
Welsh Bars in London .. ..per ton	6 15 0	0 0 0	3	
Nail Rod	7 10 0	8 0 0	2	
Hoops ..... do	8 10 0	9 0 0		
Sheets, Single ..... do	9 15 0	10 0 0		
Staffordshire Bars ..... do	7 10 0	8 10 0		
Bars, in Wales ..... do	5 15 0	6 5 0	3	
Rails ..... do	6 5 0	6 7 5	nett	
Foundry Pigs, at Glasg. No 1 .. do	2 14 0	3 5 6		
Swedish Bars ..... do	10 5 0	10 10 0		
STEEL:—				
Swedish Keg, hammered .....per ton	15 0 0	15 10 0		
Swedish Faggot ..... do	10 10 0	12 10 0		
COPPER:—				
Sheet & Sheathing, & Bolts ....per ton	81 0 0	86 0 0		
Hammered Bottoms ..... do	92 0 0	93 0 0		
Flat Bottoms, not Hammered .. do	87 0 0	89 0 0		
Cake and Tough Ingot ..... do	72 0 0	0 0 0		
Best Selected ..... do	80 0 0	82 0 0		
Australian ..... do	83 0 0	87 0 0		
Yel. Metal Sheathing & Rods ....per lb	0 0 7	0 0		
TIN:—				
English Block .....per ton	91 0 0	0 0 0	2½	
do Bar ..... do	92 0	0 0 0		
do Refined ..... do	94 0 0	0 0		
Banca ..... do	92 0 0	0 0 0	nett	
Straits ..... do	86 10 0	87 0 0		
LEAD:—				
Pig, English .....per ton	21 15 0	0		
" Spanish Soft ..... do	19 5 0	0 0		
Shot, Patent ..... do	23 0 0	0 0 0		
Sheet ..... do	21 0 0	0 0 e		
White ..... do	0 0	3 10 0		
SPELTER:—				
On the Spot*.....per ton	21 0 0	21 2 6	nett	
ZINC:—				
English Sheet .....per ton	26 10 0	27 0 0		
Devaux's V. M. Roofing Zinc .... do	28 0 0	0 0 0		
* And 5 per cent. discount if laid upon the new system.				
QUICKSILVER .....per btl	6 17 0	0 0 0		
REGULUS OF ANTIMONY				
French .....per ton	28 0 0	0 0 0		

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THE BUILDING NEWS.

LONDON, FRIDAY, JULY 19, 1867.

THE PARIS EXHIBITION.—No. VIII.

BUILDING MATERIALS.

FROM all parts of the world come building materials in great variety, but of many of those sent we shall have nothing to say; for though interesting enough of themselves, as illustrations of the products and usages of different countries, they are, from their price or nature, unsuited to our requirements. Our object in the brief survey we must necessarily make of this portion of the exhibition will be to point out where we may best glean additional resources for our own work. Examining, firstly, then, the raw materials, we shall pass over the many varieties of building stone exhibited without comment, as the cost of transport would preclude their introduction to this country. Of the marbles we shall speak more fully, and find here the finest exhibition of nature's wealth in this beautiful material which has probably ever been brought together, and the growing demand for this luxurious material in our own country renders an examination of it of particular interest and use. Following, then, the route we have before taken, we shall commence with FRANCE. From her Pyrenees and her Alps she presents us with many exquisite specimens, mostly, however, of well-known varieties; and we shall rather single out for comment her less known treasures. Remarkable amongst these are the granites and marbles from the Vosges, contributed by M. Colin, of Epinal, and M. Victor Rossett, of St. Jervoise les Bains, Haut Savoie, where we have granite of every colour, from deep chocolate brown to light yellow, with every shade of red and pink; and from the latter gentleman a beautiful specimen of "Protogyne," of deep blackish green flecked over with blotches of beautifully clear pink of high decorative value. The Russ vert, from Epinal, is a particularly useful variety of "Campan," of soft and delicate colouring, partaking of the character of Vert vert, but of smaller figure and greater variety of colour and tone. The Russ brun, from the same place, is very rich; and, as its name imports, of quiet red and brown tones, and a syenite of fawn colour and black is also particularly useful in decorative work; whilst, for rich figure and beauty of colour, the "Napoleon" marble, from the same district, is hardly to be surpassed; and the brown and red granites, and the small speckled green and grey porphyries, exhibited by MM. Varellé and Co., of Servan, in the Haute Saone, are well worthy of introduction into this country. From Cerdet, near Perpignan, in the Eastern Pyrenees, we have an useful bastard statuary, which would be acceptable for staircases and the coarser kinds of sculpture. Perhaps the most novel of all the decorative marbles exhibited by France is what is called the emerald onyx of M. Henri Bex. This is in reality not an onyx or an alabaster, but a variety of fluor spar, differing only from our beautiful Derbyshire product in having green instead of blue markings, evidently produced by copper. It is very brilliant, but can only be obtained in small pieces, which are neatly jointed together and used after the fashion of malachite; but its price of 500f. per square metre will prevent its being used, except for small inlay purposes, for which it is very applicable. From Bagneres de Bigorre we find a large collection of small pieces of very richly coloured marble, but as no information is given as to the sizes the varieties can be obtained in, and nothing but small picked specimens exhibited, we cannot say if they are likely to be very useful. In manufactured articles of marble the French Exhibition is exceedingly rich; and we would particularly enumerate those of M. Lerolle, whose works are of eminently good character and great taste; and M. Gobert, of Sèvres, whose black marble chimneypiece, with its plaques of enamel or painted porcelain, is exquisitely beautiful; whilst a chimneypiece of Griotte Fleuré, with ormolu mountings, revives the taste and luxury of the times of Louis XV., by the able hands of the house of Graux-Marly. M. Marchand exhibits his Greek chimneypiece which won for him such unqualified approbation in the Exposition of '62, and which we still admire as much as we did then. A beautiful small black marble chimneypiece, inlaid with serpentines from the Pyrenees, by MM. Parfony and Lemaire, of Paris, is an excellent work, both as regards handicraft and art, as is also a "rouge antique" (but not by any means *the* "rosso antico") marble chimneypiece, for a dining-room, with a group of fish in statuary by the same firm; whilst, for good, ordinary, commercial work, the products of M. Loichmolle, of Paris, are very commendable. In the Parc are some fine columns of great size and of usual marbles contributed by these same gentlemen, but the most notable of the manufactured articles in these materials are some granite crosses or Calvaries upwards of 30ft. high, by M. Yves Hernot, the carving of which in this obdurate material is particularly good.

From ALGERIA, we have, of course, abundance of her celebrated and so-called onyx in every variety and form, and the works of M. Viot show this material to its best advantage; its richly striated portions form draperies to innumerable statues in bronze, and its clear pellucid veins mounted in ormolu, constitute it at once the richest and the most elegant adjuncts this portion of nature's realm affords us. But Algeria offers to us other and even more useful "marbles," for by this term we embrace all the earthy minerals we use in a polished form in large masses, and M. Tardieu exhibits some very fine red and yellow brocatelle, from the quarries of Chenoa, near Cherchel, which will form a very agreeable addition to our repertory, and which seem to be obtainable in large sizes; some magnificent rich green serpentine, from Oran, is likewise exhibited by M. Tardieu. Indeed, Algeria seems to be our most hopeful ground for new marbles. Here we find a specimen equal to the most prized Giallo antico procured from Ouednoukal, near Phillipeville, in the province of Bône; a charming red and green marble from Bal Taga, and beautiful breccias from Bildah. We call the attention of our English marble merchants and architects to these, as many new combinations of colour can be effected by their aid, and a new charm be gained for our interiors.

From BELGIUM we have a large collection of the marbles she has been supplying us with for many years, but nothing very new. Indeed, that country seems to have been thoroughly explored, and we have but little fresh to look for from that quarter. She sends fine specimens of her "Petit Granit," which is no granite at all, but a limestone, and in which can be produced some very fine effects by pointing, tooling, sanding, or polishing the surface, and which is procurable in very large size, one slab being 12ft. long, 6ft. wide, and about 1ft. thick, of even quality and texture. The manufactured marbles of Belgium are chiefly represented by chimneypieces of rather ordinary design, the best being M. Beernaert's Neo Grec chimneypiece in white marble, and M. Vestrephen's, one in the same style, in black marble. One of M. Leclerque's, introducing Californian agate into black, is successful; but another of the same combination is very much overdone, and this over-enrichment makes itself prominent in another chimneypiece by the same manufacturer. It is a very elaborate one in statuary, manufactured for Mr. Wilson, of Manchester, but one-half the labour judiciously applied would have made a much better thing of it, and we must here point out the mistake we frequently see made in putting much work on variegated marbles. The sole object in designing in such marbles should be to bring out the "figure" by broad treatment and curved surfaces, not by carving, or by small and multitudinous angles, which are quite lost in the strange contortions and odd figures the veining of the material displays. Simplicity of form in figured marbles, and sculpture in low relief in plain ones, should be the aim of the designer, instead of which we see the same design repeated in various marbles without the slightest reference to the configuration of the material, and soft friable statuary is placed in the most exposed situation, honeycombed with flower work of the most fragile description. Indeed, in few things is there room for so much improvement as in the designing of chimneypieces. PRUSSIA exhibits through the Société Franco Allemande pour l'Exploitation des Carrières de Marbre some very fine Serrancolin-like marble from Vilmai-sur-Lahn, obtainable in lengths of 16ft., which is very useful, and will make admirable shafts, and a Plymouth-like black and white marble of good quality and size. The Silesian grey marbles, which form the pavilion of the King of Prussia on the grand gallery, are of good texture, but their colour will prevent their finding much favour in England. BAVARIA exhibits a fine porphyry vase, by M. Ackermann, of Weissenstadt, of large size, and if this material can be readily obtained it will be very cordially welcomed in England. From AUSTRIA we have the finest and most useful contribution of the whole exhibition. This is in a fine red marble of rich but light tone, procurable in very large masses from the quarries of M. Gerenday, at Piszke, near Pesth. A slab is here exhibited 16ft. long by 6ft. wide, and showing its capability of treatment, a portion being left dead and part of it polished. Dead it presents a soft fawn colour, which contrasts well with its richer hue when polished. Its figure is close and even, and we unhesitatingly pronounce it the most available new material of this class we have seen. The quarries of M. Gerenday seem to be of very large extent, as a yield of 2,000 cubic yards is obtained daily, and some 250 to 300 workmen employed, and we should be glad to see the results of their labours available in England. Messrs. Cloetta and Schwarz, of Santa Croce, also exhibit a good useful grey marble, but of no variety of figure or colour. The marbles of SWITZERLAND are not very brilliant in colour, and do not present much variety, but are obtainable in large sizes. From PORTUGAL comes a large collection of slabs of great variety, but chiefly of light tones of colour, very valuable for decorative work, and apparently obtainable in large pieces. Unfortunately, the names of the quarries are not given, but they all belong to M. Joaquim Antunes dos Santos, of Lisbon, and seem to be procurable at very moderate prices. GREECE almost revives her ancient reputation, and Professor Siegel exhibits some very fine varieties—one a noble "Greek green" column from Tinos, and another of the character of "cippolino" from Karysto, which can be obtained in blocks 11 metres long, and which would be exceedingly useful for columns, and large wall linings. Here, too, we see a slab of the glorious rosso antico, but we fear it is only an accidental specimen. That luxury is lost to us, and the days of ancient Rome are past. We have a very fine red and white marble of large bold figure from Peskos, and an exquisite yellow and pink marble from the port of Kalamitza, obtainable in blocks 6 to 8 metres long. Any, or all of these, would form very welcome additions to our rather restricted list of marbles, and we hope that our notice may be the means of drawing attention to them. From DENMARK we see a very fine black marble, well worth looking after, and a deep rich granite, of small figure, both exhibited

by the director of the Mineralogical Museum of Copenhagen; and from Sweden comes a very surprising exhibition of this portion of its mineral wealth, exhibited in fifty specimens, by M. Erdman, the Chief of the Geological Survey of Sweden. Many of these are very useful, and would be very highly appreciated in this country, and amongst the most notable are granites from the Hufvudsta quarries, near Stockholm, the general building stone of that city. It is of a fine, clear grey, very solid and durable, and obtainable in almost any size, and at moderate price. The granite from the Malmön quarries, on the west coast of Sweden, is of a clear yellow or light brown tone, and is remarkably easily worked, in which respect it resembles the Ornsköldsvik granite, which is dark grey in its colour, and procurable in almost any sizes. The foregoing, though capable of taking a polish, may be looked upon more as building stones than included under the general acceptation of the term "marbles," but their durability, and the facility with which they can be exported to this country, induces us to notice them. Of the Dalécarlian granites, the most useful is the delicately-coloured light red variety, from the quarries of Gashvarf, at Elfdal. It is a porphyroidal granite, obtainable in very large masses, and receiving a very high polish, and is of far more beauty than any of our Scotch granites. Of a similar character, but of deeper colour, harder, and not procurable in such large masses, is that of Roth, also near Elfdal, where are very large works for the manufacture of these materials and the porphyritic rocks of the district, which vary in colour from light yellow to deep blood-red, and where, also, is occasionally found a beautiful clear green phonolite, only unfortunately in but small dimensions. The marbles proper exhibited by Sweden are also very good. Those from Claëstorp are of a fine clear green, like the best specimens from Galway; and from Wikersvik comes a beautiful flesh-coloured marble, very useful for inlay purposes, and a beautiful light green marble from Sala, in Westmania. There are others of great variety, but the finest and most varied are the wonderful conglomerates from Dalelfven near Transtrand. These are wonderfully beautiful and of infinite variety, and the brilliant colours of the pebbles agglomerated in the highly crystalline matrix which encloses them, produces an effect of exceeding richness; a little capital and some energy would convert the conglomerate beds of the Swucku and Sölen mountains into a fruitful mine of wealth to Sweden and a source of pleasure to all Europe. At present it is only detached pieces which are collected and worked up, but there is hardly a limit to nature's supply of this beautiful material, and we recommend a "prospecting" tour in Sweden to anyone interested in this branch of industry and in search of a fortune.

Russia, as usual, exhibits things wonderfully rare, but of limited commercial value. Decidedly the most useful are the very beautiful specimens of polished granite exhibited by M. Henri Tallgrén, of Helsingfors. There is a wonderful block of malachite, 7ft. long, 2ft. 6in. high, by 2ft. thick, which is valued at 75,000 francs, but which has no influence on everyday work; and there are some most magnificent candelabra of rodonite, a brilliant crimson jasper, clouded with bluish-grey, but these are but *tours de force*, and remove themselves so far from the reach of all but emperors, that we simply admire and pass on. From Russia, or from its Caucasian region rather, comes a rival to the Algerine onyx, in an equally fine example of the same material, but we fear its distance will prevent its being of much use. In the cabinet of the Emperor are some magnificent bits of marbles from the Ural chain of mountains, which, if procurable in workable masses, would be worth almost any money, but these resources of Russia are as yet totally undeveloped. Italy, of course, exhibits largely, and the new acquisition of districts hitherto unexplored by commerce, bids fair to open out many new fields for the marble worker. Thus, from Benevento come some very fine brocatelle, and from Reggio an excellent green serpentine; the breccias from the Abruzzi are of great variety, bidding fair to find a large market; and Sicily, with its wonderful changes effected, by volcanic action, on its limestone rocks offers an inexhaustible field for research, the first gleanings from which are now beginning to appear. From Lucca, Carrara, and Sienna, come well-known varieties, and a few new ones, but without information as to sizes or prices; and Florence sends a large exhibition of small specimens of the alabasters and serpentines of the Maremma, but which, from the same causes, are rendered useless. From Turkey we derive many specimens, both manufactured and in the rough, the most remarkable of which are a pale bleached species of Griotte fleuré, very useful for panelling with gilt mouldings, or chimneypieces mounted in ormolu, and the deep purple antique porphyry of Brandrum. From Egypt we receive only small specimens of fine granites, syenites, and porphyries, with here and there a magnificent breccia; but there is nothing to indicate if these are from quarries, or only eroded fragments left in the *débris* brought down by the Nile. The continent of America sends but little of this species of her mineral wealth, though she has vast riches of this kind, and an unpolished specimen of lapis lazuli from Chili, and a few fragments from various portions of the United States, are all she has to show. Japan exhibits a most wonderful marble made up of madrepores encased in marvellously coloured jasper of great hardness, and odd and quaint as though the Japanese had made it themselves. If this variety can be introduced, it will be of great service to the makers of the smaller articles of marble work, but we fear its great hardness will prevent its general application.

Our own country exhibits very little and nothing new. From our colonies we find a few new things, and some good. Halifax, in Nova Scotia, sends a very beautiful green marble, with clear yellow markings, from Five Island; and from the northern coast of Newfoundland comes a very good rose-coloured and white marble, with some excellent specimens of serpentine, all of which are well worth inquiring after; and distant Natal sends some very delicately marked marbles. From these remarks it will be seen that there is much to be learned in this department of the Exhibition; and we hope the opportunity of receiving the lesson will not be lost on those who seek to provide us with these most beautiful products of bounteous Nature.

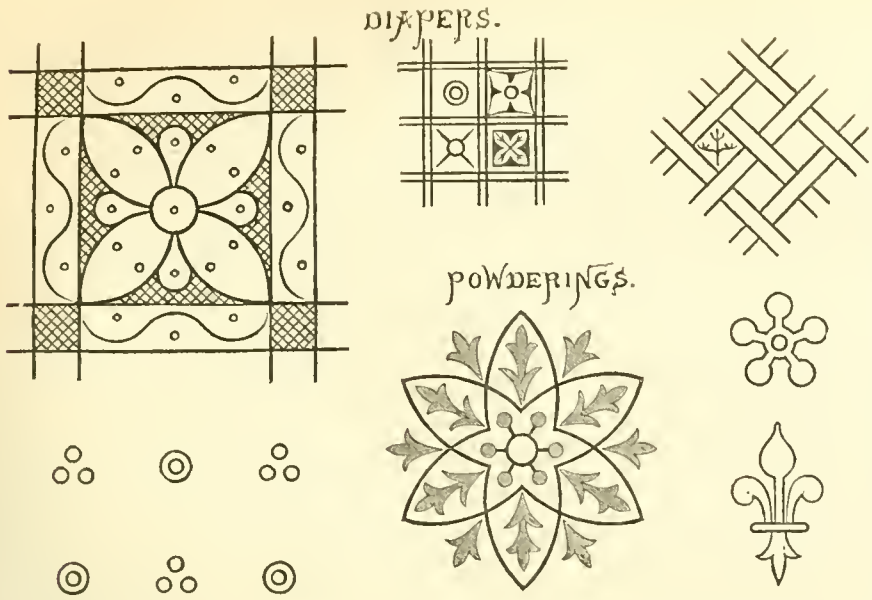
PAINTED DECORATIONS.—No. X.

I FIND it is just six months ago that I wrote my last article on this subject. I scarcely know how to apologise to my readers for this long delay. It is true one might have avoided mentioning anything about it, and by omitting the numeral under the heading have possibly escaped notice, but I would fain hope that the subject is of far too much importance to many of the readers of this paper for them to forget so easily the promise I made in my first article on Painted Decorations.* The usual plea of professional engagements was open to me, but then, again, I feel that to begin a series of articles on a professional subject in a professional journal is as much a professional engagement as any occupation by which we gain the insulting offer of some paltry premium, or the almost equally paltry commission of £5 per cent. for thought and labour, which would be underpaid at three times five. Shall I, then, plead indisposition? or shall I rather lay the blame upon my editor, and say that he is indifferent to my prosy notes about Theophilus and Henry III. so long as exhibitions and lectures afford him the opportunity of printing sharp criticism, either by way of dissecting Mr. Scott or mutilating Mr. Burges? I am afraid I have no better excuse to offer than my own indisposition, for it would indeed be a rare event to find an editor who would accept blame at the hands of a contributor. In the last article we left off at the end of the second part of my subject. I say "the end," because, although in the sixth article I included diapers and powderings as part of the architect's work, yet in good work these things are so little used, and when used are always so subordinate, and so very simple in design, that practically we have very little to do with them. Archæologically speaking, one might write a long paper on the history and use of diapers and powderings, but as my object in writing is not solely archæological, and as these methods of decoration are just those to which people who know nothing of art almost invariably resort, whenever the ornamentation of a building with colour is in question, it will be better for us to content ourselves for the present with a few good examples. I need scarcely add that flowers, especially the rose, monograms, stars, and armorial bearings were used both as powderings and diapers in the best times, but the latter not so much on walls as on tissues and furniture.

Having now reviewed the various processes of mural decoration, and set forth something of the duty of the architect—a duty which every student should look boldly but reverently in the face—we have to consider the duty of the painter. Writing of the duty of the architect, I said "it has been the fashion some considerable time past for architects to muffle themselves up in a splendid disdain for every art but their own." What I then said of architects may be said of painters. An examination of the pictures in this year's exhibitions shows us very clearly that, with the exception of Mr. Fred. Walker and Mr. Albert Moore, there is no one who gives any evidence of those powers which are absolutely necessary to a wall painter, and even these artists might fail directly they have to work with an architect; for, it may be, that these men know nothing about architecture, and are utterly indifferent to sculpture; they may, or they may not—no one can tell until the time comes when one or the other may have the opportunity of working with some architect who knows somewhat of art. "The painter (says M. Ch. Blanc), when he wishes to reach the highest regions of his art without passing its limits, must approach equally two elder artists—the architect and the sculptor. He will thus, doubtless, lose part of his liberty, but how much authority will he gain by this austere obedience?" Of course it is a necessity of the case that the architect and the sculptor *must be artists*. I happen to know of a case where a young and really good painter became prejudiced against the whole class of architects by the treatment he received from one who stands tolerably high in the estimation of ecclesiologists. It was not sufficient for this gentleman to treat the painter with somewhat less consideration than he would treat the bricklayer, but he must needs possess himself of the original sketches with which he had nothing whatever to do, and endeavour to palm them off as his own productions. I need hardly assist my readers to draw the inference, for to say that such an architect was no artist is but a small matter in such a case; and if the noble art of architecture, which someone asserts to be "the ultimate polish of man," is practised now-a-days after this fashion, it can be scarcely matter for wonder should the sister arts remain dissevered; and should painters, who are worthy of their high calling, decline to recognise in the architect anything beyond the mere man of business or allow him any authority or opinion on matters of art. With such mere traders in architecture we have nothing to do; and in the following remarks on the duty of the painter, I wish it

* Building News, April 20, 1866.

PAINTED DECORATIONS.



to be taken for granted that painters and architects are at least gentlemen whatever may be their shortcomings in special or general knowledge. I am quite conscious that the more experience we have the more we become convinced of the melancholy fact that nobility of action and gentlemanly feeling are rare gifts with the professors of the fine arts. There is little real zeal for art; plenty of it for anything else. We can wear ourselves out in struggles to overreach one another, but to open our eyes to the common weal, to recognise good honest work, and have the courage to speak of it fair, to let a word of praise escape us for anyone but ourselves and those within the narrow boundaries—the very narrow boundaries—of our special clique, would be evidence of a weakness and impolicy unknown to the art brotherhood of the nineteenth century. In saying this much I am anxious that I should not be misunderstood by anyone fancying that I have a hopeless view of the present condition of the fine arts; on the contrary, I believe too strongly in the force and vitality of art to think ever otherwise than hopefully, but my hope is founded not in what the world calls successful men, for these are mostly little more than noise and wind, but in the men of whom the world knows little or nothing, and from whom, when the opportunity comes, we shall, I firmly believe, obtain wall paintings and monumental art second only in drawing to the best Greek work, and second only in vigour of composition and dramatic interest to the noblest work of the Middle Ages. When, then, this opportunity arrives, what, we ask, will be the duty of these men? Their first and chief task will be to submit themselves to the limits prescribed them or decline the work. The latter course is unquestionably, to my mind, the right course when the architecture happens to be really bad. I can conceive few things in art more outrageous, more saddening—I may say more revolting—than to see such architecture as that of the Strand Music Hall made the framework of wall painting such as Mr. Moore might do. When the architecture is good, it is, of course, equally offensive to see it ruined by mere "decorator's" work, or by paintings which are nothing more than magnified easel pictures. As, however, one example is worth a dozen precepts, I propose to quote in my next article a few cases of modern wall paintings as illustrations of what is not the duty of the painter. We will then proceed to inquire what the old painters thought of their duty towards their brother artists, both architects and sculptors, and why the same laws which guided them and resulted in such art-unity should not obtain now-a-days. E. W. G.

TRADES UNIONS' COMMISSION.

SINCE our former report, several witnesses have been examined before the Commissioners. Among others, Mr. John M'Donald, the president of the Glasgow Master Brickbuilders' Association. He appeared, of course, in the interests of the masters, and the gist of his evidence amounted to this, that his association was entirely a defensive association, caused by action on the other side. The design and object of this society were explained to be the formation and establishment of certain rules to be observed by the members in the payment of wages to those in their employment, including apprentices, journeymen, and labourers, in particular fixing the rate of wages to be paid, and mutual counsel in carrying on their business. There is no restriction as to admission. All who approve of the object of the association, and who pay a certain amount of money, and conform to the rules, are admitted. Purely a local society, it has no connection with the General Builders' Association. Witness did not think that the trades of Glasgow had any connection with any general association; there the lines of work are more subdivided than in England, that is to say, joiner's work is done by itself, and is a trade by itself; it is the same with masons and brickbuilders and other trades—each stands by itself. Being asked what advantage there was in following out this course, Mr. M'Donald, speaking on behalf of his association, said, it was their opinion that when a man is confined to one department of work he is likely to be more efficient; and that by having the work divided and then confined to their own departments, the work is likely to be done on more moderate terms. The society had nothing to do with stone building. Witness had been an employer for upwards of sixteen years, and was a workman previous to that time. He had had experience of trades' unions, and to some extent knew their organisation and tendency. He was of opinion that their tendency is to establish a monopoly in labour. They act in that way, for instance, by limiting the number of apprentices which a master might employ. Witness looked upon this as a great grievance, and considerable efforts have been made in Glasgow to have all such restrictions removed. The masters regard this interference as an unwarrantable encroachment on their rights as employers. They do not believe that a large number of apprentices is desirable or profitable, but they hold that this is a matter the settlement of which exclusively belongs to the employer himself; a matter with which no other party, much less the operatives, has got anything to do. One of the rules of the association reads thus—"Each member of the association shall abide by and conform to such rules, regulations, and arrangements as may be agreed to at any general meeting of the association. Members shall not, in any instance, nor under any pretext, pay more wages to those in their employment, nor give anything in lieu thereof, than shall have been agreed to by the association; nor shall any member knowingly allow his employers, or any of them, directly or indirectly to supplement the wages he pays to those in his employment." Witness, in explanation of this rule, said he did not know whether it amounted to an attempt to regulate the rate of wages. It was agreeing to abide by the wages fixed, but he admitted that if a member did not abide by the fixed rate, he was fined £5. As regards the last clause of the above rule, witness further explained that the word employer there means the proprietor, the person for whom the work is being done. When work is urgent and hands scarce, proprietors have frequently offered, and sometimes paid to the men at their work, 2s. or 3s. per week above the rate paid by the masters. The design of this is to increase the hands; to get more men, that the work may be advanced with greater speed; and the effect of it has been either to raise the wages generally, or to produce discontent among the men. The object of the clause referred to is to prevent this. Subsequently, witness reluctantly admitted that this was an attempt to regulate the rate of wages. He was emphatic in his declaration, however, that the object of the association was defensive. Had it not been necessary to meet an association already in existence, this one would never have been formed. The masters would have had no association had it not been for the purpose of self-defence. If the workmen combine to say, "You shall not pay below a certain rate of wages," the masters combine to say, "You shall not pay above it." In answer to a question, witness replied that one of the complaints against trades unions, on the part of the men, is that they tend to prevent the action of the natural laws of supply and demand. Being further asked whether his association does not just the same thing, he said, "just the same thing, and I am for having them all abolished. I should be glad if that were the result of this commission." Referring to the question of apprentices in Glasgow, it was stated that seven apprentices is the number at present allowed to one employer, without reference to the number of men employed. The masters insist that there should be no limit, but they were obliged to make the best terms with the men, who some years ago restricted the number to five. Witness's next point was, that the tendency of trades unions is to establish monopoly in this respect; that they compel each apprentice to pay £2 as a fine or entry money on joining the trade. Again, trades unions have a tendency to establish a monopoly in labour, by requiring each apprentice, before his apprenticeship be completed, to join the union, which he may do by paying to the union 2s. 6d.; but should he refuse or neglect to do this before the time be out, he is compelled to pay a second fine of £2, and thus constitute himself a member of the union, or leave the district. If apprentices are sons of members of the society they pay £1 only, but they are in quite the same position as those who pay £2. Another point strongly insisted on by M'Donald, was, that the tendency of trades unions is to deprive the deserving workman of the reward of his skill and industry. He is deprived of his liberty of action, and subjected to terrorism, should he not conform to the rules of the union. In support of this, witness read rule 10 of the Operative Bricklayers' Society, which states that no member of that society shall take piecework, or make any engagement with any master bricklayer, under a penalty to be considered at the first meeting. No employer, moreover, can even keep a manager or a foreman who is not required to be a member of the union. Forbidding piecework, in witness's opinion, keeps down a skilled and industrious workman. Trades unions fix in an arbitrary manner the time the men are to work, and how the day is to be divided, without reference to the interests of the employer or the injustice of the matter involved. Formerly, the men were in the habit of working sixty hours in the week. In 1864, the union resolved to work to half-past two on Saturday. In 1865, they resolved to stop at two; and in 1866, they resolved to stop at twelve on the Saturday. These resolutions were all come to and fixed (said witness), without the employers in any instance being consulted. In common

with other masters, he complained of the mode of dividing the day into quarters, which he held was not fair. For example, workmen must either have a quarter day or nothing. Strictly speaking, two and a-half hours would be a quarter day, ten hours being the full day; but, if they wrought an hour and a-half, they would claim a quarter for it; or, if they only wrought an hour, they would get nothing for it. Members of witness's society do not object in any way to work with plasterers, or carpenters, or other employers, who are not members. The society does not interfere with the freedom of action of persons not members of it, except with regard to bricklayers. Nor do they hesitate to take contracts in conjunction with them. As to arbitration, the masters, it was asserted, were not only in favour of it, but have always proposed and urged it. On the part of the men, arbitration has been at all times declined positively and decidedly. Touching the subject of machine-made bricks, there is no difficulty in Glasgow upon that point. The bricks in use there are nearly exclusively machine-made. The Association of Bricklayers have been trying to get the bricks all made the same size, but that is all. Witness went on to state that trades unions tend to promote a feeling of antagonism between employers and their workmen, by lessening the intercourse and confidence which ought to exist between them. He thought this was very apparent to those who have been taking part in these matters, and who have been at all observant of them. It was a mistake to suppose that the rise in wages which has taken place is the result of trades unions and their actions. It is trade that regulates wages and not strikes. Strikes frequently take place on very insufficient grounds, and frequently the parties who gain are large losers after all. It is M'Donald's belief that while friendly societies, rightly conducted, may be beneficial to working men, trades unions so-called are injurious—injurious to the public, injurious to the employers, and injurious to the men themselves; and that if by healthful legislative enactment their action could be modified or abolished, it would be a great boon to the working men themselves, as well as to the community at large.

REGULATIONS FOR THE CONSTRUCTION OF STREETS, BUILDINGS, DRAINS, &c.*

NOTICES, PLANS, ETC., OF NEW STREETS.

EVERY person who shall intend to make or lay out any street, shall give one month's notice to the Local Board of such intention, by writing, delivered at the surveyor's office, which notice shall be accompanied by a specification describing the proposed construction, together with a plan and longitudinal and transverse sections of the intended street, drawn to a scale of not less than 1in. to every 44ft. for the horizontal scale, and 1in. to every 10ft. for the vertical scale; but the transverse section, which is intended to show more particularly the detail construction of the intended street, shall be drawn to a uniform scale of ¼in. to a foot; and such plans and sections shall show the intended length, width, level, and construction of the said street, and the provisions for the sewerage thereof, and its position relatively to the streets nearest thereto, and the following levels, above some known fixed datum line, viz.:—The level of the present surface of ground, the level of the intended new street, the level of the streets with which it will be connected, and the level of the lowest floors of the buildings intended to be hereafter erected in the proposed street; and every such plan shall show thereon the names of the owners of the land through or over which the proposed street is intended to pass, and also the name and address of the person intending to lay out such new street, and shall be signed by him or his duly authorised agent; and the level, width, and construction, together with the sewerage of every such street, will then be fixed by the Local Board; and no such street can be lawfully laid out, made, or built upon otherwise than in accordance with the approval of the Local Board, and any person permitting or suffering such street to continue so improperly laid out, made, or built upon, renders himself liable to a penalty not exceeding £20 for every day such street shall so continue, and also to the repayment to the Local Board of their expenses of altering any such street or any building therein, so as to make the same in accordance with the level and width so to be fixed by the Local Board as aforesaid.

Every person who shall intend to erect, alter, or add to any building, shall give notice to the Local Board of such intention, by writing, delivered at the surveyor's office, which notice shall be accompanied by detail ground and basement plans, and sections of the whole of such intended building, drawn to a scale of not less than 1in. to every 8ft., showing the covered area, distinguished by being tinted, and the position, form, and dimensions of the several parts of such building, and of the water-closet, privy, and all other appurtenances, and the construction of the walls of every part thereof, also the position of the proposed buildings and appurtenances in relation to the buildings of the properties immediately adjoining, and containing sufficient information to define their exact position in relation to each other and to the street in which it is proposed to build, and the position of any ditches, sewers, or drains over or abutting on which it may be proposed to build, together with the open space to be left in front of the intended building, and the back yard or back area extending 8ft. from the main building, and the whole length of the back of such building, the front line of the nearest buildings on either side thereof fronting the same street, the level of the lowest floor with reference to the adjoining footpath, the size, course, inclination, and description of every intended drain, with the position, intent, and description of every communication therewith, and the position and level of the intended point of junction of such drain with the public sewer; and such plans and sections shall be accompanied by a description of the material of which the building is proposed to be constructed; of the intended mode of drainage and means of water supply, and a statement of the purpose for which such building is to be used, with such other particulars as are required to fill up the form provided for this purpose; and in default of such notice, or if any such house, building, privy, or cesspool be begun or commenced, or be built, rebuilt, or constructed without the approval of the Local Board, or in any respect contrary to these provisions or of the various acts having relation thereto, the offender shall be liable to a penalty not exceeding £50; and the Local Board may cause such house, privy, or cesspool to be altered, pulled down, or otherwise dealt with as the case may require, and the expenses incurred by them in so doing shall be recoverable from the offender in the summary manner provided by the said acts or some or one of them.

NOTICES, PLANS, ETC., OF BUILDINGS, CHURCHES, ETC.

Any person intending to build a church, chapel, school, or place of public amusement or entertainment, or any building for holding large numbers of people, shall, before beginning such building, give to the board, in addition to the notices, plans, sections and particulars, hereinbefore stipulated for other buildings, a description of the manner proposed for its construction—with respect to the means of supplying fresh air to such building—and in default thereof, or if the building be erected without their approval, the Board may pull down or alter the building at the owner's expense, and such expense shall be recoverable in the manner hereinbefore mentioned.

DWELLING-HOUSES.

Any building built or rebuilt (except on the site of a building used immediately before the pulling down thereof as a dwelling-house) or any part thereof, or any building built before the passing of the Hull Improvement Act, 1854, and not then used as a dwelling-house, or any part thereof, shall not, without the previous consent of the Local Board, be used as a dwelling-house, except only during such time as there is adjoining thereto either a street or a clear open space, in and to the full extent of the front thereof, of not less than 20ft. in width; and any building not occupied as a dwelling-house previously to the passing of the Hull Improvement Act, 1854, shall not be converted into a dwelling-house without previous notice and plan being deposited with, and approved by, the Local Board, precisely as is required for the construction of new houses or buildings.

COURTS, ETC., NOT TO BE CONSTRUCTED OF A LESS WIDTH THAN TWENTY FEET.

Every court, alley, square, or inclosure for houses to be rebuilt, shall have an open area, or be of such width as the Local Board shall determine in each case; and every court, alley, square, or inclosure for houses to be built or constructed on vacant ground shall have an open area, or be of the width of 20ft. at least, measuring from front to front of the houses therein; and the same area or width shall extend from the street throughout such court, alley, square, or enclosure, and be open from the ground upwards; and no tunnel or covered entrance shall be allowed in any such court, alley, square, or inclosure.

BACK YARDS TO BE EIGHT FEET IN WIDTH.

Every house to be rebuilt, and every house to be built at the corner of any street or place shall have a back yard or back area thereto, of such size as the Local Board may deem right and determine; and every house to be constructed on vacant ground (not being the corner of a street or place, or not being the site or any other house erected thereon, immediately previously to such construction) shall have a back yard or other vacant ground and area, at the back thereof, open from the ground upwards of not less than 8ft., extending from the main building for the whole length of such building; but within that space or area, the pantry, coal-house, and privy, not exceeding 9ft. in height, and not covering more than 48 superficial feet of the above area, may be built.

THICKNESS AND MATERIALS FOR WALLS.

The external walls and division or party walls of every new building, or of additions or alterations of any existing buildings, shall be built of brick or stone, or both, not less than 9in. in thickness, unless the Local Board shall otherwise allow in cases in which it may appear to them that no danger would exist in the spread of fire; and such walls must be carried up to the underside of the covering of the roof; but if the external walls exceed 24ft. in height above the ordinary surface of the flagging or street adjoining thereto, the thickness shall be at least 14in. from the top of the footing up to the underside of the floor next below the topmost floor; and if they exceed 40ft. in height, the thickness shall be at least 18in. from the footings to the underside of the floor next but two below the topmost floor, and 14in. from thence to the underside of the floor next below the topmost floor, provided, however, that the walls of such outbuildings as coal-houses, privies, and pantries, and not more than 9ft. in height, may be constructed with walls 4½in. in thickness.

PARTY WALLS.

Every wall separating two houses, or built with the intention of forming the division wall between two houses, shall be deemed a party wall for the purpose of these regulations, although one of such houses only be erected in the first instance; but the owner of such house or wall first erected may, if he thinks fit, require an additional 4½in. wall to be erected by any other party erecting a house in contact with his already built; and no regulation or sanction of the Board shall release any party from this responsibility.

LEVEL OF GROUND FLOOR.

The level of the ground floor of every dwelling-house to be erected must be at least 6in. above the level of the adjoining footpath.

HEIGHT OF ROOMS.

In any building to be erected, every habitable room, except rooms in the roof, shall be in every part 8ft. in height at the least from the floor to the ceiling, and every habitable room in the roof of such building shall be at the least 8ft. in height from the floor to the ceiling throughout not less than one-half the area of such room.

There must not be more than one storey in any part of the roof of any house hereafter to be built.

AREA OF ROOMS.

Every house to be built or rebuilt shall have on the ground floor at least one room containing an area, clear of the staircase, of not less than 100 superficial feet.

CHIMNEYS OR FLUES.

All partitions between any chimney or flue to be built or rebuilt shall be of brick or stone, and at least equal to half-a-brick in thickness, and every breast, back, and partition of any chimney or flue hereafter to be built or rebuilt shall be built of sound materials, and the joints of the work well filled in with good mortar or cement, and rendered or stuccoed within. Every chimney or flue hereafter to be built or rebuilt, not being a circular chimney or flue lined with pipes, shall be in every section of the same not less than 14in. by 9in.; and no chimney or flue shall be constructed with any angle therein which shall be less obtuse

* Issued by the Local Board of Health, Kingston-upon-Hull.

than an angle of 120 deg., except proper doors or openings not less than 6in. square be placed between every such angle, and every projecting angle in any chimney or flue shall be rounded off 4in. at the least, upon pain of forfeiture, by every master builder or other master workman, who shall make or cause to be made such chimney or flue, of any sum not less than £10 nor exceeding £50.

WATER-CLOSETS.

Every house to be built and to be rebuilt must be provided with a sufficient water-closet or privy and ash-pit, furnished with proper doors and coverings, under a penalty of £20, and liability to repay the Local Board's expenses of providing the same after the builder's default.

WALLS, PALISADES, ETC.

No wall, palisade, fence, or other erection, shall be built over any sewer of the Local Board without the previous consent, in writing, of the said Board, under a penalty for each offence of £5, and a further penalty of 40s. for every day during which the offence continues after notice in writing from the surveyor of the Local Board to discontinue it, and the Local Board may cause any such erection, made without their consent, to be altered, pulled down, or otherwise dealt with as they may think fit, and the expenses incurred by them in so doing shall be repaid to them by the person to whom the erection belongs, and be recoverable from him as damages.

HOUSES TO BE DRAINED.

The owner or occupier of any house or building in any street shall cause the water to be conveyed from such house or buildings by proper drains, and for that purpose he may, with the sanction of the surveyor, take up so much of the pavement or flagging in any street as is requisite, and lay down such drains, under the direction of the local board or their surveyor, and all damage thereby occasioned to the pavement or flagging of the footpath or carriage way shall be made good by or at the expense of such owner or occupier; and no branch drain shall, without the surveyor's consent, be constructed otherwise than with glazed stoneware socket pipes, properly jointed and laid within a matrix of puddle 6in. in thickness.

DRAINS NOT TO BE CONSTRUCTED, ETC.

No sewer or drain shall be connected with or emptied into any sewer of the Local Board of Health, nor shall any vault, arch, cellar, or drain be constructed in or under any street, without the written consent of the said Local Board, or their surveyor, obtained after giving three days' notice, in writing, to such surveyor, describing the place and situation thereof; nor shall any wall, palisade, fence, or other erection be built over any sewer of the Local Board, without their sanction; nor shall any opening into any sewer be made, except by the Board's contractor, employed as hereafter provided, under a penalty for each offence of £5, and a further penaly of 40s. for every day during which the offence continues after notice in writing from the Surveyor of the Local Board to discontinue it; and the Local Board may cause any such sewer, made without their consent, to be altered, taken up, or otherwise dealt with as they may think fit, and the expenses incurred by them in so doing shall be repaid to them by the person to whom the sewer belongs, and be recoverable from him, as damages, in a summary manner, as hereinbefore mentioned.

STENCH TRAPS.

All openings to sewers must be provided with proper stench traps, to prevent stench arising therefrom; and if the owner of any private drain fail, for fourteen days after notice from the Local Board, to make such provision, the Local Board may do the requisite work, and recover the expenses thereof from him, as damages, in a summary manner, as hereinbefore mentioned.

OPENINGS IN FOOTPATHS.

No person will be allowed to make or have in or upon any footpath or pavement of any present or future street any cellar, window, cellar steps, cellar door, cellar grate, stepway, or hatchway leading to or giving light into any cellar or other place under ground of any house or other building, without the consent of the Local Board.

SIGNS.

No person will be allowed to erect, place, suspend, or have, keep, or continue any sign, signpost, or other emblem to denote any trade, occupation, or calling, unless the same be placed or fixed flat against the front of the house or building, or to place, hang up, keep, or continue any frame, window-shade, blind, or other projection of the like nature, to extend further than the kerbstone of the footway, or of a less height than 7ft. 6in. from the ground, or of which window-shade or blind the cloth or other materials shall hang down below the frame thereof.

SUN BLINDS.

No person will be allowed to make any penthouse, bow window, shutter case, or shutter stand, spout, pail, rail, grate, step, scraper, or projection of the like nature, to extend beyond 6in. from the wall, if there be no area, or if there be an area, then beyond such area.

PROJECTIONS.

No person will be allowed to displace, take up, or injure the pavement, stones, materials, fences, or posts of any street, without the written consent of the Local Board or their surveyor, to be obtained on application at the surveyor's office, under a penalty of £5, and a further sum not exceeding 5s. for every square foot of the pavement, stones, or other materials so displaced, taken up, or injured.

STREET SURFACES.

The labour of inserting connections into the public sewers is executed by the Board's contractor, at a charge of 2s. for each attendance, and a further charge of 6d. for every hour he shall be delayed, beyond the time appointed, in commencing his work, except the same is occasioned by his own neglect. Persons having connections to make should obtain an order at the surveyor's office the day before the work is required to be done, and should see that a time is fixed for executing the work, and such time endorsed on the order.

Printed forms of specification for new streets, and of notices for new buildings, may be obtained at the surveyor's office.

All plans submitted to the Board must be drawn in ink, on proper drawing paper, and in accordance with specimen plans, which may be seen at the surveyor's office.

N.B.—No plan furnished to the Local Board for approval can be carried into execution, nor can any building therein referred to be commenced within the Board's district, until such plan shall have been approved by the Local Board.

All plans shall be deposited at the surveyor's office on or before the Monday preceding the Works Committee at which they are intended to be submitted. The Works Committee meet every alternate Friday.

J. FOX SHARP,
Surveyor to the Local Board.

Hull, May 25.

ALABASTER AND SERPENTINE.*

AMONG the varieties of mineral material used for art-purposes alabaster is not one of the least important. This substance is a hydrous sulphate of lime in a peculiar crystalline state, sometimes quite pure, sometimes containing small quantities of carbon or iron.† When pure it is of the most spotless white, and in texture and colour is almost unrivalled among minerals. It is worked with the greatest facility, and when entirely sheltered in a dry climate, gradually hardens at the surface, sufficiently to retain its beauty for a very long time, but in damp and variable climates, or in the atmosphere of a smoky town, it blackens and spoils almost immediately. The coloured varieties, generally of a peculiar tint of pale brown, are less valued, but more durable in England.

Although common enough in many parts of the world, and met with in abundance in Derbyshire, Wales, Ireland, and elsewhere in the British Islands, near Paris, and in many parts of Europe, most blocks of alabaster, in a state fit for the sculptor's use, are obtained from Italy, and even there they are limited to a very few localities. They are found almost entirely in the hills not far from the Cecina Valley, a district remarkable as the chief European source of the supplies of borax used in the arts. Not far off is the old Etruscan city of Volterra, whose walls and surrounding antiquities are among the most interesting of the many remains of the early inhabitants of Italy. The whole country to the south, as far as Rome, abounds with Etruscan towns and burial-places, and among the sepulchral monuments that have been found in the ancient rock-tombs and cemeteries near these places, the alabaster of the neighbourhood is largely exhibited, and, for the most part, admirably preserved.

The finest white or colourless alabaster is obtained from one set of quarries opened on the hill-side in a valley between Leghorn and Cecina, through which runs the coast-line railway from Leghorn to Civita Vecchia, now partly open, and likely to be open through from Leghorn to Rome during the present year. Those who desire to visit the quarries must ascend the little stream Marmolajo, from the Acquabuona Station (25 miles S. of Leghorn). The quarries are about four miles up. They are opened in the Upper Miocene, or middle tertiary beds, exposed on the slope of the hills, and covered by yellow sands and clays of the Pliocene, or newer tertiary period. The alabaster exists in rounded blocks, varying much in size, buried, as it were, in fine marly clay, and accompanied by fetid limestone and occasionally by serpentine. The serpentine appears to be intrusive, and greatly affects the rocks. The blocks of alabaster are from eight hundred-weight to half a ton each, and are got from levels or galleries run in from the hill-side.

The very finest blocks of alabaster are generally contained in beds more or less regular. Other beds of marl of the same geological age also yield considerable quantities of this mineral throughout the district, but it is rarely that the quality is good enough to command high prices, and the best blocks seem always to be from the quarries just alluded to. It is not necessary or desirable here to discuss the geological questions that hence arise, though the vicinity of the serpentine is highly suggestive, but it is useful to the inquirer to know that there may be comprehensible reasons for the absence of the finer qualities in places where common gypsum and inferior alabasters exist in abundance.

There is very beautiful brown, yellow, and variegated alabaster got near Volterra, but this is of comparatively small value on the spot. Pure white translucent samples are certainly exceptional. In England the alabasters are generally in veins in rocks of the new red sandstone series.

The works of art now manufactured of alabaster in Italy are numerous, and very beautiful. They include models and copies of some of the principal buildings and sculptures, capitals of columns, vases, tazzas, candelabra, and other ornaments. Of slabs, tables, and shafts of columns there are not so many, owing to the extreme softness of the stone. These works are sculptured at Florence, Leghorn, and Pisa, as well as at Volterra, but the manufacture for exportation is chiefly at Volterra. In England there have been some fine works in alabaster, serving as screens in cathedral and collegiate churches.

The commoner varieties of sulphate of lime are burnt to make plaster of Paris, Parian cement, and other compositions. In this way they are indirectly subservient to the purposes of art.

Serpentine is another mineral very beautiful in itself, and very valuable for certain art-purposes. In one form or other serpentine is found in many countries. It is worked in Cornwall, where the Lizard Point receives its name from the rich colours and variegated outline of the stone of which it is made up. There are very beautiful serpentines in Galway (Ireland) and others in Anglesea (Wales). The mineral is found in Saxony, Bohemia, Siberia, and Silesia, besides some curious varieties in Canada. Tuscany has been the most available source up to the present time, though there is also a prospect of material of the finest kind from Corsica.

All serpentines are magnesian minerals. They are technically hydrated silicates of magnesia, with iron, manganese, or chrome, and sometimes alumina. Like talc, soapstone, and other allied minerals, they have a peculiarly unctuous or soapy feeling. For the most part, they are coloured only partially, leaving sometimes large patches of dead white, and numerous streaks of green. Some are of extraordinary beauty and great value, the best being combined with limestone, and when tinted throughout, and of the nature of breccia, they form the valuable antique green marble called *verd-antique*. The mixture of limestone gives hardness, and not unfrequently there are bright crimson spots, which add much to the effect.

The Tuscan serpentines are the most used. They are quarried in various places, but not generally on a large scale. The mineral does not exist in very large masses, but in numerous bosses or lumps, no two of which are precisely alike in quality. It is generally regarded by the Italian geologists as an eruptive rock of the nature of lava,

* From the *Art Journal* for July.

† Alabaster derives its name from Alabastron, a village in Egypt.

but the magnesian element distinguishes it in a very marked manner. There are, however, several varieties of texture, hardness, and colour, even among the Tuscan serpentines. Geologically, there are serpentines of almost all ages.*

The great fault of most serpentines is the extreme prevalence of cracks and flaws, and the difficulty of obtaining with certainty such blocks as shall ensure good slabs of fair size and of uniform quality. Full-sized shafts of columns are especially difficult to procure. Most of the varieties, also, are too pale in colour, and too streaky to be suitable, except for very special purposes. When, however, there is a certainty of large masses of good quality, few stones are more valuable, though the art-purposes for which the stone is adapted are rather limited in number.

There is a remarkable quarry of serpentine opened in the island of Corsica, not far from the town of Bastia. When first discovered, it yielded some fine samples, which received honorary mention and medals at the Paris Universal Exhibition of 1855. Afterwards, columns obtained from it were used in the Louvre, and more recently some slabs in the Imperial box of the Grand Opera House now building. From stones removed from this quarry, slabs measuring 9ft. by 3ft. have been obtained without flaw. From other parts of the same mass of rock close by, shafts of columns, and slabs of even larger size, and of the finest quality, might be got.

Of the Irish serpentines, blocks of large size may be got, but the colour is pale, and somewhat inferior. Flaws are frequent, both in it, and in the richer coloured, but more spotty Cornish serpentines of the Lizard, and full-sized shafts are not easily to be obtained fit for use.

The art-uses of serpentine are limited, but they have hardly been sufficiently considered, owing to the uncertainty of the material, even from the same quarry. Fonts, small columns, altar slabs, and other church employments are the most important. Tazzas, vases, and candelabra, are frequently manufactured. Chimneypieces and slabs for tables are common. In most cases the material is softer than marble; in some cases it is harder, but the great practical difficulty arises from the want of absolute uniformity of texture, which renders it difficult to procure a perfectly smooth face by polishing. When there is a combination of limestone, this material assumes much more the character of a marble, and is then capable of being worked without difficulty.

All the quarries of serpentine are small and superficial, and from the nature of the stone it is unlikely that any great improvement would be found at a distance from the surface. Considered as a marble, serpentine weathers somewhat irregularly, and for this reason is rather unmanageable, especially for exposed work. The extreme depth of colour often met with is somewhat heavy for house decoration, and still more for delicate chiselling. Perhaps the genius which has prompted the Russians to adapt dark-coloured porphyries, and stones of irregular and extreme hardness, to art-purposes, might succeed in overcoming technical difficulties, and establish a variety of cameo work in serpentine, but we have not seen any attempt in this direction. Serpentine is not wanting in Siberia.

There are some other stones occasionally used for art-purposes, whose mineral composition is distinct from that of marble, properly so called, and which are interesting from peculiar circumstances. Of these, jade is the most remarkable. It is chiefly a silicate of magnesia and lime, and therefore fitly comes in with serpentine. It differs, however, from serpentine exceedingly, being perfectly uniform in tint (generally of pale sea green), and of extraordinary hardness and toughness. It takes a high polish, but is extremely difficult to work.

Large quantities of jade are obtained in India and China, whence ornaments of many kinds, and sculptured figures, are brought in abundance, but there are few real and important indications of art employment. From Siberia, enormous blocks of this mineral have been occasionally brought, and one of the largest and most remarkable on record is now in the Exhibition at Paris among the Russian goods. It is unusually translucent.

* A very curious variety of pale serpentine, with markings resembling corals, capable of receiving a high polish, and obtained in masses of some size, has recently attracted much attention among geologists, as yielding the most ancient indications of life of any known rock. The fossil is called Eozoon, and the first discovery of it was in Nova Scotia. There is a fine specimen in the Paris Exhibition.

A DESIGN FOR A TERRACE OF FIRST-CLASS HOUSES, GREAT YARMOUTH.

THIS design was recently selected by the Corporation of Great Yarmouth in open competition, and is about to be carried out. One of the stipulations was that both north and south elevations should be fronts of good character, the offices not being conspicuous. This condition has naturally affected and determined the nature of the internal arrangements, and the necessity for it will be seen by reference to the small block plan of the locality. The terrace may be said to consist of two parallel ranges of buildings, one occupying the north and the other the south frontage, with an intermediate space, part of which is filled up by the principal staircase, which thus forms the connecting link between the two, and occupies a central position, the remaining part being left open. By this means the whole of both frontages are available for the various apartments; every room occupies a portion of and has a sea view from either north or south front, and the staircases and all the subordinate offices are grouped round the central open space. It will be observed that the plans are so arranged that the central areas of two houses come together, thus giving an open space of about 250 superficial feet. The principal entrance is placed in the north front, so that the privacy of the ornamental grounds to the south is preserved, and both dining and drawing-rooms overlooking these grounds become fine saloons, each occupying the whole width of the frontage. Access to the ornamental grounds is obtained by opening casements and steps from dining-room, and by a passage in basement, easily accessible from all parts of the house. The expenditure was restricted to £900 per house, but taking into consideration the recent rise both in labour and materials in this district the total cost will probably not fall far short of £1,000 per house. The centre and wing houses will, of course, cost somewhat more. The walling material will be white brick, with terra cotta dressings. The roofs will be covered with slate. Lead gutters and expensive decorative features have been avoided throughout.

MORE VANDALISM.

THE REV. J. C. JACKSON, of Hackney, writes an indignant remonstrance against the so-called restorations at present going on in the cathedrals of Gloucester, Exeter, and Canterbury. Though Lincoln was the silliest instance of destruction, the ruin done there being absolutely without purpose or reason, it was by no means the most wicked, says Mr. Jackson. The exterior of Lincoln was scraped, and consequently much delicate moulding and carving irretrievably damaged; but at Gloucester the interior stonework has been re-tooled; all, or almost all, of the original surface has been combed away, besides all sorts of unnecessary destruction. At Exeter some of the most interesting tombs in the country have been simply destroyed. Of the Courtney tomb there is not a vestige of old work left, and the so-called restoration is partly in stucco. The figures themselves are perfectly ridiculous. More than this, the monuments no longer stand over the places of interment. Happily, at present, there have been few funds for restoring this charming building, or we might have to regret even greater loss than in the case of Lincoln. Where cash has been forthcoming it has been worse than wasted. When I heard of the proposed restoration of Bishop Oldham's tomb," says Mr. Jackson, "I made a point of going down to Exeter to see how things really stood, and I was horror-struck. This fine monument was thus treated. First, all vestiges of old colour, of which much remained in its original condition, were removed; then all the stonework, except the sculpture, and, it is said, though I can scarcely believe it, the effigy was re-tooled, and, finally, the whole was painted up in oil colours of the most distressing crudeness, just as any village painter might do it. The face has been aptly compared to a Guy Fawkes." He next notices "how frightfully poor Canterbury has suffered, and is, in fact, still doing. On the south side scarcely any original work remains. All the beautiful Norman work has been taken down and replaced—replaced, moreover, by stone, which, apparently, is likely to utterly decay sooner than the old half-mouldered masonry that was taken down. The cloisters are gradually disappearing, scarcely an original stone being left; the interior, wherever it has been touched, has been seriously damaged by scraping and re-tooling. I know well enough" continues Mr. Jackson, "that to restore masonry in the condition that the exterior of this cathedral was in, is no easy matter, but it would be far better to leave time to do its worst, and simply stop up the joints and crevices, than treat it as the surveyor of Canterbury Cathedral has done."

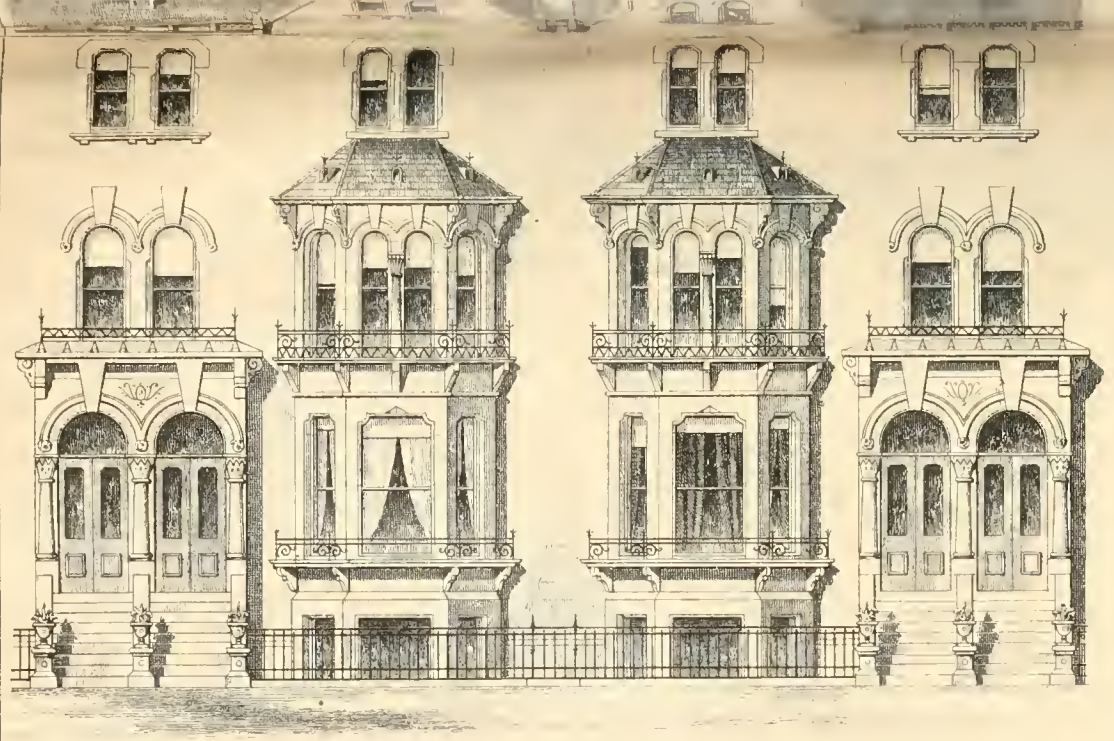
BRICKLAYERS AND THEIR BEARDS.

AT Oldham, on Monday, four bricklayers were charged with assaulting a bricklayer's labourer. The case was a very curious one. While at work one day, the defendants and others demanded from complainant one shilling, because he had shaved off his moustache. He refused to give it, and they then knocked him down, assaulted him, and threatened to throw him off the scaffold. They had since combined to get him discharged. For the defence, it was stated that there was a rule amongst the bricklayers that anyone going to work on a Monday morning unshaven, or with a dirty shirt, should be fined. On the Monday before the assault, complainant went unshaven, and on being spoken to he said that he intended to let his moustache grow. Seeing on the following Monday that he had shaved it off, defendants thought that complainant had previously told a lie in order to escape being censured or fined. This rule, it was said, was kept up on account of the men having frequently to work in respectable houses. The magistrate said no man should be dictated to as to whether he should or should not wear his moustache in a free country. He had a right on that score to please himself. Defendants were fined 10s. each and costs.

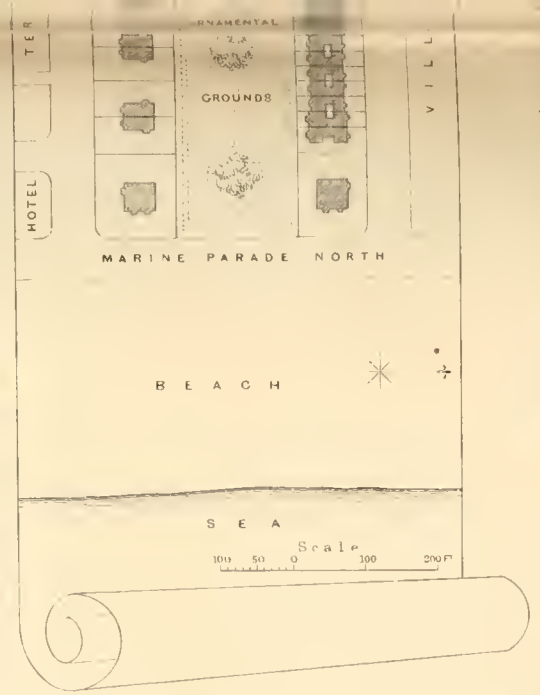
We quite agree with the magistrates that every man should do what he likes in the way of wearing beards and moustaches; and, on the other hand, we think it highly creditable to the bricklayers of Oldham that they should have a rule enforcing personal cleanliness. According to the evidence, the liberty of the assaulted bricklayer would not have been interfered with had he let his moustache grow; and he was persecuted because it was thought that he told a lie to evade the fine. But to knock him down for the offence, supposing him to be guilty, was as discreditable to the assailers as the rule alluded to was creditable to the Oldham bricklayers. When will trade unionists learn to know the folly and criminality of violence?

BENEVOLENT SOCIETY FOR ASSISTANT ENGINEERS, SURVEYORS, AND DRAUGHTSMEN.

A SOCIETY has been proposed with the object of assisting members of the various professions above noted—a body of men who have as many or more vicissitudes in the course of following out their practice than most professional men, and who have of late had to contend against the scarcity of employment, caused chiefly by the late panic. As men of liberal education and respectable connections, they have often very heavy expenses to meet, some as heads of families, while others not so engaged may have to incur heavy expenses in starting life after their pupilage, or, maybe, some near and dear relative to assist, or, through some unforeseen calamity, may fall into temporary difficulties. How natural, then, for any, who, following out the same line of study, should make an effort to promote a society whereby they may assist each other in the time of need, and to hold out that help which is requisite to those who may require it. To encourage this movement is the object in view while penning these lines, and to impress upon each individual member of his profession the importance of assisting all he can. What greater reward can a man have in this life than the knowledge of his donation or subscription, which in many cases will never inconvenience him, will go to help a brother while out of a berth, soothe the sorrow of a widow, or children, or nurse him when laid by through sickness. The proposer, R. M. Bancroft, of the Great Northern Railway engineers' staff, King's Cross Station, will no doubt be pleased to correspond with any gentleman wishing to assist in the movement.



ENLARGED PORTION OF NORTH ELEVATION



Scale for Enlarged Portions.

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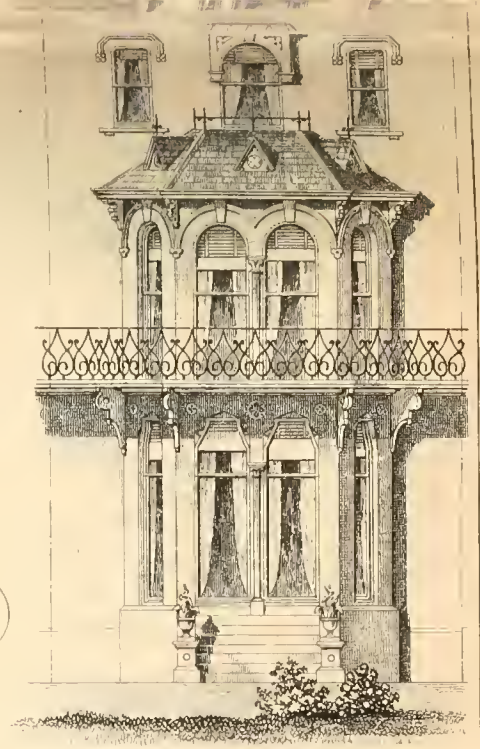
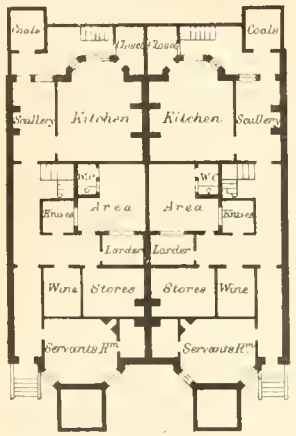
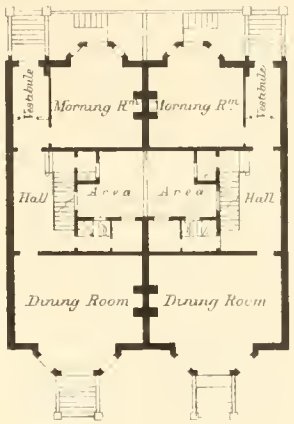


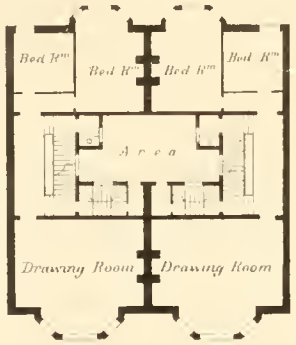
ENLARGED PORTION OF SOUTH ELEVATION



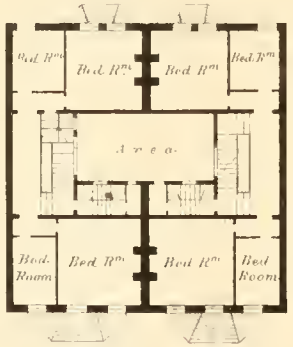
BASEMENT PLAN.



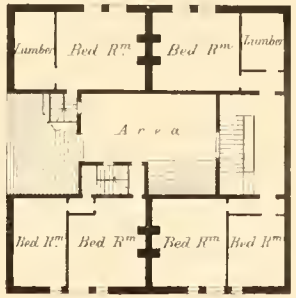
GROUND PLAN.



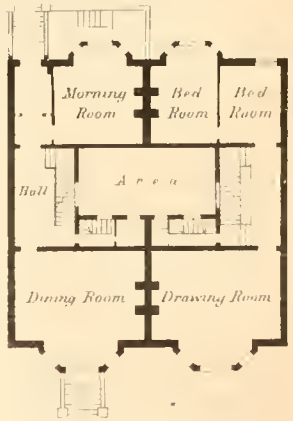
1ST FLOOR PLAN.



2ND FLOOR PLAN



ATTIC PLAN.
(Shewing alternative arrangements)



GROUND & 1ST FLOOR
Alternative Plans

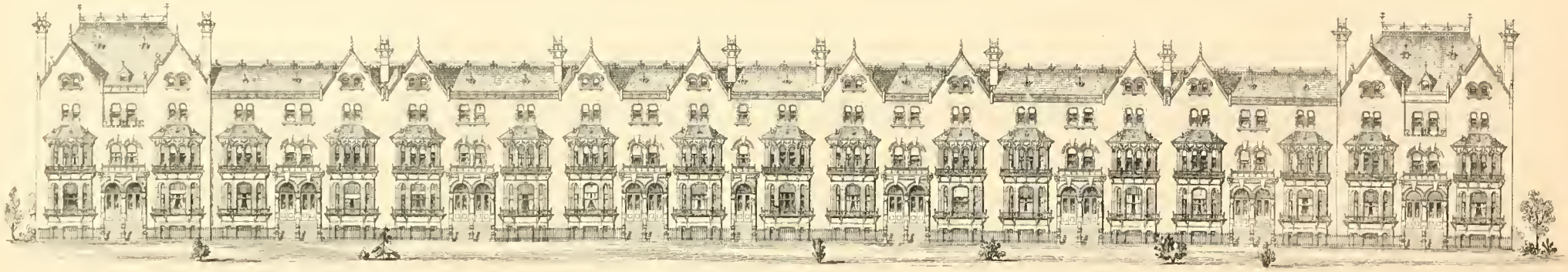
Scale to Plans.

10 5 0 10 20 30 40 50 60 70 80 90 100 FEET

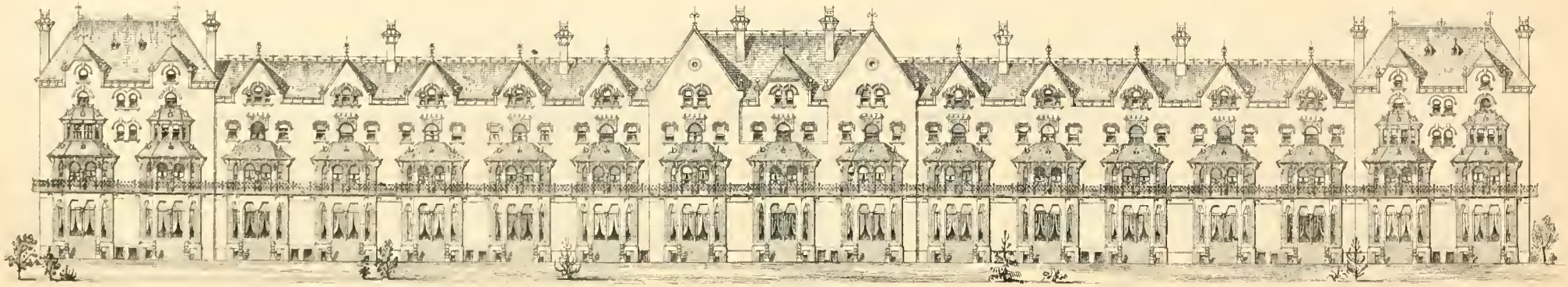
Printed by Whiteman & Bai-

TERRACE ABOUT TO BE ERECTED AT GREAT YARMOUTH.

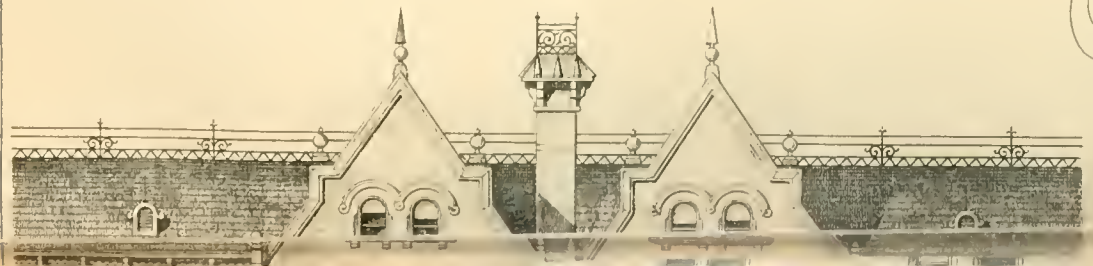
J. T. BOTTLE, GT YARMOUTH, ARCHITECT

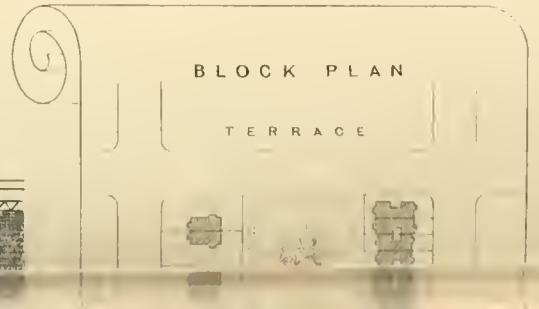


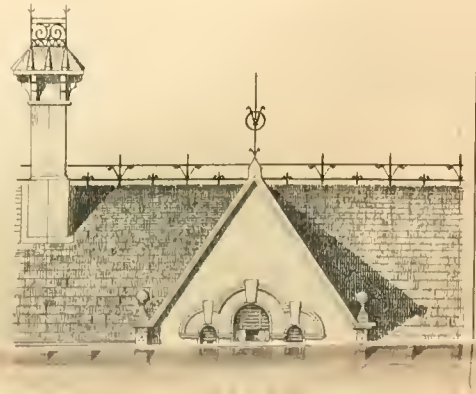
NORTH FRONT.



SOUTH FRONT.







JEWISH SYNAGOGUES.

THE architectural revival of the last half century has been fully participated by the scattered sons of Israel. At Berlin they have lately erected one of the handsomest buildings in Germany, which was opened at the beginning of the year. It is an adaptation of the Moorish style, beautifully finished in all its details, and would well repay the careful attention of the architectural student. At Vienna, Cologne, Paris, and several other places on the continent, the Jews have, within the last few years, erected very beautiful synagogues. Till lately, the British Jews have made no adequate attempt to vie with their continental brethren in the erection of places of worship, but they are now beginning to show more activity. In the spring, a new synagogue was opened in the neighbourhood of Walworth-road, for the Borough district, with schools for boys and girls attached; and another for North London will soon be commenced at Islington. But their greatest efforts are to be spent on two large and handsome buildings for the West-End, one in the Edgware-road, and the other, as a substitute for the present one in Great Portland-street. A competition has just been decided for the former of these, and, as it presents several very interesting features, we will offer a few remarks on them. A committee was formed, and instructions issued in the beginning of the year, and three Jewish and three Christian architects were invited to compete. Two, however, declined from the first, thus limiting the number to four, who were Messrs. F. P. Cockerell, H. H. Collins, Davis and Emanuel, and W. Papworth. The site chosen was in the neighbourhood of Berkeley-street, and entirely buried behind the houses, except a space for an entrance corridor about 20ft. wide, so that the efforts of the architects were chiefly confined to obtaining a good interior effect. Several things have combined to make this a really well-fought competition. The committee had wisely appointed that the successful architect was to superintend the building, and not merely have a premium, as is so often the case; also, that each unsuccessful architect should have a sum awarded him to meet his expenses; and that a professional gentleman of acknowledged ability should be the arbitrator. Mr. P. C. Hardwick was appointed for this purpose. There were so few competitors that each knew his chance was good. A synagogue is a building in which perhaps there is more scope for originality than any other, as there is no absolutely fixed precedents, and each competitor has, therefore, chosen the style and arrangement he thought most suitable.

The successful competitors are Messrs. Davis and Emanuel; they have sent in two designs in Byzantine—one, with a central dome, after Santa Sophia, at Constantinople, which is labelled design B; and another, design A, after the model of a Basilica. A peculiarity about these designs is, that though they are wonderfully pleasing in the sections and geometrical drawings, they are disappointing in perspective. Design A especially has a commonplace appearance in the view, and gives one the impression of Byzantine ornament applied to an Italian hall rather than a design really worked out in Byzantine; moreover, there is always an unpleasant effect if the columns which support a gallery are stunted and small, while those planted on them, which support the roof, are lofty and large. Design B, by the same gentlemen, has a much more imposing effect. The main idea is a central dome supported on piers with an aisle all round, and two galleries; but here we must say we think the architects have been guilty of an absurdity. In order to obtain a view of the service for occupants of the upper gallery, it is necessary to raise the seats at least 3ft. one behind the other. No person without possessing strong nerves could sit in such a gallery; and this one, which is meant for ladies, would be practically useless. We must also complain of these architects for making their ark such a very literal imitation of the one in the new synagogue at Berlin. The organ is placed round and above the ark in the sanctuary, the reading-desk in the centre of the building, and the committee-room and beadle's house over the entrance. This arrangement is almost rendered necessary by the site, and has formed the basis of the plans of all the competitors.

Mr. H. H. Collins has sent in two very elaborate designs, and, like the other competitors, has evidently given a great deal of thought to this competition. He has also sent in full-size models, showing a very comfortable arrangement for the seating. Design A is in Moorish, and consists of two domes, supported on piers with side aisles. As the reading-desk is generally placed in the centre of a synagogue, this arrangement has some advantages over a central dome, as the piers come in positions which do not obstruct the light. The organ and choir are grouped round the sanctuary.

Design B is in Italian, and consists of a central dome, with two smaller ones on the east and west sides and north and south aisles. Mr. Collins' designs are accompanied by two large and fine perspectives of the interior, and a sheet of diagrams, showing ventilation, &c.

Mr. Wyatt Papworth sends a very simple but pretty and chaste design in classic—we cannot call it either decidedly Greek or altogether Italian. The plan is a parallelogram, divided into three bays by slender iron columns, with side aisles. The ceilings of both nave and aisles are slightly arched and divided into plain panels, and above the columns is a row of clerestory windows. The fault of this design is that it lacks the distinctive character and the imposing effect of some of the others.

Mr. F. P. Cockerell sends in two designs—one in Moorish, with a central dome, and the other on the same principle, with a tinge of Byzantine.

We are much pleased with these drawings as a whole, and wish that in some of our other public competitions architects could divest themselves of their strict adherence to ancient precedent as freely as they have been obliged to do in this. In a church, for instance, most architects' ideas immediately run into the Middle Pointed style, into a building with lofty nave, low aisles, no galleries; and the only resource to obtain novelty is some ugly stunted spire, or crude barbarities stuck here and there to get effect. No plaster is allowed internally, though this is certainly the most suitable material to line the walls of a building, and all paintings, whether mural or on glass, must breathe of the middle ages, and of a time when people, as a rule, could not draw naturally or correctly. And what is the result? Most unbiassed minds will not see half so much religious effect in one of these cold, unmeaning, unreal buildings as they will in a little village church with its high-backed red cloth pews, its old wooden gallery, its debased wood carvings, and even its churchwarden's improvements.

SILICATISATION OF STONE.

TO arrest decay and to prolong life is a subject which from the earliest times has engrossed the thoughts of mankind. Whether viewed as the philosopher's stone or the *elixir vitæ*, it has been equally the dream of the alchemist and the sage, and it is no wonder that, absorbed as they were in their labours, to the utter exclusion of every mundane consideration, they should have afforded, by the asceticism of their lives, the austerity of their manners, and the secluded mode of their existence, fair grounds for the belief in those superstitious times that they were sorcerers or persons engaged in an unholy compact with his satanic majesty. With the progress of the times we have become less visionary and more material, neither believing in the validity of infernal compacts nor in the object of search for which those compacts were supposed to be undertaken. Instead of endeavouring to prolong human life beyond its divinely allotted span, we have turned our attention to prolonging the life, if we may use the term when applied to inanimate objects, of the various materials of construction placed at our disposal. Can it be said that the modern search has been more successful than the ancient? As might be naturally expected, timber was the first constructive material subjected to a preserving process. Patents were taken out for the various plans and methods proposed for accomplishing the purpose. The resources of the laboratory and the skill of the chemist were taxed to the utmost to furnish solutions and the means of applying them; sulphate of copper, salts of iron, the deadly corrosive sublimate, oil of tar, and an infinity of other chemical solutions have been tried as repeatedly as vainly. The object of impregnating timber with a preserving solution was not merely to protect it against the influence of the weather and that of the earth or water wherein it might be situated, but to defend it against the assaults of vermin and insects. In some instances this latter anticipation has been realised; in others wofully disappointed. Experience has demonstrated that while some insects abstain from attacking preserved timber, there are others, on the contrary, which make it the special object of their assaults, and prefer it to the timber in its natural state; similarly to a professed gourmand, who prefers a highly seasoned dish to the plain substantial joints.

As a proof of the total want of all veneration—in fact, of the absolute insensibility of ourselves as a nation to the beauty and attractions of art, we suffered many of our splendid monuments of ancient glory and architectural grandeur to fall into irretrievable decay, and it was not until the surfaces of modern buildings showed symptoms of deterioration that real attention was bestowed upon the means of arresting their further dissolution. The origin of siliceous compositions for preserving stone is undoubtedly due to Fuchs, who, in 1825, published a treatise upon what he termed Wasserglass or soluble glass, which in the first instance appears to have been used for protecting the surfaces of paintings against damp. It has been employed for covering muslin and other fabrics, with a view to render them fireproof. The treatise also asserted that the Wasserglass, by mixing it with sand and a little clay, would serve for the manufacture of artificial stone. Manifestly the point to be aimed at in submitting stone to the action of a siliceous solution, is that the latter should penetrate to a certain depth into the body of the stone, and should to a certain extent become absolutely incorporated with it. Unless this condition is fulfilled any mere superficial application is hopeless, and simply a waste of time and money. Experiment has proved that where a coating only has been laid on, without any absorption by the body of the stone, it has completely peeled off like a scale under the effect of frost.* Nothing more would be required to put this question beyond a doubt than to saw a stone in two, after the composition had been laid in a certain time, and it would be easy to ascertain its efficacy with respect to penetration. Supposing that the quality of the solution is satisfactorily ascertained it is clear that some judgment is required in its application. The proportion of silica, or the strength of the solution, must depend upon the nature of the stone to be coated, its position in the building, its state of humidity, and its liability to be acted upon by external influences. There is very little question but that it would be preferable to use a weak solution repeatedly and for a long time, than to lay on a strong solution all at once. Unfortunately, however, for

* "La Silicatisation appliquer à la conservation des monuments. Réclamation de priorité d'application." Par LEON DELMAONE.

this consideration the rate of the times in which we live is too fast to allow of any such judicious delay in this or any other instance. With respect to the success of the application of siliceous compositions it is difficult to speak confidently. Between the years 1851-53 the process of M. Dalemagne was applied to many principal buildings in France, including the Church of Notre Dame at Paris, the Palaces of Luxembourg, Fontainebleau, and Versailles, and in London, to the Houses of Parliament, Westminster Abbey, and some other buildings. The evidence here is conflicting. From the report in connection with the application of the solution to the Church of Notre Dame it would appear that it is a complete success, the softer stones having been rendered harder and the hard ones preserved from further decay. There is one clause in the report which it is not easy to understand. It is stated that the solution presents no impediment to the free evaporation of the moisture contained in the stone, since the pores remain open. This condition appears to be totally incompatible with the peculiar function of a solution of the character under notice. Unless it in some measure fills up the pores of the stone, which one would imagine is its special duty, what does it do, or what becomes of it? We confess we are inclined to doubt the accuracy of the above statement, more especially as it is asserted in a former paragraph that the porosity of the stones is partially destroyed. A common feature attendant upon the application of siliceous compositions is the appearance of efflorescences or blisters upon the surface. According to M. Dalemagne these produce no injurious effect upon the process, nor do they prevent the gradual combination of the solution with the stone. Whenever the wind and rain fail to remove them they may easily be obliterated by washing the walls with clean water. Their appearance may be said to be confirmatory of the existence of some chemical action involving a probable decomposition of some of the elements, and a liberation of a fixed gas.

With regard to ourselves we know perfectly well that the ablutions to which the Houses of Parliament have been subject have not had the effect which it is stated has attended similar operations upon the more ancient edifice at Paris. It is not too much to say that the former is mouldering and crumbling away perceptibly before our eyes. Year after year witnesses successive disintegrations, and there will speedily be scarcely a sound square foot of surface in the whole of the handsomest face of the building, the river front. It has been suggested that the washing process is radically wrong, and that it would be a preferable plan to dip the stones previously to setting them. However correct or incorrect this view of the case may be, it is too late to adopt it. We have to do with what is, not with what may be, although the suggestion is not without value for buildings which are yet in the future, such as the new Law Courts and proposed National Gallery. One useful lesson, at any rate, may be learned from the miserable dilapidated state into which our public edifices are falling—namely, that it is one thing to construct, another to preserve.

THE MARKETS OF THE POOR.

THE *Pall Mall Gazette* says:—"Miss Burdett Coutts has taken the initiative in an important enterprise for the benefit of the poor in one of the most destitute districts of the metropolis. A local act, promoted in her name, was quietly passed through Parliament last session, the preamble of which sets forth that the opening of a market for the sale of fruit, vegetables, fish, meat, poultry, and other provisions in a convenient position near Columbia-square, Bethnal Green, would be of great advantage to large numbers of the labouring classes, and other persons resident in that parish and its neighbourhood. And further it recites that Miss Burdett Coutts is willing to undertake the establishment of such a market at her own charge, and to maintain it for the use of the public. No time has been lost in giving effect to the authority conveyed in the act. A large piece of ground has been set apart for the market, and the buildings are already sufficiently advanced to enable one to judge of the aspect of the place when completed. The market is enclosed on each side by a range of Gothic buildings of an elegant but substantial character. On the right and left as you enter is a row of shops—twelve on each side—with a covered way in front and dwelling houses above. On the north side of the market is the market hall, containing twenty-four shambles, the access to which is by a porch, above which rises a clock tower, 110ft. high. The shops are supplied with every convenience in the way of cellarage, water, gas, &c., and the dwellings above are each complete in itself, and contain comfortable rooms, with washhouse and kitchen, well ventilated, and fitted with every sanitary requirement. The area of the market covers altogether 90,000ft. The large open square will be set apart for stalls and barrows of all kinds, the admission fees charged on dealers being at a very low scale, suited to the costermonger class who conduct in so large a degree the commissariat of the poor. This scheme will not only supplement the house accommodation of the adjoining Columbia-square, a large pile of model lodging-houses built a few years back by Miss Coutts, and now tenanted by a numerous settlement of labourers and artizans, but will supply a want severely felt by the whole population of the neighbourhood—the want of a convenient market. The project will also incidentally confer another benefit on this quarter by opening up a new street, and otherwise improving the communications. Although utility has been the first object consulted in the plans of the market, and no effort has been spared to make the fittings of the shops as perfect as possible from a business point of view, Miss Coutts has been anxious that artistic effect should not be overlooked. The general appearance of the buildings, with the lofty clock tower in the centre at the upper end, is very impressive. The architect is Mr. H. A. Darbishire, who also furnished the designs of Columbia-square. We venture to hope that the noble example which Miss Burdett Coutts has set will be followed, and that the Bethnal Green market will be the first of an important series of reforms extending throughout the metropolis. It is little to say that this market will be the best in any part of London. Compared not only with the spacious halles of Paris but even with the markets in second and third-rate provincial towns in England, the metropolitan markets are one and all simply disgraceful—small, mean, overcrowded, and inconvenient in every way."

AMBER.

AMBER is found on the southern shore of the Baltic, where it is cast up by the action of the groundswell after the northern gales. It is also found on the coast of Sicily, on the Adriatic, on the English coast Norfolk and Suffolk, and at Cape Sable, Maryland. Mining for amber in beds of brown lignite is carried on in Prussia, and it is found in excavations all over Europe. Still amber continues to be the "gem of the sea," by which it is yielded only after a storm, and in such small quantities that its value has ever remained undiminished.

Amber is found in masses, irregularly shaped and usually of small size. The colour is of all shades, from a pale straw to a deep orange. It is brittle, but can be easily cut with a sharp knife; it is the opinion, and only an opinion, that it is simply an exuded vegetable juice. Baron Liebig thinks it probable that "amber is a product of the decay of wax, or of some other substance allied to the fixed oils." Sir David Brewster says that amber is an indurated vegetable juice. Wood, leaves, flowers, and fruit have been found enclosed in amber, and recognised as having belonged to coniferous trees now extinct.

Sicilian amber is usually of a deeper colour than that from the Baltic, and it is said that in Germany an experienced amber worker can determine the locality of amber from differences in its appearance. Neither is it invariably found in a hard state. An instance is on record of a gentleman having received from a friend living on the Baltic coast a piece so soft as to take an impression of his seal; and another piece is described as soft on one side and hard on the other.

The uses of amber are not very numerous. As a material for art carving nothing can be more beautiful. The principal market is Constantinople, where it is made into pipe mouthpieces and articles of female adornment in the shape of beads. The Turks and Armenians are said to be fine judges of amber, and the bazaar at Stamboul, where the amber workers are located, is full of interest to the connoisseur.

The only purpose to which it is applied in the useful arts is in the manufacture of varnishes for carriage builders, and photographers. That used for carriages is expensive, and is a long time in drying, but it is the hardest and most invulnerable of any known varnish.—*Providence Journal.*

INDUSTRIAL ART.

AN exhibition of a very interesting character at Bermondsey deserves a word of notice. The exhibition, which occupies several of the largest rooms of the school buildings in Manning-street, comprises oil paintings, crayon and pencil drawings, prints, lithographs, chromo-lithographs, photographs, enamels, floral embroidery, needlework, lacework, leatherwork and materials used in its production, emery and its processes, stained glass, articles of clothing, models of engines, architectural models, machines, modelled flowers, arms, antiquities, bronzes, china, gems (ancient and modern), glass (ancient and modern), pottery (ancient and modern), carvings in wood, ivory, &c., Oriental curiosities, &c. Upwards of 200 competitors from among the industrial classes have sent in articles for exhibition, the style and workmanship of which are generally very creditable, and in some cases marked by skill and excellence. Under the head of "Miscellaneous," many articles of rare value are exhibited, among which may be noticed two magnificent oil paintings of the Crucifixion; an enamel ring of Charles II.; antiquities from London, illustrating its history for nearly 200 years; ancient jewellery from the Thames; enamelled metal dragon, jewelled; Italian work, 16th century; enamelled tray of pearls and rubies, Italian, 15th century; Benetien of engraved crystal; five necklaces, of gold and agate, from tombs of Egypt; magnificent portrait of Napoleon cut in onyx; pearl oyster, from Ceylon; German work watchcase of gold, 17th century; models of celebrated guns, &c. Four silver medals and money prizes will be awarded to the successful competitors at the close of the exhibition, which will well repay a visit, and which will remain open until the 26th inst. at a nominal charge. The Bishop of Winchester presided at the inaugural ceremony which took place on Wednesday last.

SHAM ANTIQUITIES.

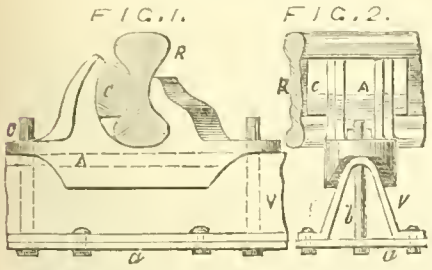
THE manufacture of sham antiquities would seem to be on the increase of late; and if we may judge from the readiness with which they find a market few things can be more successfully counterfeited than a certain class of antiquities. The notorious "Flint Jack" has found a couple of not unworthy successors in Charles Eaton and George Henry Smith, two men who have been committed for trial at the Aylesbury Assizes. They are charged with a long series of frauds by the sale of sham antiquities, represented to have been dug up at Windsor. It appears that the prisoners have been successful in gulling at least a score of persons, chiefly tradesmen in the district, by their false representations. Their story was a very plausible one. They had been employed at some excavations for an addition to the Victoria Brewery at Windsor, and while so engaged they came upon and broke (of course) with their tools an urn containing coins, spoons, daggers, and other articles of Roman and Saxon workmanship. The men would seem to have been driving a brisk trade with daggers and rings, for which they charged the modest sum of a few shillings each, when their game was put a stop to by Mr. Purcell, the secretary of the Archæological Society, who, on being consulted, of course found it difficult to reconcile the date with the characters upon the supposed antiquarian relics. A large parcel of the "antiquities" was produced in court, and it was found that they were all modern cast brass, covered with green oxidation to give them an antique appearance.

A new organ, by Mr. Johnson, of Moseley, was opened last Sunday, in the Independent Chapel, Russell-street, Wednesbury. It cost about £200

IRON SLEEPERS.

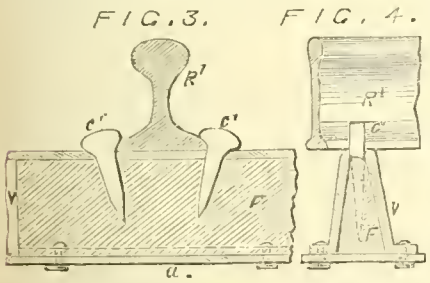
M. LANGLOIS, of Paris, has introduced an iron sleeper which, according to the *Mechanics' Magazine*, promises to be of service. About five hundred of these sleepers, on his plan, have been laid down at various places and stations on French lines, including the Chemin de Fer de l'Ouest. They have been placed both on curves and upon straight pieces of line, so as to test their powers of endurance and capability of maintaining the gauge unaltered under the two conditions. Many of these sleepers have been under service since 1862, and there has never been a necessity to replace or relay one of them. One advantage in the system under notice is, that it is equally applicable to the double tee rail as to the flanged rail, which is not the case with a large number of the iron sleepers already invented. In figs. 1 and 2 is represented the

FIG. 1. FIG. 2.



application of the principle to the former description of rail. The sleeper consists of the rolled plate V, 5½in. wide at the base, and having the same dimension for the height. These sleepers weigh about 10lb. per foot run, and can be rolled to the length suitable for the particular gauge they are required for. At each extremity are provided small plates of iron *a*, lying upon the ballast, and giving rigidity to the whole system. The chairs A are of cast iron, and are hollowed out at the under surface to sit upon the rounded top of the sleeper, the whole being bolted together and secured by the nuts and cottars *b* and *c*. To fasten the rail R the ordinary wooden key is used, shown by C in the figures. Where a flange rail is employed the arrangement is represented in figs. 3 to 6. That in figs. 3 and 4 consists of

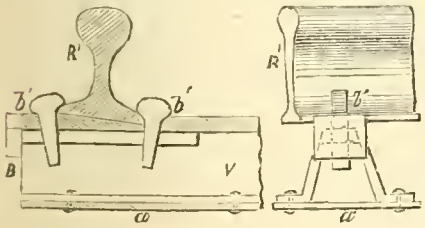
FIG. 3. FIG. 4.



filling up the interior of the sleeper V with a wooden block F, into which the spikes c' c' are driven, which serve to hold down the rail R'. For flange rails the sleeper V retains the same dimension in height and is somewhat increased in width at the base; but, nevertheless, is of a slightly lighter section, since it weighs rather less per foot run than the one adapted for the rails of the double tee form.

According to the disposition represented in figs. 5 and 6, it will be seen that the wooden

FIG. 5. FIG. 6.



wedge-shaped piece F in the former two figures is dispensed with, and its place supplied by the key B, which tightens the spikes *b'* by being screwed into holes left for it in them. To give the necessary inclination to the rail the upper edge of the sleeper is bevelled, as shown in fig. 6. As is the case with all iron permanent ways compared with those of timber, the system of M. Langlois is, so far as the first cost is concerned, rather more expensive than the usual longitudinal or transverse road, but it more than compensates for this apparent disadvantage by its great durability.

MICA FOR DECORATIVE PURPOSES.

PUSCHER, of Nurnberg, has lately suggested the use of mica for various decorative purposes. For one such application, the thin plates are first purified by treatment with strong sulphuric acid, and then silvered by the ordinary process adopted with looking glass. The mica thus acquires a beautiful silver lustre, and it may easily be cut into any shapes to be used for inlaying work. The flexibility of the mica will of course allow of its being applied to round surfaces. When a sheet of mica is heated to full redness for a time in a clay muffle, it loses most of its flexibility, and is changed considerably in appearance. Under reflected light it has a dead silver white look, but viewed by transmitted light it is seen covered with grey spots. This latter appearance is lost when two or three pieces are superposed, and the transparency is lost. The mica after heating is also a beautiful material for inlaying work. It should be cut into the shapes required before it is heated. Another very pretty effect is obtained by scattering small fragments of mica on freshly poured sheets of gelatine, and varnishing it with a dark-coloured solution of gelatine. Finely ground mica on coloured gelatine also shows very pretty effects; and the very finely ground material mixed with a solution of gum arabic may be used, Puscher says, for silver ink.

COMPETITIONS.

In compliance with a request made by several of the competing architects, it has been determined to extend the time at which drawings must be sent in for the Manchester New Town-hall, to Monday, the 5th August.

In a recent select competition invited by the council of the West London Synagogue of British Jews for the erection of a new synagogue at the corner of Upper Berkeley-street and Edgware-road, the designs of Messrs. Davis and Emanuel, of 32, Moorgate-street, City, were unanimously selected. Five other gentlemen were invited to compete, three of whom sent in designs. The unsuccessful competitors each received an honorarium of 50 guineas. The building is contemplated to cost between £12,000 and £15,000. The entrance, which is from Upper Berkeley-street, occupies the frontage of an ordinary house, and this will be the only street façade of the new building. Mr. P. C. Hardwick acted as consulting architect to the building committee.

HOLY TRINITY, DORCHESTER. — The committee for erecting a new church in the parish of the Holy Trinity, Dorchester, offer a premium of £25 for the best set of plans and designs for a church capable of containing 1,000 persons, without galleries, the total cost of which, exclusive of site, but inclusive of heating by hot water, is not to exceed £6,000. Each set of plans must be accompanied by a satisfactory guarantee that the church can be built for the sum stated by the architect in his estimate. The premium will be awarded for the plan finally accepted by the committee; but the committee will not be bound to accept the cheapest or any plan. All plans must be drawn on one uniform scale of 1-8in. to the foot. Plans of the site will be forwarded on receipt of a post-office order of 5s. The design must be under a motto, and received on or before the 14th day of August next by, and all further information may be obtained of, Mr. M. C. Weston, solicitor, Dorchester.

ARCHÆOLOGY.

THE annual congress of the Kent Archæological Society will be held at Dartford on the 25th and 26th of this month.

The annual meeting of the Royal Archæological Institute of Great Britain and Ireland will be held at Hull, commencing on the 30th inst. The Archbishop of York will be president. After the inaugural meeting in the Townhall, the objects of antiquarian interest in Hull are to be visited, and in the evening the full dress *soiree* will be given by the Mayor of Hull. After the business of the various sections, the arrangements for the week include excursions to Beverley, Minster, Hedon, Patrington, Flamborough Head, the Dane's Dykes, Driffield Church, Malton gravel beds (where a stone axe has just been found at a depth of 9ft.), Howden, Wressel Castle, Selby Church, Bridlington, and other objects of interest in the county. The visitors will be conducted to the various objects of interest by gentlemen of the neighbourhood, who will act as honorary guides.

Building Intelligence.

CHURCHES AND CHAPELS.

A new Baptist chapel has been commenced at Chew Magna, near Bristol. It will be a plain, substantial building, built of local stone, with freestone dressings, and will seat 200 persons. The architect is Mr. Henry Lee, of Clifton, the contractors being Messrs. F. King and S. Bozley, of Chew Magna.

The erection of the proposed Church of St. John, at Killingworth, has been let to Messrs. Middlemiss and Stafford, of Morpeth, at £2,050. Mr. Bassett Keeling is the architect.

A new congregational chapel in the Gothic style has been opened at Pembroke Dock. The architect is Mr. R. C. Sutton, of Nottingham. The building, which is 90ft. long by 60ft. wide, is capable of seating 1,225 persons, and the basement is provided with a school-room for 600 children.

The foundation stone of a new Wesleyan chapel, at Greengates, near Apperley Bridge, was laid on Saturday. The style is Early Gothic, and the edifice is built of stone, with roof and fittings of deal stained and varnished. The chapel, which will accommodate 420 persons, is from designs by Messrs. Milnes and France, of Bradford; the contractor being Mr. Robert Sugden, of Keighley.

ACLE, NORFOLK.—A new Wesleyan chapel has recently been opened here. It is a plain but substantial building of a modified Gothic character, and contains about 200 sittings. Cost about £300; architect, Mr. J. T. Bottle, Great Yarmouth.

BROMPTON.—A new church in Onslow Gardens was recently consecrated by the Bishop of London. It has a kind of cathedral in miniature look, and is about 140ft. long and 115ft. wide at the transept; the side aisles and nave are some 70ft. each. The main walls are of Kentish rag, with an inside lining of cream-coloured brick; the dressings are freestone. The tower and spire are nearly 160ft. high. The accommodation is for 1,500. Mr. Freake was the founder as well as the architect and builder. Mr. J. Brown acted as clerk to the works.

KIDDERMINSTER.—The foundation stone of a new Baptist chapel and schools here was laid last week. The chapel is in the Gothic style, from drawings by Mr. Bidlake, architect, Wolverhampton. It will be built of red brick and white Alveley stone, intermixed with bands of blue stone. The chapel will seat from 750 to 800 persons. The builders are Messrs. Scholes and Warington, the total cost of the buildings being £2,000.

HEADCORN, KENT.—The foundation stone of a new Wesleyan chapel was laid here a few days since. The dimensions of the building will be 52ft. by 32ft., the walling material being red brick with white brick bands and dressings. The style is a free rendering of the general features of Gothic, adapted to the utmost simplicity of form and the most economical materials. The cost will be about £700; the architect is Mr. J. T. Bottle, of Great Yarmouth.

WESTMINSTER ABBEY.—In the course of works now going on in Westminster Abbey, under the direction of Mr. G. G. Scott, it has been deemed advisable, says the *Athenaeum*, to remove the filling-up of the extreme west openings of the triforium and clerestory, which were closed by Wren when he added the towers to this church. The materials used to close these openings comprise, with common bricks and rubbish, a considerable number of carved stone-work fragments of the edifice and its decorations. These were of various dates and characters, and are now deposited with relics of similar kinds, some of which were, we believe, found near the altar, in the triforium on the south side of the building. Among these carvings may be noted two fragments of a Norman cap, probably part of the Confessor's work, Early English mouldings of extreme beauty and spirit of contour, later Decorated architectonic or decorative carvings, and odds an

ends of Perpendicular date. The greater number of the broken carvings appear to be in the Debased style, if style it can be called, of Queen Mary's time, and, are probably fragments of hastily-executed sculptures, that might have been placed in the abbey during its brief reversion to that Queen's faith, and, after her sister's accession, very summarily expelled and broken up. It is hard to say why Wren closed the openings in question, and turned them into what are called blind windows; it was not required for the security or stability of the building. A privy was placed in the space thus enclosed on one side.

The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held its last meeting for the present session on Monday, at the society's house, 7, Whitehall, the Right Hon. the Earl of Romney in the chair. Grants of money, amounting to £1,465, were made in aid of the following objects:—Building new churches at St. Gabriel's, Birmingham; St. Nicholas, Birmingham; St. Paul, Old Brentford, Middlesex; St. Colomba, Haggerstone; Hoylandswaine, in the parish of Silkstone, near Sheffield; Low Moor, in the parish of Clitheroe, Lancashire; and New England, in the parish of St. Mark, Peterborough. Rebuilding the churches at Binbrook, near Market Rasen, and Lampeter, Pont Stephen, Cardigan. Enlarging or otherwise increasing the accommodation, in the churches at Broadwood Kelly, near Winkleigh, Devon; Eddlesborough, near Dunstable; Church Stretton, Salop; East Moulsey, near Kingston-on-Thames; Middle Chinnock, near Ilminster; Peterchurch, near Hereford; Polesworth, near Tamworth; Poplar, St. Matthias; Princes Risborough, Bucks; Roborough, near Torrington, Devon; Scarrington, near Nottingham; and West Barkwith, near Wragby. The grants formerly made towards re-seating and restoring the churches at Llywell, near Trecastle, Brecon, and Springfield, near Chelmsford, were each increased; £1,000 was authorised to be paid for works completed. The society likewise accepted the following trusts, as repair funds for Christ Church, Liversedge, York, and for St. Paul's Church, Poole, Dorset. The meeting of the committee will be resumed in November, at which date it is earnestly hoped that the resources at their disposal may be so augmented as to justify a larger scale of grants to applicants, many of whom have recently been much discouraged at the small amount of aid doled out to them.

BUILDINGS.

A new opera house (Pike's) is in course of erection in Cincinnati. It will be five storeys high, with a frontage of 170ft. The lower storey is divided into six large stores. On the second floor there are 100 rooms, and a concert hall 70ft. wide and 128ft. long. The cost of the building will be more than 1,000,000 dollars, and the total rent will amount to 150,000 dollars.

It is resolved to devote the sum of £40,679, being the balance of the Liverpool Cotton Famine Relief Fund, to the building of a convalescent hospital in a healthy position near Liverpool, to act as a supplement to the existing infirmaries and hospitals.

Last week the Duke of Cambridge inaugurated the Guards' Institute in Francis-street, Vauxhall-bridge-road. The building, which is in the Veneto-Italian style, is intended as a place of occupation, resort, and recreation for soldiers when out of barracks. It consists of a basement and three storeys, and embraces coffee, reading, billiard, and lecture or concert rooms. The latter is 100ft. in length, 50ft. in breadth, and 28ft. high, and has an open ornamental roof of varnished deal. The architect is Mr. H. A. Darbishire; Messrs. Smith and Co., of Pimlico, being the contractors.

Bradwell, Suffolk.—A new national school-room has just been erected here, being an adjunct to the old school buildings. The school-room is a Gothic building 40ft. by 18ft. The walls are faced externally with split flints, having stone dressings. The cost is about £300; the architect is Mr. J. T. Bottle, of Great Yarmouth.

Edinburgh.—The new City of Glasgow Bank, in Hanover-street, is completed. The style of the building is Italian, and it is furnished with much rich ornamentation. The telling room measures about 50ft. by 35ft. The architect is Mr. David Bryce, jun., the contractors being Mr. John Alexander, Messrs. Beattie, and Mr. William Baird.

Great Yarmouth. — New Wesleyan Day Schools have been commenced here. The buildings are of a Gothic character of white brick with ornamental brick dressings, and are intended to accommodate about 200 children. The cost will be about £800; architect, Mr. J. T. Bottle.

Great Yarmouth.—The first portion of a group of new national school buildings has recently been completed here. The design comprises infant school, boys' and girls' schools, class rooms, and the necessary offices, but only the infant school has yet been built. The cost of this portion has been about £550. It is a red brick building in the Gothic style, with open timbered roof, and with covered arcade to principal front. The architect is Mr. J. T. Bottle.

Great Yarmouth.—A new drill-hall for the Great Yarmouth Rifle Volunteer Corps is in progress here, and is rapidly approaching completion. The large hall is 115ft. in length and 60ft. in width. In front of this are the sergeant's quarters, and the armoury and orderly rooms, with the necessary adjuncts. The walls are of red brick and split flints with brick and stone dressing. The walls internally are faced with red brick with white brick bands. The roof is constructed in one span with elliptic ribs and framed uprights and principals. The hall is lighted by a skylight at the apex of the roof, and the whole length of the building. The cost will be about £1,200. The architect is Mr. J. T. Bottle, of Great Yarmouth.

International College, Spring Grove.—Mr. E. F. Tremayne, the Secretary of the International Education Society (limited), 24, Old Bond-street, writes to us as follows:—"The architects and myself will feel obliged by your stating that Messrs. F. Edwards and Sons, of Great Marlborough-street, fitted up the cooking and warming apparatus. The decorations to ceilings and walls in the interior being executed by Mr. J. J. Lovegrove, of Spring-grove; that the grounds are being laid out by Mr. D. Chester, of North-street, Lisson grove, who presented the *Wellingtonia gigantea* which the Prince of Wales planted; the spade (silver and oak) used on the occasion being supplied by the Messrs. Mappin, Brothers, silversmiths, Regent-street. The furniture and fittings are being supplied by Mr. F. Moeder, of Tottenham Court-road, W."

TO CORRESPONDENTS.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the Editor, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

Received.—E. W.—G. F. P.—R. E. L.—R. W. C.—H. T.—R. M. B.—A. W. T.—H. G. L.—E. W. P.—J. P. R.—S. B.—W. S.—B. and D., answered by post.—R. P.—J. F., next week.—W. W., consult a lawyer.—W. B. R., answered by post.

W. L., Leek.—Mr. Lockwood's design for the New Law Courts will be given in a week.

J. T. T.—There were some answers on plastering ceilings [No. 371] in Building News, May 10, 1867.

"Young Architect" has our thanks for calling attention to the systematic dishonesty practised by the miserable journal mentioned. We will give it a reeling blow next week.

W. H. T.—All the numbers which contain the articles on, and illustrations of, the Law Courts are in stock.

J. P., St. Austell, does right. Whenever anyone has any complaint to make let him write to the editor.

Correspondence.

THE LAW COURTS COMPETITION AND THE *WESTMINSTER GAZETTE*.

To the Editor of the Building News.

Sir,—The melancholy diminution of your correspondent who signs himself "The Tail-tip of one of the Competitors for the Law Courts," &c., arises, I imagine, scarcely so much from what he calls the "inanity," as from the incontrovertible truth of the criticisms that have appeared on the subject. The force of such criticisms is not to be refuted by anonymous insolence or personal abuse. If "no importance is to be attached to the reviews in the *Westminster Gazette*," why should your correspondent whine so piteously? Criticism, however caustic, can have no weight unless supported by sound argument founded on facts. The scurrilous abuse of myself and my design for a church at Liverpool is a direct confirmation of the above remark. On what principle Mr. Bassett Keeling (who has had no share whatever in the reviews) is brought into the question, I am at a loss to understand; but I have no hesitation in saying that a man who could draw an analogy between my quiet and somewhat ordinary design for Holy Cross Church, now being exhibited at the Royal Academy, and Mr. Keeling's vivacious and original conceptions, must be beneath contempt; in fact, I shrewdly suspect that your correspondent attacked Mr. Keeling's works and my design, not on account of any special demerits that he could discern therein, but because you and others had done so previously; for when the mastiff growls, the curs and puppies generally yelp in chorus. I am quite prepared to admit that the church in question, as shown in my drawing, has certainly a somewhat drawn out and attenuated effect, as though it had been forced in a hothouse; but, for all that, it demonstrates sufficient unity of conception, proportion of parts, and beauty of form to make its defence possible; and I am prepared to defend it. True, it partakes rather of the poplar than of the oak, but still, like a poplar, it has a natural growth; and perhaps possesses, by comparison, some of the beauty of that elegant but not very characteristic tree.

As soon as your correspondent has the courage publicly to avow himself, I shall be ready to prove practically the truth of what I have above stated, a result which the writer who now signs himself a "Tail-tip," &c., has hitherto shown himself utterly unable to accomplish in regard to his own works.—I am, &c.,

E. Welby Pugin.

The Grange, Ramsgate, July 16.

ADVERTISING DRAUGHTSMEN.

Sir,—On perusing Mr. Street's most ungenerous communication relating to the above, it struck me that he was really doing what he so sarcastically condemned, *i.e.*, advertising—advertising his exceptional talent—taking the cheap opportunity of letting people know that he did not rely upon external help of any kind, oh! dear, no! Now, does Mr. Street really mean to tell us that he makes all his own drawings without any aid whatever? because his letter would lead one to infer this, for he utterly ignores rough sketches—does not know what they are, in fact—a sort of thing he hears about but never sees—lucky man? I have seen lots of them, and undoubtedly rough some of them were, too; so rough, in fact, that there was some difficulty in determining which way you ought to look at them in order to gain the desired inspiration, the top being often so very much like the bottom. Why he should pretend to be so innocent of what goes on around him in the architectural world, I do not know, unless it be that it gives him the opportunity of advertising that he is the architect *par excellence*—who makes all his own drawings, the latter portion of the letter leaving you to infer he is obliged to do this because there are no assistants whose art knowledge is sufficient to enable them satisfactorily to interpret his ideas.

I do not know how many a man with talents perhaps not surpassed by Mr. Street would manage to make a living were it not for the great demand there is in the profession for occasional skilled assistance—for talent does not always secure for its possessor that success which Mr. Street would appear to consider its inevitable adjunct. I know many instances where this is far from being the case, and should have thought that some such must have come within the range (though apparently narrow) of Mr. Street's observation, and why these men may not seek a market for their skill, knowing that there is a demand for it, without so seriously disturbing the *amour propre* of Mr. Street, I must confess I cannot for the life of me understand. In conclusion, I would observe that I am sorry the gentlemen specially referred to in Mr. Street's letter had not the pluck to write and defend themselves, instead of leaving the task to others.—I am, Sir, yours, &c.

A Draughtsman who does not Advertise.

July 15.

Sir,—I have no cause to regret that my engagements have prevented me, till to-day, from seeing in your colums the recent discussion upon the subject of architectural circulars, and, in particular, one lately issued by my colleague, Mr. Joseph Nash, jun., and myself. That subject has

been, on the whole, so impartially and almost exhaustively treated, especially in the latter of the able replies to Mr. Street's letter, that I feel scarcely called upon to do more than leave well alone, and thank the unknown authors of those replies for their views upon a very important question, and you, Mr. Editor, for inserting the whole. Yet I may, perhaps, be permitted to say, that, while we do not at all feel aggrieved by Mr. Street's letter, as it obviously bears its own antidote, he must pardon me for remarking that I regret it as one more needless confirmation of the oft-repeated, but undeniably true, saying, that there is more unseemly jealousy and petty acrimony in the architectural profession than in any other calling under the sun. While entertaining the utmost possible respect and esteem for Mr. Street, and admiration for his great personal talent, of which I am fully aware, and, which he himself appears in his letter to underrate, I much regret the tone of that letter, and that he should have adopted in application to himself such an unhappy construction of the unwittingly offending circular. For myself, I venture to think, that, had I the honour of being intimately known by Mr. Street, he would never have suffered himself to write that letter, and he would have been aware that, during twenty-one years' ardent devotion to my profession, I have even, as he suggests, had several successful opportunities of engaging in competition, by which means, he appears to think an architect must win his spurs. I would respectfully beg of Mr. Street to associate with his efforts in the cause of Christian architecture a little of that Christian spirit which teaches us to tolerate and sympathise with all less fortunate than ourselves in the battle of life. Having himself found an open door, let him not shut it against the next comers.—I am, &c.,

JOHN LIDDELL.

York Chambers, Adelphi, July 16.

FLIMSY SLATING.

SIR,—Why is it that men of great practice and experience are constantly recommending and using such over large size slates on roofs now-a-days, namely, Duchess, Ton, Imperial, and Queen slates? Now, for one of these monster slates there are only two small nails used for nailing them on to the roof, which are of the worst possible kind of nail that can be imagined. The result of this slop slating is that the first storm lifts the tail of one slate, which acts as a lever to those above it, and hence a great space of the roof soon becomes opened to view. As a general rule, I would first suggest that no roofing timber should be framed at a lower pitch than 45 deg., nor above 55 deg.; all slating battens should be 3in. × ½in. thick after the saw. The slates should in no case be more than 12in. × 6in., giving 3in. lap. The nails should be of the best wrought iron clout, well dipped in oil prior to being used, and, where practicable, to render the under side of slating with well-prepared lime and hair mortar. It is easily seen that small sized slates are the safest and best to adopt for works of any kind.—I am, &c.,

NEW STYLE.

THE POPULAR GOTHIC OBJECTIONS TO CLASSIC.

SIR,—Will you permit me only a small space to put a few questions that I think young men in the present day might well take into consideration. Classic architecture can have a high roof as well as Gothic—to wit, the Queen Anne houses and Inigo Jones's stone building in Lincoln's Inn-fields. You want, in the present day, in cities, a long tall window, and for modern glazing it is universally admitted that a square-topped window is the most convenient. In classic architecture of stone a square-topped window can be constructed on as thoroughly true principles of construction as any Gothic arch. In brick you have the segmental arch. The pediment is as legitimate as the hood moulding. There is nothing in the architecture of Inigo Jones or Wren that is in any way unsuited to our climate. Classic architecture stands on better ground than modern foreign Gothic because it has been successfully introduced into our climate. There is nothing in Inigo Jones's ornamentation unsuited to this climate. If we speak of the spirit of old work we shall get better political economy out of the republic of Plato than out of the 13th century feudal barbarism. But we do not want the past of any kind.—I am, &c.,

A. B. C.

JURORS' AWARDS.

SIR,—Will you kindly insert the following letter, which is a copy of one we have addressed to the British Executive Commissioners of the Paris Exhibition.—We are, &c.,

London, July 16. POWIS, JAMES, and Co.

(COPY.)

GENTLEMEN,—We consider the award of a bronze medal made to us for our Wood Working Machinery, in Class 54, Group 6, a great injustice, and unworthy of the position hitherto held by our firm. It is not in accordance with the comparative novelty in design, workmanship, and utility of the machines exhibited by us. We applied for and occupied our space with the full belief that we were going to compete fairly with the world in our particular tools; but the result of awards clearly shows that there has been most unfair partiality, or want of ability to decide the respective merits on the part of the jurors. We cannot understand why no gold medal should have been given for wood working machinery in the British section, whilst the Grand Prix and two gold medals were awarded for engineers' tools in the same class and group of that section. We consider that there have been greater recent improvements in wood working machinery than in almost any other kind; and challenge any practical and disinterested jury to deny our assertion that there is no wood working machinery in the whole Exhibition equal to our own, if novelty, workmanship, and utility, as aforementioned, are to be the tests as originally intended. Finally, we should like to know upon what principle or grounds the jurors made their awards in our class, as we shall certainly decline receiving the medal they have awarded to us.—We are, &c.

To the British Executive Commissioners, &c.

ZINC.

SIR,—We have read your article of the 12th inst. on "Zinc," and are glad to see that you express a favourable opinion of it as a material for covering roofs. We only trouble you with this, as we think the public might derive an impression that Mr. Edmeston is the only architect, and that Messrs. Devaux and Mr. Tyler are the only agents of the Vieille Montagne Company.

The facts are—that both Mr. Edmeston and Messrs. J. and R. Fisher are architects of the Vieille Montagne Company; that Messrs. Devaux and ourselves are the only agents for the Company's roofing zinc; that Mr. Tyler is not an agent to the Company, although he may, and no doubt he does, use the Company's metal, purchased through Messrs. Devaux, who are not themselves zinc workers and manufacturers, as we are.—Yours, &c.,

F. BRABY AND CO.

Fitzroy Works, Euston-road, July 17.

P.S.—We are the more induced to trouble you with the communication, as our advertisement claiming to be the sole manufacturing agents of the Company appears on the page opposite to the article in question. Without an explanation it would seem that we claim a position to which we are not entitled.

Intercommunication.

NOTICE.

Correspondents are respectfully requested to write the questions and answers in as few words as possible, to put titles to their questions, and the numbers and titles to the answers. We regard "Intercommunication" as peculiarly our subscribers' department. It was instituted for their mutual benefit, and its value almost solely depends on the interest they take in it. We find there are more correspondents disposed to ask than to answer questions, but if all were alike disposed to give as to receive trifles of this nature there would be no lack of answers. We are continually receiving letters in praise of the practical value of this part of the BUILDING NEWS.

QUESTIONS.

[485.]—RAISING BUILDINGS BODILY.—I am told that in some parts of the United States—where very wonderful things certainly are accomplished—they think nothing of lifting a large warehouse bodily and putting a new storey underneath it. Is this a fact or a fable? and, if the former, will some of your American or travelled readers tell us how it is done?—SCEPTIC.

[486.]—SHARPENING TOOLS.—Is it true that a better edge may be given to cutting tools, say chisels, plane-irons, &c., by soaking, or, rather, immersing them in water before applying them to a hone or whetstone? If so, should the water be hot or cold, salt or fresh? and why is the effect produced?—FIRMER.

[487.]—BLACK MORTAR.—Some weeks since one of your correspondents suggested the use of coal dust in order to obtain the required colour. I have a quantity of sand which has been used in an iron foundry, and into the composition of which both coal dust and charcoal dust enter. With me it is not a question of colour, but I wish to know if such sand will make good strong building mortar, or if either of the above ingredients, or its frequent use in the foundry, in any way render it unfit for this purpose. Perhaps some one will throw light on this dark subject.—C. T. H.

[488.]—CEMENT ON LATH AND TIMBER.—I am about to renew the outside plastering of a house which has been done in a lath and timber framed building, and the new work will be put on lath again. The owner wishes to have it done in cement. Will you kindly advise me as to the best mode and material to be used on the lath for the first coat to be followed with cement.—A SUBSCRIBER.

[489.]—ASSISTANT ENGINEERS AND DRAUGHTSMEN'S ASSOCIATION.—The above society, primarily suggested some nine months ago by Mr. R. M. Bancroft, and which now seems in a fair way of becoming a reality, is, I think, well worthy the attention of all interested, and therefore too much cannot be known of its intended formation. I should like, therefore, to ask Mr. Bancroft, through your columns, how he intends dealing with country subscribers?—C. T., Derby, July 15.

[490.]—APPLYING GOLD TO MARBLE.—Will any of your numerous readers kindly inform me how to proceed in applying gold and flat colour to various parts of a work in marble?—AN AMATEUR.

[491.]—WALTHAM ABBEY.—Can any correspondent, through "Intercommunication," inform me when the existing outside arch of Waltham Abbey was erected—that is, the arch which formerly divided the nave from the chancel, and is now built up to form the end of the present church?—QUIZ.

[492.]—THE NATURE OF THE GROUND FOR ERECTING BUILDINGS UPON.—Will any of your numerous correspondents favour me with some practical hints respecting the mode of procedure in ascertaining the nature of the ground where buildings are about to be erected? I have always experienced some difficulty on this point; and, if I am rightly informed, the greatest builders and contractors cannot reduce the question to any satisfactory rule.—INQUIRER.

[493.]—BUILDING STONE.—Where would be the best place in London to put a piece of stone for the inspection of architects and others; and would there be anything to pay for the same; and should it be a worked specimen? What would you recommend—a piece of moulded stone or a dressed square piece?—BUILDER.

[There is a museum of building appliances at 9, Conduit-street, W., where "Builder" can exhibit what he likes by paying for the space occupied. Write to D. O. Boyd at that address.]

REPLIES.

[433.]—DRAINING VILLA LANDS.—I beg to say that "E. E." is entirely wrong, as overflow from cesspools must naturally pollute any water it mingles with. I have a plan by which good and effectual drainage might be effected without polluting the ditch, and which I will undertake to accomplish if required to do so.—THOMAS HEEDEN, Contractor, 9, South-street, Camberwell.

[445.]—VENTILATION.—Kattray's patent waterproof and ventilating casements placed near the bottom of the building would let in air which would soon vibrate through and drive the light air or gases out at the top.—S.

[462.]—COLOURING PERSPECTIVES.—If "Once a Hod Boy" were to try and give the required tint to his drawings in the first or second wash instead of "colouring them over and over" again, he would find much greater brilliancy of effect obtained than by the latter process. If he must line in his drawings with some kind of ink, the best he can use (whether for sepia or coloured drawings) is, I think, Prout's brown, price 1s. per bottle, but he will find his drawings will have a much better effect if he leaves the original pencil outline, touching up, of course, a line here and there, and not inking them in at all, as it gives them a hard and unreal appearance. Why not, if possible, sketch a little from nature such objects as clouds, trees, foliage, &c., instead of getting into the habit of copying other people's efforts?—F. T.

[463.]—THATCHED CHURCHES.—In reply to "Inquirer," he will find several churches covered with thatch in the eastern counties, viz., Long Stanton, Cambridgeshire, which has very early lean-to aisle roofs; Thorpe St. Andrew, near Norwich; and Burlingham St. Edmund, Norfolk, which last is a good example of the collar and brace tye roof. This church also contains an illuminated rood screen and pulpit, with the original hour glass and stand in a perfect state of preservation. In 1856 when cleaning the walls, two fresco paintings were discovered, one representing the murder of Thomas à Becket, the other St. Christopher.—JOHN ELLIS.

[468.]—In reply to "Inquirer," thatched roofs are by no means uncommon in Norfolk. In the next parish to Little Melton, Marlingford, the church roof is thatched, and there are plenty of others in Norfolk, such as the following:—St. Margaret, Pastow; St. Ethelred, Norwich; St. Peter, Ridlington; St. Nicholas, Swafield; and St. Michael, Ormesby. In Lincolnshire, St. Margaret, Somersby; and in Suffolk, St. Andrew, Garleston, Pakefield, Gdesham, and Kirtley. The chancel of Horning is thatched. The church of Rigsby, near Alford, Lincoln, which was rebuilt in 1863, afforded an example of the above-named roof, and one is still existing at Markby in the same neighbourhood. The custom of thatching has probably arisen from the ease with which reeds are procured in the great marshes which even now form so marked a feature in the county. The beams supporting the chancel roof at Little Melton are arranged like those of a common barn, but those of the nave are placed together in a way which is very effective in an architectural point of view. There are faint traces of painting, too, on some of the beams in the nave at Little Melton.—J. J. P.

[480.]—LETTERS ON PLANKS, DEALS, &c.—Your correspondent in asking for full particulars of the meaning of the various marks on timbers is little aware of the magnitude of his demand, as it would fill a volume to give but an incomplete notice. The letters alluded to by "H. W." are termed brands in the trade, and they serve the same purpose as brands in other trades, denoting the name of the maker and the quality of the materials. This is a matter of no moment to either the architect or the builder, as they always judge from sight for the quality of their timber; but with the merchant, who very often has to buy from representation, but more so with the importers, who cannot be supposed to inspect the goods before purchase, a knowledge of the brands on timber is one of the leading requirements. Timber merchants, generally speaking, do not enlighten builders on this subject, but look upon them in the light of private marks, and with those who do a cutting trade different names and qualities are given to the goods to those which the brands implies. The rule in the timber trade is that the goods are branded, but there are many exceptions, some shippers simply denoting the qualities by a red chalk mark on the side, thus, I. II. III., or (I) (II) (III). The brands on the Russian and Finland goods are small, and are simply indentations caused by the blow of a hammer. Those of the Swedish make are red letters or devices stencilled on in a very conspicuous manner. From Norway we have blue letters, and from Canada, on the pine goods the letters are black. To understand the whole of the brands is to possess more knowledge than the most experienced timber merchants, as they are only acquainted with the goods they are in the habit of buying and dealing in. When it is considered there are hundreds of ports where timber is shipped from, and there are innumerable makers branding each quality of their goods with separate marks, it will be easily understood how complicated is the nature of the question your correspondent wishes to be enlightened upon. For his satisfaction I will offer a few leading remarks, but they must be received in a somewhat exceptional manner, as there are customs con-

nected with the trade that it would be too tedious to detail. As an instance, we will take a Stockholm shipment of goods. We have E crown F. for the first quality, JEF, for the seconds, and JEFO. for the thirds; this would imply they were made by J. E. FRANKE. With a make from Soderhaum we should have the first quality branded BSSC, the seconds B.C., and the thirds no mark at all; in this case they would be called "unbranded." Gefle goods would be marked, first quality, C crown B, the second quality C + B, the thirds C + + B, and the fourths C V B. Another maker's brand would be KAB firsts, NAS seconds, and *** for the thirds. With people who are acquainted with the marks there is a special language by which the goods and their qualities are understood. It would run something after this style. "How do you like the C crown B stock, the C cross B, or the C two cross B's?" In closing these hasty remarks, I may say that I do not think the information "H. W." wants the full particulars of can be obtained in a printed form; it is one of those branches of knowledge that can only be acquired by the old-fashioned principle of practice.—W. S., Nottingham.

WATER SUPPLY AND SANITARY MATTERS.

The drainage of a portion of the Zuyder Zee is seriously contemplated in Holland. An eminent engineer, M. Beyerinck, has a plan for recovering 500,000 acres from the water—that is the whole of the part situated between the south of Keteldien and the north of the Isle of Urk.

We recently alluded to the wretched sanitary condition of Newcastle, which, in truth, is just about as bad as it well can be. Our remarks are fully borne out by a correspondent of a medical journal, who states that of 55,366 people, or nearly one-half the population, within the borough of Newcastle-on-Tyne, whose dwellings were inspected in the beginning of this year, one-eighth of these houses had not, at the date of inspection, the means of good ventilation. One-eighth of the houses were without even water supply, either from the water company or other legitimate sources. One-fifth of the houses were without even privy accommodation. The drainage of two-thirds of the houses only was good; and of the remaining third, more than a third, or an eighth of the whole number, were without any drainage. We are glad to hear that the Corporation are about to take immediate steps to inaugurate a movement for improving the more miserable dwellings of the town.

STAINED GLASS.

FARSLEY.—The church of Farsley, near Leeds, has been reopened after restoration. The whole of the chancel windows, but more particularly the three eastern, have been filled with stained glass as a memorial to the Rev. Samuel Marsden, who died at Sydney, Australia, in 1838, where a memorial has been raised to him at a cost of £6,000.

GUILDHALL.—A stained glass window has been erected in this hall by the Haberdashers' Company. In the two lower compartments are representations of the patron saints of the Company (St. Katherine and St. Nicholas), with their appropriate emblems. Above the figure of St. Nicholas are placed the coat of arms and supporters of Queen Elizabeth, from whom the Haberdashers' Company derived their present charter of incorporation; and on the corresponding sides are the arms and supporters of the Company, with the motto "Serve and Obey." Immediately above the arms of Elizabeth are the emblems of the Houses of York and Lancaster, afterwards blended in the Tudor family, and here represented by the Red and White Rose. On the side above the Company's arms may be seen the symbols of the Hatters and Hurrers and the Milliners, which companies were afterwards merged in the Haberdashers. The whole are surmounted by the beehive, indicating Industry.

LEGAL INTELLIGENCE.

A carver and gilder in Wardour-street has been fined £5, or two months, for copying, exhibiting, and selling Mr. Frith's "Railway Station," the property of Mr. Graves, of Pall Mall. It appeared that Mr. Graves had bought this well-known picture and copyright for the large sum of £23,000, including the right of publishing. He had had the picture engraved, copies of which were sold for about fifteen guineas each. Spurious photographs had been made of the engraving, which could be sold for 2s. 6d. or 5s. each, thus putting a stop to Mr. Graves's profits by the sale of his engravings, and would, if unchecked, prove a serious loss. The defence was that the photograph had been left with the defendant by a gentleman whose address was not known, to be framed, and that he had put it in the window for safety. The magistrate, however, was of opinion that the photograph was placed in the window for sale, and that the case had been proved; but, believing that the defendant was the dupe of other persons, would only impose the mitigated penalty of £5, or two months.

A CASE AFFECTING JOINERS.—From a case which was decided at Leeds last week, it appeared that a Mr. Stubbs, a coach proprietor, the defendant, was building some houses, and he employed Robert Worth, joiner, the plaintiff, and another joiner to work at the buildings. After the plaintiff had been at work two days and a-half, the defendant discharged him without notice. The plaintiff demanded a day's wages or a day's notice, according to the rules agreed upon last year, when the strike took place between the master joiners and the men. The defendant, not being a master joiner, objected to give any notice, or to be bound by the rules between masters and men. It was admitted that the defendant was not bound by the rules, unless he could prove that he had agreed to abide by them, which he could not, but he contended that irrespective of those rules the plaintiff was entitled to reasonable notice. The judge said he agreed with that, if the plaintiff had done his duty whilst he was employed. The plaintiff said he had, during the two days and a-half he had been employed, fitted, hung, and completed eight doors, fixed eight sets of mouldings, set on four door latches, and pieced two door casings. Mr. Denton, a master joiner, was called, and stated that he considered the plaintiff had done his duty by completing that work in two days and a-half. On the other hand the defendant called Mr. Hart, a master joiner, and two other witnesses, who said the work was not sufficient, and that the plaintiff ought to have done more in the time. The judge said the weight of the evidence being in the defendant's favour, he should give him the verdict.

IMPORTANT QUESTION UNDER THE BUILDING ACTS.—Mr. Bryett, builder, of St. James's-road, Holloway, was charged by Mr. John Turner, one of the District Surveyors of Islington, before the Magistrates of Clerkenwell, with neglecting to give two days' notice in writing before commencing certain buildings at Cottenham-road. Defendant gave notice as to the houses, but afterwards made some additions with respect to which no notice had been given. It was admitted, however, that these additions were only coal-sheds with cisterns over them. It was contended that these additions were included in the first notice, which was for "houses and additions," though there might have been some slight extension of the area. The surveyor had already had a fee of a guinea for each house. It was also shown that the additions were made previous to the completion of the houses, and on this the magistrate dismissed the summons.

IMPORTANT CASE TO BUILDERS AT HULL.—On Friday, John Marshall, a Hull builder, was brought by summons before Mr. T. H. Travis, the Hull Stipendary Police Magistrate, charged with having committed a breach of the Hull Improvement Act, 1854. Mr. C. S. Todd, law clerk to the Local Board of Health, appeared on behalf of that body to prosecute. He said, that by the 53rd section of the Public Health Act, every builder, before erecting a building, should deposit a plan, and, if it was passed, should build according to that plan. Any persons not doing so rendered themselves liable to a fine of not exceeding £50 and costs. If the offence was continued, a further penalty of 10s. per day could be imposed. In the present case the defendant sent in a plan for sixteen houses in a terrace, when eight of this number had been erected; but the other half had not been built. There ought to have been a space of 20ft. between one side of the terrace and the other, but through some disagreement between the defendant and another party, the land on one side of the terrace was not purchased, consequently the defendant had only 8ft. in front of his houses. This was discovered by the Board's inspector (Mr. W. H. Wellsted), and proceedings were ordered by the Works Committee. The defendant said that he intended carrying out the regulations; but could only secure part of the land owing to the persons who owned the property subsequently wanting a greater price for the land than he asked at first. The Stipendary said if the defendant had not possession of the land he had no right to send in a plan. Whatever plan was sent in the defendant was bound to carry out. If the plan was not strictly carried out, he (Mr. Travis) had a right to order the buildings to be pulled down. The summons was then adjourned for a month, for the purpose of allowing the defendant to carry out the plan intact, his worship observing that the Board had nothing to do with the purchasing of the land, and of course, judging from the plan sent in by the defendant, were of opinion that the land belonged to him. He was willing to believe that the present affair was an accident.

The Emperor Napoleon has just presented to a co-operative building society the block of cottages which he had built to serve as models of dwellings for the poor. The value of the gift is 510,000f.

General Items.

A correspondent writes as follows:—"I have looked forward with some interest for a reply to the important statements made in the BUILDING NEWS, on the 28th of June last, regarding the architecture of the Westminster Palace. Mr. E. W. Pugin distinctly stated that 'the plan of Parliament House was wholly Sir Charles Barry's; the elevation and all the details wholly my father's.' Consequently, when Mr. Bright stated, amid the cheers of the House of Commons, that the Houses of Parliament were a disgrace to the architecture of the age, on account of its lack of accommodation, the blame, if Mr. Pugin is correct, is entirely due to Sir Charles Barry. Has Mr. E. M. Barry nothing to say to this charge? Does he intend to let judgment go by default? If he says nothing, I shall think that he has either nothing to say, or that he is not so much disposed to vindicate his father's reputation, as Mr. Pugin appears ever ready and willing to remove the slightest dust which may fall on the reputation of his father. This silence is somewhat ominous, to say the least of it."

The Commissioners of Lunacy complain strongly of the condition of Hanwell Asylum as regards ventilation. In a report just issued they say this establishment is so overcrowded that in some of the wards the amount of air is less than 300 cubic feet for each person. The total number of patients is over 1,758. The commissioners recommend certain structural changes with a view of remedying the defects complained of, and advise that cubical measurements be taken of all the wards, which measurements should be marked in numerals on each door. It appears, also, that the medical staff is wholly insufficient for the work, there being only four officers to supervise about 700 male and upwards of 1,000 female lunatics.

At a meeting of the creditors of the Scottish Granite Company, limited, held at Glasgow on Tuesday, the liquidators were directed to have the company's quarries at Mull and Petisbury works, at Glasgow, put up to auction at the price of £11,000; failing bidders, the upset price to be reduced to such as the liquidators might think expedient.

The 24th Annual Congress of the British Archæological Association will be held at Ludlow, commencing on Monday, July 29, Sir C. H. R. Broughton, Bart., will preside. The excursions at present arranged for the members include visits to the ancient remains on the summit of the Fetterstone Clee Hill, to Bitterby, Middleton Chapel, Downton Hall, Ludford, Tenbury, Burford, Aston ancient church and tumuli, Wigmore Castle and Abbey, Brandon Camp, Downton Castle, Stanton Lacy, Diddlebury Church, Norton Camp, Stokesay Castle, Oakley Park, and Bromfield Church and Abbey. These excursions will occupy the whole of the week, and on the following Monday, after the regular business of the congress has been concluded, an excursion has been planned to Wroxeter, the ancient Roman city of Uriconium; and on Tuesday to the Valley of Clun, Clun Castle, and Offa's Dyke. During the first week the members will be entertained by the president at Downton Hall; by the corporation of Ludlow; by Lord Northwick, at Burford Park; by Mr. Knight, at Downton Castle; and by Lady Mary Clive, at Stokesay Castle. On the evening of each day, after returning from the excursions, there will be meetings for the reading of papers and for discussion.

The sixteenth annual meeting of the Perpetual Investment and Building Society was held at Radley's Hotel, New Bridge-street, on Wednesday week, with Mr. John Gover in the chair. The capital of the society is now nearly a quarter of a million, and, in the hands of an experienced and active directorate, is profitably employed. The society have recently purchased two large estates, one at East Dulwich, and another at Sutton, which, in the hands of the members, aided by advances, are fast being covered by an useful and superior class of houses. The business of the society appears to be very judiciously conducted. Mr. Tresidder, the secretary, in addressing the meeting on Wednesday week, said there was not a single item in the balance sheet about which he could not challenge investigation. The transactions of the society had been of great magnitude, no less than £1,700,000 having been dealt with. During the past five years a bonus of 6 per cent. has been paid, which, in these times, it must be admitted, is a very satisfactory result.

No decision has yet been come to with regard to the New Law Courts. There was an article, however, in the *Times* of yesterday, which contained nothing beyond an intimation that the professional architects, consulted by the commission, shrink at present from the invidious task of making even a provisional adjudication. Is the appearance of this article a just indication of the difficulty the commissioners have in coming to a decision, and a preparatory note that some compromise may be expected?

A grindstone should not be exposed to the weather, as it not only injures the woodwork, but the sun's rays harden the stone so much as, in time, to render it useless. Neither should it stand in the water in which it runs, as the part remaining in water softens so much that it wears unequally, and this is a common cause of grindstones becoming "out of true."

The Society of Arts are about to affix memorial tablets at No. 3A, King-street, St. James's, the house occupied by the Emperor of the French when in this country; at 141, New Bond-street, the house in which Nelson resided previously to his departure for Trafalgar; at 47, Leicester-square, the residence of Sir Joshua Reynolds; 7, Craven-street, Strand, where Franklin lived; and 36, Castle-street, Oxford-street, where James Barry lived. The tablets will be similar to that in front of Lord Byron's birthplace in Holles-street.

The quaint old wooden-fronted house near the palace of the Bishops of Hereford, where Nell Gwynne was born and lived, has been swept away. Every visitor to Hereford used to call and see it, but it has, it appears, proved obnoxious to an ecclesiastical dignitary, and has been, in consequence, entirely demolished. The house was pretty, filled in with quaint old wooden piles, and in King Charles's time, facing, as it did, a pleasant bank sloping down to the river, it must have been a charming home.

A correspondent of the *Chemical News* offers a suggestion relative to the extinction of fires resulting from burning oil which may prove useful. *Apropos* of the recent terrible conflagration at the oil distillery at Hackney Wick, it mentions that the effect of the water poured upon the flames was simply to extend the burning surface by distributing the fire in every direction. The proposal is that in such cases clay or lime should be thrown upon the flames. It is the only means of extinguishing oil fires, as has been proved in several instances.

Mr. Bateman, C.E., who was appointed by the Government to design works to prevent the injurious effects of the extraordinary floods in the River Shannon, in a report recently issued, estimates the cost of the necessary works at £290,605. This would relieve 24,155 acres from inundation.

A building society has been started at Lichfield with, apparently, good chances of success. At the first meeting, which was held in the Town-hall on Saturday, it was announced that 600 shares had been taken—twice the number anticipated by the most sanguine of the promoters.

Photographs have been taken of the National Exhibition portraits, in illustration of the official catalogue. The catalogue contains biographical and historical notices, together with an introduction by Mr. Samuel Redgrave to the exhibition and the art of portrait painting generally. About eight hundred photographs have been taken, with the consent of the owners, out of a collection numbering 866 works. The entire series has been distributed in eight volumes, and the cost of the whole, bound in half morocco, is £50. Any person, however, may select for himself a volume of 100 portraits for six guineas, or a packet of sixteen for one guinea. A single photograph can be purchased for 1s. 6d. Specimens may be seen in the exhibition, or at the office of the Arundel Society, Old Bond-street.

Trade News.

TENDERS.

BETHNAL GREEN.—For the erection and completion of a new Wesleyan Chapel and Schools in Bonnor's-road, Bethnal Green. Messrs. Pocock, Corfe, and Parker, architects. Quantities supplied by Mr. R. W. Gritten:—Colls and Sons, £7,777; Wood, £7,731; Clement, £7,447; Regis, £7,280; Stimpson, £7,275; Dove Brothers, £7,055; Lathey Brothers, £6,945; Hedges, £6,936; Hopson, £6,734.

CROYDON.—For new parsonage, Holy Trinity, Warrington, near Croydon, for N. Bridges, Esq. Messrs. E. Habershon, Brock, and Webb, architects:—Simpson (accepted), £1,650.

GUILDFORD.—For a new dwelling-house and shop, North-street, Guildford, for Mr. G. P. Shepherd. Mr. Henry Peake, architect. The shop front and plate glass not included in this contract. Quantities not supplied:—Pollard, £819; W. and T. Smith, £697 12s.; Nye, £684; Mason and Son, £655 10s.; Lee (accepted), £647.

HOLLOWAY.—For rebuilding the Old Pied Bull public-house, Holloway-road, for Messrs. Taylor and Walker. Mr. Charles Dunch, architect. Quantities supplied by Mr. G. P. Raggett:—Hill and Keddell (accepted), £2,498.

LONGTON.—For the erection of schools, hospital, and nurseries in connection with St. James's parish. Mr. Naden, Birmingham, architect:—Barlow (accepted), £3,500.

LONGTON (STAFFORDSHIRE).—For the erection of St. James's National Schools. Mr. Thos. Naden, architect:—Spicer, £2,670; Collis and Hudson, £2,620; Barlow (accepted), £2,250.

LINCOLNSHIRE.—For repairs, alterations, and refitting the parish church of Harmston, Lincolnshire. Mr. Withers, architect:—Huddleston, £1,370; Birens and Co., £1,347; Loveled, £1,345; S. and W. Pattison, £1,300; Bellamy, £1,108 6d.; Stiles, £1,100; Barker, £1,028.

LINCOLNSHIRE.—For repairs and refitting to the parish church of West Barkwith, Lincolnshire. Mr. Withers, architect:—Bellamy and Barker, £524.

LONDON.—For part restoration of the offices of the London Society for the Propagation of the Gospel amongst the Jews. Messrs. E. Haberstron, Brock, and Webb, architects:—Manley and Rogers, £261; J. Warne and Co., £260; Cole, £255; Morant, £185.

NORWOOD.—For laundry buildings to convent, Central Hill, Norwood. Mr. Goldie, architect. Quantities supplied by Mr. Scofield:—Myers and Son, £2,240; Longmire and Burge, £2,110; Simpson, £2,065; Lawrence and Maw, £1,999; King and Sons, £1,948; Gammon, £1,903; Nightingale, £1,839; Roberts, £1,770.

REGENT-STREET.—For building house at Air-street, Regent-street, for Mr. Ralph Bodilly:—Nightingale (accepted, £755.

REDHILL.—For the erection of three houses with shops, in the station road, Redhill, for Mr. W. Lambert. Mr. Regis, jun., architect:—Cook, £2,762 10s.; Regis, sen., £2,698 14s.; Wesley, £2,600; Gagie, £2,349.

STEPNEY.—For the erection of additional buildings and alteration of the old buildings at the Red Coat School at Stepney Green. Mr. Henry Stock, architect. Quantities supplied by Messrs. Marsland and Widdows:—Hill and Keddell (accepted), £2,177.

STOCKPORT.—For Baptist Chapel, Stockport. Messrs. W. G. Aberstron and Pite, architects:—Brown, £6,490; Weatherley and Bymer, £5,947; Atkinson, £5,852; Eopley, £5,600; Robinson, £5,600; Statham and Sons, £5,185; Hughes, £5,121; S. and W. Pattinson, £4,995.

SHOREHAM (SUSSEX.)—For residence for Harry Bridger, Esq. Messrs. Goulty and Gibbins, Brighton, architects. Quantities supplied by Mr. J. Chester, Landsdown:—Cheesman and Co., £2,765; Howell, £2,643; Nightingale, £2,470; Simms and Marten, £2,456; Shearburn, £2,400; Bland, £2,352; Chappell (accepted), £2,346.

WEDNESBURY.—For residence for Henry Mills, Esq., on part of Bescott estate, near Walsall. Messrs. William and Samuel Horton, architects. Messrs. Taylor Brothers, Walsall, builders; amount of contract, £2,200.

WOODFORD GREEN.—For alterations and additions to house and pair of villas, for Mr. F. Puckeridge. Mr. G. R. Noble, architect. Quantities supplied by Messrs. Linsdell and Giffard:—Hedges, £2,163; Egan, £2,077; Perry and Co., £2,062; Hill and Keddell, £2,030; Rivet, £1,930; Eaton and Chapman, £1,130.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

John Hobley, Aylesbury, bricklayer, July 30, at 1—Thomas Adams, Bournemouth, builder, July 24, at 1—William Morgan, White Horse street, Commercial-road East, stone mason—Edward Watson, York-buildings, Adelphi, surveyor, July 30, at 12—C. Weavers, Palgrave, Suffolk, journeyman carpenter, July 30, at 12—Robert Welshman, Christchurch, gasfitter, July 24, at 1—A. K. Wheeler and R. Dolling, Sherborne-place, Blandford-square, plumbers.

TO SURRENDER IN THE COUNTRY.

Francis James Ames, Dorchester, painter, July 30, at 11—Benjamin Brooker, Ipswich, bricklayer, August 3, at 11—Thomas Platts, Gentleshaw, near Rugeley, joiner July 27, at 10—Thomas Rose, Buxton, plumber, July 26, at 11—Benjamin Tomkinson, Stoke-upon-Trent, flint grinder, July 31, at 12—William Thorn, Brighton, coach painter, July 29, at 11—John William Taylor, Norwich, cooper, July 27, at 11—Joseph West, Somersal, plumber, August 1, at 11—James Bailey, Hulme, cabinetmaker, July 27, at 9.30—John Churchill, Brighton, house agent, July 24, at 11—Richard Davies, Neath, engineer, July 26, at 11—Eleazar Dixon, Bourton, Berkshire, blacksmith, August 6, at 10—William Earl, Newby-cross, near Carlisle, joiner, July 29, at 11—Edward Holloway, Banbury, cabinet maker, July 25, at 10—William Morley, Red Dial, Cumberland, blacksmith, July 25, at 11—John Pope, Kingswear, Devon, engineer, July 23, at 11—George Smith, Cavendish, smith, July 25, at 12—George Smith, Alton, cabinet maker, July 29, at 1—Isaac Thomas, Aberdare, carpenter, July 22, at 11.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

METALS.

IRON:—

Welsh Bars in London	per ton	6 15 0	0 0 0	3
Nail Rod	do	7 10 0	8 0 0	2
Hoops	do	8 10 0	9 0 0	
Sheets, Single	do	9 15 0	10 0 0	
Staffordshire Bars	do	7 10 0	8 10 0	
Bars, in Wales	do	5 15 0	6 5 0	8
Rails	do	6 5 0	6 7 6	nett
Foundry Pigs, et Glasg. No 1	do	2 14 0	3 5 6	
Swedish Bars	do	10 5 0	10 10 0	

STEEL:—

Swedish Keg, hammered	per ton	15 0 0	15 10 0	
Swedish Faggot	do	10 10 0	12 10 0	

COPPER:—

Sheet & Sheathing, & Bolts	per ton	81 0 0	86 0 0	
Hammered Bottoms	do	92 0 0	93 0 0	
Flat Bottoms, not Hammered	do	87 0 0	89 0 0	
Cake and Tough Ingot	do	72 0 0	0 0 0	
Best Selected	do	80 0 0	82 0	
Australian	do	83 0 0	87 0 0	
Yel. Metal Sheathing & Rods	per lb	0 0 7	0 0 0	

TIN:—

English Block	per ton	91 0 0	0 0 0	2
do Bar	do	92 0	0 0	
do Refined	do	94 0 0	0 0	
Banca	do	92 0 0	0 0 0	nett
Straits	do	86 10 0	87 0 0	

LEAD:—

Pig, English	per ton	21 15 0		
„ Spanish Soft	do	19 5 0	0 0	
Shot, Patent	do	23 0 0	0 0 0	
Sheet	do	21 0 0	0 0 0	
White	do	0 0	3 10 0	

SPELTER:—

On the Spot	per ton	21 0 0	21 2 6	net

ZINC:—

English Sheet	per ton	26 10 0	27 0 0	0
Devaux's V. M. Roofing Zinc *	do	28 0 0	0 0 0	0
QUICKSILVER	per btl	6 17 0	0 0 0	0

* And 5 per cent. discount if laid upon the new system.

REGULUS OF ANTIMONY

French	per ton	28 0 0	0 0

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£9 0	£10 10	Archangel, yellow	£11 10	£12 10
Quebec, red pine	3 0	4 10	St. Petersburg, yel.	10 10	11 0
„ yellow pine	2 15	4 0	Finland	8 0	9 0
St. John N.B. yellow	0 0	0 0	Memel	8 0	0 0
Quebec Oak, white	5 5	6 0	Gothenburg, yellow	8 10	10 10
„ birch	3 10	4 10	„ white	8 0	9 0
„ elm	3 10	5 0	Oefle, yellow	9 0	11 0
Dantzic oak	3 10	6 0	Soderbam	9 0	10 10
„ fir	2 0	3 0	Christiania, per C., 12 ft. by 3 by 9 in.		
Memel fir	2 0	3 10	yellow	16 0	22 0
Riga	3 0	3 5	Deck Plank, Dantzic, per 40 ft. 3 in.	0 15	1 4
Swedish	1 15	2 2	PUMICE STONE pr ton	5 0	6 0
Masts, Quebec red pine	6 0	7 0	OILS, &c.		
„ yellow pine	5 0	6 0	Seal, pale	per tun 30 0	0 0
Lathwood, Dantzic, fm	4 10	5 0	Sperm body	108 0	0 0
„ St. Petersburg	6 10	7 10	Cod	30 0	0 0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.			Whale, Sth. Sea, pale	38 0	0 0
Quebec, white spruce	14 10	21 10	Olive, Gallipoli	63 0	0 0
St. John, white spruce	13 10	15 10	Cocoanut, Cochin, ton	54 0	56 5
Yellow pine, per reduced C.			Palm, fine	40 0	40 0
			Linseed	39 0	39 0
Canada, 1st quality.	17 0	19 10	Rapeseed, Eng. pale	39 10	0 0
2nd do.	12 0	13 0	Cottonseed	36 0	38 0

WANTED.

*** *The* BUILDING NEWS *inserts advertisements for* "SITUATIONS WANTED," *&c., at One Shilling for the first Twenty-four Words.*

A STONE and WOOD CARVER, good workman, is in WANT of a JOB.—Address, W. T., Post-office, till called for, Birmingham.

WANTED, by an experienced STAIRCASE HAND, WORK in the above line. First-class reference if required.—A. O. Z., 48, Sussex-road, Brixton.

TO ARCHITECTURAL PUPILS.—An office in the country has a VACANCY for an IMPROVER. Good Gothic draughtsman preferred.—Apply, J. B., BUILDING NEWS Office.

A LONDON MONUMENTAL LETTER-CUTTER, of experience, TAKES occasional WORK in the country round Surrey, Sussex, and Kent.—Address, S. H. Gardiner, 236, New Kent-road, London, S.E.

TO ARCHITECTS' ASSISTANTS.—WANTED, a thoroughly qualified ARCHITECT'S ASSISTANT. Must be a good draughtsman.—Apply to Mr. R. J. Goodacre, architect, 5, Friar-lane, Leicester.

TO ARCHITECTS and Others.—A Youth, who can draw, trace, and write, desires EVENING EMPLOYMENT. Is willing to give his services where he can improve himself.—M., 6, Jefrey's-street, Camden Town.

TO MASTER STONEMASONS and BUILDERS.—WANTED, by an experienced man, a SITUATION as LETTERCUTTER, CARVER, and Stonemason in general.—Address, Veritas, Post-office, Colchester.

A BRICKLAYER is in WANT of EMPLOYMENT. Is thoroughly acquainted in all classes of buildings, repairs, and jobbing, tuckpointing, cutting of every description. First-class reference. Age 42.—Address, A., 22, Adam-street West, Bryanston-square.

WANTED, for a permanency, in a small Builder's firm, a SITUATION as FOREMAN or Under Foreman. Is willing to fill up his time in masoning or bricklaying. Has had good experience.—Address, W. H. W., 1, Cook's Cottages, Eagle-place, King-street, Old Kent-road, Surrey.

TO BUILDERS, CONTRACTORS, and Others.—WANTED, a RE-ENGAGEMENT as GENERAL FOREMAN, by a man of great experience in the general management of building. Can get out workings, drawings, and make estimates. Joiner by trade. Good testimonials as to ability and general character.—Address, R. H., office of the BUILDING NEWS.

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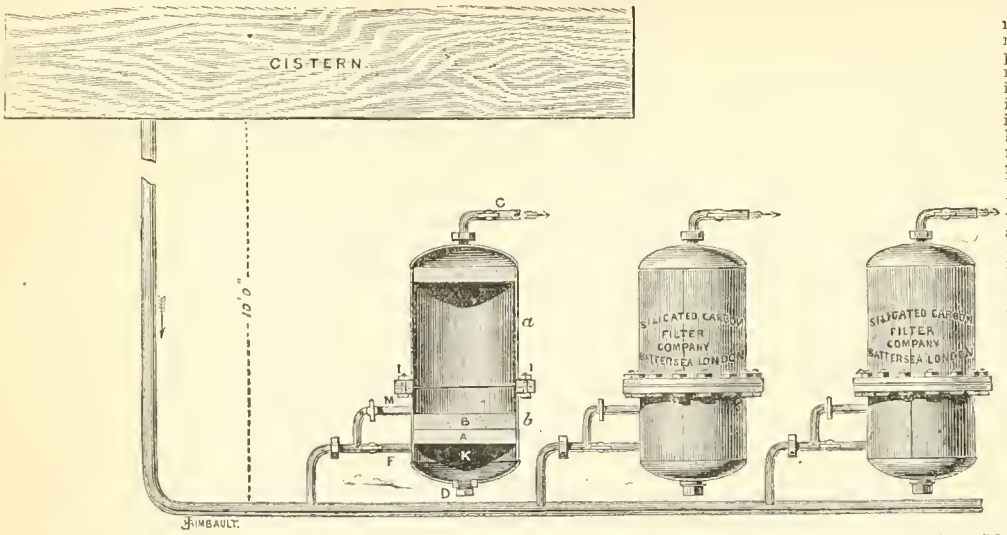

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THE BUILDING NEWS.

LONDON, FRIDAY, JULY 26, 1867.

THE BRISTOL ASSIZE COURTS COMPETITION.

MR. STREET'S report on the designs submitted in this competition has just reached us, and it may well form the basis of a few remarks upon the general subject. Regarded as the carefully-prepared judgment of a referee, the document before us is perfectly unique; while considered as the elaborate statement of an opinion, it is certainly the most wonderful composition it was ever our lot to examine. To dispose of the last phrase, first, we may remark that the subject seems to have confused the mind of the writer so hopelessly that he is altogether unable to express himself in language of ordinary clearness. What, for example, does the following sentence mean?—

> As I observe that no competitor is to receive more than one premium, I may say that I cannot help thinking that the plans marked "Usui Civium," &c., and those marked "Avanti," are by the same architect, as, also, I believe are those marked "Dos-à-Dos" and "Studium"; if, therefore, both these designs are placed amongst the first three it would be necessary to be provided with a fourth in order of merit, so as to be provided for this contingency.

Mr. Street has not selected three of the four designs he here specifies for premiums; and, therefore, it is impossible to conceive how it is necessary for him "to be provided with a fourth." Does he imagine that the Finance Committee will send his report back to be amended? There is certainly some ground for supposing that such a course might be politic.

Having achieved this extraordinary exordium, Mr. Street proceeds to expound what he is pleased to call the "architectural merit of the various plans"; and here, again, a strange, if not inexplicable circumstance, stares us in the face. The opening sentence reads thus:—"Upon this head I have to report as follows, taking the plans in what seems to me to be the order of their merit." After this it is, of course, fair to presume that the referee has carefully considered the case, and come to the conclusion that the plan he places first is the most meritorious, or, in other words, ought to get the first premium. Yet, strange to say, the design placed first is that by "Quis," and this Mr. Street has recommended, not for the first, but for the second prize.

Mr. Street next proceeds to the plans of "Usui Civium," which he places second at the opening of his report and first at the close, as though he had been inspired with some new idea during its composition. The next step is to bracket two designs, marked respectively "Dos-à-Dos" and "Studium," on the ground of merit; and, as the conditions of the competition prevent any architect from receiving more than one premium; and, as they are (as he thinks) by the same hand, he places "Dos-à-Dos" first for the third prize, although the arrangements are not first-rate, and in this respect not so good as "Dolphin." It is very evident that Mr. Street has either found his task a very difficult one, or been embarrassed by circumstances not apparent on the face of the report. The judgment he pronounces is neither plain or dignified; and the means by which he arrives at the conclusion, such as it is, shows that it is with considerable difficulty he has at last made up his mind on the subject.

The plans are next dealt with as regards convenience of arrangement; and here, again, the order is 1. "Quis;" 2. "Usui Civium;" then "Dos-à-Dos," "Studium," and so on. Yet, when we come to look into the report, we find that "Quis" is the best, except in a few particulars; "Usui Civium" is not quite so good as "Quis," but "Studium" is better than "Dos-à-Dos," so that clearly as the two last-named were equal in architectural merit, and "Studium" is better than "Dos-à-Dos" in point of arrangement, "Studium" ought to have the third prize, as far as the two tests already applied are concerned.

We next come to the question of cost, and find the designs arranged as follows:—1. "Usui Civium"; 2. "Dos-à-Dos"; and then ought to come a plan by "Dolphin." It must not be supposed that Mr. Street has carefully considered the plans under this head; he begins to do so, but, apparently, weary of the task, jumbles them together in inextricable confusion. Indeed, it is difficult to tell how far he has allowed the three considerations of merit, arrangement, and cost, to affect his judgment. The following is the dictum:—

> It remains to sum up the total merits of these designs so as to award the three first places in this competition. Looking, then, to the requirements as to design, plan, and cost, I cannot hesitate in recommending the Finance Committee to award the first prize to the design marked "Usui Civium," &c. It is, I believe, one of the most economical designs submitted. It is, though not perfectly well-arranged, still, very good, and may easily be altered so as to make it all that can be desired. It has the very great merit of preserving intact Colston's House, a point, as it seems to me, which ought not to be overlooked by the Finance Committee. I should place the design marked "Quis," second. I should do this in spite of its costliness. It is clear not only that the designer is capable of making a very good elevation, but that he has taken the trouble to study the question of arrangement, and with one exception his plan would make an admirable working building. The cost would be very great as compared with that of the design marked "Usui Civium," and it is mainly on this account that I feel I must give it the second place. The instructions to the architects appear to me to leave me no choice on this point. The third place, after much consideration, I should award to the author of the design marked "Dos-à-Dos"; the arrangements are not first rate, and in this respect not so good, I think, as "Dolphin." But in other respects "Dos-à-Dos" is much superior, and ought to be placed first of the two. It does not seem necessary that I should attempt to place the others in their order. But I may say that on the whole I should be disposed to bracket "Studium" and "Dolphin" together for the fourth place.

Turning from Mr. Street's report to the plans themselves, we are afraid we cannot approve his judgment. The design he has selected for the first premium, "Usui Civium," &c., is a low, monotonous, and mean-looking building, little more than a reproduction of the Colston Schools. It is not sufficiently original to be objectionable, and no one would take the trouble to criticise its composition. If it is built, the Bristolians will soon tire of their toy, and probably regret the bargain. It is one of those thin, meaningless, every-day sort of elevations, which might be put up without the aid of an architect, and clearly does not imply one iota of art knowledge on the part of its designer. It is no great compliment that Mr. Street has paid the Bristolians in selecting this design as the most suitable to be erected in their city, nor is the plan so remarkable for simplicity or appropriateness as to make the selection inevitable. Colston's House is preserved, but we thought the Finance Committee and the Town Council were careless on that point; if they really meant that this should be done, it ought certainly to have been stated as a *sine quâ non* in the instructions. According to Mr. Street's own showing, the arrangement of this plan is not the best possible, but he thinks it may be altered. We must at once enter our protest against such an unprofessional recommendation. A design once drawn should not be altered; it is unfair to the architect who submits it, and it is still more unfair to the other competitors. For example, in the case before us, Mr. Street takes objection to the entrances in the design by "Quis"; can they not be altered even more easily than the internal arrangements of that by "Usui Civium."

The second premium is awarded to "Quis," and a grand elevation it is that the architect has submitted; the style is pure and good Gothic, and the ornament is well concentrated on the upper portion of the building, leaving the lower storey massive and substantial. We do not quite like the large windows; the tracery is somewhat coarse, and the circles large, but the general effect is extremely fine and impressive. This is the building to erect if Bristol wants something to be proud of. The only question is whether the city will go to the expense. The instructions merely say that economy of cost will be an important question affecting the choice; but, with an unaccountable vagueness, they do not afford the slightest clue to the figure which the committee may consider economical. This is a strange omission for a finance committee to make; moreover, it is a most embarrassing one to the architects. The author of the design marked "Quis" can scarcely be supposed incapable of producing a plan of proportionate beauty at half the cost (especially when it is remembered that in the former competition for the same building he carried off all three premiums with designs of much less costliness, preserving the Colston's House). The manner in which he has handled the larger sum proves clearly that he is quite competent to deal with the smaller, though the converse is by no means true of his competitors.

But as it is, one and all of the competitors have been left in the dark as to what they ought to do, both as to the question of preserving the Colston's House and that of cost. The Finance Committee has acted in the matter about as reasonably as if it had commissioned several Bond-street tailors to fit the mayor with a suit of clothes, told them that cost was an object, and left them to discover by some intuitive knowledge or "hanky panky" whether it was a dress suit or a dressing gown that was needed.

The design of "Dos-à-Dos" is by no means attractive; it is what may fitly be called Elizabethan, weak and poor in conception. The front of Colston's House is the best part of the façade. The plan is simple almost to excess. A long corridor runs through it, and in time this would form a public thoroughfare from Broad-street to Small-street. There is nothing particularly noticeable about the design, and one wonders on what principle it has obtained a premium.

In our next number we shall have something to say concerning the other designs, and some general remarks on the competition. Meanwhile we must enter our protest against Mr. Street's report as a most illogical document; and, after a careful examination of the designs, we very much doubt the accuracy of his judgment.

THE PARIS EXHIBITION.—No. IX.

TERRA COTTA.

UNDER the heading of terra cotta we propose to consider all contributions in burnt clay, taking the word in its wide and general sense rather than in its restricted and particular one, and shall include in it everything from the ordinary brick to the highest forms of architectural ceramics. The products of this class exhibited by FRANCE are very numerous, and present many new features to us. The bricks generally are perforated, not transversely, as ours most frequently are, but longitudinally, and, as a rule, are much thinner than those in use in this country. In the neighbourhood of Paris they are generally of the colour of a good specimen of a London brick, but some of the clays from other parts of France furnish a very clear and bright red brick. The most notable bricks, to our mind, are the hollow arch bricks and springes of the Société Avril and Cie, at Mont Chemin les Mines (Saône-et-Loire), and a peculiar brick, with a chevron-like joggle-joint

for building in between I-iron joists, and thus forming a fireproof and straight ceiling

and floor of great rigidity and strength. But decidedly the greatest novelties are presented to us in the form of tiles for roofing purposes. Very great ingenuity is displayed in the design and manufacture of some of these, and many are the modes by which the maximum of strength is endeavoured to be combined with the minimum of weight. The sizes of these tiles are generally about 9in. wide by about 16in. long, and have a groove on one edge and a fillet on the other, so that they fit into each other, and form a very weatherproof roof. In order to overcome the difficulties of breaking joints, many ingenious devices are adopted, and much beauty is added to the roof, but which without the aid of drawings it would be hardly possible to explain. On an average, 13 tiles will cover a square meter, and the cost of the best is about £8 per thousand. Ventilation into the roof is obtained by making some of the tiles the size of three or four ordinary tiles, and fitting movable iron frames, which may be glazed or not, into these, or by constructing single tiles with a species of bonnet or curved tube, oftentimes developed into an ornament, and producing a pleasing effect in a long line of roof. Another species of fictile manufacture from which we may gleam some good is the manufacture of chimney flues; of these enormous quantities are used in the rubble walls of Paris houses, varying from 20in. by 15in., down to very small ones, suitable for ventilating flues. These are much better manufactured than anything of the kind we have in England. They are made either to be built into the wall, encased in masonry, or of such a thickness as to form a structural portion of the partition walls. Similar tubes are also made with vertical flanges and sockets, so as to form light yet sound proof and fireproof partition to rooms built over voids. In the manufacture of this species of terra cotta ware France is undoubtedly ahead of us, and the extensive use of hollow bricks, in conjunction with iron for floors, divisional walls, and other building purposes, is deserving of careful study by English architects. Passing from the purely structural to that portion of fictile manufacture which is more essentially decorative, we must notice the charming portico of M. Boulenger, or Auneuil (oise) which we have before slightly alluded to in our notice of the reserved garden. This is a construction entirely in coloured clays, or, as we term them, encaustic, and consists of a portico in antis, of three bays, the middle one being left open, and the side ones partially enclosed by a dwarf pluteal wall supporting a small shaft. Piers, parapet, entablature, and cornice are all in coloured clays of excellent design, and good, though evidently somewhat hurried, manufacture. The side and back walls of this charming little structure are covered with tilework, arranged in panels, the central one being of great beauty and a triumph of manufacture, representing Venus rising from the sea. It is a plaque measuring no less than 2ft. 8in. wide by 4ft. 7in. high. The figure of the goddess, and the shell from which she is issuing, are of the natural buff colour of the clay, the latter being rather browner than the former, and the general groundwork blue. The form is expressed by an exquisitely drawn black line of remarkable decision and purity. The side panels, and those occupying the wing walls, are panelled with a large square tile about 2ft. each way, each occupied by an equally well drawn head of one of the four seasons in a circular medallion, having below them oblong panels bearing the fruits and emblems proper to them. Nothing could be finer or purer than these, and the remainder of the work is of its kind equally good, and we most heartily commend M. Boulenger and his works to the notice of English architects. In the Palace he has a stall where he exhibits a retable for an altar in the same material, and many other good things worthy of notice, the drawing of all being scrupulously exact and the manufacture good. Many other manufacturers of encaustic tiles exhibit their products, the chiefs amongst whom are MM. Boch Frères, of Mauberge, and Villeroy and Boch, of Mettlack, in Prussia, being, in fact, the same firm, whose works are situated just on the frontiers of the two kingdoms, and they are thus enabled to supply both countries without any trouble from custom house authorities. Their works are very excellent, and are distinguished chiefly for their intense hardness and quiet tones of colour. Their patterns generally run larger than is the custom with our manufactures in this ware, and have many shades of greys and neutral browns we have not introduced, and a very pleasing quiet colouring is produced thereby; a rich pattern costs about 15s. per square metre. For Renaissance or Classic floors they leave nothing to be desired; their Gothic patterns are too much Gothic for English taste, cusped, foiled, and floriated to an extent we have not indulged in for the last twenty years; but with, to our taste, better patterns these tiles would be formidable rivals to our English manufacturers.

In cheap tiles a very pleasing effect is produced by mixing various coloured clays, so as to produce a very variegated "marbling" of black, red, and buff. Good illustrations of this are exhibited by M. Bernard, of Piegiraud, near Orange, and are sold from at 3s. to 4s. per square metre. Ascending from tiles decorated by clays to painted ones, we come, firstly, to the marvellously fine painted ones of M. Yvon, of Sèvres. There are two figures of his in Gallery No. III. which are perfectly marvellous in colour and drawing, and afford illustrations of the richest form of architectoric decoration ever known. But one thing is wanted to make them perfect—we allude to the disfigurement occasioned by the square form of the various tiles on which they are painted. Careful consideration of the cartoon and a little management of the design would allow of the several pieces on which such subjects are painted being arranged to take the form of various portions of the subject, and it would be easy to obviate the difficulty which arises from the twisting of irregular shaped masses in the firing by having each plaque square or regular, and making a deep incision in the clay so as to allow of its being easily broken to the required shape on completion of the painting, letting the jointing lines form an outline, as in fresco painting and stained glass. Near to these wonderful figures are some majolica tiles for wall lining, of excellent manufacture, with discs of coloured glass inserted, offering a new idea of large and varied application to those who will follow it up. The painted faience friezes of M. Jean are very admirable specimens of decorative art as applied to architecture, and of which we have already seen a practical illustration in the pavilion of the Empress in the reserved garden. A terra cotta of great hardness and extremely stonelike texture is exhibited in the machinery gallery by MM. Clemendot and Co., of Paris, who also contribute a specimen of very fine red ware, and their works are, of their kind, amongst the foremost exhibited. Here there are models of some singular and useful tile constructions of MM. Gilardoni Frères, of Altkirck, in the Haut Rhin. The most remarkable of these consists of a three-storey building, erected in the form of a Gothic arch, in hollow bricks, or, rather, thick tiles, the lower series of which are equivalent to three courses in thickness, the second storey of two thicknesses, and the upper one of a single course of tiles, all rebated or groved on the edge, having on the opposite side a tongue fitting into the recess thus formed in its neighbour. By this arrangement great strength is obtained, the resistance being thus proportioned to the thrust, and the set-off formed by the diminution, which takes place from the inside, forms a ledge on which the floor joists rest. For agricultural buildings this kind of construction is admirably adapted, and there are other forms of tile construction exhibited by the same gentleman eminently worthy of examination. In the Parc is a very fine trophy of glazed majolica ware, exhibited by MM. Virelent Frères, consisting of a triangular baldechino and altar, with the Blessed Virgin Mary and infant Christ, and figures of Faith, Hope, and Charity, all of large size and good modelling, painted and coloured after the fashion of Lucca dela Robbia ware, whilst the two sides not occupied by the frontal of the altar have reclining figures, painted on the flat, of Jesse and David. This trophy is deserving of serious attention, and marks out a grand *rôle* for this important material to play, showing what may be done to provide our smoky cities with an unalterable style of decoration. Not far from this is an enormous fountain, with figures of great size. The design is taken from the well-known painting of the "Shipwreck of the Medusa," and though the subject is not one a person of good taste would choose for a pleasure-giving decoration, yet it is a veritable triumph of firing and modelling, and is produced by MM. Gossin Frères. This branch of industry is so largely exhibited by France that we have only space to point out some few of the many good things she presents, and have selected those most applicable to architectural uses. Spain sends a few tiles reminiscent of her Moorish days, but they are painfully like needlework or oilcloth, the surface of the tile being formed into little square compartments, having a narrow raised ridge dividing them, and into the spaces thus formed the coloured clays or glazes are painted. As examples of manufacture they are good, but all artistic effect is destroyed by this mode of treatment. Her principal exposants are MM. Novella and Gaces, and MM. Nolla and Sagrera, of Valencia. By far the most important of the foreign contributors are those of M. Henri Drasché, of Vienna, who ably represents the resources of Austria, having brickyards and potteries for the manufacture of terra cotta both in Lower Austria and Hungary, and who is, without doubt, the largest brick-maker in the world, and we very much doubt if Pharoah, with all his Israelites, ever rivalled him. His (M. Drasché, not Pharoah), annual production of bricks alone is close upon 190,000,000, and he employs over 5,000 persons, so his manufacture attains an almost national importance, and we are glad to find that it is not merely the labour of these persons he cares for, but schools, hospitals, infirmaries, and well-built houses form as much a portion of his establishment as do his kilns and steam engines. Of course, with such large resources, and with such a vast extent of country at command, all kinds of clay are obtainable, and we find bricks of every variety of colour and quality, and at prices varying from 35f. to 50f. the thousand. We fear no considerable trade can be carried on between Vienna and London in bricks, and shall, therefore, dismiss this portion of M. Drasché's production, and confine ourselves to the examination of his works in terra cotta. These are by far the finest of purely architectural terra cottas we have ever seen, and his window-dressings, doorways, cornices, and other accessories are as varied as they are good, and we are convinced that a very large trade could be effected with this country in such excellent materials. The carriage from Trieste to London is but small, and the ability with which the designs of M. Föster, and others to whom we have referred in our critiques on Austrian architecture, have been carried out, fully justify English architects placing themselves in the hands of so able and energetic a manufacturer. Well-modelled pilaster caps can be obtained from 5f. upwards, and excellently designed consoles and trusses for equally small amounts; whilst in figures and groups an almost endless variety of subjects and sizes exists already, suitable for the internal or external decoration of every species of building, civil, military, or religious, at very moderate prices. The Twelve Apostles are obtainable at 6s. each, and almost every kind of icono-

graphy is represented; whilst for garden decoration the vases in various coloured clays leave nothing to be desired, except their introduction into this country. We are making great strides in this species of manufacture in England, and the surest way to hasten them forward is to point out the course and progress of others; and without wishing to detract from the well-earned honours of Minton and Maw, Blanchard or Blashfield, we tell them that if they do not push onwards they will speedily have to make way for others. Increased facility of communication will bring all peoples into more intimate contact, and the best products of any country will command the market of all. In majolica tiles and rich-coloured glazes we are beyond all others, and in ordinary encaustic tiles we are equal to the average; but for modelled terra cotta at a moderate price we are far behind-hand, despite the labours of South Kensington, and the impetus given by the labours of, the too-soon lost, Godfrey Sykes. Much of the handiwork of this talented young artist is here seen, and commands the admiration of all. We only regret that we have not hundreds such, and it is only when we have them that we shall be able to satisfactorily compete with continental nations. Scarcity of labour means costly production, and costly production means small demand. Let us increase the demand by obtaining our supplies from abroad at first, and we have no doubt then but that our own country, whose clays once produced worthy rivals of the famed Samian wares, will then be as successful in the production of the coarser varieties of ceramic art as she has recently been in its higher branches.

DURABILITY OF VARIOUS KINDS OF STONE.

IN the year 1839, the Commissioners of Woods and Forests instituted a searching enquiry into the nature and durability of the various kinds of building stone principally used in this country. This was done in order to select the best kind of stone for building the New Houses of Parliament. The report addressed to the commissioners that year was reported in 1845, and contains much valuable information. Take, for instance, the following:—

As examples of the degree of durability of various building stones in particular localities, the following may be enumerated. Of the sandstone buildings which we examined, we may notice the remains of Ecclestone Abbey, of the thirteenth century, near Barnard Castle, constructed of a stone closely resembling that of the Stenton quarry in the vicinity, as exhibiting the mouldings and other decorations, even to the dog's-tooth ornament, in excellent condition. The circular keep of Barnard, apparently also built of the same material, is in fine preservation. Tintern Abbey may also be noticed as a sandstone edifice that has to a considerable extent resisted decomposition; for although it is decayed in some parts, it is nearly perfect in others. Some portions of Whitby Abbey are likewise in a perfect state, whilst others are fast yielding to the effects of the atmosphere. The older portions of Ripon Cathedral constructed of sandstone, are in a fair state of preservation. Rivaulx Abbey is another good example of an ancient sandstone building in a fair condition. The Norman keep of Richmond Castle in Yorkshire affords an instance of a moderately hard sandstone which has well resisted decomposition.

As examples of sandstone buildings of more recent date in a good state of preservation, we may mention Hardwicke Hall, Haddon Hall, and all the buildings of Craigleith Stone in Edinburgh and its vicinity. Of sandstone edifices in an advanced state of decomposition we may enumerate Durham Cathedral, the churches at Newcastle-upon-Tyne, Carlisle Cathedral, Kirkstall Abbey, and Fountains Abbey. The sandstone churches of Derby are also extremely decomposed; and the church of St. Peter at Shaftesbury is in such a state of decay that some portions of the building are only prevented from falling by means of iron ties.

As an example of an edifice constructed of a calciferous variety of sandstone, we may notice Tisbury Church, which is in unequal condition, the mouldings and other enrichments being in a perfect state, whilst the ashler, apparently selected with less care, is fast mouldering away.

The choir of Southwell Church, of the twelfth century, may be mentioned as affording an instance of the durability of a magnesio-calciferous sandstone, resembling that of Mansfield, after long exposure to the influences of the atmosphere.

Of buildings constructed of magnesian limestone, we may mention the Norman portions of Southwell Church, built of stone similar to that of Bolsover Moor, and which are throughout in a perfect state, the mouldings and carved enrichments being as sharp as when first executed. The keep of Koningsburgh Castle, built of a magnesian limestone from the vicinity, is also in a perfect state, although the joints of the masonry are open in consequence of the decomposition and disappearance of the mortar formerly within them. The church at Hemmingborough, of the fifteenth century, constructed of a material resembling the stone from Huddlestone, does not exhibit any appearance of decay. Tickhill Church, of the fifteenth century, built of a similar material, is in a fair state of preservation. Huddlestone Hall, of the sixteenth century, constructed of the stone of the immediate vicinity, is also in good condition. Roche Abbey, of the thirteenth century, in which stone from the immediate neighbourhood has been employed, exhibits generally a fair state of preservation, although some portions have yielded to the effects of the atmosphere.

As examples of magnesian limestone buildings in a more advanced state of decay, we may notice the churches at York, and a large portion of the Minster, Howden Church, Doncaster Old Church, and others in that part of the country, many of which are so much decomposed that the mouldings, carvings, and other architectural decorations are often entirely effaced.

We may here remark, that, as far as our observations extend, in proportion as the stone employed in magnesian limestone buildings is crystalline, so does it appear to have resisted the decomposing effects of the atmosphere; a conclusion in accordance with the opinion of Professor Daniell, who has stated to us that from the results of experiments, he is of opinion 'the nearer the magnesian limestones approach to equivalent proportions of carbonate of lime and carbonate of magnesia, the more crystalline and better they are in every respect.'

Of buildings constructed of oolitic and other limestones, we may notice the church of Byland Abbey, of the twelfth century, especially the west front, built of stone from the immediate vicinity, as being in an almost perfect state of preservation. Sandysfoot Castle, near Weymouth, constructed of Portland oolite in the time of Henry VIII., is an example of that material in excellent condition; a few decomposed stones used in the interior (and which are exceptions to this fact) being from another oolite in the immediate vicinity of the castle. Bow and Arrow Castle, and the neighbouring ruins of a church of the fourteenth century, in the Island of Portland, also afford instances of the Portland oolite in perfect condition. The new church in the island, built in 1766, of the variety of the Portland stone termed *roach*, is in an excellent state throughout, even to the preservation of the marks of the chisel.

Many buildings constructed of a material similar to the oolite of Ancaster, such as Newark and Grantham Churches, and other edifices in various parts of Lincolnshire, have scarcely yielded to the effects of atmospheric influences. Windrush Church, built of an oolite from the neighbouring quarry, is in excellent condition, whilst the Abbey Church of Bath, constructed of the oolite in the vicinity of that city, has suffered much from decomposition; as is also the case with the cathedral, and the churches of St. Nicholas and St. Michael in Gloucester, erected of a stone from the oolitic rocks of the neighbourhood.

The churches of Stamford, Ketton, Colley Weston, Kettering, and other places in that part of the country, attest the durability of the Shelley oolite, termed *Barnack Rag*, with the exception of those portions of some of them for which the stone has been ill-selected. The excellent condition of those parts which remain of Glastonbury Abbey show the value of a shelly limestone similar to that of Doulting, whilst the stone employed in Wells Cathedral, apparently of the same kind, and not selected with equal care, is in parts decomposed. The mansion, the church, and the remains of the abbey at Montacute, as also many other buildings in that vicinity, constructed of the limestone of Ham Hill, are in excellent condition. In Salisbury Cathedral, built of stone from Chilmark, we have evidence of the general durability of a siliciferous limestone; for, although the west front has somewhat yielded to the effects of the atmosphere, the excellent condition of the building generally is most striking.

In the public buildings of Oxford, we have a marked instance both of decomposition and durability in the materials employed; for whilst a shelly oolite, similar to that of Taynton, which is employed in the more ancient parts of the cathedral, in Merton College Chapel, &c., and commonly for the plinths, string-courses, and exposed portions of the other edifices in that city, is generally in a good state of preservation, a calcareous stone from Heddington, employed in nearly the whole of the colleges, churches, and other public buildings, is in such a deplorable state of decay, as in some instances to have caused all traces of architectural decoration to disappear, and the ashler itself to be in many places deeply disintegrated.

In Spofforth Castle we have a striking example of the unequal decomposition of two materials, a magnesian limestone and a sandstone; the former employed in the decorated parts, and the latter for the ashler or plain facing of the walls. Although the magnesian limestone has been equally exposed with the sandstone to the decomposing effects of the atmosphere, it has remained as perfect in form as when first employed, while the sandstone has suffered considerably from the effects of decomposition.

In Chepstow Castle, a magnesian limestone in fine preservation, and a red sandstone in an advanced state of decomposition, may be observed, both having been exposed to the same conditions as parts of the same archways; and in Bristol Cathedral there is a curious instance of the effects arising from the intermixture of very different materials, a yellow limestone and a red sandstone, which have been indiscriminately employed both for the plain and decorated parts of the building; not only is the appearance in this case unsightly, but the architectural effect of the edifice is also much impaired by the unequal decomposition of the two materials, the limestone having suffered much less from decay than the sandstone.

Judging, therefore, from the evidence afforded by buildings of various dates, there would appear to be many varieties of sandstone and limestone employed for building purposes which successfully resist the destructive effects of atmospheric influences; amongst these the sandstones of Stenton, Whitby, Tintern, Rivaulx, and Craigleith, the magnesio-calciferous sandstones of Mansfield, the calciferous sandstone of Tisbury the crystalline magnesian limestones, or *Dolomites* of Bolsover, Huddlestone and Roche Abbey, the oolites of Byland, Portland, and Ancaster, the Shelly oolites and limestones of Barnack and Ham Hill, and the siliciferous limestone of Chilmark appear to be amongst the most durable. To these, which may all be considered as desirable building materials, we are inclined to add the sandstones of Darley Dale, Humbie, Longannet, and Crowbank, the magnesian limestones of Robin Hood's Well, and the oolite of Ketton, although some of them may not have the evidence of ancient buildings in their favour." The Report upon which we have drawn so largely, and from which we shall extract still larger drafts, then proceeds to close by a preference to limestones on account "of their more general uniformity of tint, their comparatively homogeneous structure, and the facility and economy of their conversion to building purposes," of which it prefers the crystalline; on which account, and its combination with a close approach to the equivalent proportions of carbonate of lime and carbonate of magnesia, for uniformity in structure, facility and economy in conversion, and for advantage of colour, the parties to the Report prefer the magnesian limestone or dolomite of Bolsover Moor and its neighbourhood. The Report deserves every commendation; upon the whole it has been well done, and is the first scientific step the government of this country has ever taken in respect of practical architecture. It, moreover, only cost the moderate sum of £1,400, including the many collections of specimens deposited in various institutions for reference.

DRY EARTH.

ON the subject of disinfectants, Voelcker says:—

Porous earth acts on putrefying animal and decaying vegetable matters on the same principle as that on which the putrefying powers of

charcoal depend. On account of their greater porosity and absorbing properties, wood and peat charcoal are superior to earth as disinfectants. However, dry earth is a very good absorber and destroyer of foul smells; and, as it can be had anywhere at little cost, it deserves to be used extensively, especially in the country, for preventing nuisance and loss in fertilizing constituents, which is caused by the careless mode in which human excreta are usually disposed of. Earth impregnated therewith, like charcoal, has the power of purifying itself on exposure to the air; so that earth may be used over and over again for the disinfection of human excreta. It is, indeed, worthy of special notice that a mixture of earth with night soil, after having been kept for some time under a shed, confined at one or more sides, and covered by a roof to exclude rain, and become dry, has its original disinfecting powers almost completely restored, and may be used again for absorbing and retaining the manuring elements of a fresh quantity of night-soil. Earth in this way may be used three or four times over for the disinfection of human excreta, and at the same time becomes a valuable vehicle for absorbing and concentrating all the fertilizing constituents which enter into the composition of liquid and solid excreta. Human urine contains from 91 to 94 per cent. of water, and fæces not less than 80 to 85 per cent.; hence the practical difficulty of converting them into a dry and portable manure. Simple evaporation or artificial drying is impracticable; because, in the first place, it creates an intolerable nuisance; and, secondly, because it is attended with the decomposition and loss of the nitrogenous and most valuable manuring constituents. These practical difficulties, which are experienced in the conversion of night-soil into a portable manure, may be completely obviated, at all events in the country, by the free use of dry earth in closets. If a sufficient quantity of earth is employed to absorb completely the mixture of the excreta, the contents of the closets can be removed periodically, say once a month, in the daytime, with little or no inconvenience. They should be wheeled at once under a roofed shed, and spread out as much as the space admits, and left exposed to the drying influences of the air. According to the state of the weather, the mixture of night-soil and earth will become sufficiently dry in two or three months, when it may be used again in the closet like fresh soil, and the same process is repeated three or four times. During the drying in the shed no appreciable amount of fertilizing matter is lost; and as the earth, after each removal from the closets, becomes charged with an additional quantity of manuring matter, a very useful manure is finally produced with little trouble and at a mere trifling expense. In country places, where proper drainage is not provided, the nuisance of open closets may be best avoided by the use of the arrangements adopted in the so-called earth closets.

MODERN ARCHITECTURE AND ARCHITECTS.*

THE so-called revivers of Gothic architecture are as yet mere imitators, however clever and well-intentioned; but this is not the worst. Their imitations have taken a most unfortunate direction. They choose the cathedrals for their models. The most ornate style, elaborated for the highest objects, is transferred by them to mere secular work; and this, not so much by copying its beautiful forms, as by depending on the piquant prettinesses of Gothic detail, which they have used up without restraint. They have gone over to France, and worked the Sainte Chapelle and Notre Dame; or they have explored Italy, and even Spain, in search of novelties. They have had to satiate an ignorant and exacting multitude, who have money and will have show. There may be students here and there, whose intelligence and culture might direct and guide the mass; but these are not the men to whom the conduct of our public buildings is confided. Mere wealth and position are sufficient to ensure the appointment of a committee to decide on a public work, and we know the results.

The popular idea of Gothic architecture is that of a large symmetrical building. Thousands visit the English and foreign cathedrals, admire their fronts, and wonder at their interiors. But how few are aware, or take the pains to consider, that these cathedrals were, in fact, but the chief rooms—those devoted to the highest purposes—in a vast assemblage of conventual or monastic buildings? Consequently, a mere glimpse at York, at Notre Dame, or at Cologne, will give a most imperfect idea of the true character and spirit of Gothic architecture. It would be as reasonable to take the grand soliloquy of Wolsey as a substitute for the varied incident and tragic power of the whole drama, as to assume that these isolated buildings form by themselves an exhibition of the whole method of Gothic work. We appeal to those who have repeatedly seen that model of perfect symmetry, Cologne Cathedral, whether at each successive visit there is not a constant diminution of interest. Is it not, after all, felt to be infinitely inferior in sustained effect to the homely variety of Peterborough or Canterbury, where the limbs, though mutilated, are still seen in their connection with the head? Here we behold the essentials of variety, fitness, and subordination, and we feel that the collection of buildings stimulates the imagination and elevates the mind. But when we go back to our imitations, and see the high enrichment and graceful conceptions of Ecclesiastical architecture brought into secular buildings, the effect is merely the sense of degradation.

When we thus view these ancient buildings as a whole, we see that they grew, not only in their plan and their forms, but in every detail and decoration. Each part was made as it was wanted; every room had its proper use, and that use was expressed in its style. Decoration was not put on by bits to please the eye; but, as a rule, it was distributed according to the relative importance of the buildings. The whole was a building, not a design, and the builders were true workmen, who would have felt that to "design" a building, in the modern sense, was like designing a tree, much as our fathers cut their yews and boxes into elephants and pin-cushions. These were houses made with hands and heads, not with drawing boards and T-squares, bow-pens and hair-dividers. As in those works of literature which live the longest, and take the strongest hold on human sympathies, Shakspeare and Scott did their work as craftsmen, so art will never live till sculptors turn their studios into workshops, and architects are content to be chief masons.

The simple, sad truth is, that architecture in England is a dead art. Let not the reader start with incredulity. A noble poet has expressed, in language too familiar to need repeating, the truth, that beauty may for a while survive death, in its "fixed yet tender traits," but a beauty only lighted by

> Expression's last receding ray,
> A gilded halo hovering round decay.
> The farewell beam of feeling past away.

The ever active powers of nature soon sweep with dissolution the form that has lost its life; but in art and literature the "one treacherous hour" may be prolonged into an age before we know that we have lost "the lines where beauty lingers." Alexandrian grammarians may drawl out their dull hexameters in the dead language of Homer, and architects may reproduce the lifeless forms of Doric or Ionic, Gothic or Palladian, with wondrous unconsciousness. The dress of the mummy, that same constant guest at our artistic feasts, may be changed so often as to distract our attention from the inexpressive features, till at length the truth is suddenly revealed—

> We start, for *soul* is wanting there!

To ourselves, we candidly confess, after years of sympathy with the Gothic revival, this discovery has come while studying the designs exhibited in New-square.

The works of our modern architects are composed in a foreign language; a style as suitable for our Law Courts as if the barristers were to plead in Greek or mediæval Latin, or the judgments were to be given, as of old, in Norman French. Not only is the language foreign, it is a heterogeneous jargon; these towers are literally towers of Babel. If, by that evil fate which dogs our national efforts at building, any of them should come to be erected, and if workmen from France and Flanders, Italy and Spain, with small helps from almost unknown lands, each in some antique dress, were to be heard mingling their native tongues in admired confusion, the result would not be more absurd than that already presented to our eyes. One dialect, perhaps, predominates over the rest, and this certainly is not native. There was a time, while Pugin was in the ascendant, when, like an infant trying his first steps with his mother's aid, our architects were content to lean on the pure Edwardian Gothic. But the infant gained no strength of his own; as he grew, he still wanted go-carts and crutches, and he found comfort and amusement in varying their pattern; if they could not give him strength, they might amuse him as toys. The favourite toy has been Italian Gothic. Its forms are picturesque, and to the ignorant public they offer a novelty, which only makes the more instructed wonder whether these artists think that no one has been in Italy but themselves. It matters little that the Italian Gothic is essentially a southern variety, with shadowy arcades, diminutive windows, and a compactness of plan suited to the oppressive brilliancy of a southern climate, and to a town like Venice, where the light is absolutely painful. The long frontages of the proposed building seem to have offered a special temptation to the adoption of the horizontal lines peculiar to this style, together with a constraint of symmetry which is as much in place as if counsel were bound to plead in hexameters or ottava rima. After all, Venetian is but half Gothic, Italian arcading enriched with Gothic detail, and the style is in its principles essentially antagonistic to pure English work. Ours originates in a perfect simplicity, admits of any amount of enrichment, and, in its authentic examples, is never known to be anything but beautiful.

* From the *Quarterly Review*.

LURKING PLACES FOR INFECTION.*

WHEN the British Association for the Advancement of Science met at Glasgow, in 1853, our late member, Mr. Thomas Dobson, B.A. of Cambridge, presented a report on the relation between explosions in coal mines and revolving storms. In this elaborate comparison of recorded storms with recorded explosions in the years 1851, 1852, and 1853, there is presented a mass of evidence which the most sceptical can hardly resist. The rational explanation of the connection between these two sets of phenomena is a ready one. The passage of a cyclone, or revolving storm, is accompanied by a sudden fall of the barometer, indicating a diminished pressure of the atmosphere. This extends to the cavity of the coal mine, as it does to all other places over which the storm passes. Connected with the mine are, it may be, old workings, blocked off more or less imperfectly, and natural cavities or fissures in the strata, always giving off more or less of combustible gases. The atmospheric pressure being suddenly diminished, this oozing of gas is greatly promoted, and, if not counteracted by increased ventilation, an explosive atmosphere is produced in the mine, and waits only the contact of an open light to cause the dread result. Assuming, then, this principle, as clearly proved in the mine on a large scale, I think it admits of being carried usefully into the consideration of other cases, particularly those of our sanitary arrangements in hospitals, private houses, ships, &c. What is true of the old working of the mine is true of any cavity whatever, which is not closed hermetically from the air, be it a well or cess-pool, a vault or coffin, a roof cavity, floor or ceiling, a cavity wall, lath and plaster partition, shut-up closet, cupboard, drawer or box, or even the sewers and drains in our towns and houses. In every one of these instances, a rise of the barometer will cause air from without to be condensed into the interior cavity through all the chinks and crannies; and on the fall of the mercury it will ooze out again, pure and simple, or fœtid and poisonous, as the case may prove. My object in this paper is to draw attention to the probable importance, possibly the great importance, of keeping this idea present to the mind of architects of our houses and hospitals, and to all who are brought in contact with disease of an infectious nature. Let us for a moment picture to our minds a bad case of scarlet fever, in a house where there are many children: all but the sick child are sent away, and when the case is ended the room is fumigated, white-washed, and papered, ere the family return; but, alas! the disease attacks perhaps another, and another, and we dare not say the issue. Where did the infection lie hid? May it not have lurked in some shut-up cavity, from which a low state of barometric pressure caused it to come forth? In attempted explanation of the spread of disease, we find terms used,—"atmospheric influence," "contagion," "infection," "epidemic," "zymotic," "cholera cloud," "fever cloud," "typhus wave,"—all implying that morbific influence has been lurking somewhere, and has shown itself in localities ready to receive it. Whether, in such hiding places as I

* From a paper read before the Liverpool Philosophical Society, by Alfred Higginson, M.R.C.S.

have pointed out, morbific matters may gain a greater potency, I know not. I am simply desirous that, in our future hospitals and dwelling-houses, these possibilities shall be banished as far as may be.

From these sources of possible harm in our houses, I turn briefly once more to the subject of sewers and drains. It is a well-known popular remark, that "we shall shortly have rain, the drains smell so bad." Of course, the atmospheric pressure being diminished, the noxious effluvia escape into the streets and houses through any untrapped opening. Nay, even the trapped openings are not proof against the pressure, which is greater than a two or three inch column of water in the trap. The only way of preventing the escape of foul air from sewers and drains is by adopting a system of ventilation, which shall even cause an in-draught at all such openings. I have already advocated such a plan before this society, May 19th, 1845, and again before the Health Section of the Social Science Association, at their Liverpool meeting, 1858. My proposal was, to connect the main trunks of sewers, near the river openings, with the fires of steam-engine furnaces, thus drawing out the foul air and burning it; fresh air would, in this way, be drawn in at the untrapped openings. The practice of connecting rain water spouts with the sewers, for the purpose of ventilating them, I believe to be both inefficient and injurious. Why should the air go forty or fifty feet up a spout, rather than escape at the first gulley hole, or untrapped sink-stone, particularly the latter, to which it is drawn by all the rarefying power of fires in the house? I thus consider it inefficient. Also, it seems to me injurious, because in rain, the rush of water down a spout carries air with it into the sewer, and so causes it to blow out elsewhere.

At a subsequent meeting of the society, April 15th, Mr. Higginson stated that he had tried the experiment here alluded to with partial success; enough to establish the principle, but not on a scale, or with a certainty, sufficient to warrant its exhibition to the society. Dr. Birkenhead and Mr. Davies at the same time expressed themselves as familiar with the fact of falling water carrying air down with it, forcibly enough to be made of practical use, in the laboratory or elsewhere.

BAPTIST CHAPEL, REDLAND.

THIS building is being erected from the design of Mr. S. Hancorn, architect, of Stephen-street, Bristol, and Dock-street, Newport, Monmouthshire. The design was chosen out of several others submitted in limited competition. The builders are Messrs. Marquis and Munro, Old Market-street, and Mr. Hotham is the clerk of works. The design is in the Decorated style of Gothic, and includes the chapel, with transepts, vestibule with two lobbies in connection therewith, open porch, chancel with baptistry underneath, and organ recess on one side of same, ministers' and deacons' vestries, and private entrance, and ladies' vestry, with private entrance. Underneath the latter the heating apparatus is placed. An end gallery is also proposed over the vestibule and lobbies, with stone staircases leading thereto. A tower is also included in the design, but it is not intended at present to carry it higher than necessary for the stairway therein, although every preparation is made in regard to foundations for its future erection. The principal front faces White Ladies'-road, from which the chapel floor will be raised about 3ft. 6in., and attained by a flight of broad easy steps extending the entire length of porch (26ft.) A five-light traceried window is intended in the principal gable, and three-light traceried windows to each transept; the chapel will be further lighted with two light traceried windows, with gables over same at the side.

The roof of chapel will be in single span, the principals being a combination of the hammer and collar beam, and ceiled at collar beam, forming the ceilings with purlins and wind braces into panels. The seats, which have been well considered by the committee (as, indeed, have all the fittings), are proposed to be low, with sloping backs, with hat and footboards and umbrella stands in each. Pitch pine is proposed to be used for these. The pulpit will be of oak, and placed on one side of the chancel arch in connection with ministers' vestry. The plates and doorframes will be made of red deal, and remaining timbers of yellow deal. The walls internally of chapel are proposed to be stuccoed, and to have a string of encaustic tiles above the pews of appropriate design. The elevations of chapel will be faced with Pennant stone, in random range courses, tuck-pointed. The roof will be covered with Bangor slate, alternating in plain and ornamental courses. Cathedral glass in patterns with two tints is proposed for the windows. The floors of vestibule and lobbies are intended to be paved with encaustic tiles. The chapel will be both heated and ventilated by Messrs. Haden, of Trowbridge. The contract has been taken at £5,652, and it is thought the tower can be completed for about £800 additional. The chapel will accommodate 580 persons.

GLASS WALLS.

A CORRESPONDENT of the *Journal of Horticulture* says:—"The above contrivances for more thoroughly ripening fruit have lately been introduced by the inventor of the cylinder vinery, on the principle of which they have been constructed. The glass wall is placed either opposite walls of slate made on purpose, or opposite to brick and stone walls already built, the fruit trees being trained against the glass wall on the inside, so as to receive the reflected heat from the wall opposite. The great benefit to be derived from this mode of growing fruit is light given in every direction both to the leaves and fruit. The mode to be pursued in constructing a wall of this kind opposite to one already built is as follows:—I drive into the earth, about 3ft. from the old wall, square bars of wood, grooved about five-eighths of an inch deep in the angles, boiled in creosote, and thus rendered indestructible. I slip glass down the grooves until the top of the bars is reached. I then nail a plate on the top of the bars to strengthen the glass, and also to admit of a cover being placed on the structure to keep off spring frosts. I nail small rafters from the glass wall to the brick or stone wall. After frosts are over I remove the covering, when the trees are exposed to dew and rain. They require no watering and no further attention than an ordinary wall. The result of this mode of culture is the perfection of growth. I find the best and cheapest covering is the material made for packing hops; it is 6d. a square yd. retail. Boiling in creosote would render it indestructible. Glass walls can be made on the same principle. Facing each other, and running north and south, they might be made 10ft. high and 4ft. apart, open at the top. The trees can be trained on each wall. I have never seen foliage so healthy and of such deep colour as on this principle. The temperature is always higher, and when the sun is out from 10 deg. to 12 deg. higher than the external air."

THE GENERAL BUILDER'S ASSOCIATION.

THE annual meeting of this association was held on May 9 last, and the report of which has only just reached us. We find that the receipts of the association from the local societies during the past year were £998 4s. 6d., which was appropriated in the following manner:—

	£	s.	d.
Balance of general account on September 1, 1866	£383	6	10
Salaries, three quarters of a year	306	18	0
Rent, rates, and taxes	55	15	2
Office expenses, including postage, printing, and stationery	51	17	10
Expenses of general meetings and committee and sub-committee meetings	75	19	6
Deputations and travelling expenses	97	14	3
Payments on account of strikes	59	1	0
	£1030	12	7

The principal rules of the association are the following:—

2. The association shall consist of every local association of employers of labour connected with the building trades that shall agree to the principles of these rules, and shall subscribe to the general fund in accordance with the following scale, that is to say:—For each member of such local association who employs less than

			s.	d.	
5 men			0	2	per week.
5 men and less than	10 men		0	4	,,
10 ,, ,,	20 ,,		0	6	,,
20 ,, ,,	30 ,,		0	9	,,
30 ,, ,,	40 ,,		1	0	,,
40 ,, ,,	60 ,,		1	3	,,
60 ,, ,,	80 ,,		1	6	,,
80 ,, ,,	100 ,,		1	9	,,
100 ,, ,,	150 ,,		2	0	,,
150 ,, ,,	200 ,,		2	6	,,
200 ,, ,,	300 ,,		3	0	,,
300 and above			4	0	,,

and the sums so subscribed are to be remitted to the General Association every three months, and used for carrying on the ordinary business of the association.

9. It shall be the duty of the committee to generally manage the whole business of the association. It shall elect the secretary, and fix the amount of his salary, and the other terms of his engagement. It shall have power, either at the request of a local association or at its own option, to call, upon six days' notice, special general meetings of the association, to consider any subject (which subject only shall be taken into consideration at such special meeting). It shall hold quarterly meetings and such other meetings as shall be requisite or desirable. It shall, at the invitation of a local association, but not otherwise, take into consideration any matter arising in or affecting the district of that association, and take such action in the matter as it shall think desirable; provided that such action, if it at all interferes with the general trade or interests of the country, shall not be taken until it shall have been approved by a special general meeting. It shall have the control and management of the money and other property belonging to the association. And it shall take all necessary steps to carry out the principles and objects of the association.

10. It shall be the duty of each local association affiliated to this association to forward to the secretary the subscriptions due every quarter, and a report of its affairs every half year. It shall, every quarter, send to the secretary a report of the state of the trade in the district. And immediately on a strike taking place in its district, it shall send to the secretary a list of the names of all men on strike, together with the cause of strike, a copy of which list the secretary, if the committee so direct, shall at once transmit to every other local association. And, during the continuance of a strike, no member shall take on or newly employ any operative connected with the trade on strike without ascertaining the name of his last employer, and enquiring of that employer whether the operative is on strike. The local association also may request the advice or action of the general committee on any affair beyond its influence and control. And it shall further, by all means in its power, the success of the General Association.

11. Every member sub-letting work shall stipulate with the sub-contractor that the works shall be carried on in accordance with the rules and resolutions of the General Builders' Association, and of the local association with which the member is connected, especially as regards rates of wages and the employment of men on strike; and every member taking sub-contracts shall carry out such rules and resolutions.

THE PARIS EXHIBITION AND SCHOOLS OF ART AND SCIENCE.

THE select committee appointed to consider and report on the advisability of making purchases from the Paris Exhibition for the benefit of the schools of science and art in the United Kingdom, and any other means of making that Exhibition useful to the manufacturing industry of Great Britain and Ireland, have considered the matters to them referred, and agreed to the following report:—"1. They are of opinion that it is desirable that purchases should be made at the Paris Exhibition of objects of art and science, especially of such as illustrate modern scientific inventions and discoveries, and the application of art to manufactures, and that the exhibition of such objects in the museum of South Kensington, and, by circulation, in local museums in different parts of the United Kingdom, would be useful to the manufacturing industry of the country, and for the artistic and scientific instruction of the schools in connection with the Science and Art Department. 2. That, as one of the principal objects of such purchases should be to show the progress made by other nations in manufactures, and in the application of art and science to practical purposes, examples of foreign origin should, in the first place, be secured in preference to those of British production. 3. That it is not desirable that pictures and modern statuary sculpture should be purchased. 4. That considering the importance of such purchases to the development of the manufactures and trades of the United Kingdom, they recommend that a liberal grant be asked from Parliament for the purpose of making them. They have not sufficient data before them to enable them to suggest the sum which might be advantageously expended, but they consider that under no circumstances should it exceed £25,000. 5. Lastly, they are of opinion that no objects should be purchased at the Paris Exhibition except such as shall be recommended by a commission consisting of gentlemen distinguished for their artistic and scientific attainments, who should consult with the two art referees attached to the Department of Science and Art, and other competent persons. They further think it desirable that the referees should furnish written reports upon the objects recommended by them for purchase."

Dr. Lyon Playfair, having been asked by Lord Taunton, Chairman of the Schools Inquiry Commission, to state his opinion on the relative merits of English and foreign workmen, says, in a letter dated May 15:—"I have just returned from Paris, where I acted as a juror in one of the classes of the Exhibition. In this capacity I had no other opportunities than any other juror of forming a

judgment in regard to it; but having had the charge of the working of the juries in the Exhibition of 1851 and 1862 I naturally made the acquaintance of many eminent men of different nations, and meeting with a large number of them congregated on the international juries in Paris, I endeavoured to gather their opinions as to the position which England occupied in this great industrial competition.

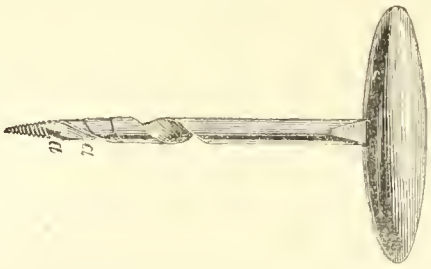
"I am sorry to say that, with very few exceptions, a singular accordance of opinion prevailed that our country had shown little inventiveness and made but little progress in the peaceful arts of industry since 1862. Deficient representation in some of the industries might have accounted for this judgment against us, but when we find that out of ninety classes there are scarcely a dozen in which pre-eminence is unhesitatingly awarded to us, this plea must be abandoned. My own opinion is worthy only of the confidence which might be supposed to attach to my knowledge of the chemical arts; but when I found some of our chief mechanical and civil engineers lamenting the want of progress in their industries and pointing to the wonderful advances which other nations are making—when I found our chemical, and even textile, manufacturers uttering similar complaints, I naturally devoted attention to elicit their views as to the causes. So far as I could gather them by conversation, the one cause upon which there was most unanimity of conviction is that France, Prussia, Austria, Belgium, and Switzerland possess good systems of industrial education for the masters and managers of factories and workshops, and that England possesses none. A second cause was also generally, though not so universally, admitted, that we had suffered from the want of cordiality between the employers of labour and workmen, engendered by the numerous strikes, and more particularly by that rule of many trades unions that men shall work upon an average ability, without giving free scope to the skill and ability which they may individually possess."

ST. CLEMENT'S SCHOOLS, BARNSBURY.

THESE buildings are situate in Cumberland-street, Roman-road, Barnsbury, near the North London Railway, and give accommodation, according to the Government mode of computation, for 623 scholars. Their erection was undertaken by the inhabitants of the new parish of St. Clement's, as their part of an arrangement made between themselves and George Cubitt, Esq., M.P., who, in the most munificent manner, erected a handsome new church, of which Mr. G. G. Scott, R.A., was the architect, purchased a parsonage-house, and endowed the incumbency. The cost of the buildings, exclusive of the site, was about £2,800. In raising the necessary funds the parishioners were largely assisted by the Bishop of London's Fund, and they also received the customary grant from the Committee of Privy Council on Education. The upper floor of the building is occupied by the girls' school. The boys' school is on the first floor, while the lower floor is appropriated to the infants. The first and second floors each contain a large L-shaped room, with desks placed against the wall on one side of the room, and a class-room fitted up with a gallery. On the infants' floor the space under the large schools is divided into two rooms, so that the very small infants should be separated from those who are more capable of receiving instruction. The majority of the windows are fitted with double-hung sashes, and the arched heads are made to open by falling inwards, so as to admit fresh air with an upward tendency, when the temperature renders a direct current undesirable. The building will have houses of a very ordinary character on both sides of it, and this position has considerably affected the kind of treatment given to the façade. The attempt has been made to impart an architectural character to a building composed of ordinary materials, without the introduction of unnecessary or expensive decoration. The work has been carried out by Messrs. Scrivener and White, of Fitzroy-road, N.W., according to the designs of the architect, Mr. Lacy W. Ridge, of 23, Bedford-row, London.

IMPROVED GIMLET.

EVERY one who uses the common gimlet knows that it is almost impossible to bore a hole with it without splitting the materials. Besides this, in hard woods, the tool works very unsatisfactorily, as the screw on the end draws out before the hole is completed. In any case the action of the gimlet is defective from the manner in which it is constructed. It is not a cutting tool, but performs its work by crowding or forcing the wood to one side.



Mr. E. P. Watson, of New York, has hit upon an invention, the object of which is to produce a gimlet that will bore without splitting, and cut as true a hole as an augur. By referring to the illustration it will be seen that the tapering portion is provided with a series of shoulders, *a*, which form cutting edges, and remove chips as the screw on the end draws in. The object is attained perfectly, and the result is a much better tool at little additional cost of manufacture, and can be applied to gimlets already manufactured, either double or single cut. The advantages of this gimlet are apparent.

LLANDAFF SCHOOLS.

ONE of our illustrations this week represents schools recently built at Llandaff by Mr. Thomas Williams, builder, from the design of Mr. John Prichard, architect, for £900. The schools consist of two rooms, one for boys and the other for girls, with a class-room in common to both. The dressings are in Bath stone, slightly relieved by green sandstone from Bridgend, and the walls are composed of large river pebbles of excellent colour, banded with lines of Pennant stone.

TRIANGULAR LODGE AT RUSHTON.

THE report of the proceedings of a meeting of architectural societies at Kettering, which appeared in the BUILDING NEWS some weeks ago, contained a brief description of the Triangular Lodge at Rushton Park. Since then we have received numerous communications expressing a desire to know more about this very remarkable building, and a wish that we should give an illustration of it in our pages. We comply with the request by presenting our readers this week with a lithographic illustration of the structure, and a more minute description than we were formerly able to give. This Triangular Lodge is unquestionably one of the greatest architectural curiosities to be found anywhere. Indeed, it may be described as unique. It is situated at one extremity of the park, in which stands Rushton Hall, the seat of Captain Clarke Thornhill, about four miles north-east of Kettering. Although there are no traces of its history left behind, yet it is clear that the Lodge has stood for nearly three centuries. It was built by Sir Thomas Tressham (or Tressam), who, during the visit made by Queen Elizabeth to the Earl of Leicester at Kenilworth, received the honour of knighthood. The family appears to have come into possession of Rushton in the reign of Henry VI. It has been supposed by some that the building was intended for a hunting lodge, from its lonely situation in the forest; by others, to have been used as a place of meeting for the Gunpowder Plot conspirators—(1605)—but, from the religious emblems and mysterious inscriptions upon it, and from the well-known character of its first owner, the more probable conjecture is that the building was erected as a retreat for private devotion. The triangular form of the building was evidently intended to symbolise "the Trinity," as Liveden House, from its form and carvings, was "the Passion." Almost every feature of the Lodge bears on the number 3. The form, as we have said, is triangular, as denoting the three persons, and in reference to the equality of the Godhead in the Trinity; all the triangles are equilateral; while over the door is the Latin text, "There are three that bear witness." Next, each side of the building measures 33ft. 3in. Then, the height of the parapet (28ft. 7in.), is exactly that which the apex of a triangle would reach with equal sides of 33ft. 3in. The Rev. H. Ward, who read a paper at the meeting referred to, remarked that he had little doubt, if he could have ascertained the height of the centre pinnacle, that it would just be comprised within a triangle of exactly the same size if lines were drawn from the corners of the building to it. Again, the building is of three storeys, with three windows in each storey on each of three sides, and each of these windows have divisions or compartments of threes. The shields of arms are arranged on each side in twice three couplets in three lines. Each of the Latin inscriptions consists of thirty-three letters, and the single words below them are three sets of two letters on each face of the building. The following are the Latin inscriptions on the frieze round the building, each side having thirty-three panels, with a letter in each:—"Aperiatur terra, et germinet salvatorem; quis separabit nos a charitate Christi; consideravi opera tua, Domine, et expavi." The arms are made of trefoils arranged in threes; and it may be noted that the very name of Tressham has a sound of three about it. The crosses in the lower windows—which are supposed to be a monogram of the initials of the owner's name—did not form part of the original design. They must have been inserted after the window was finished, as the mouldings round the small circular openings are injured by cutting through. On the three sides of the exterior are the following inscriptions, over the door:—

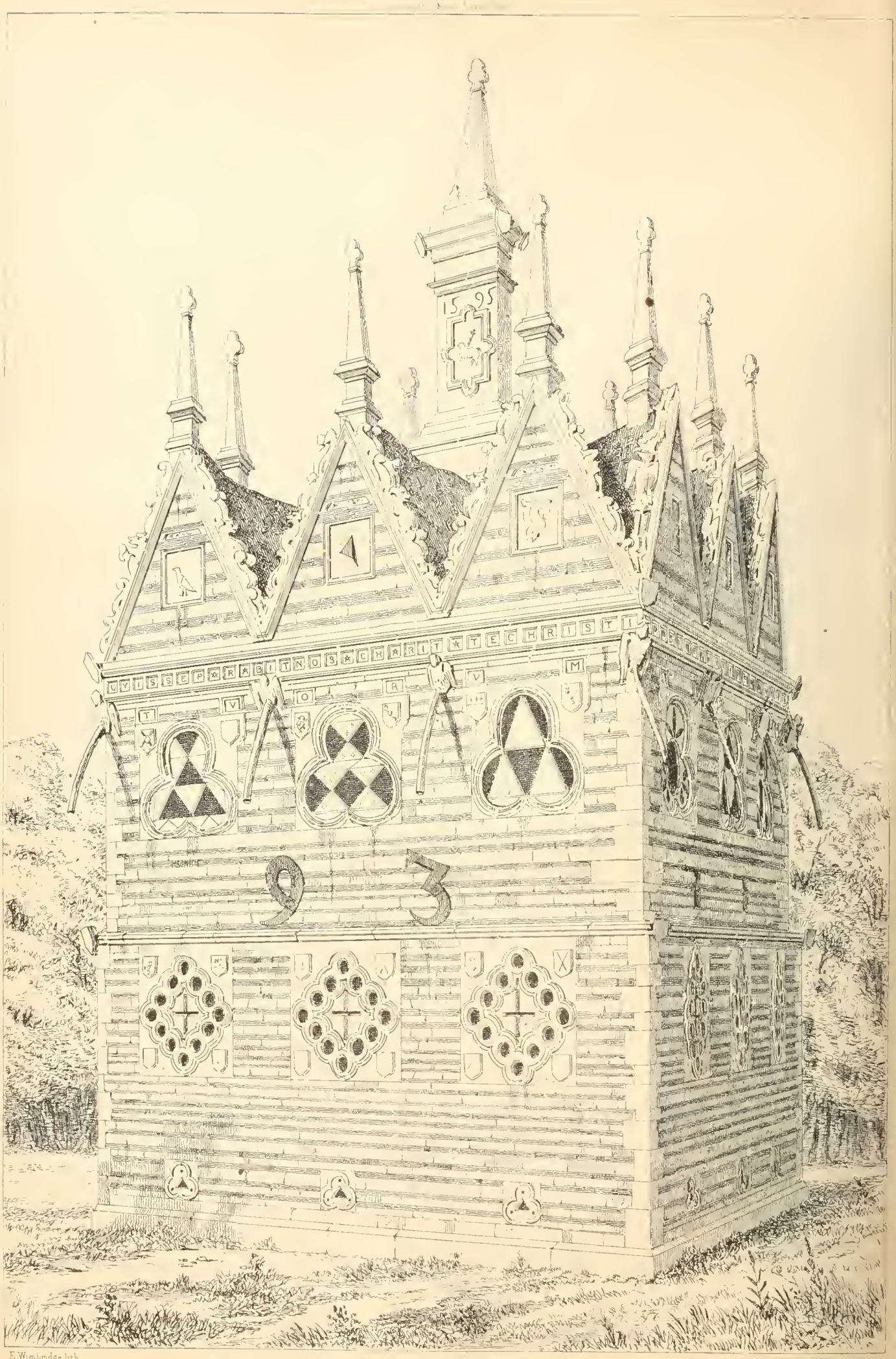
TRES-TESTI.
MONIV. M. DANT.
5555.

In the centre of the gables, "Visita mentes, non mihi: 3898; respicite, 3509." In the different fronts of the building we have these dates—1580, 1593, 1595, 1626, 1640. The iron ties in the three fronts, which are T. T. 15. 93, indicate, as is supposed, the date of the completion of the building. The turret at the top bears the date 1595, the year that part was finished. The Lodge contains one room of hexagonal form, with a table corresponding to it in the centre. There is probably also a vaulted apartment beneath. Liveden House, already mentioned, was also the work of Sir Thomas Tressham, who was a man of very peculiar temperament and taste. He was also the architect of the fine old manor house of Rushton, with its extremely curious interior, and of the market house of Rothwell, long since in ruins.

THE HOUSE OF COMMONS.

A CORRESPONDENT, who is usually well informed, writes:—There seems a general agreement that the House is to be enlarged, which of itself involves a pretty bill. But if in addition to a new House, and new dining and other rooms, we are to build new Government offices for every department, a quarter of a million will go a very little way. And, after all, the space is limited. The late Sir C. Barry, who got the discredit of many of the alterations insisted upon by Commissions and Committees, foresaw the need of more room, and proposed to enclose New Palace Yard, and form a new quadrangle, by a line of buildings continued west from the Clock Tower, and then south to the present Law Courts. The plan was abandoned on account of the expense; and it was certainly objectionable, in shutting out the exterior of Westminster Hall from public view. Accordingly, during the whole of the present session, workmen have been employed in laying the foundations of a low wall upon the site of the former row of houses, once terminated by Fendall's Hotel; and an elegant iron palisade is rearing itself upon the site of the old Magpie and Horseshoe, well known to thirsty witnesses upon the railway schemes of 1845.

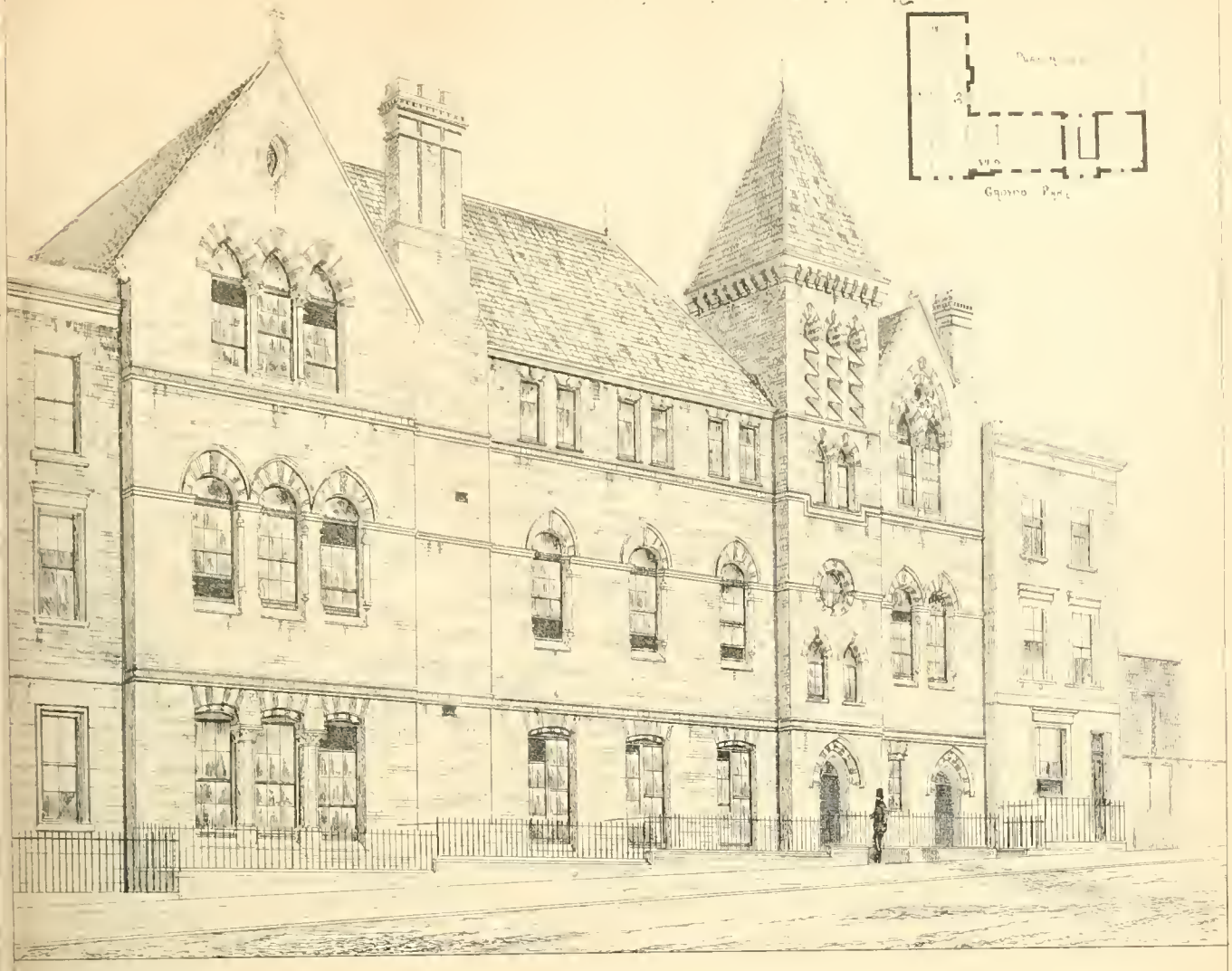
A useful invention by a nobleman is not of so common an occurrence as to be left unrecorded. For more reasons than one, therefore, we gladly notice the fact that the Earl of Caithness (already favourably known as an inventor) has just given us a mariners' compass on a new and improved principle. The new instrument was tested on board the new steamer "Russia," on the Clyde, the other day, and the result, it is stated, was in the highest degree to show its great superiority to that now in use. One of its chief recommendations is its simplicity, but there are other features, such as its not being affected by those influences that produce motion on other compasses, the absence of the pendulum, &c.



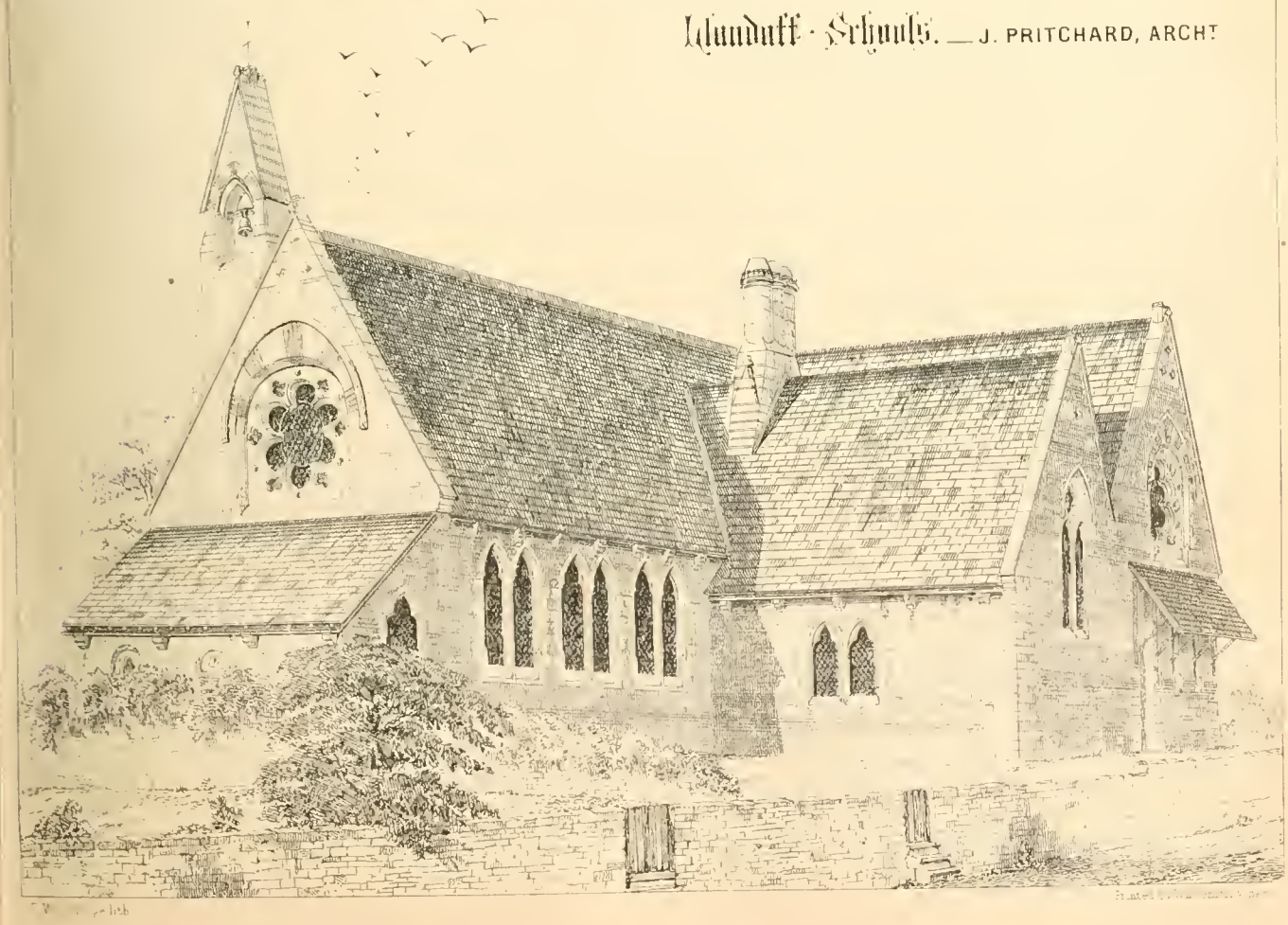
E. Wimbridge, lith

TRIANGVLAR LODGE – RVSHTON

St. Clement's Schools · Barnsbury. — LACY W RIDGE, ARCHT



Llanduff · Schools. — J. PRITCHARD, ARCHT



THE NEW LAW COURTS AND THE *QUARTERLY REVIEW*.

AFTER the daily and weekly papers and monthly magazines had given their criticisms on the competitive designs for the New Law Courts, we might fully expect that the quarterlies would follow suit. A quarterly reviewer is not only supposed to express his thoughts more deliberately, but he enjoys advantages generally unknown to a writer in a daily or weekly paper. He not only has more time to form and express his opinions, but he knows, or may know, what others have said on the subject. We therefore look to him for maturer thoughts and a riper judgment. The writer in the *Quarterly Review* has approached the subject in no timid spirit. He has grasped the pen with unusual energy, and distributed condemnations with an unsparing hand. It was said by some that the criticisms which appeared in our pages on the New Law Courts were chary in commendation, and unnecessarily severe. The writer in the *Quarterly*, however, sees in those plans scarcely anything to admire, and almost everything to condemn. He says with truth that the vastness of the undertaking, and the irretrievable permanence of the work, justify any degree of caution against an irreparable mistake, and he points to the New Houses of Parliament, which occupied so much public attention, and which have turned out such a disastrous failure. To prevent a similar mistake he would reconsider every intention, and deliberately measure every step that may be taken. He objects, in the first place, to building a "palace" at all. He would have a building more in harmony with the commercial character of the Strand. He would have no majestic building, involving symmetry, balance of wings, towers, and other architectural features. He would brush away with one dash of his pen all the elevations which occupied for nine months the dreams and thoughts of the competitors, and on which were lavished so many hopes and so much labour. He would prefer something like Sir Thomas Gresham's Exchange or the Palais Royal in Paris, which were so contrived as to combine the homeliness of trade with the splendour of the Court. To produce a great work of art, which should reflect credit on this age and be an object of admiration to future generations, appears never to have entered the writer's head. He says that by an accident the proposed site seems to force on us the arrangement which he suggests. The ground slopes in such a manner from Carey-street as to make the lowest storey towards the Strand in reality a basement. On the Strand front he would "place a range of really noble houses, with shops all life and utility along the street; their upper storeys (which might contain chambers and legal offices) enriched with delicate and varied work, and all crowned with those picturesque gables which would give us the only sky line fit for a London street, and the restoration of which is as essential to the very beginning as to the completeness of a revival of our street architecture." He would not even have this line of houses erected with symmetry of form and detail, but would entrust them to a "dozen or a score" of our best Gothic architects, who should combine their abilities, not to produce a captivating picture, but an example of architecture which would prepare the way for the transformation of the whole of London. He would combine the grace of one with the dignity of another, the picturesqueness of a third with the organizing genius of a fourth, for the desired result. He admits there was some feature whereby the new building should be known from a church or a theatre. It should express the purpose of its existence somewhere, and he would have a noble portal, with or without a tower, and in its design he would give ample scope for a full display of the resources of architecture. This "majestic portal should be as grandiose and as splendid as you please. Its whole form and every feature should express the calm dignity of English law." The suggestion, or, rather, series of suggestions, of this writer, are so revolutionary in their character as to render it impossible to select either of the designs submitted. He does not enter into the comparative merits and demerits of these designs, but would supersede them all as effectually as Paxton's design for the Exhibition of 1851 supplanted the various designs submitted for that work. Public expectation has been directed to one or other of the competitions, but here they are all disregarded, as equally unfit for the requirements of London. Having, at considerable length, carefully analysed the plans of the eleven selected competitors, there is no necessity that we should re-state our opinions, and we prefer, in this article, to indicate the views of the writer in the *Quarterly*.

This writer does not confine himself to a new arrangement for the exterior merely. He is equally bold and aggressive in his dealings with the interior arrangements of courts. He would treat the interior "as an aggregation of courts, not as a building cut up into rooms." He considers it desirable to have a central hall, and treats with something like contempt the idea of excluding the public from such a hall, as it is contrary to the spirit of the times. He would have each court separate, and, with its precincts, forming a group distinctly visible. Each court should have a dignity, a completeness, and an individuality of its own, its own special ante-chambers and ambulatories; each should be spacious, well-ventilated by direct access to the open air and sky, and cheerful in all its aspects and surroundings. This should be secured by good-sized open courts or quadrangles, not mere wells, as at Westminster. He complains that the buildings, as shown in the designs, are high enough to overshadow the width of Portland-place. Judges and barristers are a hard-worked class of men, and are well deserving light and air, which are so essential to the health of eye, and mind, and nerve. "And yet these gorgeous palaces, with their crowded areas and excessive height, are worse-conditioned than the squalid tenements which they supplant." The exaggeration of this statement carries with it its own contradiction. He instances Mr. Street's design, which has been particularly praised for its provision of light and air; but a glance at the bird's-eye view of this design, as illustrated in the BUILDING NEWS, shows that we look down on the space between the central hall and the outer shell as almost entirely occupied by *roofs*. The first obvious objection to this is that the specified space is insufficient, and we have no doubt that each contributor would say that he could not make bricks without straw, and that he could not give courts and quadrangles when there only was room for courts. The writer disposes of this difficulty with the greatest ease by asking for more space, which others have asked for before him. He admits that as the question has been discussed, architects and the profession have come to this conclusion. It has been discovered that Westminster Palace is too small for the two Houses of Parliament and their adjuncts, and he asks, "is it to be endured that a million sterling, or more, should be expended on twenty-four courts which will be so closely packed as to make them so many dark and dismal chambers, with tunnels and dirty skylights, viaducts and bridges, pits, hydraulic lifts, and other appliances, to make seven acres of land do the duty of fourteen?" No doubt if the competing architects had twice as much space they could have obviated the difficulties here spoken of. They acted in accordance with instructions, and endeavoured to turn to the best account the room at their disposal. A thing that is worth doing is worth doing well, and we may work in haste and repent at leisure, and before the final award is given, or, at all events, before the foundation of the building is laid, it is well to reconsider this all-important question of an extended area. The reviewer proposes to obtain it by going west, and appropriating the small "Inns," Clare Market, and Holywell-street. He would, in fact, have the whole ground from Chancery-lane to Newcastle-street, and from the Strand to Carey-street, within the scope of the present scheme. "Give me," said Archimedes, "a fulcrum, and I will lift the world." Give either of the selected architects space enough and money, and no doubt he would produce something which should even command the admiration of the *Quarterly* reviewer. That gentleman does not shrink from difficulties, small or great, and he would remove, without a twinge of conscience, the two churches from their present obstructive and noisy sites. Temple Bar is not surrounded with sufficient historical reminiscences to justify its continuance or reproduction. The frontages to Chancery-lane, Carey-street, and Newcastle-street, should be characterized with a corresponding simplicity in architectural detail as the Strand front, and the rents of the offices along these fronts, and especially of the shops in the Strand, would go some way to cover the extra cost of the site. We have merely indicated the scope of the article, which will amply repay attentive perusal. A substantial extract in another column states what the reviewer thinks of modern English architecture and architects.

PRESERVATION OF TIMBER.

No. II.

IN the year 1838 Mr. Bethell took out his patent for preserving timber by the injection of creosote,* and very soon after it found favour with some of our railway engineers, as we find in 1840 this method was in use on the Eastern Counties Railway (now Great Eastern). The half-round sleepers laid down at the Burnt Mill station were prepared by this process, and inspected nine years after (1849) by two of the directors from the Midland Great Western Railway of Ireland, in company with G. W. Hemans, C.E., in November of that year, when they found, after inspecting the sleepers both in wet and dry places, in every instance the creosoted timbers were sound, and smelling strongly of oil when cut, but other sleepers used in the same locality which had not been thus prepared, were in some cases black with rot, and in most instances considerably decayed. The same deputation afterwards went to the Gravesend and Rochester line, where creosoted and other sleepers had been laid four years previously (1845) on a very wet soil on the banks of the Thames and Medway Canal. Here they found precisely the same results as they had witnessed on the Eastern Counties Railway, the creosoted sleepers being sound, the uncreosoted rotten.† The deputation also visited the line from Manchester to Crewe with the like results; and after returning home sent in a report to the general board strongly recommending the use of this preparation for all their timber, which was adopted with satisfactory results. In 1853, M. Molinos read a paper in France on the preservation of wood,‡ wherein he stated "the heavy oils gained by distillation from tar, and known under the name of creosote, have been long employed in England for the preservation of timber, and no one instance can be produced in which they have not had a most complete success."

Creosote forms a very hard compound with vegetable albumen, acts as a most energetic poison to all insects, its very odour being sufficient to drive them away, and, moreover, as proved by experiments, does not deprive the wood of its power of resistance; but much prejudice against its use seem to have been created by the decay of timber treated

* See Burt "On the Nature and Properties of Timber," page 19.

† See paper read by John Paton at the Institute of Civil Engineers, November 27, 1849.

‡ Memoirs of Society of Civil Engineers, Paris.

by the pyrolignite of iron, and still more so by the niggardly and disgraceful mode in which the creosote itself has been used, for in many samples we have seen no more is found in the timber than it would be able to absorb by a very short immersion. Dr. Letheby, in bearing testimony to the efficacy of this mode of preserving timber, states that "the dead oil of common coal tar contains all the elements which are necessary for giving permanent stability to organic compounds by checking decomposition, by opposing the process of oxidation, and by destroying the vitality of the lower forms of animal and vegetable life. If, indeed, the application of creosote to timber has ever failed in preventing decay, it has been because of the improper use of it. In point of fact, its preservative action is of four kinds :—

"1. It coagulates albuminous substances, and gives stability to the constituents of the cambium* and cellulose of the young wood.

"2. It absorbs and appropriates the oxygen which is within the pores of the wood, and so checks, or rather, prevents the eremacausis of the ligneous tissue.

"3. It resinifies within the pores of the wood, and in thus way shuts out both air and and moisture.

"4. It acts as a positive poison to the lower forms of animal and vegetable life, and so protects the wood from the attacks of fungi, acori, and other parasites.

"No doubt the action of the oil is injurious to higher forms of animal life. It is even offensive to ourselves, and hence the objection to its use in the interior of buildings. But I am led to think that this objection may be overcome by the use of agents, which, like nitric acid in its action on the benzole of the lighter oil of coal tar, may give to the dead oil a less offensive if not a positively pleasant odour. When this is accomplished there can be no objection to its use in the interior of buildings, or for the preservation of ships." Messrs. Armstrong and Foster, of Sunderland, who creosoted a quantity of pit props for the proprietors of the South Durham Colliery, hold from Dr. Letheby a testimonial which states that "after fifteen years they are to all appearances as sound as when first put down in the pit."

Mr. Bethell, of King William-street, had, in February last, a piece of a creosoted sleeper sent him from the Lancashire and Yorkshire Railway, which had borne service for nineteen years, and is now in a state of perfect preservation. Mr. R. Badge, who forwarded it to him, states that "during a period of twenty years, I have creosoted above a million of sleepers, as well as large quantities of timber of various kinds, and from my experience gained during that time I would recommend that all timber be creosoted which is intended to be placed in exposed situations." As a further proof of the thorough efficacy of this mode of preserving timber, we may state that J. Abernethy, Esq., of 2, Delahay-street, Westminster, the engineer to the West Pier at Swansea, has recently been extending the works 1,000ft., chiefly with creosoted timber, and also bears testimony, so lately as April last, that the timber was not in any degree rendered brittle by the process. The ground being exceedingly hard and trying for pile-driving, the result of a work of this description affords the very best test of this fact. Creosoted woods having been subjected, in fact, for the last thirty years, to various and conclusive experiments, and whether immersed in water or buried in the earth, have always completely resisted the different destructive actions to which they have been submitted. We believe, therefore, that on the strength of these long-continued experiments we must regard this method as the best preservative actually known.

As in the previous paper mention was made of sleepers sent out to India, it may be as well to see in what light this method is looked upon there. In the excerpt minutes of proceedings of the Institution of Civil Engineers, Session 1862-63, Mr. Bryce M'Master gives an account of the difficulties engineers had in 1858 to obtain sleepers for the Madras Railway, when, in July of that year, an establishment was sanctioned for the working of the Salem Jungles, from which a large portion of the railway was supplied with sleepers. The supply of good timber was far short of the demand, and wood was used, green and unseasoned, to complete the laying of the permanent way. During the year 1859-60, 46,000 sleepers were cut in the Salem Jungles, and the following analysis shows the waste of timber and the great expenditure that prevailed at that time, and how large the number of sleepers which can be obtained if artificial means are used for preserving those of a perishable nature :—

The sleepers here referred to may be divided as follows :—

	Good.	Bad.
Known to be good	82,000	...
Known to be bad	...	96,000
Not known, of unsanctioned woods, and probably rejected	...	46,000
Ditto, of sanctioned woods, allow one-half to be good	11,000	...
Ditto, of sanctioned woods, allow one-half to be bad	...	11,000
TOTAL	93,000	153,000*

It therefore appears that of these 246,000 sleepers, about 62 per cent. were practically useless. In a communication in the *Times*, dated Calcutta, January 8, 1863, public attention was called to this matter, as the following extract will show :—"Take the one item of railway sleepers. India is a country where damp, dry rot, and white ants consume the best sleeper in six years, and what will Government and the shareholders say to the cost of renewing the sleepers, which, on the Calcutta and Delhi line alone is estimated, at present prices, at £130,000 per annum." Mr. M'Master gives the four following valuable estimates, showing the cost of one mile of single line of permanent way in the Madras Presidency, viz. :—

No. 1.—With Cast-iron Sleepers.

Rails, fishplates, bolts and nuts, cast-iron sleepers, wrought-iron tie-bars, gibs and cotters, and keys, delivered at Madras, per mile	£2,065	0	0
Conveying 25 miles by carts, 262 tons at 6d. per ton per mile	164	0	0
TOTAL COST PER MILE . . .	£2,229	0	0

No. 2.—With Creosoted Sleepers sent from England.

Rails, chairs, fishplates, bolts and nuts, delivered at Madras, per mile	£1,439	15	0
Conveying 25 miles, by carts, 164 tons, at 6d. per mile . . .	102	10	0
Keys and trenails, native-made, and carried 25 miles	47	0	0
1,584 English creosoted sleepers, delivered at Madras, each 7s. 1d.	561	0	0
Conveying ditto 25 miles by carts	100	0	0
TOTAL COST PER MILE . . .	£2,250	5	0

No. 3.—With Native Wood Sleepers, used plain.

Materials and carrying, as before, per mile	£1,589	5	0
1,584 plain native wood sleepers, each 6s.	475	4	0
TOTAL COST PER MILE . . .	£2,064	9	0

No. 4.—With Native Wood sleepers, Creosoted.

Materials and carrying, as before, per mile	£1,589	5	0
1,584 native wood sleepers, creosoted, 5s. 6d. each	435	12	0
TOTAL COST PER MILE . . .	£2,024	17	0

The reason of a less price being allowed in these estimates for creosoted native sleepers than for plain native wood is that to ensure the duration of plain native sleepers for a sufficient length of time, a high price must be given for hard woods, whereas common soft woods for creosoting might be obtained at much cheaper rates. It would appear from the above comparison that English creosoted sleepers make the dearest, and native creosoted sleepers would make the cheapest road. Best Baltic red pine timber is extensively used for floors of bridges, viaducts, &c., having been previously prepared by creosote, and is found to preserve it from wet and damp, and is mostly specified for such works by our best engineers ; and Mr. Brotherhood, C.E., lately sent out timber for forty bridges in Ceylon, to replace bridges built of lignum vitæ, which had been eaten by ants, but creosoting prevented the ravages of those insects in India and Ceylon.*

TRICKERY EXPOSED.

THE following letter has been addressed to the Editor of an obscure weekly paper :—

BUILDING NEWS OFFICE, 166, Fleet-street, July 24, 1867.

To the Editor of the "BUILDERS' WEEKLY REPORTER."

SIR,—I suppose such a questionable publication as the one above-mentioned must have an editor of some sort, and I therefore address an observation or two to him. I have long been aware that your paper habitually begs, borrows, or steals much of its contents; but I have not hitherto thought it prudent to say anything about it, as I did not wish to advertise it by even rebuking its editor. I do not suppose that one in a hundred of the readers of the BUILDING NEWS knows of the existence of your paper. Some things stink the more they are stirred, and I have consequently left the *Builders' Weekly Reporter* alone. But nuisances, when they become intolerable, must be mitigated or removed; and I therefore give you notice that unless you mend your ways I will stop your publication by injunction. Though insensible to reason you will no doubt cower before an impending judge's order. The BUILDING NEWS, July 5, contained an original review of Dr. Oppert's work "On the Construction of Hospitals." In your number for July 15, you reprint this review, word for word, in leading type, as a leading article, without acknowledgment. You did not even have the common courtesy to mention at the foot of the article the title of the book, its author, and publisher, and thereby did a double injustice, first to the BUILDING NEWS, and secondly to Dr. Oppert. Had this been the first or fiftieth offence of the kind, I should have passed it over in silence; but it is your constant and unvarying practice. The very first "leading" article in this number, for the 15th of July, is taken without acknowledgment from the *Builder*. You appropriate other people's goods on principle, if that word can be applied to anything so disreputable. You disregard all trade regulations by publishing your sheet on the MONDAY, so that you may rifle the contents of the *Builder*, the BUILDING NEWS, the *Engineer*, the *Mechanics' Magazine*, and other papers, almost as soon as they appear. No journal that aims at a circulation is dated and published on the Monday, as the London newsagents make all their arrangements for collecting publications and sending off parcels to the country the *latter part* of the week. You cannot care about circulation, or you would follow the custom established by all well-known and widely circulated journals, and publish on Friday or Saturday. If you appeared simultaneously with these journals, you would be unable to appropriate the articles that appeared the same week. Hence you appear to work all day on Sunday in collecting materials from other papers, and publish on the Monday,

* Cambium, or "formative fluid," or "organic mucus," or "organisable matter," all of which terms have the same original signification," and is the sole source of production of every tissue found in plants.

* Page 13 and following, "M'Master on the Woods Used for Sleepers on the Madras Railway."

* See Price Williams's paper on Permanent Way, 1866.

and then you flaunt your sheet before the eyes of ADVERTISERS as an original production. Advertisers are really the most gullible people in the world. As a rule they do not read the contents of the publications put before them, and they are much too apt to believe any exaggerated statements told them. The *readers* of scientific papers know better, and do not buy journals full of secondhand information.

Now, Sir, if you cannot afford to pay for original contributions, have the ordinary honesty to acknowledge the sources of your information. Poverty is no disgrace. You need not be both poor and dishonest. You are at liberty to appropriate articles from the BUILDING NEWS whenever you like, but only say so. Try and turn over a new leaf, if not in obedience to a correctly inspired motive, for the sake of the journalistic profession. A crust tastes all the sweeter when accompanied by a conscience void of offence; and I do not see why you should be debarred from such a luxury. I know it is difficult to abandon rooted habits, and I therefore sympathise with you. Others have remonstrated with you in vain; but possibly these remonstrances were not coupled with a threatened injunction. An appeal to Cæsar has a wonderful effect on some minds, and particularly on those that are indifferent to considerations of honour, and susceptible to the logic of force.—I am, &c.,

J. PASSMORE EDWARDS,
Proprietor "BUILDING NEWS."

Building Intelligence.

CHURCHES AND CHAPELS.

The foundation stone of the new Methodist New Connexion Chapel at Shelton was laid on Monday. The style is Early English. The walls will be of brick, with Hollington stone dressings, and the building is intended to seat 450 persons, and will cost over £2,000. The architects are Messrs. Scrivener and Son, of Hanley, and the contractor is Mr. C. Woolridge, of the same place.

There are now 1,553 Roman Catholic chapels, stations, convents, male communities, colleges and schools in England, and 259 in Scotland. There are five in the Isle of Wight, and the same number in the Isle of Man.

The parish church of Leek—an ancient Gothic structure, dedicated to Edward the Confessor, has just been restored by Mr. Street, at a cost of £3,500. The contractor was Mr. John Naden, of Leek.

The restoration of the parish church of Woodford, Northamptonshire, has been completed. Mr. Fowler, of Louth, was the architect of the chancel restoration, and the body of the church was under the supervision of Mr. Slater, architect. The builder was Mr. Allen, of Irthlingborough. The parish church of Hornsea (St. Nicholas) was last week reopened by the Archbishop of York. The architect is Mr. G. G. Scott, the clerk of the works Mr. William Sissons, of Hull. Messrs. Barr, of Hornsea, are the builders; and Mr. Waller, of Hull, the mason. The entire cost of the restoration will be about £3,000.

A new Wesleyan chapel has just been opened at Fairfield, near Liverpool, the cost of which (£9,000) has been defrayed by Mr. Leather, merchant.

The church of St. John, Torquay, now being rebuilt, under the directions of Mr. Street, was last week struck with lightning, and damage to the amount of £100 was done. Some of the stones were carried a distance of more than 100 yards south of the church, falling through the roof of a shop on the strand.

BIRMINGHAM.—Mount Zion Methodist New Connexion Chapel, in Horsley Fields, was opened last week. The edifice is in the Anglo-Italian style. The principal feature of the chapel is a handsome portico of peculiar form, 20ft. long, with circular ends, supported by four detached columns of Corinthian character, with rich foliated capitals of stone work. The plan was supplied by Mr. C. Manton, architect, of Wolverhampton, and the works have been carried out under his direction.

BROADSTAIRS, KENT.—The Church of the Holy Trinity of this place has recently been considerably enlarged under the superintendence of Mr. E. Smith, of 45, Upper Bedford-place, Russell-square, at an outlay of £1,200.

PARIS.—The restoration of the beautiful Sainte Chapelle, built by Pierre de Montereau, by order of St. Louis, is just terminated; besides the chapel which is well known to visitors, there is another below, which has hitherto been closed; this is now completely repaired, the walls decorated with paintings, the windows filled in with stained glass, and the floor laid with mortuary stones of the fourteenth and fifteenth century. This chapel will shortly be added to the list of interesting sights in Paris.

SUNDERLAND.—The Wesleyan Methodists intend erecting two new chapels, one in Herrington-street, New Hendon, the other at Monkwearmouth. Mr. Tone has the contract for the erection of the former building, which will be in the Italian style, from plans prepared by Mr. Tillman, architect. The chapel, which is of stone, will seat about 850 persons, whilst the adjoining schools will be brick, and accommodate 400 children. The buildings to be erected at Monkwearmouth will be somewhat similar to those in Herrington-street, and the entire cost of both is estimated at between £6,000 and £7,000.

WESTON-UNDER-PENYARD.—The quaint old Norman church at this picturesque village has recently been restored. The church consists of a nave and north aisle of the early Norman period; the chancel had been rebuilt at a later date. The tower and half-timbered porch are in a still later style of architecture. A new chancel arch and screen wall has been built of local red stone, and a new sedilia in the architect of the fourteenth century, of Forest of Dean stone, has been inserted. The architect is Mr. G. E. Street, and the work has been executed by Messrs. Collins and Collins, builders, of Tewkesbury.

BUILDINGS.

A Methodist college is to be established in Ireland. It is to cost £22,000, of which sum £17,000 has been raised.

Messrs. Nelson and Sons, the publishers, have purchased a large range of buildings at the corner of Warwick-lane and Paternoster-row (the ground rent of which is £1,600), for the purpose of erecting new publishing premises.

The Strand Music-Hall has been an unfortunate work from the commencement. Its architecture called down almost universal condemnation. As a commercial speculation it has been a disastrous failure. The furniture it contained has recently been sold by public auction, and the building itself, it is said, is likely to be purchased by the Jews for a synagogue.

OLD BUILDINGS IN LONDON.—A correspondent to a contemporary, in speaking of the buildings which are now being removed to make way for the New Law Courts, says:—I went down to look at the old buildings last week, and found something to attract my notice. The bressummers were, in every instance, considerably bent downwards. On looking on some of the upper brickwork, I found it cracked and bulged over the place where the bressummer showed the greatest curve of deflection. The dimensions of the beam appeared to me to be too small; in fact, not more than half the scantling I should put in myself. If to this is to be added the employment of imperfectly seasoned balk, the cranky state of the old buildings may be accounted for in the front part. In some of the single parti-walls I observed a distribution of glazed bricks. What could they be doing there, scattered up and down like plums in a slice of Christmas pudding? Some of the mortar was so chalky, as if marking a deficiency of sand. I placed several lumps under my heel, and crushed it like a bit of whiting. In the interior walls the work in several places seemed to have been done by copper-setting jobbers, and done abominably. Nothing could look more tumble-down, deplorable, or disgraceful to the art and mystery of bricklaying.

The first gold medal given by her Majesty the Queen, to be competed for annually by the students of the Female School of Art, 43, Queen-square, has been awarded to Miss Alice Manly, for three groups of flowers, painted in tempera from nature. The adjudicators were Mr. Westmacott, R.A., Mr. Cope, R.A., and Miss Mutrie. Miss Manly is also, this year, the successful competitor for a national silver medal given by the Science and Art Department.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the EDITOR, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty four Words.

RECEIVED.—V. and Son.—E. W. P.—R. M. B.—J. T. B.—T. P.—C. W. S. B.—S. and L.—T. G.—E. P. E.—B. and P.—I. M. T.—R. T. H.—W. W.—P. T. G.—S. T. G. (send stamps and the numbers shall be sent).—J. H.—W. R. W.—E. J. R.—R. M. J.—A. G. H. A. M. F.—A. R.—E. S. N.—H. H.—J. and W.—J. E. G.

J. H. R.—The price of Mr. Colling's "Art Foliage" is £2 2s.

In No. 445 Intercommunication (answer) the name Kattray should be Rattray, of 5, Minshull-street, Manchester.

"Provincial" is informed that Willcox's "Sketches of Early French Architecture" are not published in a separate volume, but will appear from time to time in the BUILDING NEWS.

W. E. G.—Letter reads too much like a puff.

J. J.—You can get the desired information in any glossary of architecture.

FABER (Manchester).—Your agent is at fault. You ought to get your BUILDING NEWS on Saturday morning at latest. It is published on Friday mornings at 6 o'clock.

Correspondence.

THE WEST LONDON SYNAGOGUE COMPETITION.

To the Editor of the BUILDING NEWS.

SIR,—Having had the pleasure of inspecting the designs sent in for the above, which were on view at the Synagogue, 50, Margaret-street, Cavendish-square, I shall feel obliged by your inserting the following observations, as I think they will interest those who were unable to see the plans; and, also as the present is another remarkable instance of the great uncertainty of competition, and the unfairness with which they are nearly always decided. This is most palpable, even to an unprofessional eye, in the competition under notice; and the only conclusion to be derived from the circumstances is, that favouritism and interest decided this, as it has previously determined many other competitions.

Mr. Cockerell's design, No. 1, has a rather mean elevation in Berkeley-street of a Moorish character, and is, I must say, both ugly and incongruous. There is a comical protruberance on the roof, looking as if an enormous dumpling had fallen on the ridge. This I found was to form a species of dome, and is perforated by lights, giving the interior a very gloomy appearance. Both the elevations are meagre, and entirely unfitted for this climate; they are too eastern, and decidedly plain. The seats are crowded up on plan, and the pulpit is crammed into an out-of-the-way corner, where (taking into consideration the great intervening columns or piers), it would be quite impossible for a large portion of the congregation to get a glimpse of the minister, even if they should be fortunate enough to hear him. Another great defect is the want of sufficient space for perambulation. I do not think that either of these designs have had sufficient consideration, and the effect of the gloomy colouring made me feel very sad, until I happened upon a lively water-colour sketch in the corner of one of them, representing Miss Miggs hanging out the washing. At this I felt relieved; and still more so when, upon another, I discovered a faithful representation of the family water-butt and birch broom.

Being in a happier state of mind, I passed on to Mr. Papworth's designs, which were very good, but severely Greek, yet so pure that I hesitated to criticise. But for all that I do not think the style appropriate. The designs are evidently well considered, though I fear that Mr. Papworth's masterly hand has been too much fettered in endeavouring to fulfil building committee requirements. These, as every professional man is aware, are invariably issued by a body of individuals completely innocent of architectural knowledge; and, generally speaking, the so-called instructions, by their vagueness and inconsistency, conduce to the production of an abortive design. The western elevation is of solid merit, and the arrangement of ground plan is good; but here, also, there is not sufficient room for perambulation, nor are there enough urinals. All the gentlemen have to pass up the length of the building to one spot, to

reach the retiring room. The ladies' staircase is not sufficiently commodious, and I do not admire the appearance of the flatly curved ceiling, nor the construction of the roof with iron joists, concrete, and asphalte.

I next inspected the selected designs, those of Messrs. Davis and Emanuel; but for what excellence they were chosen I am at a loss to discover. The shape of the ground plan is execrable, being 69ft. 3in. wide, and 66ft. long. Then, again, one of the principal rules in synagogue construction is violated, as the authors, in order to obtain the requisite number of seats, place some eighty odd sittings between the reading desk and the sanctuary, where, owing to the processional nature of the Jewish service, no obstacle should exist; and the space between reading desk and altar is, therefore, always (in good examples) left clear. In the internal perspective of design A, these seats (although existing in plan) are not shown, which I consider is calculated to mislead. Everything in this design appears to have been sacrificed in order to produce a large vestibule or retiring room, with urinals, water-closets, and lavatories between the hall and the synagogue, thereby placing the conveniencies in the most objectionable position possible. The entire synagogue is made a passageway to the retiring room, and the vestibule, at the time of congregation leaving, would be converted into a species of crush room, where everyone would be pushing in different directions, the whole being rendered worse by a nasty flight of four steps down in the hall, where they are dangerous in the extreme. It was evidently essential that the entrance in Berkeley-street should be the principal, if not, indeed, the only ingress for the accommodation of the large number of one thousand persons; and I should have thought, seeing the many examples that architects have had under their attention of late years, that the rudimentary arrangement of uninterrupted ingress and egress would have been considered by the authors and the committee. It appears to me, however, that this, like many other of the elements of design, has been singularly neglected. There are only four doorways to the body of the synagogue, which are scarcely sufficient for the speedy clearance of the building. The gallery arrangements are equally bad, as they project so far as to destroy the requisite acoustic proportions, and the voice of the minister would be lost beneath them. Again, they are arranged as steep as a precipice, and the upper galleries especially are fearful to contemplate. No person sitting in them could feel safe, and the steps and gangways leading to seats are hazardous in the extreme, having as many as three, four, and even five steps down between front and back of pew. The interiors are remarkable for want of character. That of "*a*" has a flat ceiling, certainly not up to the ordinary music-hall architecture, to which it bears some faint resemblance. Design B has a nondescript dome, and no style about it at all, and very little originality. The elevation in Berkeley-street is Moorish, and somewhat resembles Mr. Cockerell's. The ground plan is noticeable for the extreme fidelity with which the pattern of tile paving is shown, and the joints of the stones in street footway are faithfully rendered. I fear that by the arrangement of ground plan and upper portion of building, the light and air to adjacent houses on Berkeley-street side must be seriously interfered with, as the synagogue building is only 4ft. 11in. distant from the existing buildings. In design B the same error as to seating in front of reading desk is perpetrated. The galleries have the same defect as in first design; and the sanctuary, in both instances, bears too great resemblance to that of the Berlin synagogue.

The most perfect set of designs, in my opinion, are those of Mr. Collins, who appears, from the simplicity and correct adjustment of his plans, to have had more practical experience in the construction of synagogues than the other competitors. A good feature of the ground plan is its having a corridor running the entire length of synagogue, and on each side thereof, for entrance and exit of congregation, and containing also the retiring rooms and conveniences. The side corridors also preserve the quietness of building, by interposing a space and inner wall within the external case of building. This arrangement is all the more necessary as the building is placed unfortunately in a rather noisy locality, bounded on one side by a mews, and close at hand is a forge and carriage factory. There are ten entrances to ground floor, four at each side and two at the end; and the whole of the vestibule and entrance to Berkeley-street is left perfectly clear from any impediment. Two spacious staircases lead to the ladies' galleries, and their retiring rooms, lavatories, &c., occupy a central and easily accessible position. The arrangement of the seats are efficient, and, whilst affording ample accommodation, are not crowded together. I noticed an ingenious model of the proposed seating by the same architect, with a neat and comfortable arrangement of book desks, with a separate cupboard under for each person. The seats hang upon pivots, so as to lift up and lay back, giving thereby greater space during the time the congregation are standing.

There are two interiors, one very light and Classical; and the other, Moorish, or rather of the Alhambra style; and this latter, to my mind, was much superior to any other in the room.

It has been announced that the committee had the professional advice of P. C. Hardwick, Esq., in arbitrating on the designs. This I can hardly credit, as the choice is evidently misjudged and non-professional; and, I venture to think, would have assumed a different aspect if the well-known, just, and impartial opinion of that gentleman had been appealed to.—I am, &c., Gentile.

[We think our correspondent has no right to assume that Mr. Hardwick's decision was not conscientious and impartial. When will architects give each other credit for purity of motive and sincerity of purpose, though they may differ in matters of taste and opinion. During the last week a gentleman who occupies an enviable position in the profession told us that he thought that Mr. Street had not selected the best design for the Bristol Assize Courts, because he was jealous of one of the competitors. When we stated that we thought that Mr. Street was incapable of being influenced in such a matter by any such consideration, the gentleman significantly shrugged his shoulders. Architects must endeavour to form a higher estimate of each other, and then probably outsiders will form a higher estimate of them.—Ed. B. N.]

ANCIENT AND MODERN FURNITURE.

Sir,—May I venture to suggest, in answer to your article on "Gothic Furniture," that the gentlemen who design these things seldom understand construction; and the difference between the modern system of joinery and the ancient being so great that most of the workmen and foremen who carry out the work do all they can to mar the effect, even if properly designed, and so few men understand the proper system of ancient joinery, that perhaps the conclusions I have arrived at, in restoring a great deal of ancient woodwork, may prove of use to others in the production of work of a similar character. These are:—

First. The ancient joiners never concealed the construction, but made it part of the design.

Second. No glue was used.

Third. The material was always small enough to make the shrinking or swelling of little consequence.

Fourth. Having no screws and few nails, pins were generally used.

All designers of Gothic woodwork should bear this in mind.

The principles of modern joinery, as now practised, are these:—

First. Conceal the construction as much as possible; hide and cover everything you can, till you make the work appear as if grown together, and as one piece. This is modern perfection.

Second. Use as much glue as you can—in fact, if it is possible, stick it altogether.

Third. Put the material in as wide widths as you can, as long as the panels do not shrink out of the plough. Groove it will do.

Fourth. Screws are the best construction; wherever you can use one instead of a tenor, do so.

When we see how diametrically opposed these principles are to each other we cannot wonder at so few good things being produced, and when we consider that many of the designers of Gothic furniture are gentlemen who do not understand the simplest constructions in joinery, our surprise must be that there is anything good produced. The two examples you have shown in your last number are at sea in construction, and a slight acquaintance with ancient work would prevent anyone from calling them attempts at early examples. The doors in the centres are constructed in a style I believe that belonged exclusively to the Elizabethan period, and are not Gothic at all. I have never seen a dovetail in Gothic joinery, and certainly never seen one used in this way. I should like to be corrected if it was used by them. Again, Gothic joiners always sloped their mouldings or finished with a mason's mitre. It remained for a later age to let them lose themselves before they intersected, but ignorance of this point causes many to mistake this. Hoping this will set them right, I am, &c.,

Dobroyd Castle, Robert Phillips.
Todmorden, July 16, 1867.

INSTITUTION OF CIVIL ENGINEERS.

Sir,—I am instructed to forward a copy of the bye-laws and regulations of the Institution of Civil Engineers, as amended and enlarged at a general meeting of members, held here pursuant to notice, on Wednesday the 26th day of June last; and I am particularly to direct your attention to Section IV., respecting the admission of students.

With a view of increasing the usefulness of the Institution, particularly to the junior members of the profession, it has been decided, you will observe, to create a student class, to take very much the place of that which was formerly the graduate class, but with certain modifications, so as to avoid the difficulties which previously arose, and to provide those advantages which experience has pointed out to be desirable

Although not specifically mentioned in the rules, it is contemplated to grant, under the control of the council, the use of the theatre of the Institution to the students, for supplemental meetings, for the reading and discussion of papers among themselves, and possibly, also, for the delivery to them of lectures upon special subjects; the object of such supplemental meetings being for the advancement in scientific and technical knowledge of the junior members.

Believing it to be of the highest importance that the profession should not be divided, but should remain one united body, having a position and an influence which one united body only can have, the Council trust that you will cordially unite with them in the endeavour so to extend and enlarge the basis of the Institution, as that it shall continue to embrace within it all branches of engineering and all classes of engineers.—I am, &c., James Forrest, Secretary.

25, Great George-street, Westminster, S.W.,
July 16.

EXTRACTS FROM THE BYE-LAWS.

Section II.—Constitution.

1. The Institution of Civil Engineers shall consist of three classes—viz., members, associates, and honorary members, with a class of students attached.

2. Members.—Every candidate for admission into the class of members, or for transfer into that class, shall come within one of the following conditions:—He shall be more than twenty-five years of age, shall have been regularly educated as a civil engineer, according to the usual routine of pupilage, and have had subsequent employment for at least five years in responsible situations as resident engineer, or otherwise, in some of the branches defined by the charter as constituting the profession of a civil engineer: or, he shall have practised on his own account in the profession of a civil engineer for at least five years, and have acquired a considerable degree of eminence in the same.

3. Associates shall be persons of more than twenty-five years of age, who are not necessarily civil engineers by profession, but whose pursuits constitute branches of engineering, or who are by their connection with science or the arts qualified to concur with civil engineers in the advancement of professional knowledge

4. Honorary members shall be either distinguished individuals, who from their position are enabled to render assistance in the prosecution of public works, or persons eminent for science and experience, in pursuits connected with the profession of a civil engineer, but who are not engaged in the practice of that profession in Great Britain or Ireland.

5. Students shall be persons not under eighteen years of age, who are, or have been, pupils of members or associates of the Institution, and who have the object or intention of becoming civil engineers; and such persons may continue students until they attain the age of twenty-six years, but not longer.

Section III.—Election, &c.

1. Any person desirous of being admitted into the Institution (excepting to the class of students) must be proposed and recommended according to the Form A, in which the name, usual residence, and qualifications of the candidate shall be distinctly specified. This form must be signed by at least four members and two associates, certifying a personal knowledge of the candidate. The proposal of any foreigner who may be desirous of joining the Institution shall be signed by at least one member, certifying personal knowledge of the candidate, and by at least three other members and three associates, certifying a full conviction of his qualifications.

2. The proposal so made, being delivered to the secretary, shall be submitted to the council, who, on approving the qualifications, shall determine the class for which the candidate is to be presented for ballot.

Section IV.—Admission of Students,

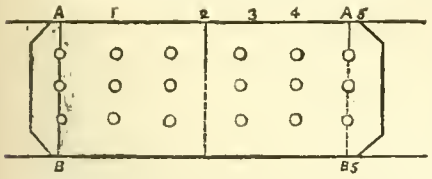
Any person desirous of being admitted by the council as a student must be proposed and recommended according to the Form A 2, in which the name, usual residence, and age of the candidate must be distinctly stated. This form

must be signed by the member or associate of the Institution under whom the candidate is, or has been, in the course of preparation and training, with the object of following the profession of a civil engineer, and be also subscribed by the candidate himself.

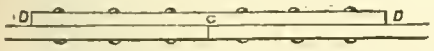
PLATE GIRDERS.

SIR,—I take it for granted that you are glad to have any apparent error in your paper pointed out, and therefore do not apologise for saying that you appear to me to have made a somewhat serious error in your article on plate girders, No. 5. I have not seen your previous articles, but from No. 5 I gather that you take the tensile and shearing strength of iron per square inch as equal, and on this supposition the area of the rivets on each side of the joints should equal the effective or nett section of the plate—*i.e.*, in the tension flange.

The joint shown in your drawing fails—if it fails at all—either by the plate giving across one of the shortest lines of fracture A B or A_5 B_5, or



by the shearing of the rivets along C D or C D. In



the latter case the resistance to shearing is simply the area of the rivets on one side of the joint × by resistance to shearing per square inch. The thickness of the cover-plate—provided it be thick enough not to fail itself by tearing—can have nothing to do with the question. The calculation should stand—Number of rivets × by area of one rivet × resistance to shearing per square inch, which in this particular case is $12 \times (\cdot 75^2 \times \cdot 7854) \times$ (5 tons say), and not $12 \times \cdot 5 \times \cdot 75 \times$ (5 tons say) as you have it.

If a second cover plate, of any thickness sufficient to prevent the rivets cutting into it, be put on the lower side, there would be two shearing surfaces, E F and G H, and the area of the rivets might be reduced one-half, and a better construction be got also.

H. W.

[As regards the question of "Cover Plates," in "Fairbairn's Application of Cast and Wrought Iron to Building Purposes," second edition, page 216, you will find (fig. 80) the following:—

"Eight rivets are required in each of the lines, four on each side of the joint, to give sufficient strength, and the area of the rivets collectively should be equal to the area of the jointed plates taken transversely through one line of the rivets, the area of the parts punched out in that line being deducted. These proportions give the required security to the joint, and afford nearly the same strength to a tensile strain as the solid plate, that is, if the covering plates be as much thicker as will give the same area of section through the rivet holes as the imperforated double plate."

In the example given in "Plate Girders, No. 5"

	in.
The sectional area of cover plate (15" × ·5") = ...	7·5
Deduct area of four ¾in. rivets = . . .	1·76
Area of section through rivets . .	5·74
Area of imperforated flange plate, 15" × ⅜" = ...	5·625

or practically the same as each other. It is not always practicable to get two cover plates (top and bottom), but no doubt it is very good, and is often used, care being taken that they are of sufficient thickness to prevent the rivets cutting them.]

MANCHESTER TOWNHALL COMPETITION.

SIR,—As a competitor, I strongly endorse the suggestion of your correspondent "X. Y.," that each drawing of the selected preliminary design should receive the corporate seal, and that it be a condition that the same drawings be exhibited in the final competition. I cannot see how piracy—*sub rosa*—is to be prevented, or the especially good points of one plan transferred or grafted on to another. If it be necessary, I think that such competitors as choose might jointly memorialise the corporation on the subject. The attempt at preservation of the anonymity in the second competition is futile as far as the corporation are concerned.—I am, &c., J. H.

PAYING FOR ESTIMATES.

SIR,—Can anyone inform me on the following case:—A gentleman came to me, and said he wished me to give an estimate for some repairs to a house which he had bought. The repairs consisted of whitewashing, painting, papering, and carpenters' work and plasterers' work. He did not furnish any specification or writing of any kind; nor did he say that he should have an estimate from another party. I had to measure the work and estimate from it. I left the estimate at the gentleman's house, who told me he would let me know: and, without taking any further notice, he gives the job to another builder. I wish to know, under these circumstances, whether I cannot charge for my time; and, if so, what charge is usual; should it be for time or a percentage on the estimate? I do not complain of not having the job, as every man has a right to get whomsoever he pleases to do his work, but I most decidedly object to have my time taken up, which might have been profitably employed. It is the custom with a great many to run about from one place to another to see who will do work cheapest, and for all I know this man may have taken the paper which I wrote, specifying what was to be done to the said house, and to get other estimates from that.—I am, &c.

DEAL ON THE SQUARE.

DELIVERY OF THE *BUILDING NEWS*.

SIR,—I am happy that your publication finds such a ready sale, but I do not like being disappointed, after many years' subscribing to your journal, as I was last week. When I called for my BUILDING NEWS, the answer was, "They have not come down yet; there is not sufficient printed; wait until next week." I called again to-day, but no last week's BUILDING NEWS to be had. Now, Mr. Editor, I shall be glad if you will see to this. Your journal is of great value to the profession in Manchester, and we do not like to be disappointed,—I am, &c., CHARLES BARNETT.

Manchester, July 25.

[Either the London or Manchester newsagent must be at fault. The BUILDING NEWS is published every Friday morning at 6 o'clock, and should be delivered in Manchester on Saturday morning. We have recently received several complaints, but the blame does not rest on this office.]

METROPOLITAN SUBWAYS.

SIR,—I observe that a great deal of controversy has been waged recently in reference to this subject. Can you explain how it is that there is always so much opposition shown to improvements which have for their objects the facilitation of traffic through the streets of London, and the advancement of practical science? Surely, the formation of subways under the main thoroughfares of the metropolis for the reception of gas and water mains must contribute to both those ends! We all have had painful experience of the evils arising from the disturbance of roadways, caused by the ever-recurring reparation or relaying of pipes beneath them. All these would be obviated by the creation of a system of subways, and yet those giant monopolists, the gas and water companies, oppose their construction, and even refuse to avail themselves of those already existing. Why is this, sir? and why is it allowed to hinder the promotion of public convenience?—I am, &c.,

SUBTERRANEAN.

ASSISTANT ENGINEERS AND DRAUGHTSMEN'S BENEVOLENT ASSOCIATION.

SIR,—When the above institution has assumed a tangible shape I would suggest that branches be organized throughout the country. Will Mr. Bancroft please state what would be the subscription; also the advantages to be derived; and any other information he may be in possession of will oblige several of the fraternity in the country.—I am, &c., SAML. BRIGHT,

3, Prince of Wales-terrace, Rochdale-road,
Manchester, July 16.

Though an effort was made some time ago to call the New Law Courts "The Courts of Justice," by some means or other the public won't have that name. We suppose the reason is that "Law Courts" sounds more English than "Courts of Justice." Besides, it is shorter, more homely and acceptable, and is certainly likely to be more durable.

Intercommunication.

QUESTIONS.

[494.]—WEIGHT OF LIME.—I shall feel obliged if some one will inform me what is the weight of a cubic yard of stone lime.—J. L.

[495.]—PIGEONS.—Could any friend inform me how I can legally get rid of some pigeons my next-door neighbour has, to my great annoyance? They spoil my roof, and break my rest all night. Can I shoot or poison them when they are on my own premises?—G. W. F.

[496.]—ESTATE AGENCY BUSINESS.—I wish to know what are the usual terms for transacting house and estate agency business. I am an architect and surveyor in provincial practice, and would like to increase my business by the above means, but I don't know what are the usual charges, or whether the agent has to draw up the agreement. —R. COWLEY.

[497.]—GREENHOUSES.—I wish to have a greenhouse about 9ft. × 5ft. Could any of your numerous readers tell me how or where I can get one at a moderate sum? I think I have seen some advertised in the BUILDING NEWS, naming size and price, but have looked in vain.—J. C. M.

[498.]—THE "BUILDING NEWS."—Please inform me if the BUILDING NEWS from January to the present time can be had. I have ordered them through my bookseller, but the answer is "out of print." My customer is very desirous of having and continuing the work, if it is possible to obtain it from the beginning of the year.—HENRY PACE, 15, High-street, Reading.

[Our correspondent and all other similar inquirers are informed that all the numbers from January this year to the present time are in print. The London agent has reported falsely.]

[499.]—EARLY ARCHITECTURE OF FRANCE.—Will you kindly inform me whether it is intended to continue the series of sketches of the "Early Architecture of France," by Mr. Willcox, in the BUILDING NEWS, or whether the one given in your number for July 12, is only a specimen; and, if so, where the series may be obtained.—R. A. L. NUNNS.

[It is intended to continue this series of sketches in the BUILDING NEWS. They are being sketched exclusively for this paper.

[500.] — MICROSCOPE-PERSPECTIVE. — Can some reader kindly inform me what to use to black the inside of the tube of a microscope with, and how to mix and apply it. I am like "Once a Hod Boy," trying my hand at perspectives, but find that when I have finished the outline that it requires the ends of the lines to be cleaned off where they have been overrun, and that it has got so dirty with the square passing over it as to require cleaning with india-rubber, which, however lightly applied, takes off the sharpness of the lines so much that nearly all of them want going over again. Can some one advise me?—J. S.

[501.] — CONCRETE CEILINGS AND FIBROUS SLABS.—Allow me to inquire, through the medium of your valuable "Intercommunication," what is the nature of the economical iron framing for concrete ceilings, invented by Colonel Scott, R.E., and mentioned in a long article by Edwin Chadwick, Esq., C.B., which appeared in the *Illustrated London News* of July 6? Also what would be the approximate cost of the iron framing, applied in ceilings not above 12ft. × 12ft. I should also be much obliged for any information respecting a new kind of fibrous slab, mentioned in the article to which I have alluded, as the invention of Mr. B. Nicoll, of London What would be the cost per foot super of this material 2in. thick, and what is the address of the inventor?—COTTAGE.

[502.]—ADMIRALTY SURVEYORS.—Will you kindly inform me through the medium of your valuable paper how the appointments for the department of the surveyor to the Admiralty are obtained? If by examination, what are the principal subjects.—P. D, 7, Wellington-parade, Gloucester.

[503.]—ZINC FOR ROOFS.—As there has been so much said the last two weeks in the columns of your journal about zinc for roofs, I would like to be informed how long a roof covered with such material would last? I admit it can be used, and plates of tin I have seen on roofs abroad, and almost every kind of covering, even bark of trees, but zinc is not suitable nor elastic enough to turn into angles and over rolls as lead will do.—A. B.

[504.]—CHEAP GOTHIC.—In your last week's issue you reported, in the column under the heading of "Churches and Chapels," Acle, Norfolk—"It is a plain but substantial building, of a modified Gothic character," cost £300, &c. The next report is Headcorn, Kent:—"The style is a free rendering of the general features of Gothic, adapted to the utmost simplicity of form and the most economical materials." And, dear Mr. Editor, I am tempted to inquire if this is not really acrobatic? for if the buildings alluded to are not, they are not Gothic.—WEE TIP.

[We can scarcely understand the purport of this note. Does the writer mean to say that we cannot get cheap Gothic chapels and schools?]

[505.]—PAYING FOR AGREEMENTS.—I should be obliged if some "Intercommunication" contributor would inform me whether it is customary for architects or surveyors to charge in their bills sums for preparing an agreement.—JOHN THOMAS, Falmouth.

[506.]—FIXTURES.—A dispute has arisen about some "fixtures" which are not specified in an agreement, but only under that general word. Will you or some one oblige by giving me a legal definition of the word, or rather, what would be considered "fixtures" in a court of law.—COMPOUND HOUSEHOLDER.

[507.]—STUDENTS' CLASS AT THE INSTITUTION OF CIVIL ENGINEERS.—I have just heard that a students' class has been formed at the Institution of Civil Engineers. Will you inform me of the conditions of admission?—W. W.

[Our correspondent will find his question answered in a letter from the secretary of the Institution of Civil Engineers in another column of to-day's BUILDING NEWS.]

[508.]—BISHOPS AND CHURCHES.—Could any one inform me whether it falls within the specified duties of a bishop to view churches, vicarages, &c., to ascertain whether they stand in need of repair?—PETER.

[It is certainly the duty of a bishop in his visitations to view the state of the churches, and when requisite admonish the incumbent to repair them out of the revenues of the church. In this office he should be assisted by the archbishop. Rural deans have a right to visit every church, mansion, and house in their deaneries.]

[509.]—BRASS RUBBINGS.—Would one of your rubbing and sketching correspondents be so good as to inform me how brass rubbings are taken?—IN MEMORIAM

[510.]—STRENGTH OF WOODS.—Would some one skilled in different kinds of woods inform a country bumpkin of the absolute and relative strength of the different kinds of woods generally used in building in this country; or could you inform me where the subject is treated scientifically?—COUNTRY BUMPKIN.

[511.]—FOOTINGS FOR WALLS.—I am about to build a house on not a very firm soil. Can you inform me how wide the footing should be and of what material it should consist? The wall will be about 20ft. high.—BENJAMIN.

[It will all depend on the nature of the soil. Footings are used so that walls might thereby have a bearing upon a breadth of ground wider than the walls themselves. If, for instance, the camel's foot were no wider than the horse's hoof the camel would have much greater difficulty in walking over the desert, because the hoof would sink deeper into the sand than the other foot. Footings under walls answer a similar purpose. Footings, therefore, should be wide or narrow according to the character of the ground on which they rest. A house built on a rock of course wants no footing; if upon chalk, upon loose or hard gravel, upon sand or on clay, the footings should be expanded in proportion to the resisting power of the foundation. If it be made ground it might be necessary to cover the whole with a platform of concrete. Concrete is not only the most easily obtained for such a purpose, but it is the cheapest and most durable. When there is any doubt as to the resisting nature of the ground it is wise to make sure with a good footing. If not actually required it gives a sense of security in return for its cost.]

REPLIES.

[478.]—ARCHITECTURAL STUDENTS.—The lectures at University College, London, I have found highly practical and useful, upon subjects that could not be learnt at an office or from any but expensive books. King's College is exclusive, being only for members of the Established Church.—CUDDIE.

[481.]—ACCOUNT OF MATERIALS.—"A Builder" should put down in his account every item of materials required for the new building, and likewise the number of hours of labour.—CUDDIE.

[485.]—RAISING BUILDINGS BODILY.—"Sceptic" is right in doubting many stories from America. It is true, however, that some houses have been bodily set back for widening the streets of New York, and this has been done by "fixing" stays, rollers, &c., underneath, and drawing it back with winch pulleys, &c. They are, I believe, generally wooden houses of a rather temporary character, and many of them are made movable. I knew a man who, on leaving New York, had sold his house and not long after met it rolling down the street towards him. I surmise, however, there were not much bricks and mortar in it. I don't think they raise houses to put a storey underneath—they may just as well put it on the top.—PROVINCIAL.

[485.]—The process was put in practice on a very extensive scale some few years ago, and very successfully, in San Francisco. The city originally was built on a very irregular site, and those who then travelled through its streets—like many of its occupants at present—were subject to "ups and downs." In order to obviate this inconvenience the streets were afterwards "graded," that is to say, some were cut down and others filled in, so as to produce something like level roadways. When the latter operation was performed some of the houses and stores were half buried, and it was necessary to raise them. This was accomplished by hydraulic pressure and appliances. Indeed, whole piles of brick buildings were thus lifted until their front floors were brought up to the new levels of the streets. One warehouse in particular, with 50ft. frontage, a depth of 70ft., and comprising three storeys and a basement, the whole of massive brickwork, was raised 5ft. and then underbuilt with stone. In the first place, balks of timber were inserted through the base of the structure at certain distances, and the rams safely bedded below them were connected and made to work simultaneously. Literally, therefore, the place was pumped up 5ft. Another building with 2,000 tons of goods in it, was, at the same period, raised in six days and a new storey added to it at the bottom.—BELIEVER.

[486.]—SHARPENING TOOLS.—When the razor was more generally used in this country than it now is, it was a common practice to put it in hot water immediately before applying it to the chin. This was only a partial and perhaps an imaginary good. It would have been very different had a little muriatic or sulphuric acid—say about one-twentieth in weight of the water used—been mixed with the water, and had the razor been immersed in the mixture for half an hour before setting it on a hone. In this case the acid supplies, to a great extent, the place of a whetstone by slightly corroding the whole surface of the blade, uniformly, so that to give a keen edge nothing more than a smooth polish is afterwards essential. This process never injures good blades, but may improve bad ones, and there is no reason why it should not be extended to all tools which are required to cut clean and smoothly. If "Firmer" and others who may use tools in the workshop would provide themselves with acidified baths, such as I have described, and would at the dinner hour or other convenient time moisten the blades of their tools in them, they would soon find the advantage of the operation. It may be said that the tools should, after the immersion, be lightly wiped before setting. This plan saves labour, gives a finer edge, and makes the tools last longer. The cost of the acid is next to nothing, and there would be no difficulty in contriving a mode of suspending the tools over the bath so that only the blades are acted upon. Cold water will do very well, but warm water is better.—CHEMICUS.

[487.]—BLACK MORTAR.—If "C. T. H." will use good stone lime to the sand from the foundry he will find it will make mortar that will set hard, if properly made. I have had it used, therefore speak from experience.—CLERK OF WORKS.

[487.]—The sand you have is only fit for cow shed and yard walls. If used in dwellings the "soot" in the sand would destroy everything.—SOOT.

[487.] Its use in the foundry is not objectionable. Unless the charcoal ashes are in excess, use the sand with confidence. Sand in mortar is valuable, as it is clean, sharp, and angular, sufficient lime only being required to crystallize and bind the particles of sand together, the usual proportions being three of sand and one of lime. A fair test of the sand is, does it feel sharp in passing through the hand, or is it smooth and earthy? If the latter pass the whole through a fine screen, rejecting the fine, as the charcoal is in excess. Should this process leave you short, mix up with the lot a few yards of clean river or pit sand (the last is to be preferred, it is in general sharper); should you use the foundry sand pure and simple, a few months hence, when the mortar has unashed, your report as to its colour will be interesting, as the coal ash and charcoal ash would, I think, make a good black mortar.—A. Z.

[487.]—"C. H. T." may rely upon black sand taken out of the moulding shop of an iron foundry making mortar much harder than the sand generally used for that purpose. I have built several blocks of houses within the last three years, in which black mortar has been used, which has been made of Buxton lime and black sand from various foundries, which has proved exceedingly hard when thoroughly dry.—W. L., Bootle, Liverpool, July 22.

[488.]—CEMENT ON LATH AND TIMBER.—"T. Morgan," of 2, Carlton-road, Portobello-road, Notting-hill, says that "this is really and truly a trade secret and in the possession of a very few." He will, however, undertake to do the work, or see that it is done as foreman of plasterers.

[488.]—It would be far better to bricklay on flat than to relath the partitions. If the latter be preferred I would recommend lath and half Memel. The first coat should be 2 cement, 1 of sand; floating coat, 1 and 1; last or setting coat, all cement.—RESEARCH.

[492.]—THE NATURE OF THE GROUND FOR ERECTING BUILDINGS UPON.—I would advise "Inquirer" to select the southern declivity of a hill or the north side of a valley. The object thus obtained would be warmth and regularity of temperature, being shaded from the north winds. Rocky districts are the most dry and healthful, but sandstone is preferable to limestone, on account of the quality of the water. If I am mistaken, and the question is asked by a builder or a contractor, I would advise a very careful examination of the ground by the old-fashioned principle of digging holes. If sand or grave is found, the examination may advisably end at this stage if the building about to be erected is of small dimensions; but should it be a large building the question is so much greater, and the test holes must not be relied upon without sound corroborative evidence. The labours of the geologist should here be taken advantage of. Throughout nearly the whole of Great Britain the geological surveyors have mapped out the various rocks, and sectional sheets can be obtained from the map sellers for any particular district. The builder can thus lay his hand upon the site, refer to the colours, and get correct information respecting the lithological character of the district. It will possibly transpire that the district is coloured as sand or limestone, whereas the test holes implies the ground to be sand, clay, or gravel. Should this be the case it is clear there is a superficial covering over the native rocks, and should deep or extensive excavations be required a sensible allowance should be made in the estimate for the probability of the rock presenting itself nearer to the surface than required. As geologists are becoming pretty numerous in every district, their advice can readily be obtained, and were this line of action strictly carried out there would be less mistakes to lay to the charge of the builders. I have known builders, who, in the theory of contracting, have allowed the ordinary price of excavating, who in real practice have come upon the live rock before half the depth has been attained, and they have had to resort to the expensive process of blasting and quarrying with the remainder of the work. I have seen contractors ruined with railway tunnels and cuttings, from a want of knowledge in the nature of the ground. On the other hand, I have seen valuable materials, such as ironstone, cut through at immense cost, and unknowingly carted away to be again buried in some embankment. There is no subject more closely bound up with the builder, and there is none so little studied. The day is not far distant when it is hoped a scientific education will be an item in the stock of every builder. To further this step it might be wisely suggested that Government should add schools of science to those which already exist for the sister arts.—W. S.

[492.]—Unless your building is very heavy this is a simple matter. There are few districts where you cannot get a geological section—railway cuttings, excavations] for sewers, borings for artesian wells, &c. For simple buildings sink a shaft to the depth of your contemplated footings, and then ascertain if you are working on made ground or a natural foundation; if the former, bore until you find yourself in the natural soil. A proper use of your observing faculties will, in general, give you all the information that is necessary, without shafting or boring.—A. Z.

WAGES MOVEMENT.

The Bristol masons' strike is at an end. The matter in dispute has been arranged amicably and by mutual agreement between the employers and the operatives.

A strike of joiners has taken place at Messrs. Day and Raby's at Bolton. It is said that the reason for the strike was the engagement by Mr. Day of a foreman whom the men did not like—a satisfactory enough reason for men to leave but not to strike.

STAINED GLASS.

A stained glass window of two compartments has been placed in the hospital church of St. Mary the Virgin, Rye Hill, Newcastle. The subjects are Our Lord in the house of Lazarus, and Martha receiving the promise from Christ that Lazarus would be raised from the dead. The window was designed and executed by Mr. G. Bagaly, of Newcastle.

In the chancel of Leek Church a window has been erected to Mr. John Cruse by his fellow townsmen. The subject represented is the descent of the Holy Ghost upon the Apostles at the Day of Pentecost. A stained glass window has been placed in the tower at the west end as a memorial to his late father, by Mr. George Young. The east window has been given by Mr. T. Carr in memory of his late father and mother, and cost £300. The subjects represented are the Crucifixion, the Arraignment, the Transfiguration, the Ascension, the Suffering, Raising of Jairus's Daughter, the Last Supper, the First Miracle, and the Feeding of the Multitude. In the upper part of the window is the figure of Our Lord, surrounded by the twelve Apostles. In the south wall of the chancel there is a window given by Miss Wood, of Manchester, in memory of her late aunt, Mrs. Grosvenor. The subjects on this are "Touch me not," "Feed my lambs," the Entombment, and the Three Marys. A window over the organ in the aisle at the south of the chancel was purchased for £200, left by the late Mr. Crompton, of Dunwood, and there are represented on it David and his Harp, St. Cecilia, and Bishop Audlem. In the south aisle there is also a window erected by the Sleigh family, of Leek and Thornebridge, "In memory of Miles Atkinson, for 18 years vicar of this parish, D.D.," the subject represented being St. Edward the Confessor (the patron saint) with St. John the Evangelist. The whole of the above windows are of stained glass, by Messrs. Clayton and Bell, of Regent-street, London.

STATUES, MEMORIALS, ETC.

A subscription to erect a statue to the Emperor Maximilian has been organized at Trieste.

A massive ornamental monument, measuring 12ft. high by 3ft. square at the base, and table tombstone have been erected in the churchyard of Kilmorack, in memory of the late Mr. D. D. Mackenzie, of Wellbank, Beauly, factor, on the Chisholm estate. The design and execution of the monument is the work of Messrs. D. Forsyth and Son, sculptors, Inverness.

The Albert Memorial Museum is now nearly completed, as far as the first portion is concerned. It will contain a life-size statue of the late Prince, and the architect (Mr. Hayward) has chosen a place for it on the first landing of the grand staircase. The committee have had many offers from sculptors to execute the statue on terms varying from a few pounds to 300 guineas. Mr. R. Boulton, of Cheltenham, has sculptured on approval a small model of a statue, which he offers to execute for the sum of £50.

LEGAL INTELLIGENCE.

BREACH OF BUILDING REGULATIONS.—A Manchester builder has been fined 40s. for having connected a private drain with a common sewer without first obtaining the consent of the Corporation. The defendant had applied to one of the officers of the Corporation for the requisite permission, and was informed that he must make application through an authorized contractor. He subsequently requested the Corporation to appoint himself a contractor, but without receiving any reply he made the extension which he had sought for. He now put in one of the building bye-laws to show that he was justified in what he had done by reason of his having received no reply from the Corporation within a certain time. The magistrate, however, held that there had been an infringement of the act.

General Items.

The Royal Commissioners of Trades' Unions met at their office in Park Prospect, Westminster, on Tuesday last, when Mr. Tucker gave evidence. Mr. Applegarth also gave evidence, principally in reply to Mr. Mault. The Commissioners will meet again on August 1, when it is supposed that Mr. W. Alleu, secretary of the Amalgamated Society of Engineers, will be examined. A great deal of dissatisfaction has been expressed by the trades' unions and by the press outside at Mr. Roebuck's miserable policy in insisting on the exclusion of Mr. Connolly because he spoke disrespectfully of Mr. Roebuck. Perhaps Mr. Roebuck, being so thin-skinned and sensitive himself, will be a little more scrupulous in future in what he says of others.

A not very creditable attempt has been made to remove Professor Beesly from his professional chair at the London University for some remarks made at a trades union meeting at Exeter Hall in connection with the Sheffield outrages. No doubt the professor was first incorrectly reported, and then intemperately criticized. The council of the University have decided to take no action in the matter.

Mr. E. Welby Pugin has published in a pamphlet form, price one shilling, the thunder and lightning articles which appeared in the *Westminster Gazette* on the New Law Courts; also the correspondence on the same subject between him and others which appeared in the *Standard* and BUILDING NEWS. By so doing Mr. Pugin assumes the responsibility of the *Westminster Gazette* articles.

Mr. Robert Stapleton, as First Commoner of the Corporation, and Chairman of the City Lands Committee, has given notice of the following important motion for consideration at an early Court of the Common Council:—"That the repeated and heavy expenditure which takes place at the Guildhall on every occasion of public reception affords evidence of the insufficiency of the accommodation at the disposal of the Corporation for such purposes, while the space available for the library and museum has also been declared altogether insufficient; that, therefore, it is desirable some comprehensive and well-considered plan for providing permanently for such objects should be at once prepared and laid before this Court, and that it be referred to such committee as the Court shall direct to obtain a plan and estimate accordingly."

Mr. Thomas Hughes, M.P., presided, on Tuesday, at a distribution of prizes to the successful competitors at a flower show held in the parish of St. Saviour's, Hoxton, during the week. Mrs. Hughes distributed the prizes, and Mr. Hughes delivered a short address on the good effects of flower cultivation, and advisability of holding local horticultural shews during the summer season throughout every district of the metropolis.

Mr. Titus Salt, formerly M.P. for Bradford, and the proprietor of the well-known alpaca manufactory at Saltaire, has just made a very magnificent offer to the borough of Hull. He proposes to give £5,000 to the Sailors' Orphan Institution connected with the Port of Hull Society, on condition that the institution be enlarged to give accommodation for 100 orphans, and the school 200.

Just now that our garden roses are covered with aphides, it will be well to know that soap suds sprinkled over the trees with a syringe will effectually destroy the noxious vermin. And it should be borne in mind that, all the year round, soap suds form a most valuable manure for bushes, shrubs, and flowers.

The Rev. C. J. Elliot Walkey, vicar of Llantrissent, Monmouthshire, writes us in reference to the statement which appeared in the BUILDING NEWS a fortnight since, saying that there still remains a considerable sum to be obtained before the church can be finished, and that he should be glad of any subscriptions for that purpose.

The Town Council of Lancaster has resolved to invite the Committee of the Royal Archæological Institute of Great Britain and Ireland to hold their annual meeting in that town next year.

The characteristics of an individual are strikingly pourtrayed in little things. An American paper, in describing traits of inner life in the workshop, alludes to the moral calibre of the men by the way they get tobacco of their shopmates by begging, or borrowing, as they are most apt to term it. One man will offer his fellow workman his tobacco box from which to help himself; another will take a bit from his box and hand it begrudgingly to his companion; and another will deny that he has any tobacco about him, or, perhaps, that he ever uses it. One man, a Jesuit in nature, if not in creed, used to keep two tobacco boxes, one he called "The World," the other "Providence." When asked for a pipe of tobacco, he would answer, "I have not a bit in 'The World;'" then calmly go off to one of the secret smoking places and light his pipe with a serene conscience. If taxed with falsehood, or asked how he had got his tobacco, "I put my trust in 'Providence,'" he would answer. This anecdote, though adroitly appropriated by the Americans, had its origin in Cornwall about thirty years since, and has frequently been repeated by us, and raised many a smile.

Great preparations, we understand, are being made to form an interesting Museum of Antiquities at Hereford, on the occasion of the meeting of the Cambrian Archæological Association, next month.

Mr. Edward W. Wyon has submitted to private view at his studio, 19A, Stanhope-street, Hampstead-road, a figure of Nausicaa, intended to illustrate a passage from the Odyssey, which describes how—

> Forth from her snowy hand Nausicaa threw
> The devious ball.

Shirley Brooks tells the following in his new story of "Sooner or Later:"—"A friend of mine, a great contractor, who was making a harbour somewhere, fancied he did not get work enough out of the men who went down in the diving bell. He felt that they wasted time, but he could not imagine how. So, one day, when they were at dinner, he went into the bell; and there he found seven large crabs, and on the back of each was chalked the name of a favourite for the Derby. The men had crab races at the bottom of the sea."

A movement is on foot to erect a statue to King Robert Bruce, at Dumfriesshire. Might we suggest to our Scottish friends the advisability of first completing the National Wallace monument, which, they must confess, has been rather an unfortunate affair altogether?

Something new in the exhibition line is being organized in Paris by M. Constant Cimetière, viz., a free exhibition of pictures. The subscription is fixed at the sum of 24f. yearly, by instalments, and artists may take as many subscriptions as they please, each conferring the right of exhibiting one work of art during the whole year, the artist being allowed to change one picture for another when he pleases. The conditions are—that the works exhibited shall be insured against liabilities as regards rent, &c.; that in case of injury the directors shall repay the artist two-thirds of the value of the work as fixed by himself; that a register containing the names and addresses of the artists, with the numbers and prices of the works exhibited, shall be open to visitors; that the directors shall make no charge for sales; that artists shall send in their works within one month of the opening day, or of the date of their subscription, or forfeit their claim to a place on the walls; that the price of admission shall be half a franc on week-days, and half that sum on Sundays; that the exhibition shall remain open all the year round; and that each subscribing artist shall have two free passes at his disposal.

A correspondent of *The Freeman* gives an account of a curious discovery. He says that within the last few days, on the farm of a man named Thomas M'Garry, residing at Aughamore, near Granara, in Ireland, there was discovered a curious relic in the shape of a wooden house, which is constructed of black bog oak. It was found under water in an exhausted bog at a considerable depth beneath the surface. It measures twenty-three by ten, and consists of eight very strong beams ranging in length from ten to thirteen feet, which are supported by cross beams of great strength, and firmly jointed. The side beams are firmly morticed as if intended for uprights. In the interior of this house there was a large trough, which appears to have been scooped out of one solid block, and has a hole at one end as it would seem for the purpose of letting off some liquid matter; there was also a cover for it, and there was a flooring consisting of some hardened matter, which I presume was not asphalte. The house was necessarily taken asunder in the process of raising, but M'Garry has very properly preserved the parts, which are in good and sound condition, and can be put together. Of course it will be for antiquaries to speculate on the probable age and purpose of this wooden structure, which some of the innocent people in the locality where it was found conjecture may have been intended and used for the purposes of illicit distillation, perhaps centuries ago, a hypothesis I think not all likely to be borne out on investigation, as I am quite certain it was constructed centuries before our ancestors knew anything of excise laws. In fact, it presents the same appearance as any bog oak I have ever seen, and must have been submerged for ages. No doubt, however, it will attract the attention of some learned local antiquaries, who perhaps will give the public a profound disquisition about its probable use.

The *Athenæum* speaks in enthusiastic terms of a discovery of considerable importance which has been made among the Arundelian marbles at Oxford. This refers to a bust, rather larger than life, of fine Greek work, representing, and apparently the portrait of, a lady of great beauty and singular dignity of expression. This sculpture, with others of the Arundel and Pomfret bequests, was reported on by Sir Francis Chantrey as "only fit to be thrown away or used for road-mending." Thus far, as concerns English knowledge of art. Nothing can exceed the exquisite fidelity to nature with which, while much of the heroic character was preserved, this triumph of art has been wrought. The flesh was treated with uncompromising respect for the human character; thus the commonly received Greek ideal of the heroic style, which was founded on an exalted virginity and somewhat exuberant temperament, being essentially youthful and fully developed, has been made to give way to a very noble, but somewhat unusually literal mode, and the action of time in changing it—it would be hard to say reducing—the beauty of the subject's contour most craftily, most admirably indicated. Thus, the modelling of the throat and bosom, the cheeks, chin, and forehead, is full of character, and, although intensely lovely, not simply beautiful in the abstract. The bust cannot well have been the work of Phidias or his school, but agrees more with that order in art which was practised by Praxiteles, and admitted more of simply human qualities than the earlier canon dictated. With the necessities of portraiture this rule has, we suppose, permitted so much of individuality as this superb relic exhibits. In form we have the figure nearly to the waist; a chiton of fine material rests on the left shoulder, is fastened there in the usual manner, and in front descends diagonally, leaving one breast almost entirely bare, and revealing nearly half the other; the hair, which is abundant and richly waved, is raised from the face, gathered behind, and bound in that position by a fillet which goes twice round the head. The face is of a somewhat long oval, with a delicately-modelled chin, a broad forehead, flat cheeks, and oblong rather than oval eyes. For lack of a better name, it is proposed to call the bust "Aspasia." The nose is broken off, the upper part of the head has been fractured, and a small portion lost. In spite of these injuries, the sculpture is invaluable. Mr. Brucciani has instructions to mould it.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

3088. F. R. A. GLOVER. AN IMPROVED MODE OF AND APPARATUS FOR RAISING AND LOWERING PERSONS, GOODS, OR ARTICLES IN DWELLING-HOUSES AND OTHER BUILDINGS. Dated November 23, 1866.

The patentee claims mounting a platform, chair, or receptacle on a vertical rod or rods, post or, column or columns, in such a manner that in its ascent or descent, it will be made to gyrate or move round such vertical rod, post, or column, or between such columns, so that it may pass over the successive flights of stairs, substantially as set forth. *Patent completed.*

3170. H. A. DUFRENE. IMPROVEMENTS IN CHIMNEYS. (A communication.) Dated December 3, 1866.

According to this invention the grate containing the fire is placed in a hollow metallic casing, which is filled with water. This casing is of a cylindrical form, leaving the front of the fire open, and the upper part is open for the passage of the smoke. This kind of jacket may be placed in a fireplace with a marble mantlepiece, or may be isolated; it is filled and emptied by means of taps. The place under the grate where the ashes fall is cased with sheet iron, and closes like the lower part of the casing of the grate. A door made in the ashbox allows of the ashes being removed, and openings give access to the air, which, after entering, is heated by the lost heat of the ashes and small coal falling therein. *Patent abandoned.*

3174. B. J. B MILES. IMPROVEMENTS IN BENCH VICES. (A communication.) Dated December 3, 1866.

This invention relates to that description of bench vice which runs horizontally on a fixed bedplate. The bedplate is fixed to the bench by screws or otherwise, and is provided with a pivot hole to receive a pivot projecting from the bottom plate of the stationary jaw carrier, such bottom plate being provided with three slots, each of which is curved to the arc of a circle struck from the centre of the pivot upon which the vice turns, one of such slots being on each side, and the other at the back of the bottom-plate of the stationary jaw carrier. A set screw is provided for each slot, such screws passing through the slots and into the fixed bedplate. From the bottom plate of the stationary jaw carrier rise guide plates, which are connected together at the top by a crosspiece to which the stationary jaw is connected. The stationary jaw and parts connected therewith are cast in one piece of metal. The movable jaw is provided with a hollow shank, in the interior of which is a screw, which, when turned, gives motion to the movable jaw by taking into a nut formed in a standard rising from the bottom-plate of the stationary jaw carrier. The jaws

are formed so that a considerable portion of them shall project beyond a vertical line drawn down one side of the shank of the movable jaw, thereby affording facility for holding long articles, such articles extending down one side of the shank of the movable jaw. *Patent completed.*

Trade News.

TENDERS.

BETHNAL GREEN.—For extensions and alterations at Bethnal House Asylum, Bethnal Green, Middlesex. Messrs. Tolley and Dale, architects:—Hedges, £3,250; Perry, £3,140; Johnston, £3,035; Forrest, £2,995; Pritchard, £2,937; Rivett, £2,773; Ennor, £2,759; Henshaw, £2,680.

CHELMSFORD.—For new schools and class rooms, New London-road, Chelmsford. Mr. Charles Pertwee, architect. Quantities not supplied:—Roper, £2,020; Baker, £1,973 6s. 10d.; Last, £1,955; Brown, £1,950; Choat and Son, £1,950; Thorn, £1,925; Gozzett Woodham Walter (accepted), £1,910 10s.

CITY.—For alterations in Finsbury-street. Mr. H. J. Hanson, architect:—Foster, £2,590; Hennor, £2,489; Brass, £2,389; Webb and Sons, £2,345; Pritchard, £2,337; Mocey, £2,293; Browne and Robinson, £2,225.

HOLLOWAY.—For building house and tavern, Seven Sisters'-road, Holloway, for Mr. J. Pigot. Messrs. Finch Hill and Paraire, architects. Quantities supplied by Mr. Doughney:—Warne, £4,250; Hoare, £4,057; Wiltshire and Harold, £3,998 18s.; Langmead and Way, £3,746; Newman and Mann, £3,590; Easton and Chapman, £3,513.

HASTINGS.—For new wing, &c., to the East Sussex, St. Leonards, and Hastings Infirmary. Mr. W. J. Gant, architect. Quantities supplied by Mr. Henry Wm. Broadbridge:—Simms and Marten, £1,221; Nigbtingale, £1,156; Sawyer, £1,142; Hughes, £1,124; Jones and Moyes, £1,083; Broadbridge, £1,070; Waiter, £1,065; Poxon and Smith, £1,065; Gray, £1,061; Kenwood, £1,045; Longhurst (accepted), £998; Sadler, £927.

ISLINGTON.—For six houses, Cross-street, Islington. Mr. William Smith, architect. Quantities by Messrs. Pain and Clark:—Webb and Sons, £3,069; Eaton and Chapman, £2,293; Nightingale, £2,833; Sabey, £2,816 3s.; Thompson, £2,795; Bishop, £2,695; Crabbe and Vaughan, £2,549 0s. 6d.; Henshaw, £2,521; Rodda, £2,150.

KENTISH TOWN.—For parsonage house for the incumbent of Holy Trinity Church, Kentish Town. Messrs. Beck and Lee, architects. Quantities supplied by Messrs. Pain and Clark:—Ashby and Sons, £3,333; Conder, £3,215; Manley and Rogers, £3,190; Colls and Son, £3,184; Woodward, £3,168; Foster, £3,020; Webb and Sons, £2,879.

MARYLEBONE.—Tenders for new sewers in Charlotte-street, Duke-street, and part of Devonshire-street:—Wainwright, £3,020; Wigmore, £2,498 10s.; Higgles, £2,429; Bloomfield, £2,122; Knight and Hanswell, £1,990 18s.; Robinson, £1,780; Crockett, £1,778; Thirst, £1,679; Piggey, £1,675; Dickenson, £1,660; Thackrah, £1,560; Harvey, £1,392. Parish surveyor's estimate, £1,736.

ROCHESTER.—For building new sewers in Charlotte-street, Duke-street, and part of Devonshire-street:—Wainwright, £3,020; Wigmore, £2,498 10s.; Higgles, £2,429; Bloomfield, £2,122; Knight and Hanswell, £1,990 18s.; Robinson, £1,780; Crockett, £1,778; Thirst, £1,679; Piggey, £1,675; Dickenson, £1,660; Thackrah, £1,560; Harvey, £1,392. Parish surveyor's estimate, £1,736.

ROCHESTER.—For building new inn at Rochester, for Mr. George Beer, Canterbury. Mr. John Green Hall, Canterbury, architect:—J. G. Naylar (accepted), £1,147, after deductions for old materials.

SCARBORO'.—For All Saint's Church, Scarboro'. Mr. G. F. Bodley, London, architect:—J. Kirby, £4,511 9s.; W. Peacock, £4,403; B. Smith and Son, £4,373 0s. 1d.; Mr. D. Climie, £4,100; Foster and Peyton, £4,061; Thomas Petch, £4,051; John Barry (accepted), £3,872.

STREATHAM.—For the erection of two houses at Streatham for Mr. G. Pratt. Quantities supplied. Mr. Henry Jarvis, architect:—Loat, £2,050; Nicholson, £1,900; Mason, £1,885; Marsland and Sons, £1,867; Tarrant, £1,832; Thompson, £1,758; Higgs, £1,657; Henshaw, £1,642.

SOHO-SQUARE.—For new wing to Hospital for Women, Soho-square. Mr. E. L. Bracebridge, architect:—Read and Sons, £9,220; Patman and Co., £8,090; Wood and Co., £7,183; Myers and Sons, £7,890; Piper and Wheeler, £7,637; Hill and Son, £7,560; Webb and Sons, £7,157; Axford, £7,087; Wagstaff and Sons, £6,960.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

PROPERTY SALES.

AT THE MART.—By Messrs. Norton, Trist, and Watney. Copyhold residence, situate in Lower-road, Richmond, let on lease at £170 per annum—£3,000.

Copyhold residence, known as Verandah Cottage, situate on the Hill, Richmond, and let on lease at £40 per annum—£660.

Copyhold residence, known as York House, situate as above, let on lease at £63 per annum—£1,000.

Freehold seven houses, Nos. 1 to 7, Riverdale-terrace, Lower-road, Richmond, let at from £26 to £30 per annum each—£400 to £430 each.

Freehold plot of building land, fronting Lower-road, Richmond—£220.

Leasehold property, known as Bush Hall Park, Hatfield, Herts, comprising a residence, with stabling, farm, homestead, and park-like land, containing about 35 acres, term 17 years unexpired, at £250 per annum—£500.

Leasehold five houses, one with shop, Nos. 29 to 31, Knott-street, and 27 and 28, Sun-street, Deptford, producing £78 per annum, term 46½ years unexpired, at £15 per annum—£260.

Leasehold nine houses, Nos. 18 to 26, Sun-street, Deptford, producing £105 6s. per annum, term 85¼ years unexpired, at £26 7s. per annum—£300.

JULY 22.

AT THE MART.—By Mr. John Peisley.—Freehold farmhouse, with sheds and outbuildings, and 20a. 1r. 39p. of garden ground, situate in the parish of Acton, Middlesex, let on lease at £113 4s. 2d. per annum—sold for £9,450.

By Messrs. Wilkinson and Horne.—Absolute reversionary interest, on the death of a lady aged 48 years, in one-fifth of the freehold properties known as Prospect Lodge, Belmont Lodge, and Bel-air Cottage, London-road, Tunbridge Wells, rent producing £294 per annum—£320.

Leasehold two residences, Nos. 106 and 108, Hill-street, Peckham, producing £58 per annum, term about 20 years unexpired, at £10 per annum—£270.

By Messrs. Hofman and Son.—Leasehold two houses, Nos. 3 and 4, Thornton-street, Walworth, producing £39 per annum, term 60 years from 1850, at £5 2s. 8d. per annum—£205.

Leasehold two houses, Nos. 5 and 6, Thornton-street, producing £39 per annum, term 61 years from 1851, at £5 per annum—£215.

Leasehold three houses, Nos. 7 to 9, Thornton-street, producing £58 10s. per annum, term 60 years from 1852, at £7 10s. per annum—£345.

AT THE GUILDHALL COFFEE-HOUSE.—By Mr. Gairdner.—Leasehold residence, No. 113, Gower-street, and stabling, No. 40, Upper Chenies-Mews, St. Pancras, annual value £116 per annum, term 17¾ years unexpired, at £14 per annum—£805.

Freehold house and shop, No. 94, St. John-street, Clerkenwell, and workshops in the rear, let on lease at £40 per annum—£1,170.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Samuel Clarke, Bennerton, Wilts, architect, August 6, at 12—Martin Cubitt, Middleton-road, Dalston, builder, July 31, at 11—Henry Newman, Teddington, builder, July 31, at 11—T. J. Carr, Douglas-road, Canonbury, timber merchant, August 5, at 12—John Kershaw Day, Cloudesley-road, Islington, carpenter, August 7.—William Forman, Francis-street, Waterloo-road, contractor, August 5.

TO SURRENDER IN THE COUNTRY.

John Bartlett, Birmingham, builder, August 2, at 10—William Fantom, Bilston, carpenter, August 6, at 12—Martin Giles, Bromsgrove, builder, July 31, at 12—George Wright, Uppingham, ironmonger, July 30, at 11—Henry Walker, Ulverstone, plasterer, August 1, at 10—Benton Ord, Middlesbrough, slater, August 5, at 11—Joseph Scrivens, Truro, painter, August 3, at 3.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9	0	£10	10	Archangel, yellow ..	£11	10	£12	10
Quebec, red pine	3	0	4	10	St. Petersburg, yel..	10	10	11	0
,, yellow pine..	2	15	4	0	Finland	8	0	9	0
St. John N.B. yellow	0	0	0	0	Memel.....	0	0	0	0
Quebec Oak, white ..	5	5	6	0	Gothenburg, yellow	8	10	10	10
,, birch.....	3	10	4	10	,, white	8	0	9	0
,, elm	3	10	6	0	Gefle, yellow.....	9	0	11	0
Dantzic oak	3	10	6	0	Soderham	9	0	10	10
,, fir	2	0	3	0	Christiania, per C.,				
Memel fir	3	0	3	10	12 ft. by 3 by 9 in.				
Riga.....	3	0	3	5	yellow	16	0	22	0
Swedish	1	15	2	2	Deck Plank, Dantzic,				
Masts, Quebec red pine	6	0	7	0	per 40 ft. 3 in.	0	15	1	4
,, yellow pine..	6	0	8	0	PUMICE STONE pr ton	5	0	8	0
Lathwood, Dantzic, fm	4	10	6	0	OILS, &c.				
,, St. Petersburg	6	10	7	10	Seal, pale....per tun	39	0	0	0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Sperm body	108	0	0	0
					Cod	39	0	0	0
					Whale, 8th. Sea, pale	38	0	0	0
Quebec, white spruce	14	10	21	10	Olive, Gallipoli.....	63	0	0	5
St. John, white spruce	13	10	15	10	Cocoanut, Cochin, ton	54	0	56	0
Yellow pine, per reduced C.					Palm, fine	40	0	41	0
					Linseed	39	0	39	0
Canada, 1st quality.	17	0	19	10	Rapeseed, Eng. pale..	39	10	0	0
2nd do.....	12	0	13	0	Cottonseed	36	0	38	0

METALS.

IRON:—							
Welsh Bars in London .. ..per ton	8	15	0	0	0	0	3
Nail Rod ..... do	7	10	0	8	0	0	2½
Hoops ..... do	8	10	0	9	0	0	
Sheets, Single ..... do	9	15	0	10	0	0	
Stafordshire Bars ..... do	7	10	0	8	10	0	
Bars, in Wales ..... do	5	15	0	6	6	0	3
Rails ..... do	6	5	0	6	7	6	nett
Foundry Pigs, at Glasg. No 1 .. do	2	14	0	3	5	6	2½
Swedish Bars ..... do	10	5	0	10	10	0	nett
STEEL:—							
Swedish Keg, hammered .....per ton	15	0	0	15	10	0	2½
Swedish Faggot ..... do	10	10	0	12	10	0	2½
COPPER:—							
Sheet & Sheathing, & Bolts ....per ton	81	0	0	86	0	0	3
Hammered Bottoms ..... do	92	0	0	93	0	0	
Flat Bottoms, not Hammered .. do	87	0	0	88	0	0	
Cake and Tough Ingot ..... do	72	0	0	0	0	0	
Best Selected ..... do	80	0	0	82	0	0	
Australian ..... do	83	0	0	87	0	0	
Yel. Metal Sheathing & Rods ....per lb	0	0	7	0	0	0	
TIN:—							
English Block .....per ton	91	0	0	0	0	0	2½
do Bar ..... do	92		0	0	0	0	
do Refined ..... do	94	0	0	0	0	0	
Banca ..... do	92	0	0	0	0	0	nett
Straits ..... do	86	10	0	87	0	0	
LEAD:—							
Pig, English .....per ton	21	15	0	0	0	0	2½
,, Spanish Soft ..... do	19	5	0	0	0	0	
Shot, Patent ..... do	23	0	0	0	0	0	
Sheet ..... do	21	0	0	0	0	0	
White ..... do	30	0	0	31	10	0	5
SPELTER:—							
On the Spot .....per ton	21	0	0	21	2	6	nett
ZINC:—							
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THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 2, 1867.

THE BRISTOL ASSIZE COURTS COMPETITION.—No. II.

We regret to learn that the Finance Committee of the Bristol Town Council has determined to recommend that Mr. Street's report on the competition should be acted upon. If this is done, the old City of the West will add another item to its already long list of follies. The design the referee has selected, doubtless with the most laudable intentions, and to the best of his judgment, will produce a building which cannot fail to provoke the hostile criticism of everyone who knows anything of art. It is a weak, meaningless composition, devoid of a single excellence, and it will be simply waste of money to build it. For the same or even a less cost, Bristol might have had a respectable work, not of the charity schoolhouse type, and not ineffably contemptible. But, from what we have already seen of Bristol mismanagement, we have no doubt but that the Town Council will plunge headlong into this new folly; and, moreover, remain utterly blind to the facts of the case until it is too late to seek a remedy. We are not, therefore, disposed to waste a single moment in attempting to remove the scales from the eyes of the committee. We regret to see the city which was once so near the van of English progress, falling rapidly into the rear, and allowing itself to be blinded by prejudice; but we do not venture to hope that it will recover its senses in time to escape this fresh pitfall. That a renowned member of the architectural profession should have piloted the Bristolians into the midst of this difficulty, is, however, to be deplored most deeply. Mr. Street has certainly done this; and, while we have nothing but pity for the Finance Committee, who, of course, cannot be expected to know anything about architecture, we cannot overlook the circumstance that the gentleman to whom they have applied for advice, has either found the task of selection too much for him, or not centred upon it that attention which it deserved. Certain it is that Mr. Street's report is a most incoherent composition. If his words mean anything, they mean that the design which he has placed second, is, even in his own estimation, the best; and the fact that he has not given it the first prize, and recommended its adoption, is utterly incomprehensible. If Mr. Street had objected that the design of "Quis" was too costly, we could have understood him; but, had he done so, common honesty would have impelled him to say, that as the committee had not given the competitors the vaguest hint as to the sum that might be considered economical, it could not, on the score of costliness, refuse the premium to a design otherwise claiming it legitimately. "Quis" seems to have haunted Mr. Street all through his report, and he certainly uses it repeatedly as a standard of comparison, yet he cannot make up his mind to give it the first prize. Why? We cannot pretend to answer the question. It is sufficiently evident that the grandeur of its elevation, and the able arrangement of the plan, both produced a great effect upon the mind of the referee; but, nevertheless, he is unable to come to the conclusion that it ought to be placed first on the list, and awarded the premium.

Nor is Mr. Street more happy in the selection of a design for the third prize. "Dos-à-Dos" and "Studium," he thinks pretty nearly equal, and the way in which he distinguishes between them is entirely inexplicable. The plan of "Studium" is better than that of "Dos-à-Dos," is certainly far inferior in its arrangement to the two plans "Quis" and "Usui Civium" (note the order!) Nevertheless, Mr. Street thinks "Dos-à-Dos" must have the prize, and "Studium" must not. Why? We cannot conjecture. There can be little doubt but this cost has constituted a very main element in Mr. Street's consideration. The process he has adopted has been simple. He has taken those of the designs which he deemed worthy of the arithmetical exercise, and cubed them, estimating per foot, at an uniform price, and that clearly a very high one. Proceeding in this manner, Mr. Street has come to the conclusion that "Usui Civium" will cost some £18,600, or more than double what the architect says it will cost; "Quis" £40,000, whereas it is estimated at £19,700; and "Dos-à-Dos" £18,400 in the place of £12,000, which the architect says it will cost. It is quite clear that Mr. Street has gone to work in the wildest way in this matter, and, therefore not the slightest reliance can be placed on his guesses at cost. But taking them as they are, the relation in which the several designs stand to the item of cost would appear to afford the only clue that can be found to the principle (if such it may be called) on which the professional adviser of the Finance Committee has prosecuted his work of selection. The first and last of the three premiated designs are the cheapest, but even here "Quis" has come in most awkwardly.

It is estimated at £40,000, and yet it gets the second prize, while one at £18,000 only gets the third. Mr. Street confesses that it is mainly because the cost of "Quis" would be very great, as compared with that of the design marked "Usui Civium," that he places it second; but he is not prepared to place it third. Now, we cannot avoid the conclusion that this is most unreasonable. If cost operated so powerfully in the matter, why did not Mr. Street report concerning "Quis" that it was clearly the best design, but much too expensive, and so throw it overboard altogether. To play with the matter was simply absurd. We will not, we cannot, believe that in the mind of so accomplished a student of architecture as Mr. Street really is, there can exist the slightest doubt on the subject. No one who has carefully examined the several drawings can fail to see that the one marked "Quis" is incomparably the best design. The sole question is one of cost; and as regards that, if the committee had intended to lay any great stress on that point, it ought in common fairness to have given the architects some idea of the figure. And so with respect to the question of preserving Colston's House, there ought to have been a determination. The effect of these details having been omitted from the instructions is most mischievous. The architect who is the author of "Quis," in the earlier stage of this competition, produced designs of very small cost, preserving Colston's House, and carried off all three prizes. Now he gets only the second, notwithstanding Mr. Street thinks so highly of his work, simply because he has not chosen to repeat a procedure which on the former occasion only got him the prizes and not the commission.

"Studium" is a cleverly composed and elegant design, extremely well planned and grandly wrought out; the tower is not so good as the rest of the building, but the mass as a whole is effective and very creditable to the designer. This ought certainly to have had a prize. It is far better than "Dos-à-Dos"; but Mr. Street probably thought it too expensive, as the estimate he has given is £32,000. We had thought of noticing some of the other designs at length, but they are really too insignificant to call for description. There is nothing to learn from them; both as respects plan and elevation they are either absurdly simple or simply absurd. The Bristol Assize Courts competition has clearly gained little by being re-opened. The whole business has been most unsatisfactory. In a manner impossible to justify, the adjudication made on the first trial was set aside, notwithstanding the fact that one competitor carried off all the prizes; and now what has Bristol benefited by this new expenditure of funds in the shape of prizes? It has got a miserably meaningless design instead of a good one; and has not even the satisfaction of thinking that it has selected the design which its professional adviser considers to be the most meritorious in an architectural point of view, or even the best as to arrangement. If the Bristolians believe Mr. Street's report they must come to a contrary conclusion. The art instructor they have invoked to aid them in the choice of a suitable design has clearly formed his own estimate of their character, and left them to console themselves with something which, in his estimation, ranks A1 for cheapness; and very richly do the Bristolians deserve to be thus abandoned. If they had made up their minds as to what they really wanted, and then asked for it in a sensible manner, they might have obtained it without trouble, and been amply satisfied. Whereas, by a vacillating puerile policy, they have only earned the derision of the community at large, and obtained a bad bargain.

THE PARIS EXHIBITION.—No. X.

METAL WORK.

Very numerous are the works in metal exhibited, and, as may be expected, these embrace a very wide range of subjects, but we are with regret obliged, at present, to review those only which bear directly on architecture as an art or as a science, and we shall confine our remarks to these only. Iron, steel, lead, copper, zinc, and bronze, each present themselves in every variety of form and purpose to our notice, and each affords some new illustration of its applicability, or demonstrates the increasing power of human ingenuity to overcome difficulties which have been deemed insurmountable hitherto. In fact, our faith in the possible future is almost illimitably extended when we examine some of the products here exposed, and we recognise the wisdom of the first Napoleon in expunging that idle word "impossible" from his dictionary. The works in iron divide themselves readily into those whose chief merit is their structural use, and those which serve chiefly a decorative purpose. Of the former of these rolled iron is pre-eminently that which exhibits the greatest advance, and we have in it a wonderful variety of good things. France and Belgium are the principal contributors in this class, and, as their works are now becoming so competitive with the products of our own country, it behoves us to examine them with close attention, an examination which, we regret to say, leaves a lasting impression unfavourable to ourselves. Few architects who have had to design works in iron have escaped the annoyance and mortification of finding that their plans have had to be modified, and sometimes their construction changed entirely, from the crassitude of the manufacturer, who declines to do anything new, or to endeavour even to roll a long length of iron, or one of deep section; the large demand for ordinary sizes satisfies him, and advance he will not, and many and bitter are the disappointments the English architect has to experience if he would advance one step beyond the dull routine of engineering, when he essays to construct in iron. The French exposants, and their Belgian *confrères*, show us now where to go, and the small shed of the Compagnie Anonyme des Forges de Châtillon et Commentary, and the circular annexe of the Belgian Commissioners, offer to the English architect many opportunities, which we are certain he will not be slow to avail himself of, and we know it as a fact that already contracts have been taken by this French company for the supply of sections and sizes of iron which English houses had refused to supply.

In their Exposition we see most wonderful triumphs of mechanical skill, and, as a

tour de force, illustrative of what can be done, there is a single rolling of iron of L section 170ft. in length, without weld or flaw. Of course this is only a curiosity of manufacture, so enormous a length would be of little practical use, but we see many sections 25 as 30 metres long, and in depth varying from 2ft. to 18in., of great practical utility. A further illustration of the great range taken by this company is afforded by the exhibition of a portion of a rolled iron girder upwards of 3ft. deep. The quality of the metal is excellent—twisted bars show its great toughness, and fractured portions its admirable texture; and with the able assistance of such an enterprising firm as this to fall back upon, we cease to wonder at the large use made of rolled iron by French architects, and if our own manufacturers will not aid us, we must help ourselves from the stores thus exposed to us. The same company exhibits a corrugated iron for roofing purposes, with which the Exhibition building is itself covered. This is of very great strength, its section being more angular, and thus presenting greater resistance than is obtained by the ordinary wave form in use in this country. The width of each corrugation is about 6in., and a good illustration of its economic application is exhibited at the entrance of the Parc, opposite l'Ecole Militaire, where a roof is formed by bending sheets of this corrugated metal into an arch form, and simply riveting a king bolt to one of the corrugations, and attaching a tie rod to it and the two extremities of the arch; a roof of 60ft. span and great rigidity is thus obtained at a very small cost. Many other are the utilities offered by this enterprising company to the notice of the architect, and of which we trust he will avail himself until he induces the English manufacturer to think it worth while to pay some attention to the suggestions and requisitions of the profession; at present an engineer will be listened to occasionally, an architect never. The Belgian rolled iron is in its way equally good, but not exhibited in such extraordinary lengths, but lengths of 30ft. are looked upon as ordinary affairs by them, and exposed as such. These are of very fine tough quality, and admirably rolled, and are such as it is hopeless to expect from an English house at present, and the greatest good the Exhibition could effect in this class of its contributions would be to cause the diversion of trade from England until some of its wonted enterprise in this branch of its manufacture is again engendered.

Very excellent are the specimens of cast-steel girders exhibited by MM. Petin, Gaudet and Co., whose products are exhibited in a special building near the entrance from the Pont de Jena, and where we see admirable castings, 31 metres long by 0·280 deep, which present an evenness throughout perfectly wonderful in castings of such enormous length. These girders offer a great advantage over all others. Their extreme lightness and great strength render them available for flooring girders to voids, which it has been hitherto impossible to cover, except by the use of columns, or of constructed beams, of so deep a section and so great a weight as to be almost useless for architectural purposes. The cast-iron productions contained in the Exhibition are more of an ornamental than a constructive character, and some of these call for our greatest praise, more especially in this highest branch of the moulder's art—the casting of the human figure. The works of Barbezat and Co. are very noteworthy for their excellent quality, and many of the statues and figure subjects, exhibited by this firm in the state in which they have left the moulds, are veritable triumphs of casting, needing no separation and but little dressing to make them complete. Few metals run so fine or present so beautiful a surface as iron when properly cast, and it is painful to reflect upon the wretched, coarse, granular, and imperfect surface we so often see in this material, when we are shown the very high development of it in the figure castings of the French department. As an admirable illustration of its capability, we would direct attention to a very fine group of the Blessed Virgin Mary and St. John, cast by M. Zégut, of Tussey (Meuse). This consists of two figures, each larger than life, cast at one single founding without the slightest flaw; and when we say that one arm of St. John hangs down by his side, entirely detached in its whole length from the large mass representing the two other figures, and that no undue shrinkage or cracking of any kind has taken place in the cooling, we but indicate the extreme difficulty of the work, and accord our praise to the care which has overcome it. The figure castings of M. Ducel are also very praiseworthy; but we cannot give to their altar of cast-iron much commendation. Such things are ritually wrong; and, as a matter of feeling, we abhor all shams in connection with such matters. M. Durenne exhibits a remarkably fine selection of wonderful works, from the large fountain in the Parc to fine tazzi of remarkable thinness and delicacy of casting. Prussia is represented by the wonderful works, in cast steel, exhibited by Krupp, but these scarcely belong to our subject; and we have to turn to the exquisite light castings furnished by Lauchhammer, of Berlin, and Count Stolberg-Wernigerode, of Alsenberg, whose works are of particularly excellent character, and show very great care in the preparation of the metal; and the doors of the pavilion, belonging to this kingdom, on the gallery in the machinery department, are of very admirable workmanship, by M. Hauschild, of Berlin, from the designs of MM. Henicke and Von der Hude. The wrought-iron work exhibited by France is much of it of very excellent character, chiefly in the style of the early part of the last century, but with very refined detail. For beauty of design and knowledge of the true effect to be produced by the hammer, there is nothing in the Exhibition equal to the small collection of excellent specimens exhibited by M. Baudrit, of Paris. The *repoussage* of some of his work is very admirable, and the surface finish leaves nothing to be desired. A small three branch chandelier, attached to his stall, is an exquisite specimen of forging in light work; the lines and scrolls are so cleanly and beautifully true, and the composition so refined, that it is a work of very high merit. Some of the ramps, for staircases and balcony fronts, here exhibited are wonderfully clever; nor do we think it possible to find so much good work in so small a space in any other part of the Exhibition. Whilst here we may, in parenthesis, comment on a very ingenious arrangement for dispensing with the ordinary balance weight and pulley to sliding pendants or chandeliers. It consists of two or more small barrels, enclosing springs so arranged that the chain or cord by which the lamp is suspended shall, by passing over one barrel, wind up or slack out the spring to the extent required, the spring in the other barrel resisting it to an amount equal to the weight of the object. Of a nearly equal degree of excellence is the wrought-iron work exhibited in some gates by M. Roy; indeed, in some respects, M. Roy's work is superior to that of M. Baudrit: his fitting and ornamental forging, as distinct from *repoussé*, is finer, and some of his beating-up almost as good. These two gentlemen exhibit in their works the most scrupulous exactitude and care in the smallest detail, and offer to English metal-workers an excellent example they would do well to follow. The fitting together of all the parts is equal to anything done in machine work, whilst so long as our work can be induced to hold itself together by rivets and wedges it is all that can be expected of it. Of the use of very light sections of iron by M. Tronchon and M. Carré we have spoken before, and can recommend the works of these and the other gentlemen we have named to the careful study of English metal-workers and architects. Lead plays a much more important part in French architecture than with us, and although we have a few exceptions to the modern neglect of this very durable and applicable metal in England, they are so few as to serve the exceptional purpose of marking the rule rather than to indicate a revival of a disused handicraft. During the middle ages, and even through the Tudor and Stuart periods, it was well and ably used, but of late it has almost disappeared from the list of materials used in the *art* of architecture as practised in England, and is confined to the simply utilitarian purposes of building. Of its application as a vehicle for artistic labour we have many excellent examples here, and MM. Monduit and Bechet show an admirable beaten-up lucarne front, entirely constructed of lead work, and some fine figures serving as finials, of both lead and copper, with cresting, hip knobs, and other architectural accessories in great variety, and the actual process of producing these may be seen in operation in the building. M. Grados also has a very fine exhibition of *repoussé* work in lead, copper, and zinc, and some of his adjunctive works to other exhibitors, such as his Neo-Grec pavilion, in Class 65, and his framework for the Vieille Montagne Zinc Company's exhibition are admirable specimens of zinc work. Both these gentlemen are exhibitors in the chapel in the Parc, and were engaged in the lead and zinc accessories to the pavilion of the Emperor. MM. Monduit et Bechet are, moreover, the producers of a very extraordinary work in beaten copper—the crown of the dome for the new opera-house now erecting in Paris. This is an exceedingly well-executed and very badly designed production, without outline or grace. It is a confused mass of the prows of vessels stuck against a couple of circular belts. Paris may be eminent as a seaport, and her galleys may bear their proud prows into all sorts of queer places, but the last place in the world we should have thought of looking for them is the top of this very queer new opera-house. Apart from fitness, the thing is positively ugly, even when so near the eye that the richness of the detail makes itself felt, but what it will be when mast-headed up there with its two bristling rows of beaks merged into a curled-up hedgehog, is more than we dare venture to predict. We are glad to seize the opportunity of describing what it is before it goes up; hereafter, it will defy all speculative ingenuity to make it out. Sundry other works in metal for this building find themselves here, and though none are good, yet none reach the absurdity of this, which literally out-tops all. The bronze capitals by M. Christofle are wanting in unity and dignity, and are very meaningless, and the best, or, rather, the least bad of any portion exhibited are the gates deposited by the galvanoplastic process of M. Audry, of Paris. This same galvanoplastic process is very well illustrated in the Exhibition, and some full-size deposits of portions of the Trojan Column at Rome, and other equally large objects show admirably its monumental application. From the other parts of the Continent come but little architectural metal work, and the exhibits of our own country are of no very great art importance. Of course the inevitable Prince Consort Memorial brings a dreary train of Skidmoresque work, with its troublesome little curly scrolls and its little bits of meaningless inlay—work that a few short years of London smoke and English weather will reduce to an undistinguishable mass of rust and soot. For small accessories this sort of thing may be all very well if not overdone, but for a semi-regal monument on a more than regal scale it is totally unfitted, independent of climatic considerations. Messrs. Skidmore and Co. exhibit a few other works of the usual character, and many photographs. Messrs. Hart exhibit somewhat largely, and some of their works are very good, but we must award considerable praise to Messrs. Barnard, Bishop, and Barnard, of Norwich, for their Sandringham gates, which are very well manufactured. We see the same tendency to small and overwrought ornament here which was so painfully apparent

in their gates exhibited in '62, but the design of these is better, and not quite so much crowded. The *repoussé* work here is most affectedly coarse, and is in such strange meaningless places that it would have been better away; still there is very much of great merit in the manufacture of these gates, and their chiefest faults are those of design. Into the wide world of beauty opened out to us by works in metal partaking exclusively of a decorative character we dare not wander. Barbedienne and his *confrères* would lead us too far away from our subject, and Elkington and our English goldsmiths would detain us too long, and the ecclesiastical metal work of France and Spain frighten us beyond recall. Yet, with these two last exceptions, there is very much for the architect to study in the productions of these two large schools, and the exquisite refinements of detail in the one and the richness of the other are worthy of examination, and will repay it. We can scarcely compare the works in metal of our own country with others, their art tendency and expression being so far opposed to each other, yet we regret to close our notice with the impression that both as regards refinement of detail and neatness of execution, French wrought work as far surpasses ours as does her incontestible cast work. In manufacturing energy she has shown herself decidedly our superior, and we hope in pointing this out to those whose object it is to reverse this picture we shall be pointing to the means by which they can achieve it. Greater desire to provide such works as architects can use will lead to their successful production, and this will lead to so increased a demand that we trust an ever increasing improvement will be the result. The whole of the Continent, and especially France and Belgium, are competitors with us now, not only for our foreign but our home trade; and if the supineness of the English manufacturer continues unroused much longer that competition will scarcely exist and the fate of the English manufacturers will be like it.

GOSSIP FROM GLASGOW.

(From our own Correspondent.)

Some weeks ago there was copied into the columns of the Building News a series of questions submitted by Professor Gairdner, M.D., the civic sanitary officer, to the Glasgow architects, and relative to the accommodation, arrangement, ventilation, &c., of houses for "the working classes." Since then, the professor, along with Mr. Carrick, the master of works or city architect, and Dr. MacGill, the police surgeon, has had a private meeting with about a dozen of the leading architects for further consideration of the subject. Nothing definite, however, was agreed to, and the meeting was adjourned. With such a combination of "all the talents," something practicable ought surely to be the result.

Notwithstanding that the salmon has been always a prominent charge upon Sanct Mungo's scutcheon—and is now more so by reason of recent innovations upon the municipal blazon—Glasgow has had long to complain of a wretched and totally inadequate fish market. This state of things has just been remedied, and in a manner that leaves little room for fault finding. The bazaar in Great Clyde-street, hitherto but partially appropriated to the sale of fish, is now wholly devoted to that purpose, and has been so altered as to give an available floor room of 3,280 square yards. The new market is lofty, well lighted, and well aired; conveniently situated for alike supply and sale; and, moreover, has externally a public building character about it, of which, among many of its town relations, it need not be ashamed. *Apropos*, the town clerk's office has issued a public notice that anyone selling fish wholesale without the market is liable in a penalty of £5.

The old pictures of the kings and queens that so long have hung upon the walls of the pretty little townhall at the Cross have been sent to the MacLellan Rooms in the West End. Flaxman's marble statue of Pitt preceded them some years ago. The equestrian statue of the Hero of the Boyne is still in front of the townhall, but the East Indians would require a material guarantee that it be not some day sent to keep company with its erstwhile friends. The MacLellan Rooms (designed by Mr. James Smith, and built about fifteen years ago), were, with his gallery of pictures, bequeathed by Bailie (Alderman) MacLellan to his native city; but his death having discovered a bad state of money matters, the building and pictures were bought by the corporation. Besides the MacLellan (and permanent) Gallery, there is within the Rooms the annual exhibition of the West of Scotland Academy of Painting, Sculpture, and Architecture. As they are unsuited for a purpose for which they were never intended—two distinct exhibitions—the Rooms have for some time been undergoing an extensive remodelling from the designs of Messrs. Wilson and Thomson. Although over the entrance there is a bust, by Mossman, of the Queen (the association of ideas is certainly not obtrusively obvious), the Rooms contain no memorial, picture, or bust of their well-meaning founder—a man, moreover, one of the very ablest of Glasgow citizens. A fine full-length portrait of him, by Graham-Gilbert, adorns the Trades' Hall. I may mention that admission to the MacLellan Gallery is free—the citizens for this and for the public parks being taxed 2d. on each pound of rental.

That great and wealthy proprietary, the *Glasgow Herald* newspaper, finding its present premises much too limited for its still rapidly growing business, has purchased the property in Buchanan-street known as the "Monteith Rooms." The price paid is £26,000, or about £20 per square yard. With Buchanan-street in front and Mitchell-lane behind, a better site could not have been selected, even were selection possible.

When it was proposed to fill the windows of the cathedral with stained glass, there was a good deal of angry discussion by alike press, platform, and pamphlet, as to whether the work should be given to native or foreign artists. The foreigner got it. A meal of one's own words may not be a nice thing to digest; nevertheless, some of the committee have had to swallow it with what face they may. Of course, nothing artistic could come out of Glasgow, for there turkey-red is your only dye, and success therein your only "honourable mention." Beyond our sapient selves, however, we are esteemed otherwise; for it appears that our fellow-citizen, Mr. Cother, has received an award for the excellence of his stained glass windows shown in the Paris Exhibition, an honour similar to one achieved by Mr. Cother in the London Exhibition of 1862.

In a former communication I mentioned that the bridge at foot of Saltmarket was to be taken down and rebuilt. The wooden bridge which is to do duty in the interval is now nearly finished. Its extreme width is 30ft., and length 410ft. The carriage-way is macadamized, and the footpaths are asphalted. Some of the piles on which it rests are driven 23ft.; others, 18ft. and 20ft. The engineers are Messrs. Bell and Miller, and the cost will be between £3,000 and £4,000.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

The twenty-fourth annual congress of this association was inaugurated by a public dinner on Monday evening last, at Ludlow. The inaugural address was delivered after the public dinner, by Sir Charles H. Rouse Boughton, Bart., the president. Among those present were Captain the Hon. G. H. W. Windsor Clive, M.P., Mr. Jasper More, M.P., Mr. J. E. Severne, M.P., Colonel Colvin, C.B., Mr. T. Wright, M.A., F.S.A., Mr. G. R. Wright, F.S.A. (hon. curator, &c.), Mr. Gordon M. Hills (treasurer), Mr. E. Levien, M.A., F.S.A., and Mr. E. Roberts, F.S.A. (hon. general secretary), Rev. W. C. Sparrow (hon. local secretary), and several ladies.

The President, after some introductory remarks, said he remembered when, many years ago, he lived at the Old Priory at Wenlock, very little was said against the former owner of the ruin, who had pulled portions of it down to provide materials to build cottages with; but great indignation was expressed against another individual, who a quarter of a century ago committed dire antiquarian offence by knocking off a nose from one of the corbels. That circumstance demonstrated how much antiquarian taste had improved, that the entire destruction of a ruin should excite less indignation in one generation than the abstraction of an unfortunate corbel's nose in this day. He felt it would be presumption in him to attempt to read a lecture to the higher classes of the inhabitants of Ludlow, who had done so much in our days not only by the creation of waterworks, the amelioration of its drainage, the establishment of markets, of schools, and of reading rooms for the modern wants of its inhabitants, but who had largely burdened themselves to make their church what it now was—the finest ecclesiastical edifice in Shropshire. But there were other members of society who did not always see the real value of archæological remains, and who did an infinity of mischief sometimes in knocking off corbels' noses. To all such he would say that they were not marching with the intelligence, the refinement, or the education of the present day, when they destroyed or permitted the destruction of archæological remains—relics which, once destroyed, no commercial success could ever replace. He then referred to the local historians of the district, citing the names of men, living and dead, who had contributed to illustrate and elucidate that history—the late Mr. Botfield, who so long represented Ludlow in Parliament, Messrs. Wright, Duke, Pigeon; Archdeacon Owen, Blakeney, R. Anderson, Nightingale, and a host of other Shropshire writers. He might remind them that it was in that neighbourhood—at Berrington, near Shrewsbury—that an individual was born in the reign of Edward IV., who was still living in the time of Charles I.—that old, old, very old man, Thomas Parr. He proposed to say nothing to them that evening of all the ancient remains in that locality—the British earthwork, the Druidical remains, the Roman camp and town, the Norman abbeys, the Plantagenet castles with which that part of the country was so thickly studded; but he trusted his archæological friends would bear with him if for a moment he reminded them of how much of interest lay at their very feet. If they would learn all that was known of the early history of Ludlow and the solitary time the inhabitants must have had, they could consult no better authority than Wright's History. Others had chronicled the subsequent feuds in which their castle was engaged, and how different great men were alternately lords of the castle and inmates of its dungeons. It was here, probably, that the great victory of Mortimer Cross, Wrighton, Barnet, and Tewkesbury, were planned; and here, probably, the forces were rallied after the great defeats of Ludford, Wakefield, St. Albans, and others. But it was not only as a stronghold of war that Ludlow Castle appealed to their sympathies; but after these tribulations had passed it became the chosen residence of royalty. Could those old walls speak, how many a story of the courtly revelries of the Princes of York might they not unfold; how much of misery might they not divulge! But 365 years ago the saddest scene of all was presented when the funeral *cortege* departed from those gates with the remains of Prince Arthur for their last long home under Worcester Cathedral, after a short period of happiness in wedded life with the lovely Katherine of Arragon. Then, again, it was here that the lofty intellect of Milton first drew attention in his "Comus," and here Butler's satirical pen was wielded. Passing over the government of Sir Henry Sidney they came to the time when, stripped of its roof, the old border rallying place of centuries, the castle, became the ruin it now was. If they would gather something from these antiquarian reminiscences they might ask themselves how careful the thought ought to make them when they reflected who the men were that quietly viewed the destruction of Ludlow Castle, and how anxious they should be that posterity should not pass on them the same verdict as we did on those before us. Those days which saw the ruin of this fortress were not the days of what was called a barbarous age, but were the days when Swift and Congreve lashed the most prominent of our national vices; they were the days when the *Spectator* and the *Tatler* charmed our forefathers with the wit of Steele and Addison; the days when Bolingbroke, Pope, Arbuthnot, and others gave to the world a literature which is still among our most cherished possessions. If, then, there was much to cause them to mix regret with pleasure in viewing Ludlow Castle, he was glad to say no such mingled feelings need be entertained with respect to Ludlow Church. Sir Charles briefly sketched a history of the church, which, he said, had gone through three periods—a period of splendour, a partial eclipse, and a perfect revival. He then referred to other ancient remains in the town—the old town walls and one of the original gateways still standing, sites of

two priories, and half-timbered gabled house, and acknowledged the invitations received from the mayor and corporation of Ludlow, Lord Northwick, Lady Mary Clive, and Mr. Knight, of Downton, to visit Oakley Park, Burford, Downton Castle, &c. He should also himself have pleasure in receiving the associat on at Downton Hall, though he had not much of antiquarian interest to show them, for they knew that old stones must not be moved if they wished them to retain their moss, and his family had its foundation on a Warwickshire soil. In conclusion, he announced the inauguration of the twenty-fourth anniversary of the British Archæological Association.

CONTINUOUS GIRDERS.

In a continuous girder we have only part of the binding action due to the load exerted at the middle of the span, the other part being transmitted through the flanges to that part of the girder which rests on or is adjacent to the piers or supports. The bending action is exerted more intensely over the piers than at the middle of the span, and in the reverse direction. The result of the bending action at the middle of the span is to form a "couple," tending to produce curvature of the girder in a figure which is convex downwards. Over the piers, however, the opposite is the case; there the beam is bent in a curve, having the convex side upwards. One result of this change in the direction of the forces constituting the bending couple is, that at a certain distance from the middle of the span there is a point at which the bending action disappears; it gradually decreases from the middle of the span (the beam being supposed to be under a uniform load disposed over the whole span) to a point at which its value becomes equal to nothing, and then goes on increasing until it reaches its maximum effect over the piers. This result can only be realised when the various spans are similarly loaded. Those points at which we have no bending action or points of contrary flexure are situated at a distance from the ends of the beam or girder of ·577 of the half span, or about one quarter of the span. At these points, theoretically speaking, the flanges might be reduced to nothing, whilst at the middle and ends of the span the greatest sectional area would be required. Professor Rankine, in his "Manual of Civil Engineering," gives the following values for the bending moments at the part of the girder at which the bending action is most severe. In a uniformly distributed load the bending moment at the middle of the span is $= \frac{w\,c^2}{6}$ where $w =$ load p, unit of span, and c half span. Over the piers the binding moment is $= \frac{w\,c^2}{3}$. The bending moment in a beam simply supported at the ends is $= \frac{w\,c^2}{2}$. If we compare this value with those framed for the moments in the continuous beam we find that the sum of the moments $\frac{w\,c^2}{6}$ and $\frac{2\,w\,c^2}{6}$ is equal to $\frac{3\,w\,c^2}{6}$ *i.e.*, $= \frac{w\,c^2}{2}$. We have, then, in the continuous girder, when loaded over all its span, an advantage over the girder simply supported at the ends, in transferring a large part of the bending action of the load to those parts of the girder over the piers, and thus requiring less sectional area in the flanges at the middle of the span, thereby reducing the weight of the girder at that point, and also the deflection which would arise from the straining action due to a bending moment of the value $\frac{w\,c^2}{2}$. The straining action in the flanges over the piers taking place in an opposite direction to that in the flanges at the middle of the span, necessitates that the upper flange over the pier be designed to withstand the effects or tension, whilst the lower flange must be designed to resist compression, the reverse being the case at the middle of the beam.

W. J. M.

A new organ has just been placed in St. John's Church, Stockcross, Newbury, at a cost of upwards of £200, Messrs. Bryson, of London, being the builders.

SANDSTONE QUARRIES.

Last week we gave some information on the durability of various kinds of stone, taken from the report addressed to the Commissioners of Woods and Forests. The following table is taken from the same report, and will be found of considerable value to the architect and builder. Since the return was made, the facilities for the conveyance of stone have increased, and so, also, has the cost of labour. The prices of them have, therefore, most probably, in many instances, been modified.

Name of Quarry, and where situated.	Component Parts of Stone.	Colour.	Weight of a Cubic Foot in its ordinary state.	Weight of Block, and the Thickness procurable.	Price per Cubic Foot at the Quarry.	Price per Cubic Foot, delivered in London.	Where used.
			lb. oz.			s. d.	
Abercarne and Newbridge, near Newport, Monmouthshire.	Quartz and siliceous grains, moderately fine, with argillo-siliceous cement: micaceous, and with remains of fossil plants.	Dark bluish grey.	167 15	1 to 10 tons, in thicknesses of 5ft.	4½d., or 5s. per ton.	1 5	Old churches and modern buildings in vicinity; new Docks at Newport and Cardiff.
Ball Cross.	Siliceous grains with argillo-siliceous cement; occasionally micaceous, ferruginous.	Ferruginous brown striped, and zoned in deeper tints.	.....	.....	.....	.....	At Chatsworth and Bakewell.
Barbadoes, Tintern, Monmouthshire.	Fine and coarse quartz, and other siliceous grains, with argillo-siliceous cement, ferruginous spots, and plates of mica.	Light greyish brown.	146 12	1 to 10 tons, thickest bed 10 to 12ft.	10d. to 1s.	.....	Tintern Abbey.
Binnie, Uphall, and in Linlithgowshire.	Fine quartz grains, with argillo-siliceous cement, micaceous, chiefly in planes of beds.	Brownish grey.	140 1	Bands 14 to 18ft. thick (3 in number).	1s. 1d. to 2s. for largest blocks.	2 9 to 3 3	New club-house in Princes-street, Edinburgh, and numerous private houses there and in Glasgow.
Bolton's Quarry, Aislaby, Yorkshire.	Moderately fine siliceous grains, with argillo-siliceous cement, plates of mica, and spots of carbon disseminated.	Warm light brown.	126 11	100ft. cube; top beds for house building, bottom beds for docks. Beds 3 to 8ft. thick.	10d. to 1s.	1 9 to 2 1	Whitby Abbey, New University Library at Cambridge, Scarborough and Bridlington Piers, Sheerness and St. Katharine's Docks, &c.
Bramley Fall (Old Quarry), near Leeds, Yorkshire.	Quartz grains (often coarse), and decomposed felspar, with argillo-siliceous cement. Mica rare. Small ferrugiocus spots disseminated.	Light ferruginous brown.	142 3	Up to 18 tons.	.....	.....	In numerous bridges, waterworks, &c.
Calverley, Tunbridge Wells, Kent.	Fine siliceous grains, with a slightly calcareous cement.	Variegated browns.	118 1	70 or 80ft., and upwards to 500. Beds to 3½ft.	4d. to 6d.	1 2 to 1 4	Upper part of new church at Tunbridge Wells, Catholic chapel, the Calverley Hotel, new Market House, and Victoria National School, and about 100 houses, &c., at Tunbridge Wells and its vicinity.
Craigleith, Craigleith Hill, near Edinburgh.	Fine quartz grains, with a siliceous cement, slightly calcareous, occasional plates of mica.	Whitish grey.	145 14	Any practicable length and breadth, from 6in. to 10ft. thick.	9d. to 2s. 6d. according to quality	1 10½ to 3 7½	Used extensively in public buildings in Edinburgh, the College (1580), Registry (1774), Courts of Law, Custom House, Royal Exchange, National Monument, and numerous churches, and now using for repairs at Blackfriars Bridge.
Crawbank, Borrowstones, Linlithgowshire.	Fine quartzose grains with an argillo-siliceous cement, somewhat ferruginous; disseminated mica.	Light ferruginous brown.	129 2	5ft. thick, 6ft. broad, 10ft. long.	1s. for blocks of not more than 5 cubic ft.	2 2	A Roman bridge (A.D. 140), old church of Kinneil, of the twelfth century.
Duffield Bank, Duffield, Derbyshire.	Quartz grains of moderate size, and decomposed felspar, with an argillo-siliceous cement, ferruginous spots, and occasionally plates of mica.	Light brown with dark brown and purplish tints.	132 14	150ft.; thickest beds about 4ft.; half the depth brown, half white.	1s. 1d. the white stone, 9d. the brown stone.	.....	St. Mary's Bridge, Reporter Office, Mechanics' Lecture Hall, and Bishop Ryder's Church, now building (Derby); also Duffield Bridge, and chimney shafts to Grammar School, Birmingham.
Duke's Quarries, Holt Stanwell Bridge, Derbyshire.	Quartz grains, generally coarse, with decomposed felspar, and an argillo-siliceous cement; ferruginous spots.	Red, varied with green, brown, and grey.	144 8	.....	7d.	8	Penitentiary at Millbank, and the filling in parts of Waterloo Bridge, London.
Elland Edge, near Halifax, Yorkshire.	Fine quartz grains, with an argillo-siliceous cement, micaceous in planes of beds.	Light grey brown.	153 4				
Gatherly Moor, near Richmond, Yorkshire.	Quartz grains of moderate size, and an argillo-siliceous cement; ferruginous spots and plates of mica.	Cream.	135 13	1 to 3 tons, a bed 12ft. deep.	8d. for the 12 ft. bed.	2 1	Aste Hall, near Richmond, and Caterick bridges over the Swale, Purse Bridge, over the Tees, Skelton Castle, Darlington Town Hall, Lockburn Hall, and numerous modern buildings.
Gatton, Gatton, Surrey.	Fine siliceous grains, with a calcareo-siliceous cement, containing green silicate of iron and plates of mica.	Greenish light brown.	103 1	35 to 60ft. cube, from 4 to 10ft. long.	1 4 to 1 6	.....	Hampton Court and Windsor Castle, &c.; many churches in Surrey; Townhall and Almshouse Establishment at Croydon; and several modern buildings in the parish of Gatton.
Glammis, Forfarshire.	Siliceous grains of moderate size; cement slightly calcareous; mica abundant in planes of beds.	Purple grey.	161 2	Any practicable size; thickest bed 6ft.	0 7 to 1 0	about 19s. per ton.	Glammis Castle and Invergquharity Castle, supposed of the tenth century; Cortachy Castle; and in modern buildings, Lendertis House, &c.

SANDSTONES—*continued.*

Name of Quarry, and where situated.	Component Parts of Stone.	Colour.	Weight of a Cubic Foot in its ordinary State.	Weight of Block, and the Thickness procurable.	Price per Cubic Foot at the Quarry.	Price per Cubic Foot delivered in London.	Where used.
			lb. oz.		s. d.	s. d.	
HEDDON, near Newcastle, Northumberland.	Coarse quartz grains, and decomposed felspar, with an argillo-siliceous cement, ferruginous spots.	Light brown ochre.	130 11	Beds 4 to 12ft. thick.	0 6 to 0 10	1 8 to 2 0	Church at Heddon, steeple, 1764; Norman chancel; columns of portico to theatre, and Grey Monument at Newcastle; and nearly all the buildings, ancient and modern, in and about Newcastle.
HOLLINGTON, Staffordshire.	Quartz grains of moderate size, with an argillo-siliceous cement; plates of mica.	Light brownish grey	133 1	30 to 40ft. square, and 8ft. thick.	0 7 to 1 0	2 6	Trentham Hall, Drayton Manor, Heath House, and various public and private buildings in Staffordshire; Townhall, Derby; Mear Hall, Cheshire, &c.
HUMBIE, Humbie, Linlithgowshire.	Fine quartz grains, with siliceous cement; slightly calcareous; mica chiefly in planes of beds.	Pale grey and light brown.	White 140 3 grey 135 13	90 cubic feet and upwards, if required; thickest bed 8ft.	1 0 to 1 10	2 6 to 3 2	Newliston House, Kirkliston; Dundas Castle; additions to the Royal Institution; front of Surgeons' Hall, spire of Tron Church, and various other public buildings in Edinburgh; also in Glasgow.
LONGANNET, near Kincardine, in Perthshire.	Fine quartz grains, with siliceous cement, containing oxide of iron; a few plates of mica.	Light ferruginous brown.	131 11	4 to 5 tons; thickest beds 5ft.	0 8 to 2 6	1 8 to 3 6	Staadt House, Amsterdam; Exchange, Edinburgh; Tulle Mare Castle, Perthshire; and part of a street in Perth.
MUNLOCHY, in Ross-shire.	Fine siliceous grains, with an argillo-siliceous cement; micaceous.	Red and variegated.	160 9	Of large size; beds 2½ to 6ft. thick.	0 5 to 0 5½	.....	Cathedral Church of Ross at Fortrose, A.D. 1124; Inverness Old Bridge. Cromwell Court, &c.
MYLNEFIELD, or RINGOODIE, near Dundee, in Perthshire.	Fine siliceous grains, with a calcareo-argillo-siliceous cement; micaceous in planes of beds.	Purplish grey.	160 0	Any practicable size.	0 9 to 1 5	.....	Old steeple of Dundee, twelfth century, well preserved: Royal Asylum of Dundee, &c.; Bell Rock Lighthouse, Royal Asylum of Perth, Kinfauns Castle, Castle Huntley, &c., &c.
PARK SPRING, near Leeds, Yorkshire.	Fine quartz grains, and decomposed felspar, with an argillo-siliceous cement; mica chiefly in planes of beds.	Light ferruginous brown.	151 1	10 to 12ft. long; thickest bed 2ft. 4in.	0 7	2 1½ to 2 5	Commercial buildings at Leeds, from the old quarry, which is of exactly similar stone to that of this quarry.
PENSHER, near Houghton-le-Spring, Durham.	Coarse quartz grains, with an argillo-siliceous cement; plates of mica.	Pale whitish brown.	134 5	Any practicable size; thickest bed 20ft.	0 8¾	1 7	Pensher Chapel; Scotch Church, Sunderland; Sunderland Pier, Seaham Harbour, Victoria Bridge on the Wear.
PITDYKES, near Dundee, Forfarshire.	Siliceous grains of moderate size, with a calcareo-argillo-siliceous cement; micaceous.	Purplish grey.	162 8	Thickest bed 3 to 4ft.	0 10 to 1 2	2 1 to 2 5	Extensively for the works at Dundee Harbour, &c.
SCOTGATE HEAD, Huddersfield, Yorkshire.	Quartz grains of moderate size, with an argillo-siliceous cement; mica in planes of beds, and occasional specks of carbon.	Light greenish grey.	158 3	Thickest bed 3ft. 6in.	0 8	1 2	York Castle; Bath Hotel, at Huddersfield.
STANCLIFF, or DARLEY DALE, near Bakewell, Derbyshire.	Quartz grains of moderate size, and decomposed felspar, with an argillo-siliceous cement, ferruginous spots, and plates of mica.	Light ferruginous brown.	148 3	Of very large size.	1 5	3 3	Abbey in Darley Dale; Stancliff Hall, Birmingham; Grammar School, Birmingham, and Nottingham Railway Station Houses.
STENTON, near Barnard Castle, Durham.	Fine quartz grains, and decomposed felspar, with an argillo-siliceous cement, ferruginous specks, and some plates of mica.	Ferruginous light brown.	142 8	15 to 20ft. long, 2 to 8ft. in thickness.	0 5½	1 5	The Round Keep of Barnard Castle; Joint Stock Bank, and Market House, Barnard Castle.
WHITBY COMPANY'S AISLABY, near Whitby, Yorkshire.	Siliceous grains of moderate size, with an argillo siliceous cement; some plates of mica and spots of carbon disseminated.	Light brown	126 11	40 × 25ft.	0 10	1 8	Some parts of Whitby Abbey; New Library at Cambridge; Baths and Townhall at Whitby; Cemetery at Highgate; Hungerford Market, &c.
WHITBY COMPANY'S EGTON QUARRIES, being Arncliffe, Julian Park, Proddams, and Lease Rigge, near Whitby.	.....	Pale, to dark brown.	.....	Arncliffe, 15 × 10 × 9 Proddams, 10 × 8 × 8	0 11½	1 9¾	Grosmont Abbey and Bridge; Egton Bridge; London and Birmingham Railway; Whitby and Pickering Railway.
	.....	.....	127 14	Lease Rigge, 10 × 6 × 5			
WHITBY COMPANY'S SNEATON, near Whitby.	.....	.....	134 13	24 × 9 × 3½	1 1	11	Parts of Whitby Abbey, and a portion of the parapet of old Blackfriars Bridge, London.
WHITBY COMPANY'S NEWTON DALE, near Whitby.	.....	.....	131 11	6 × 4ft. and 18in.	0 10	1	Lewisham Church.

IRISH ILLUMINATIONS.

THE last number of the *Art Journal* contains the following observations on Marcus Ward and Co.'s illuminations:—The revival of the beautiful mediæval art of illumination has led to the formation and establishment of a school of illuminators in Ireland, whose works may justly claim to be held in as high esteem as the productions of the palmy days of the thirteenth century. A collection of some of their most choice and characteristic works has been sent by Messrs. Marcus Ward and Co., of Belfast (with whom the revival of Irish illumination originated, and who have brought it to its present high perfection), to the Universal Exposition, but the necessity of keeping such delicate and precious objects as illuminations secured under glass, has prevented this remarkable and most interesting collection from having become so generally known as otherwise it might have been, and, consequently, its rare merits have at present been by no means adequately appreciated.

Remembering that, in the olden time, Ireland produced illuminated volumes which, while they were distinguished by a style peculiarly their own, were second to none of the most famous contemporaneous works of the same order, Mr. Marcus Ward, when he saw the practice of illuminating again becoming prevalent, resolved to make an effort to raise the revived art above the rank of an elegant amusement; and in so doing, he aspired to restore to Ireland an early art, and at the same time to secure for the country an honourable and beneficial industry. In carrying out these most laudable views, this gentleman has felt that his object could be attained only in a very imperfect degree unless he could adapt the revived art of another age to the conditions and sentiments of the age now present; and he also was conscious that his illumination, however perfect its productions might become in his hands, could not hope to attain to a permanent existence without being applied to uses and requirements such as would create a definite, systematic, and sustained demand for its productions. Accordingly, during the last ten years, Mr. Ward, and the allies whom he has associated with himself in the working out of his project, have applied themselves, with excellent judgment, and untiring zeal, on the one hand, to form a school of their own, in which a band of Irish students might be trained and disciplined in the art of illumination, under their personal care and direction; and, on the other hand, to adapt the exquisite old art, which already had acquired a general popularity (we quote their own words), "in a practical manner to the tastes and wants of a utilitarian age." As a matter of course, it was a point of primary importance to infuse the true ancient spirit into the new illuminations; and at the same time it was judiciously determined to render every modern improvement in colours and *materiel* available, while the subjects of the various works and their illustrations, the figures, the ornaments, and the scenes and landscapes introduced, would necessarily benefit, in no slight degree, from the superior knowledge of drawing which is characteristic of the present day. In the treatment of heraldic subjects, which constitute such peculiarly appropriate and felicitous elements of historical illumination, it was decided, with the same sound taste and good judgment, to adhere as closely as possible to the practice of the best heraldic artists of the noblest era of mediæval heraldry, with such slight modifications in drawing, and such an association of more recent details with the earlier figures and compositions, as circumstances might render either desirable or necessary.

These excellent plans have been carried into effect by the projectors with a success so complete that it would not be possible for us to express our admiration of the exhibited evidences of their ability in too decided terms; nor is there anything still to be accomplished by them that we consider it our duty to suggest to Messrs. Marcus Ward and Co., when we offer to them our cordial congratulations upon the distinguished success they have achieved.

They have thus been enabled to create a new artistic industry for Ireland, and, in so doing, have introduced a fresh class of historical materials that are at once eminently valuable, and of peculiar beauty and interest. Several hundreds of these illuminated chronicles and documents have been executed by Messrs. Ward and their artists for various members of the British Royal Family, and for the nobility and gentry of the United Kingdom; and in many instances these illumi-

nated works have attained to the rank and importance of noble volumes of truly magnificent splendour. Several specimens have been selected from the volumes executed for the Prince of Wales, the Earl of Hillsborough, the Dean and Chapter of St. Patrick's Cathedral, and the citizens of Dublin; and these works, having been considered to be specially meritorious, are now exhibited at Paris. In order, also, that the style of the designs, and the quality of the artistic treatment, might be the more easily and also the more carefully examined, without opening the case in which the whole collection is deposited, duplicates of some of the most characteristic leaves have been executed (as all the originals are) on vellum, and they are exhibited separately framed as distinct works. A most interesting example of this group is a leaf from the volume presented to Sir B. Guinness, as a memorial of the princely and wise munificence which prompted him to undertake, and to complete, the restoration of St. Patrick's Cathedral, at his own cost.

It is only necessary for us to add that the bindings of the illuminated volumes, all of them designed by Mr. Marcus Ward, and executed in his establishment, are thoroughly worthy of the works they both protect and adorn; each binding, indeed, as its own proper motto, might be impressed with the three significant words of the great Roman poet, *Decus et tutamen.*

BUILDERS' BENEVOLENT INSTITUTION.

On Wednesday afternoon the twentieth annual meeting of the subscribers and friends of the above charity was held at Willis's Rooms, King street, St. James's, for the purpose of receiving the report for the past year, for the election of president, treasurer, directors, and auditors for the year ensuing, and for other matters connected with the welfare of the Institution. Mr. Benjamin Hannen, president of the Institution, occupied the chair.

The minutes of the last meeting having been read and confirmed, the balance-sheet was next received and passed.

The Secretary then proceeded to read the following report:—

The directors, in presenting to the friends and supporters of the Builders' Benevolent Institution their report for the past year, take leave to state, that notwithstanding the unparalleled monetary depression of the last twelve months, which has so seriously affected all classes of society, the funds of the Institution have not diminished, the annual subscriptions having increased, which, taking into consideration the above-named cause, is highly creditable both to the feelings and generosity of all connected with the building trades.

Since the last general meeting several friends have been removed by death, and the directors have to announce the receipt of the following bequests in aid of the funds of the Institution:—Firstly, the late Robert Forest, Esq., £1,000, less duty; secondly, the late Charles Beachcroft, Esq., £50; thirdly, the late H. Larner, Esq., £21; fourthly, late Charles Hack, Esq., £200, less duty; and they take this opportunity of expressing their deep regret and the lasting obligation which is due to their memory, together with a feeling of gratitude for the generous sympathy which prompted those gentlemen to think of the sorrows, and alleviate by their bounty those of their brethren who had been less fortunate in life than themselves.

Two elections of pensioners have been held, the first in November last, when three were elected—viz., two males and one female; the second in May, 1867, when a similar number was chosen, making a total of four males and two females during the past year, and two deaths have taken place during the same period, one man and one woman, making the number now in receipt of the benefits of the charity forty-five—twenty-three males and twenty-two females. Pensioners elected:—Males—James Webb, elected November, 1866; I. F. Goff, ditto; George Hunt, May, 1867; Charles Gravell, ditto. Females.—Mrs. A. Colbron, Brighton, November, 1866; Mrs. Ann Walker, May, 1867. Pensioners deceased.—John Noble, elected November, 1862, died August, 1866; Mrs. A. Thomas, elected May, 1856, died April, 1867. £1,368 18s. stock has been added to the relief fund, and £100 4s. 8d. to the building fund, making an addition of £1,469 2s. 8d. stock Three per Cent. Consols purchased during the past year. There is now standing in the names of the trustees—For the relief fund, £9,806 10s. 1d.; for the building fund, £2,832 11s.; being a total of £12,639 1s. 1d. The directors again notice with regret that there is still a large number of builders, carpenters, bricklayers, plumbers, &c., who have not yet responded to the numerous appeals made to them to become supporters of a charity which relieves so many of the trades in immediate connection with the building interest, but they do hope that either of themselves, or through the persuasion of subscribers they may be induced to give their support to the Builders' Benevolent Institution.

In accordance with rule 15, section 3, a special general meeting was held on December 3, at Willis's Rooms St. James's, to take into consideration what should be done with the £2,500 and upwards now subscribed to the building fund, when the following resolution was passed:—"That it be recommended that there be a sub-committee formed from the general committee, for the purpose of selecting such sites of ground as may be eligible for the erection of almshouses hereafter within a radius of seven miles from Charing Cross, the land not to be less than three acres in extent, and the report of such sites shall be laid before the general committee at their monthly meeting for March, 1867, when they shall be empowered to negociate the purchase of the site upon which they may determine. Several meetings of the said sub-committee have been held within the past six months, and plots of land viewed, but no definite result has been determined on.

The subscribers and donors are respectfully requested to notice that permanent offices have been taken in an eligible and central position at No. 4, Vernon-place, Bloomsbury-square, W.C.

The Chairman moved that the report be received, adopted, and printed, which being seconded, was unanimously carried.

Mr. Plucknett, of the firm of Cubitt and Co., proposed that Mr. W. R. Rogers, his partner, be elected president for the ensuing year.

Mr. G. Bird seconded, and Mr. Rogers was unanimously elected.

Mr. Plucknett was re-elected treasurer to the Institution, and the directors and auditors of the past year were reinstated for the year ensuing.

The usual vote of thanks to the chairman and retiring president concluded the proceedings.

SEFTON PARK, LIVERPOOL.

The Corporation of Liverpool, being desirous of proceeding vigorously with the works of Sefton Park, the authors of the prize design, M. André, of Paris, and Mr. Lewis Hornblower, of Liverpool, have been instructed by the Improvement Committee to use every exertion to accomplish their desire. We have, therefore, given plans and views of a few of the proposed buildings connected therewith.

The area of the park is 400 acres, and is thus appropriated:—

	a.	r.	p.
Building sites (surrounding park)...	113	0	0
Botanical garden	19	0	0
Area of roads and drives	64	0	0
Area of lake	14	0	0
	210	0	0

The 190 acres left will be planted and laid out with carriage drives and walks. The ground is beautifully undulating, and offers great advantages to the artists that are to develope the design.

The principal approach to the Sefton Park, from Liverpool, will be by a prolongation of Croxteth-road, which is a continuation of Prince's Park-road, leading directly from Upper Parliament-street. At the point where Croxteth-road enters the park, a grand boulevard, 75ft. wide, leads to Otterspool, on the main Garston-road. This will give a magnificent and direct communication between the town of Liverpool and the fashionable suburb of Aigberth and Mossley Hill. A gallop for equestrians, or Rotten-row, 25ft. wide, is carried parallel with the boulevard from the principal entrances. It is proposed to erect the octagonal double lodges in accordance with the design given by us. All the lodges will be kept in harmony with this.

The Botanical Gardens are placed in a central position, and will be railed off and kept perfectly distinct from the park. Lodges, in accordance with the design given in our illustration, will be erected at each entrance. The head gardener's house will also be placed in a convenient site in the gardens. Effect will be introduced in these buildings by the introduction of stone and coloured bricks; and the roofs will be covered with ornamental coloured tiles.

In various parts of the park, covered shelters for equestrians will be erected. These will be constructed of rough rustic boughs, and the roofs ornamentally tiled. We give a shepherd's house or house for under gardener, and the cricket pavilion. This will be placed in an excellent position, overlooking the cricket ground of 12 acres in extent. The Corporation are most anxious to encourage this manly game, and every facility will be given to the public who wish to enjoy the privilege of playing. The cricket pavilion contains ample dressing-room accommodation, with large dining saloon, kitchens, lavatories, waterclosets, &c.

Many other buildings will be scattered over the park, in various convenient positions. The building sites are divided into 290 plots, in sizes varying from 1,250 to 5,000 square yards. The whole will be offered by auction to the public in a 75 years' lease. The plans of all houses erected upon the sites must be submitted to the Corporation, and approved by them, and nothing will be omitted to render this park the most desirable site for residences in the neighbourhood. The views of the River Mersey, well backed by the hills of Cheshire and Wales, are exquisite, and the well-wooded foregound of Aigburth, Fulwood, and Otterspool, give additional charm to the landscape.

The park will be readily accessible from Liverpool by means of two lines of railway—the London and North-Western, on the eastern side, and the Liverpool and Garston, on the western. The soil of the park is all that can be desired, and it is hoped that the acknowledged skill of M. Edouard André, as a landscape gardener, the designer and constructor of the park in the Bois de Boulogne, the park of the Butte de Chaumont, on the north-east side of Paris, and of the new park now commenced in the south-west suburb of that city, in conjunction with Mr. Hornblower, architect, who was long connected, in his professional capacity, with the late Sir Joseph Paxton, in the construction of the architectural works in the Birkenhead Park, will ensure to the inhabitants of Liverpool a park and botanical garden equal, if not superior, to anything of the kind in the kingdom.

KENT ARCHÆOLOGICAL SOCIETY.

The proceedings of the annual gathering of this society were brought to a close on Friday last. Notwithstanding the heavy fall of rain which set in during the night, and continued until nearly noon, about 100 ladies and gentlemen assembled at the Bull Inn, Dartford (where carriages were provided), in order to make an archæological tour through the valley of the Darenth, which runs from Dartford to Sevenoaks. The very interesting churches of Darenth and of Lullingstone were the principal points of attraction, and the tourists had the advantage of the description and explanatory remarks of those distinguished archæologists, Mr. J. H. Parker, the Rev. T. Hugo, Mr. Bloxam, and Mr. Dunkin. The Rev. T. P. Coates, the incumbent of Darenth, conducted the party over the church, which is a remarkably fine edifice of the Norman period, and it has the very unusual arrangement of what is called a sanctuary between the chancel arch and the nave. The roof of the chancel is groined, but that of the sanctuary, which is of a loftier pitch, is open work. Mr. Hugo supposes that there was some kind of monastic establishment, under the priory of Rochester, attached to the church; and that the sanctuary was the place of the monks in the sacred edifice. The font is evidently of great antiquity. Mr. Bloxam described the very interesting monuments at Lullingstone; and the tilt-yard at the castle there, the seat of Sir Percyvall Hart Dyke, attracted much attention. Sutton-at-Home Church and the fine old Elizabethan manor house, known as "Franks," at Horton Kirby, were also visited. Altogether the trip was a most successful one. An interesting museum of ancient articles found in the district was opened in the Bull Assembly Rooms. Amongst the exhibitors were Mr. J. B. Monkton—specimens of English silver coinage; Mr. A. Russell—ancient legal parchments relating to Dartford; the Rev. G. Rashleigh—a number of Anglo-Saxon ornaments in gold found at Southfleet; Mr. Ashenden—bones and pottery, found at Farningham; the Society—some remarkably fine armillæ, found in the bed of the Medway, and flint implements found at Ospringe; Mr. A. Dunkin—a collection of ancient MSS. and printed documents, &c. A white marble slab 2ft. 2in. by 2ft. 4in., having on its surface a "Calvary" depicted by alabaster and coloured marbles, was shown by Mr. Bray. This slab is known to have been in use for more than 100 years in the Bull Hotel kitchen for making pastry upon, but although there is at least one antiquarian of note resident in Dartford whose researches have been neither few nor unsuccessful, he had never heard of this slab until now. A number of complimentary resolutions, particularly votes of thanks to the chairman (Earl Amherst), the secretary (Mr. Godfrey Faussett), and Mr. F. Hards (the local secretary), whose exertions added much to whatever degree of success attended the meeting, were passed, and the proceedings then terminated.

Great preparations are being made for the ensuing meeting of the Cambrian Society, which has fixed to hold its meeting at Hereford early in August. A museum for specimens of antiquarian and archæological interest will be opened at the Shire Hall, to which the county gentry of Wales and the western counties of England will contribute.

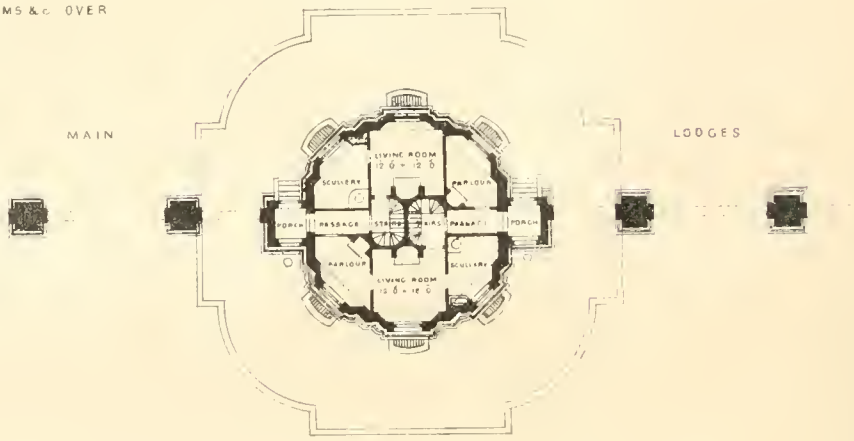
SEFTON PARK LIVERPOOL

ANDRÉ AND HORNBLOWER ARCH^TS

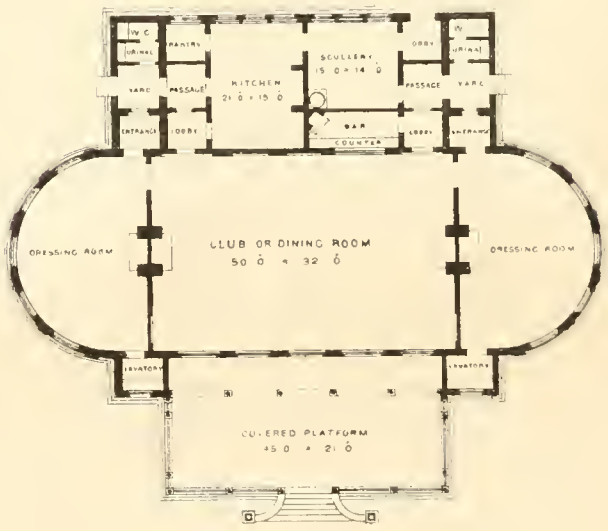
HEAD GARDENER'S HOUSE
GROUND PLAN
FOUR BEDROOMS &c OVER

PLAN SHEWING ARRANGEMENT OF FLUES
AND LIGHTING OF STAIRCASES

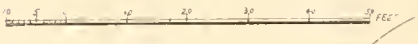
LODGE TO BOTANICAL GARDENS
GROUND PLAN



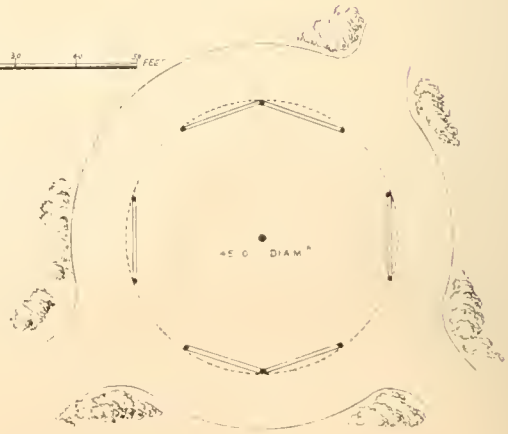
GROUND PLAN
SIX BEDROOMS &c OVER SIX CELLARS &c UNDER



GRAND CRICKET PAVILLION
GROUND PLAN



SHEPHERD'S HOUSE
GROUND FLOOR
FOUR BEDROOMS &c OVER



SHELTER FOR HORSEMEN. GROUND PLAN

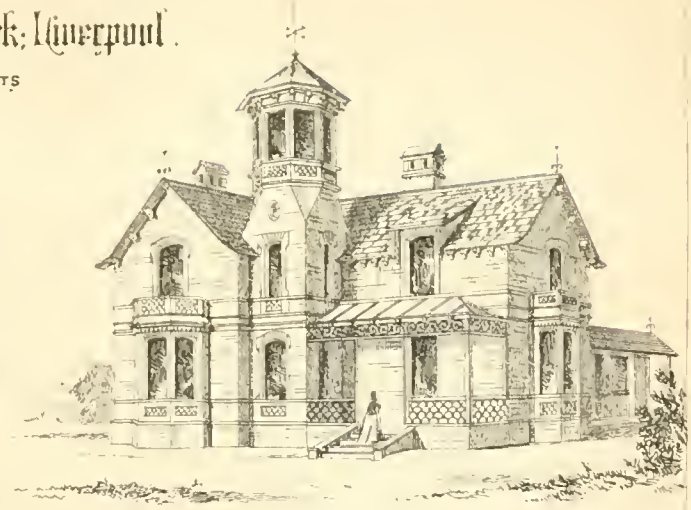
Printed by Whiteman & Bass

E. Wimbridge, Lith

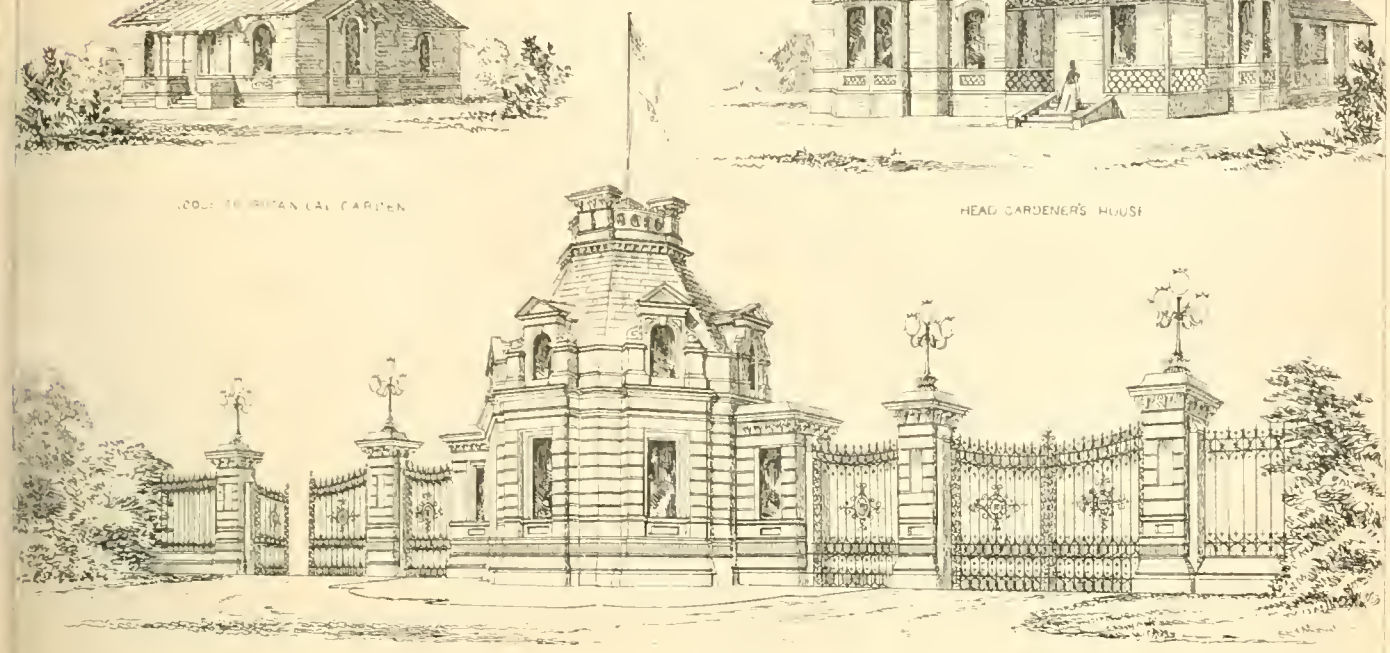
Designs for Proposed Buildings in Sefton Park, Liverpool.

MESSRS ANDRÉ & HORNBLOWER, ARCHTS

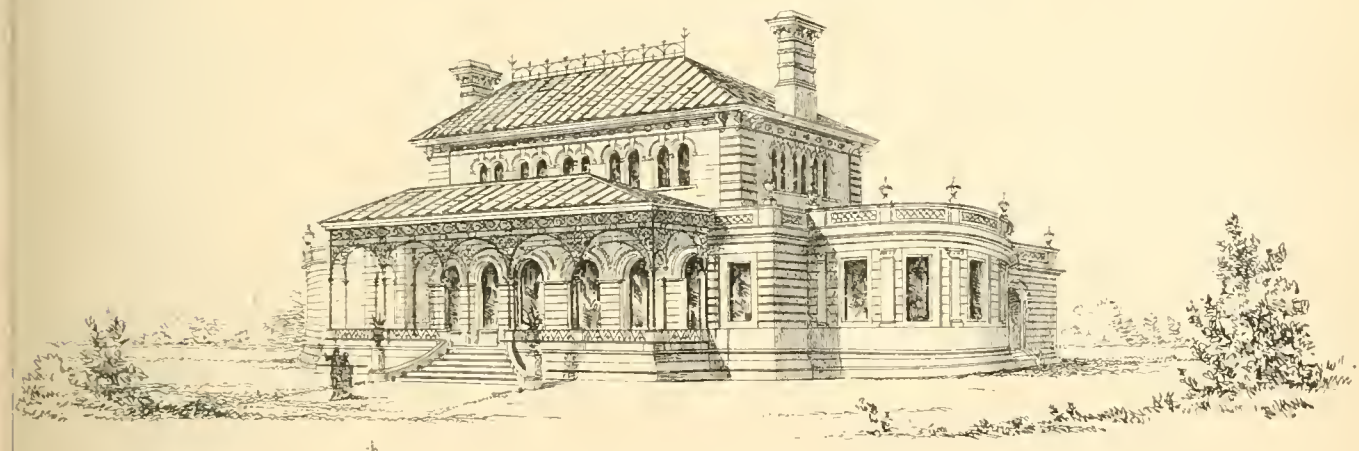
LOOSE TO BOTANICAL GARDEN



HEAD GARDENER'S HOUSE



MAIN LODGES



GRAND CRICKET PAVILLION

SHELTER FOR HORSEMEN

SHEPHERD'S HOUSE

Printed by Whiteman & Bass

H. Wimbridge, lith.

CONCRETE AND BETON.

WITH the accustomed apathy of our national disposition we are just ten years behind our French neighbours in the use of the two materials forming the subject of our present article, although for some time past they have successfully undergone trials and proofs calculated to convince the most cautious of their real value, and to gain the confidence of all architects and engineers. In thus mentioning the advantages of the employment of concrete and bêton, we allude more particularly to their extended application to large works of construction, and not merely to their use on a smaller scale in ordinary houses and buildings, a subject which has already been well ventilated in our columns. As it was in France that the field was first opened to these substitutes for masonry and brickwork, we shall naturally expect to find there the most prominent examples of their application, and it will be seen that in Paris they have been used for a variety of walls, and not merely confined as many imagine to the construction of upright walls. In the capital and the suburbs there are upwards of three miles of sewers built entirely of concrete. To avoid confusion it may be stated that the difference between concrete and bêton is that the former is not necessarily possessed of hydraulic properties whereas the latter always is. It will, of course, depend altogether upon the nature of the lime with which the concrete is made, whether it will be a simple concrete or an hydraulic concrete, that is, a bêton. As a rule, however, in all cases where concrete is used in large masses, especially for foundations, it is made with blue lias or other limes possessed of hydraulic properties. It is worth bearing in mind that in getting in loose concrete foundations it is an excellent plan to throw in a barrel or two of good Portland cement, particularly if the site be wet. The basement of the Paris Exhibition building is all of concrete. The revêtement wall and monumental staircase of the Boulevard de l'Empereur, a portion of the municipal barracks of La Cité, the church of Vesinet, the sawmills of Aubervilliers, and a number of other works, all bear witness to the increasing use made of these valuable adjuncts to the constructive arts.

Those who would really desire to witness to what a pitch of perfection this particular description of construction can be carried should visit the building at present in progress of erection at the corner of Rue Mivoménil and Rue de Naples, where every difficulty is not only met but fairly conquered. There are to be found monolithic foundation walls, flat crown vaults, doors, and windows, possessing alike a delicacy of moulding, with all the durability of rock itself. The above examples are sufficient to dissipate all doubts respecting the capabilities of the materials in question; and we may, therefore, direct our attention to some of the especial advantages enjoyed by them, and which are deserving the notice of all those engaged in similar works. Concrete, in the most general acceptation of the term, possesses the inestimable advantage of being capable of application in any locality, since in its manufacture every description of sand and lime can be used. Moreover, it requires no skilled labour to make it. The most inexperienced hand at building can manipulate it without fear of damage, and a very short time suffices to render him a proficient. Under conditions so favourable it is easy to perceive what a vast field is open to its employment in countries where stone is scarce and skilled workmen still scarcer. As a corroboration of our statement, we may allude to the important works of hydraulic engineering that have been carried out in Egypt by the ignorant fellahs and labourers equally unacquainted with everything relating to the art of building. The best known system of manufacturing concrete, or, as it may be appropriately termed, artificial masonry, in France, and that having the widest application, is the plan of Coignet; and it is to this that we shall more particularly direct the attention of our readers. The concrete mass is composed of a mixture of a large quantity of any sand procurable, a small quantity of hydraulic lime, and, according to circumstances, of a trifling proportion of cement. This last should, when possible, be Portland cement, and if a little overburnt so much the better. When these ingredients have been mixed together in a dry state the whole is barely moistened with water, and subjected in a special apparatus to a vigorous and lengthened trituration. This operation is managed in a manner so that the whole mass is reduced to the consistency of a paste, in a condition highly favourable to its future agglomeration. The pasty mass is then passed in thin layers into a mill, where it is effectively incorporated by the repeated action of a pestle. The result of the mechanical action to which the ingredients are subjected and the amount of compression they undergo is well demonstrated by the fact that to make one cube yard of solid masonry 1·7 cube yards of materials are required. Moreover, it will be at once apparent that the density of the artificial stone will be greater than that of a natural one, and the weight of a cube foot is considerably in excess of that of ordinary sandstone.

The proportions in which the ingredients are mixed will naturally affect the strength of the specimen which is dependent upon the relative quantities of lime, or cement, and sand in its composition. Thus, with one hundred weight of ground lime and half a ton of sand we obtain a stone capable of resisting an ultimate crushing force of nearly three-quarters of a ton to the square inch, which is comparatively a very weak specimen, and far inferior to the natural sandstone. By altering the proportions of sand to 15 cwt., keeping that of the lime constant, and adding nearly 1½cwt. of cement, we obtain a stone capable of withstanding a crushing weight of three times the above, which is but a very little stronger than the natural specimens. A very strong block is obtained, capable of resisting four tons to the square inch, by maintaining the same proportion of lime, increasing that of the sand to 18 cwt., and that of the cement to 2½cwt. There is an important difference to be noticed between the manufacture of this artificial masonry and that of ordinary mortar. In the latter too much water is always used where manual labour is employed, as it would be insufficient to effect a thorough incorporation of the ingredients if they were not saturated. The evil of too large a quantity of water is that it gets between the atoms of the lime and prevents its binding with the sand. Consequently, when after a time it evaporates, it leaves the mass in a porous, friable condition, with very small powers of resistance to crushing. On the other hand, when the materials are properly prepared, thoroughly triturated, and reduced to a due pasty consistency, almost without the aid of water, they constitute a dense, solid, impermeable block, becoming harder and harder with the progress of time, and absolutely insensible to the destructive influences of frost and damp. The mistake committed in the first attempts to manufacture artificial masonry was the employment of an excess of water, whereas theory requires, and practice has confirmed, that the water should be diminished to a quantity as small as possible, and that the proper incorporation of the ingredients should not be accomplished by its instrumentality, but by the aid of mechanical mixture. If the operation of mixing in the mill is carried on upon the masonry itself, the production of one day's work amalgamating with that of the day previous, it is quite possible to raise a monolithic block of almost any dimension. There are, however, practical limits to this method of construction, and for many reasons the manufacture of isolated blocks is that more usually adopted. The application of concrete to ornamental work as a substitute for carvings and mouldings is a branch of artificial masonry which we shall refer to at another occasion.

THE IMPERIAL HOTEL, SOUTHAMPTON.

THIS imposing structure has just been opened to the public. Situated close to the docks and terminus, and commanding two fine frontages—one possessing extensive views over the Isle of Wight, Southampton Water, and the sylvan border of the New Forest—it seems admirably calculated to answer the object of its erection. For passengers embarking or arriving by the steamers to and from the East and West India stations, France, and the Channel Islands, and for those alighting from the trains, the position of this commodious and handsomely-furnished hotel must command a decided preference; and from its two arms or frontages extending and enclosing the arrival and departure platforms, passengers from the trains can have their luggage unloaded from the railway vans within the hotel barriers. Perhaps the most peculiar feature of its construction, nearly all fireproof, is the fact that it stands mainly upon a massive framework of wrought plate box girders, supported upon cast-iron columns, the principal façades only being brought up upon a massive stone arcaded basement, open to an inner screen wall on the longest front, which arrangement constitutes a pleasing boldness of elevation, and lifts the main floor to a commanding height. Two handsome stone staircases, one in each arm of the building, lead to spacious corridors traversing the whole length of each front, opening on one side to the *salle-a manger*, one of the handsomest rooms in the provinces, and is well lit and ventilated by lofty casement windows in the main fronts. This room is nearly 80ft. long, 35ft. wide, and of proportionate height, and opens into an elegant apartment, elliptical on plan, which occupies the circular corner of the two façades, and becomes a pleasing climax in the internal perspective. There are various other apartments, comprising saloons, ladies' coffee-room, private dining-rooms, &c., &c., the building containing nearly 100 principal bed-rooms in addition to nearly an equal number required for other purposes. The kitchens occupy that part of the fourth floor which forms the centre of the main façade, and are immediately underneath the large pavilion roof crowning this portion of the composition, thereby avoiding the unpleasantness of the fumes from the culinary department, not always acceptable to the olfactory organs of the fastidious visitor. In connection with this department of the hotel are some large hydraulic lifts, traversing the entire height of the building, the pressure of water being obtained by a large tank in the pavilion roof, supplied by steam power from the basement, the lavatories, baths, &c., being also supplied from it. The kitchen fittings were manufactured and fixed by Messrs. Edwards and Sons, of London, and are complete of their kind; while the gas fittings were supplied by Messrs. Ching. Electric bells are fixed throughout the building. Messrs. Burroughs and Watts have fitted the billiard-room; and the handsome and costly furniture of the entire establishment was supplied by Messrs. Blyth and Sons. Exteriorly, the two façades are judiciously treated in the Italian style, the upper portion and skyline being happily broken and relieved by mansard and pavilion roofs; while each front is emphasized by a slight projecting centre relieved by pilasters. The materials are Fareham red bricks and Bath stone dressings, the stone being liberally used. A boldly sculptured tympanum, together with a massive blocked cornice and stone arcading, combine to form a successful whole. Messrs. Farmer, of Westminster, having been entrusted with the stone carving; Messrs. T. Shaw and Co., of Cannon-street, with the ironwork; the contractors of the whole building being Messrs. Holland and Hannen, of Duke-street, Bloomsbury. We hear that the directors have expended a sum approaching £100,000; and under the managerial superintendence of Mr. Ferrar, we heartily hope the hotel will prove a commercial success. The architects who designed and superintended the various works were John Norton, Esq., of Old Bond-street, London; and Messrs. Guillaume, Parmenter, and Guillaume, of Marland-place, Southampton.

HOW THE PACIFIC RAILROAD IS BUILT.

THE wonderful rapidity and energy with which this railroad is stretching its iron trail across the plains and into the Rocky Mountains, are thus graphically described by a correspondent of the *Cincinnati Gazette*:—

There is really little known by the people of the character of the enterprise. Most think that a company of capitalists are hastily putting down a rude track, over which cars can be moved with care, for the purpose of securing lands and money from the Government. The fact is, that one of the most complete roads of which the country can boast, with equipments that surpass many, is now being laid with a speed that fails to impress the nation, simply because it is not believed. But let the facts tell their plain yet wonderful story.

Generals J. S. and D. C. Casement, of Ohio, grade the road, lay the track, and put up the telegraph. The graders go first. There are two thousand of them. Their advance is near the Beach Hills. They protect themselves, and are digging the great fortifications which makes the future sure for us, on through Indian battle fields, while the daily fight goes on. Of tie getters and wood-choppers there are 1,500. Their axes are resounding in the Black Hills, over Laramine Plains, and in the passes of the Rocky Mountains. They have 100,000 ties in these hills awaiting safeguards for trains to haul them. A mile in advance of the track-layers are the squads which place the ties. There are three of these. First, however, the engineers set their levelling stakes at distances of 100ft. on the straight lines, and 50ft. on curves. At each of these points sawed ties are placed and levelled by them Then come two men with a measuring rod, marking off spaces equal to the length of a rail, and also the half of this space. These sawed ties are laid by the second squad, to give firm support to the ends and middle of each rail. These are placed by sighting along the guide ties already laid. The third squad then place the intermediate ties, and the bed is then ready for the iron. Now go back twenty miles on the road and look at the immense construction trains loaded with ties and rails, and all things needed for the work. It is like the grand reserve of an army. Six miles back are other trains of like character. These are the second line. Next, near the terminus, and following it, hour by hour, are the boarding cars, and a construction train, which answer to the actual battle-line. The one is the camp; and the other is the ammunition used in the fight.

The boarding cars are each 80ft. long. Some are fitted with berths; two are dining-halls; one is a kitchen, store-room, and office. Under the whole those men who prefer fresh air have swung hammocks. Rifles are hung overhead, plentiful in number, loaded, and convenient. The party protects itself without attention from the Government. The track-laying gang numbers 400. On the 350 miles already built there are 1,000 track repairers constantly improving the road-bed. The boarding cars go in advance. They are pushed to the extremity of the track; a construction train then runs up, unloads its material, and starts back to bring another from the second line. The boarding train is then run back till it has cleared the unloaded material.

Three trucks, each drawn by two horses, ply between the track-layers and their supplies. The horses run outside the track, pulling with a long tow line, as boats are moved on canals. They must be out of the way of the workmen. One of these trucks takes on a load of rails, about forty, with the proper proportion of spikes and chairs, making a load, when the horses are started off on a full gallop for the track-layers. On each side of these trucks are rollers to facilitate running off the iron. On reaching the end of the last rail the truck is stopped. A single horse is attached to move it over each successive rail. Meantime, the truck last emptied has been turned on its side, to allow the loaded one to go to the front. The two horses released are started back on a keen gallop for another supply. The third one moves up in like manner, and thus, through all the day, they are rushing forward with their iron load. To see them, and reflect what their rush and roaring mean, is as exciting as it ever was to watch a battery thunder into position at a needed moment at the vital point in its line.

The rails within reach, parties of five men stand on either side. One in the rear throws a rail upon the rollers, three in advance seize it, and run out with it to the proper distance. The chairs have, meantime, been set under the last rails placed. The two men in the rear, with a single swing, force the end of the rail into the chair, and the chief of the squad calls out "down," in a tone that equals the "forward" to an army. Every thirty seconds there came that brave "down," "down," on either side of the track. They were the pendulum beats of a mighty era; they marked the time of the march and its regulation step. One of the rear men drives the cars, in addition to handling the rail. The horses started as each rail fell into its place, the truck rolled on to the end of it; a second rail was projected into the wilderness, with the same precision and haste. Then came the magic "down," the car moved on again, and another length was accomplished. Two spikers followed each rail, one party a little in advance of the other. One rail was fastened at the end and at the middle. The second party then drew the opposite rail to the exact gauge, and fastened it at the middle and the end. Then came other squads of spikers, moving along with the precision of military drill, each having a particular spike to drive, and no one interfering with another. Track liners followed these, and, with their crowbars, rectified the line. The The fillers came last. One party of these filled and packed the spaces at the ends and middle of the rails; the other completed the intermediate intervals, and the job was left till the squads of track repairers could come up and finish the ballasting. But, as the fillers leave it, full trains can run over it with safety at twenty miles an hour.

A NEW CEMENT.

LAST week, says a recent impression of *Galignani*, M. Sorel, communicated to the Academy of Sciences a new cement, being a basic hydrated oxychloride of magnesium. It may be obtained by slaking magnesia with a solution of chloride of magnesium in a more or less concentrated state. The denser the solution the harder it becomes on drying. This magnesian cement is the whitest and hardest of all those known to this day, and it can be moulded like plaster, in which case the cast acquires the hardness of marble. It will take any colour, and has been used by the inventor for mosaics, imitations of ivory, billiard-balls, &c. The new cement possesses the agglutinative property in the highest degree, so that solid masses may be made with it at a very low cost, by mixing it up on a large scale with substances of little value. One part of magnesia may be incorporated with upwards of twenty parts of sand, limestone, and other inert substances, so as to form hard blocks; while lime and other cements will hardly admit of the incorporation of two or three times their weight of extraneous matter. By means of these artificial blocks, building may easily be carried on in places where materials for the purpose are scarce. All that is required, is simply to convey a quantity of magnesia and chloride of magnesium to the spot, if there be none to be had there, and then to mix them up with sand, pebbles, or any other matter of the kind close at hand; blocks can then be made of any shape, and imitating hewn stone. This magnesian cement may be obtained at a very low cost, especially if the magnesia be extracted from the mother-ley of salt works, either by M. Balard's process, whereby magnesia and hydrochloric acid are obtained at the same time, or else by decomposing the ley, which always contains a large proportion of chloride of magnesium, by means of quicklime, which, by double decomposition, yields magnesia and chloride of lime, containing a certain quantity of chloride of magnesium, and which, with the addition of various other cheap substances, may be used for whitewashing.

SOLDERING IRON AND STEEL.

M. BERNARD LIETAR, of 4, Rue de Houblon, Brussels, has just patented an improved composition to be employed in welding or soldering iron or steel. This composition consists of 1,000 parts of filings of iron or steel, according to whether the composition is intended to weld or solder iron or steel; 500 parts of borate of soda (borax); 50 parts of balsam of copaiba, or a resinous oil; and 75 parts of ammoniacal salt (hydrochlorate, carbonate, or other). A mixture is made of the whole, which is then calcined and reduced to powder. To make use of the powder thus obtained M. Lietar proceeds as follows:—Suppose two pieces of iron, or two pieces of steel, or even a piece of iron and a piece of steel, should be required to be soldered or welded one to the other the composition is placed between the two pieces at the place to be united; the whole is put in the fire until the pieces have attained a temperature which permits the powder to become fuzed, which happens when the pieces have attained a cherry red temperature. The pieces are then withdrawn and welded in the usual way. If the dimensions of the pieces, or any other obstacle, hinders their being put in the fire together they may be welded as follows:—Heat first one of the pieces to a cherry red temperature at the place were the soldering or welding is to be made, then place the composition and apply the second piece, heated this time to white heat, then weld the whole together. This method is particularly applicable to the repair of large pieces.

COMPETITION.

The committee appointed to choose the designs for the memorial of the Countess of Ellesmere have selected those of Mr. C. H. Driver, of Westminster; Mr. T. Graham Jackson, of Devereux-court, London; and Mr. J. Gibbs, of Oxford. On being submitted to the arbitrament of Mr. G. E. Street, of Russell-square, London, the well known architect, that gentleman visited the locality, and after having carefully examined the drawings and specifications, has decided in favour of Mr. Graham Jackson's design.

Building Intelligence.

CHURCHES AND CHAPELS.

BIRKENHEAD.—St. Peter's Church, Birkenhead, having reached the stage in its construction known as "roof rearing," the workmen employed were entertained by the Rev. C. Fenton, at the Queen's Hotel, on Saturday evening last. The edifice has attracted interest, from the fact that it is constructed entirely of common brick, the stonework used being confined to the window tracery. The contractor for the works is Mr. John Hogarth, of Rock Ferry; the designs being by Mr. David Walker, of Lord-street, Liverpool.

NEW BAPTIST CHAPEL, SCARBOROUGH.—This building, which was opened on the 24th inst., is designed in the Geometric Decorated style, and its site is the centre of Albemarle crescent. The south-east corner of the principal front is occupied by a tower and spire rising to a height of 110ft., the windows of the upper stage of the tower being richly moulded, filled in with bold tracery, and surmounted by crocketed canopies rising high up the four faces of the spire. The centre portion of the façade consists of a vestibule, entered by triple arches springing from circular shafts, with moulded bases and bands, and richly-sculptured capitals; and from this vestibule the entrances to the ground and gallery floor of the chapel are reached. Above the arched vestibule is a large six-light window, filled in with handsome tracery. The façade is flanked by the gallery staircases, which are so treated as to become marked and ornamental accessories to the elevation. The materials used are Bradford wallstones, with dressings and spire of Whitby ashlar, the combination resulting in a pleasing contrast of colour and a good effect. Internally, the chapel consists of a nave and aisles divided by iron columns, and supporting an open timbered roof of ornamental construction. The transepts correspond in height with the nave, and have each a large, five-light, tracery window; while behind the pulpit is an ornamental baptistry with an apse end, the three two light windows of which are filled in with memorial windows of beautiful design. Vestries, with convenient doors, are situated on each side of the baptistry, and a large lecture room is built on the ground behind. An organ chapel, a minister's vestry, and a gallery across one end of the chapel, complete the accommodation provided, the whole having an air of completeness, simplicity, and appropriateness The accommodation provided is for 750 people The cost of the building, including the land, is estimated at £5,500, and it has been erected by Mr. John Barry, of Scarborough, from the design of Messrs. Lockwood and Mawson, architects, of Bradford and London.

BUILDINGS.

The Masonic Hall at Llandudno is upon the eve of completion. The contract has been carried out by Mr. John Jones, Llandudno, in a very satisfa

tory manner. The carving was executed by Mr. Edward Griffiths, of Chester, and possesses much merit. The cost of the works will be about £2,300. Architects, Messrs. Lloyd, Williamson, and Underwood.

Dr. Grant, Bishop of Southwark, laid the foundation stone of a new Roman Catholic college at Beaumont, near Windsor, on Wednesday week, in the presence of a large number of distinguished members of that communion. It is to be known as the College of St. Stanislaus.

New Wesleyan Methodist day and Sunday schools are now being erected at Baptist Mills, Bristol. A memorial stone was laid on Friday last, by Mr. Holden, M.P. The architect is Mr. Samuel Hancorn, of Bristol and Newport, Monmouthshire, and the builder Mr. Summerville, Stapleton-road, Bristol.

A large and handsomely got-up building, has been erected in Argyll-street, close to Regent-circus, Oxford-street, for bazaar purposes. The Corinthian Bazaar is, to all intents and purposes, a resuscitation of the well-known, but now bygone, Pantheon, in Oxford-street. It is not, perhaps, as extensive as the Pantheon was, but it will be found to be more comfortable for purchasers of the endless variety of goods exhibited therein, and for loungers. The new bazaar will doubtless, become a very well-patronized resort. It is well worth a visit.

Framlingham, Suffolk.—A "People's Hall" Company, has been formed here to provide a hall for the general uses of the town. For this purpose the company have purchased most eligible premises at the entrance to the town from the railway, which they are about to alter and enlarge for a public hall, with reading and committee rooms, library, &c. A new staircase tower rising to a considerable height above the building, will be erected, in connection with the intended additions. The buildings throughout will be warmed by Haden and Sons' apparatus. Mr. Sugden, of Leek, is the architect to the company.

Scarborough.—On Thursday week the Grand Hotel, Scarborough, was opened. The building, which has been nearly four years in course of construction, is in the Italian style. Externally it is built with coloured and ornamental bricks, the latter being red and placed round the windows. They are cast bricks of an unusually ornamental character. A considerable amount of terra cotta is likewise used in the stringcourse, besides which there are about 40,000 cubic feet of stone used in the ornamental portion of the exterior. The building consists of two blocks, the main building and the terrace building, the latter occupying the east, or side next to the sea, and containing about 50 rooms, the former, or main building, being separated from it by a narrow area, and containing about 300 rooms. The total height of the building on the sea side is 160ft., whilst that on the cliff or town side is 112ft. high. This inequality of the height is caused by the building being erected on an incline of the cliff, which falls rapidly towards the sands. There are eleven storeys on one side, and eight on the other. There are seven hoists in different flats for the service of the dining and sitting rooms, &c., and an ascending room for passengers. The building covers 3,996 square yards of ground; the total area of the several floors is 17,500 square yards. About 6,000,000 bricks have been used, and 50,000 cubic feet of stone, exclusive of that used in the staircases and stone floors. Mr. Archibald Neill, of Bradford, was the general contractor for the works. The engineering works are by Sir W. Armstrong and Co., and the warming and ventilating by Messrs. Haden, of Trowbridge. The kitchen fittings, which are most elaborate and complete, have been planned by Mr. Augustus Fricour, the manager, and executed under his supervision by Messrs. Konder and Co., of Sheffield, in the English department, and by Messrs. Baudon and Co., of Paris, for the French apparatus. The general furnishing of the house has been executed by Messrs. Smee and Sons, of London. The drawing room, one of the most splendid rooms ever seen, is decorated in a most chaste manner, white, gris perle, and gold being the predominating colours. The seatings are in amber silk and brocade. White and gold lower-sized fauteuils and chairs, covered in gris perle reps, tufted with amber, break the monotony of amber that would otherwise prevail. The room is lit by four bronze gas statues, made by Messrs. Moray and Sons, Paris and London, each bearing a cluster of twenty lights, with crystal pendants, which produce the most brilliant effect. The land and sea views from this room are splendid. The dining room takes the form of a horseshoe, and is 69ft. by 53ft. The coffee and restaurant rooms take the form of a quatrefoil, and are each 79ft. by 63ft. The hall is of a triangular form, with two tiers of corridors running round and connecting with the hall. The cost has been upwards of £100,000. Mr. C. Brodrick was the architect.

Wincle, Cheshire.—The new school buildings at this place, the gift, with the site, of Mrs. T. R. Daintry, of North Rode, have recently been opened. They comprise school and master's residence, with the requisite offices, and with yards and playground. The buildings are erected of stone, and the school is faced interiorly with pressed brick, blue and red, in bands and patterns; the porches being faced with stone at the exterior. The roof is open timbered, with ventilating spirelet on the top, and covered with plain and ornamental tiles, and the whole of the woodwork is stained and varnished. The site offered some difficulties which have been satisfactorily overcome. The inequalities of the ground have been formed into terraces round the building, and planted with shrubs. The school is warmed by Messrs. Haden and Sons' apparatus, and arrangement is made by which the entrance and staircase of the master's house can be warmed when desired. Mr. Sugden, of Leek, was the architect.

TO CORRESPONDENTS.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the Editor, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

Received.—R. W. S.—J. P. C.—J. C.—J. W.—R. D.—J. W. T.—T. B. H.—L. B.—M. H. and Co.—S. and G.—R. B., St. Leonard's, answered by letter.—G. B.—T. M. S., numbers sent.—G. H. P., manuscript returned.—J. J. O. C.—D. R.—P. and Sons.—J. and T. H.—M. H. and Co.—B. B.—L. and R.—E. W. G.—J. J. L.—A. W.—A. S.—C. H.—E. B.—R. W. S. and Co.—G. H. G.—S. H.—J. H.—E. T.—F. F. M.—J. G.—L. W. and U.—G. and L.—H. A.—J. S.

W. G. P., Bagshot, Surrey.—Consult the town pump.

H. H. V., Liverpool.—Thanks. We should be glad of an enlarged photograph; also of house at Eastbourne, &c.

B. B.—Cannot commit ourselves to any particular view of the water question until the evidence appears.

Correspondence.

ANCIENT AND MODERN FURNITURE.

To the Editor of the Building News.

Sir,—I have just seen a letter in your last week's number on ancient furniture, by Mr. R. Phillips. Without pretending to the knowledge which Mr. Phillips says he possesses, I shall take the liberty of examining his letter. After a pretty bit of writing, in which he blows his own trumpet with great vigour, and modestly infers that no one knows anything of Gothic construction but himself, he proceeds, with great self-complacency, to lay down as original conclusions some threadbare truisms which every Gothic pupil has at his finger ends. So far, his letter, though amusing as an instance of conceit, is harmless; but when he, after some more self-glorification, says that the examples of Gothic cabinets which you published, "are all at sea with regard to construction," he must forgive my saying that his assertion is presumptuously incorrect. The only part which he instances as not Gothic in construction is a door; but very curiously, the Sainte Chapelle, at Paris, has a very early door framed on the same principle. He then says, dovetails were not used in old woodwork, that the ancients always "sloped" their mouldings, or finished with a mason's mitre. With all due respect for the knowledge he has acquired as a mender of old furniture, I must say his information is neither extensive nor correct. In Viollet le Duc's Dictionary he will find plenty of examples to prove the reverse of all he states. But let me say, in addition to this, that our modern Gothic does not pretend to an exact imitation of old work. Gothic, to be a living style, must grow and change with those among whom it has its being, and the fine art of the present day has no right to ignore the improvements in the mechanical arts which have come year by year since the days of our rude forefathers. In conclusion, I was very much pleased with the cabinets you published; they are certainly amongst the very best efforts I have seen, both constructively and artistically.—I am, &c., J. M. S.

METROPOLITAN SUBWAYS.

Sir,—In reply to your correspondent "Subterranean" I have a few observations to make. My impression as to the opposition offered by many persons to the creation of subways is, that fears are entertained of the great cost of the operation, and of the practice of what is known as "jobbery" in the execution of the work. There is no doubt whatever that the construction of subways under existing thoroughfares, even if carried out in rigid accordance with economy, would be found a very expensive as well as a tedious proceeding. It is a very different thing to making a longitudinal tunnel coincident with the formation of a new street, as was done in regard to the line of communication which now extends from Blackman-street, Borough, to Blackfriars-road. The interference with existing traffic during the progress of subway making must necessarily be very great, and as the conduct of the work would fall into the already very full hands of the Metropolitan Board of Works, there do exist, justly or otherwise, misgivings in many quarters as to whether it would be managed with a due regard to the pockets of the ratepayers.

There are, however, I am aware, some individuals, and those of great practical experience, too, who object to subways *in toto*, and who consider that, from difficulties in the way of ventilation, they would simply become dangerous reservoirs of leaked-out and diffused gas, ready to explode, like firedamp in a coal pit, on the application of flame. I do not share in the doubts of these latter, which are, however, apparently or really participated in by several of the great gas companies, because it seems to me that such danger is purely imaginary. The advantage of always having the joints of gas and water mains amenable to inspection and repair without disturbing roadways and diverting vehicular traffic through almost impassable bye-ways, is a very great one. Leakages would be readily detected instead of going on, as they now sometimes do, for months undiscovered, and adequate ventilation is surely not an impossibility. It is probable that the evidence taken during the present session of Parliament before the select committee of the House of Commons on subways, and the report of that body, will throw additional light on the whole question. "Subterranean," therefore, will soon be in possession of more information than I am prepared to give upon the very important subject to which his letter refers. I believe that many experiments have recently been made in the subways of Southwark and Garrick-streets, London, as well as in that of the Rue Napoleon Trois, in Paris, and the results of these will shortly be published. Claudius.

WEST LONDON SYNAGOGUE.

Sir,—Whilst perfectly acquiescing both in word and spirit with your editorial remarks, as appended to a letter which appeared in your columns of last week, permit me to correct a mistake which has appeared on several occasions in critiques upon the above competition.

Mr. Philip Hardwick was not (I am informed on undoubted authority) ever consulted either directly or indirectly, nor was his advice asked for or given with regard to the merits of the designs submitted. My position as an unsuccessful competitor precludes my venturing any opinion as to what the result might have been had the committee fulfilled their inferential obligations and been guided by his impartial judgment and well-known ability, but I may mention that I should have hesitated to compete, even in a limited competition, had I not reposed full confidence that his opinion would have guided, if not determined, the ultimate selection. Without the slightest anger, but with some sorrow, I fear I must add this competition proves no exception to the general rule.—I am, &c. H. H. Collins.

2, Queen-street, E.C., July 31.

THE NEW LAW COURTS.

Sir,—I have read with much interest the article in the last *Quarterly Review* respecting the Law Courts designs. In much I agree with the writer, even more so than you did in your last week's review. There is one point, however, which

I think deserves mention—namely, the writer pointedly states that he had not read any review on the subject until he had finished writing his own. This may be so, but it is quite certain that every word he has written on the designs them selves have been previously more forcibly set forth either by yourself or Mr. Welby Pugin in your pages.

I have heard on good authority that the judges are anxious to have the whole matter reconsidered, and that we shall probably have a fresh competition. Certainly nothing can be more unsatisfactory than the present one.—I am, &c.,

AN ADMIRER OF ARCHITECTURE.

Intercommunication.

QUESTIONS.

[512.]—MUIR'S VENTILATOR.—Can some reader inform me whether Mr. Muir (whose address, in 1860, was in Ducie street, Manchester), still manufactures his patent four-points ventilators; and, if so, where is his present address? Or the name and address of any other person authorized to sell the same articles.—A. H., 31, East India-road, E., July 25.

[513.]—INSTITUTION OF CIVIL ENGINEERS.—The information given in Mr. Forrest's letter in last week's BUILDING NEWS, with regard to the admission of members, associates, and students, did not include the "fees." If you could supply this deficiency I should feel obliged.—J. N.

[The following is the desired information:—Fees on election: Admission fee—associate, £3 3s.; member, £3 3s. Building fund—associate, £4 4s.; member, £7 7s. Annual subscription—non-resident student, £1 11s. 6d; resident student, £2 2s.; non-resident associate, £2 12s. 6d; resident associate, £3 3s.; non-resident member, £3 3s.; resident member, £4 4s.]

[514.]—CHURCH, HOXTON-SQUARE.—Can any of your readers inform me who was the architect of the Roman Catholic Church, Hoxton-square, N.?—ECCLESIOLOGIST.

[515.]—OBTAINING PHOTOGRAPHS ON COPPER-PLATES.—Can any of the scientific readers of "Intercommunication" inform me of the process employed in obtaining photographs on copper plates?—INQUISITOR.

[516.]—THE NEW LAW COURTS.—Would you please inform me the numbers of the BUILDING NEWS which contained the series of articles on the New Law Courts.—J. H. J.

[The following are the numbers which contain the articles:—Nos. 627, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 649, 650, 655.]

[517.]—BRICKS AND WAGES IN LIVERPOOL.—I should be greatly obliged if any of your Liverpool readers would be kind enough to inform me the price of stock or other equal bricks in that town, and what is the general charge per rod for labour only.—J. C.

[518.]—MALT KILN.—I shall be obliged if some one will kindly inform me of a material (that will endure the heat and steam) for plastering the inside of a malt kiln.—W. S. B.

REPLIES.

[388.]—PAYING FOR ESTIMATES.—Charge for your time; if not paid, sue in the county court. You will recover, if your case be as you have written. There are precedents reported in the BUILDING NEWS which you should read with greater attention, and will enable you to judge of your chance of success.—A. Z.

[457.]—ROYAL ACADEMY.—To become a student of the Royal Academy it is necessary to produce from the registrar, Mr. Eyre, by means of a letter from some well-known member of the architectural profession, a printed form to be filled up and signed by the aforesaid well-known member (a Fellow of the Royal Institute of British Architects will do). With this printed form, on December 28 or June 24, must be sent in drawings, carefully executed, of architectural work, not necessarily one's own design. If approved of, the applicant will be admitted as a "probationer," and then must work out, during any time he may like within the following three months after his admittance as probationer, in twelve consecutive days (Sundays not included), a design to be set forth in plane section and elevation, the subject of which is given in advance. A wall drawing from the cast must also be executed in the same time. These drawings, if accepted, will admit the probationer to the privileges of a student, which are the right to attend the lectures and free admission to the Academy exhibitions for a period of seven years. To compete for medals and prizes, the student must attend all the lectures given in one session, and must obtain from the secretary or registrar a certificate of having done so. The medals and prizes open to architectural students are:—1. For a perspective drawing, and specimens of sciography (on which a course of lectures is given)—medal and books. 2. For a measured drawing of some building or part of a building (subject given)—a first-class medal and books, and second-class medal; and a second class medal in alternate years. 3. For an architectural design—the gold medal (value £20), prize in books, and scholarship of £25, tenable for two years. Offered every other year. 4. For an architectural design to be executed on the walls of the Academy in one month—the travelling studentship of £100 for one year. To become a student of the Royal Institute of British Architects, the applicant must be in his articles, and must produce a letter from his professor, together with some architectural drawings executed by himself. The privileges of a student of the R. I. B. A. are, first, the attendance at the lectures given in the rooms of the Institute on alternate Monday evenings; second, admission to study in the very valuable library at all times when it is open (every day from twelve to five, and three evenings a week from seven to ten); and, third, the exclusive right of competing for two prizes, first a design, and second, mostly sketches of architectural details. To become a student or member of the Architectural Association it is necessary to sign a paper stating that the applicant is engaged in some way in the study of architecture for professional purposes; to be regularly proposed and seconded by members of the Association, and balloted for at open meeting. The privileges are the attendance in the rooms of the A. A. on alternate Friday evenings, when lectures are given or papers read, and the right of joining the following classes:—1. Class of design, where fortnightly sketches are submitted by any member and mutually criticised. 2. Class of construction, where questions in the practical part of the profession are given out, and the answers contributed by the members and commented on. 3. The figure drawing class, where students, on payment of a monthly fee, have the opportunity of drawing from the living model, under the guide of a professor. 4. The water-colour class, during the months of May and June, when twelve lessons are given by Mr. A. Penley, six of them out in the country; fee, three guineas. There is also a lending library, where members can take books to their homes to read them; an Architectural Association sketch book, subscription one guinea, 72 plates of lithographed drawings a year from existing buildings; Saturday afternoon visits to buildings of importance in construction in the metropolis; and innumerable prizes for designs, essays, and resumés of the courses of the above classes.—INDUSTRY.

[478.]—ARCHITECTURAL STUDENTS.—"Cuddie" is mistaken in saying that the lectures at King's College, given by Professor Kerr, are restricted to members of the Established Church: they are open to all religious sects, whether Christian, Jew, or Mahometan, on payment of the necessary fees. The main difference between these lectures and those delivered by Professor Hayter Lewis at University College is, first, that the latter include the fine art as well as the constructive element; and, second, that Professor Kerr's lectures at King's College are from four to five in the afternoon, and Professor Lewis's, at University College, from six to eight in the evening, so that the latter are more convenient for those who are otherwise occupied in the daytime.—A. K. C.

[485.]—RAISING BUILDINGS BODILY.—I was very sorry to see you allow the flippant answer of "Provincial," in reply to the legitimate question raised by "Sceptic," as to whether it was true the tales told respecting the moving of houses bodily in America. The question was evidently by a *bona fide* inquirer, but the answer to it was evidently by a man who knew nothing of the subject he was writing upon, and, therefore, I say I was sorry to see such an answer in the "Intercommunication" column, which is too valuable to be allowed to be desecrated by writers who only wish to see themselves in print, and you must excuse me if I say I think you were a little to blame. The moving of houses in America is a regular business, carried on by men who do nothing else, and have all the appliances for the purpose, and, therefore, "Sceptic" must perceive it to be very common indeed. It is, of course, more usually frame houses than brick that are so treated, but at the same time brick house moving is not uncommon. The writer of this has seen many such, and which he can point out at New York, Brooklyn, and elsewhere. One instance was the cutting of Canal street from river to river. Several five or six storey warehouses, of bricks and mortar, with no more woodwork in them than would be found in the same class in England, were moved from 10ft. to 15ft., to meet the new line of the street. Another instance was on the corner of Hick and Atlantic-streets, Brooklyn. A gentleman's brick mansion, such as a merchant in England would live in, was not only shifted back some 50ft. but turned right round to a right angle, with its original frontage. Again, ten or twelve of the largest brick stores in Chicago were lifted bodily 10ft. in one mass, and not a shop amongst them was closed, but customers came in and out buying during the whole period. The business of house movers more usually consists of raising frame houses from the foundation, and putting a brick storey underneath, or the shifting of frame houses from one street to another. A remarkable instance of this came under the writer's observation. It was on a street through which a line of cars ran, viz., Fulton-avenue, Brooklyn, and, therefore, to have moved a house during the day would have stopped the traffic. I went up on the cars at eight o'clock, and saw the house being moved to the edge of the railway. The cars, I must remark, ran until 11 30 p.m., and started again at 5 a.m.; the writer went down about 5.45 a.m. and saw the same house fully three miles away from its original place and launched about 50ft. from the railway. This house was a frame house of about six rooms, such as a respectable mechanic would live in. In this case they had two trucks with a frame work upon them to rest the house upon. The house being moved over the centre of the rails, and lifted by screwjacks to the right height, the trucks then run underneath it, and the house lowered upon the foundation made for it on the trucks. I should like to say a word upon the way it was done in the other instances, but I have already trespassed too much upon your valuable space.—THOMAS BURGESS, Bristol.

[485.]—So far from this being a rare occurrence in North America, I have seen in several of the larger cities signboards to the following effect: "———, house raiser and remover. In fact, it is in many places quite a business of itself. There is very little difficulty in removing the common wooden house, when the outside is finished with "clap" or "weather boarding," or if it be "rough cast," or stuccoed. In either case the frame is of timber and rests upon a wooden sill (generally about 12in. square), framed together at all angles and supported by a brick or stone foundation, or (where there is no basement underneath) on cedar posts. I have seen a "rough cast" house of this kind removed half a mile in the course of ten days, the wife and family of the occupant living and sleeping within it all the time; and after its being fixed in its new position and put to rights I obtained permission to inspect it, and found that very little damage had been done to any part of it. But perhaps the greatest feats in house raising have been performed in Chicago, where, from the same reason as mentioned of San Francisco by your correspondent last week, whole streets of houses have been lifted and raised fully 5ft. In 1861, the "Tremont House" of that city—one of the large hotels of the Continent—accommodating about 500 boarders and visitors, a brick building five storeys in height (if my memory serves me), was raised bodily 5ft. without any serious obstruction to the business of the establishment, which was carried on as usual. The operation of raising this was performed (as I understood) entirely by "screwjacks," the contractor (for it was let by contract) being an Englishman of the name of Sollett, a native of Yorkshire.—H. HADDEN, Architect, Great Malvern.

[487.]—BLACK MORTAR.—In my reply last week you made me say "unashed" for "weathered." The printer's devil or some other fellow has made nonsense of the text. I wished to say when the mortar has been exposed to the weather he should report as to its colour. I will endeavour to write clearer in future. I hope others will take the hint.—A. Z.

[503.]—ZINC FOR ROOFS.—If the questioner on this subject would take the trouble to pay a visit to my establishment I will show him how completely and effectually I work the angles and rolls of zinc, so that it will last as long as ordinary lead.—JAMES W. TYLER, 12, Abingdon-street, and Wood-street, Westminster, July 26.

[503.]—Fifteen years ago the flat of a Mansard roof was stripped. The zinc was No. 9, badly laid; it had been down 14 years. Had the boards been properly laid, covered with Croggon's felt, and No. 12 zinc used, laid freely in a proper manner, I believe its duration would have been nearer 30 years. I had the flat covered with No. 12 zinc, and as I have described. As yet, it has not needed repair. Much will depend on situation. This case was in the suburb of an inland provincial town. Cats could not gain access to the roof. It is said (is there any authority for the assertion?) that the acid in the urine of cats will eat through zinc. It seems strange that, interested as so many are in the use of zinc, we have so few instances of its durability. I for one have faith in it when properly laid on flats or flashings, but reject it for parapet gutters.—A.Z.

[505.]—PAYING FOR AGREEMENTS.—There was a case in point heard at the Portsmouth County Court a short time since, namely, that of Rawlinson and Wheatham. It was a case to recover for professional services alleged to have been rendered by the plaintiff, who was an architect and surveyor. One point of interest had reference to an item for preparing an "agreement." His Honour questioned whether an architect or surveyor could prepare an agreement. The plaintiff said it was customary, and had frequently done so. He was, however, nonsuited. W. W.

[506.]—FIXTURES.—Fixtures are defined by the lawyers as those things which are fixed to house or land by a tenant or occupier, either for purposes of domestic comfort or ornament, or for the convenience of trade, more commonly known as house fixtures and trade fixtures. Mr. J. Chitty, in his "Law of Contracts," has exhausted the subject. He is the authority cited in the majority of cases, and to his work I refer you. The divisions and subdivisions of things removable and things not removable are too long for quotation.—A. Z.

[506.]—Mr. S. G. Grady, in his little work on the "Law of Fixtures," says "fixture is a word of ambiguous signification, or rather it has a two-fold signification. It means anything annexed to the freehold of which by such annexation, it becomes part; it is used, secondarily, to denote chattels of a personal nature which have been affixed to land and which may be removed at the will of the person who annexed them. They are defined to be such inanimate things of a personal nature as have become affixed or annexed to the realty; but which may be severed, disunited, or removed by the party who has assessed them, or his personal representative, without the consent of the owner of the freehold."—W.W.

[510.]—STRENGTH OF WOODS.—At the Great Exhibition of 1851 there was exhibited a valuable collection of woods from all parts of the world, by Mr. W. W. Saunders. A classified list was published at the time, and is deserving your attention. Barlow and Tredgold have treated the subject scientifically in their treatise on carpentry. A useful stepping stone is Weale's "Rudimentary Treatise on Carpentry," vol. 123.—A. Z.

[511.]—FOOTINGS FOR WALLS.—Those who seek advice should put their case clearly; you have neglected to do so, and are scarcely entitled to a reply. Let us suppose a case. Your loose soil is a natural deposit, has only been disturbed by the plough some 12in., is tolerably level, and the site not likely to be lowered or the foundations disturbed; it may be sand beneath. Sink your trenches 2ft. deep and 2ft. wide (unless your case be exceptional, the ground will be found firm and solid), fill with concrete, then two courses of 18in. brickwork, and on this build your 9in. or 14in. brickwork. I conclude you are an amateur, building a detached cottage. If so, engage a surveyor; have practical advice on the spot. This opinion, very good in its way, might be very different had I correct data before me, and cheap advice may eventually cost you dear. A bad foundation is a most expensive article, a never ending source of expense.—A. Z.

WATER SUPPLY AND SANITARY MATTERS.

One of the greatest requirements of the town of South Malton at the present time is a good supply of water, and we hear that at a public meeting, held last week, a committee was appointed to carry out the desired object.

The Paris correspondent of the *Morning Star* says:—"The subject of sanitary reform is daily assuming a more extensive and interesting character in this country, and more especially in this city. Active minds are being directed towards it, and speculation, observation, and experiment are causing new light to be thrown on the subject from day to day. Thus it is that the French Govern

ment has at last acknowledged that in great cities fevers and epidemics always haunt the vicinity of burying-grounds, and that the time has now come to do away with urban cemeteries. Before the eleventh century the Parisians buried their dead in the Roman fashion, without the city walls; and well would it have been had they continued this practice." Preparations will soon be made to bury the dead of Paris outside the city walls.

The Halifax Corporation Waterworks in Luddenden Valley.—The works in this valley have hitherto been prosecuted under immense difficulties. Situated in the moorland district of the parish, inclosed by hills of great altitude, some seven or eight miles from Halifax, and nearly as many miles from a railway, the material employed and the labour required are obtained with difficulty. The most formidable difficulty the contractors have had to contend with, however, has been in finding safe geological measures for the embankments of the reservoirs. The reservoirs will be three in number, formed by throwing huge embankments across the valley, and the series will rise lake-like one above another from Castle Carr.

STATUES, MEMORIALS, ETC.

Mr. Steel has completed full-sized models in clay of the bas-reliefs for the Scottish national memorial to the Prince Consort, and submitted them to her Majesty, who has approved of the same.

A monument is about to be erected to the memory of the late Duke of Hamilton, who died in 1863. The site fixed on is at the entrance to Cadzow Forest, near Edinburgh. The monument is to be erected on a rock of red sandstone on the bank of the river Avon. It is designed in the Classic style of architecture, the plan being circular, with square projections for pedestals under columns. The basement will consist of masonry 8ft. high, with channels wrought on the joints, having a moulded base course about 2ft. high, and a cornice at top. At the front there will be a flight of steps leading to the interior of the monument. The floor will be paved with stone, and it is intended to fix seats between the columns all round the apartment. These seats, which are to be of stone, will be 1ft. 6in. high. There are to be nine columns placed at equal distances; each will be about 15ft. high and 19in. diameter at the foot, diminishing to 16in. at the top. The shafts of these columns are to be of Aberdeen granite, while the bases and capitals will be formed of freestone. In the interior of the monument, a pedestal of grey granite, 6ft. in height, and surmounted by a bust of the late duke, will be erected. The whole structure will be about 22ft. in diameter outside, and, from ground to top of roof, about 32ft. high. The works are estimated to cost about £1,500. Messrs. C. H. Wilson and D. Thompson, architects, of Glasgow, furnished the design.

Paisley.—A public monument was inaugurated in the Paisley Cemetery, on Tuesday week, to the memory of Wilson, Hardie, and Baird, the political martyrs of 1820. The monument is a handsome obelisk raised on a pedestal, which carries the inscriptions. The proportions of the monument are happily chosen, and both as a whole and in detail the structure is very effective. The shaft of the obelisk is enriched by some graceful Greek ornamentation. The sculptor is Mr. W. Robin, of Paisley. The inauguration took place in presence of Provost Macfarlane and several leading townsmen.

STAINED GLASS.

One of the five stained glass windows of the Glasgow Cathedral, which cost £2,000, was maliciously broken by a knave called Marshall. He did it, he said, because he had an ill-will against the church. Perhaps a whipping is the best thing to relieve him of his ill-will.

A memorial window to the memory of the late Lord Northbrook, in Micheldever Church, is now completed. The stonework, executed in Bath stone in the Decorated style, consisting of three lights with tracery, is by Messrs. Newman and Son, of Winchester. The stained glass represents the "Crucifixion" and "Good Samaritan," with the emblems of the Apostles, and is by Messrs. Clayton and Bell. Mr. John Colson, of Winchester, was the architect.

Two stained glass windows, the joint gifts of the Lord Mayor of York and Robert Farrer, Esq. (the ex-sheriff), have been erected in the Guildhall, York. One of the windows is the first of a series of historical subjects, commemorating the election of Constantine as Roman Emperor. This window is by Messrs. Hardman, of Birmingham. The other window represents King Edgar announcing before the ecclesiastical and military chiefs his grant to them of the privilege of making or choosing the laws for themselves. This window is by Messrs. J. Powell and Sons, of Whitefriars, London. Both windows were designed by J. E. Doyle, Esq., the author of "The Chronicles of England."

LEGAL INTELLIGENCE.

At the Vice-Chancellor's Court on Saturday last, Mr. Macnaughten made an application on the part of St. Thomas's Hospital, the new buildings of which are to be erected at Stangate, on the south side of the Thames. The Governors had accepted the contract of Mr. Parry, his being the lowest of the contracts tendered, for a sum of £327,000 odd; and they now asked the sanction of the Court to those payments being made. It would be necessary also that the Governors should set aside £110,000 for the purchase of the site, and there were other matters which would make the total amount asked to be set aside £140,000. The Charity Commissioners would be asked for their sanction to a proposal to set aside £90,000, which had been paid by the Governors as a sum which would be required for other matters in connection with the fitting up the new building. The Charing Cross Railway Company would pay the costs, under the Land Clauses Consolidation Act. Vice-Chancellor Sir W. Page Wood gave the sanction of the Court to the various proposals of the Governors.

A Disputed Agreement.—At the Vice-Chancellor's Court, on Tuesday, July 30, before Sir J. Stuart, the cause of "Lock v. Nokes" was heard. This was a bill for specific performance of an agreement for the purchase of Nos. 13 and 14, Basinghall-street, for the sum of £14,000. In July, 1865, the premises were put up for sale by auction, but were not sold. Shortly after the auction a Mr. Kelday called on the vendor, and stated that he could get a purchaser. The plaintiff referred him to Messrs. Davidson and Carr. Mr. Carr subsequently told the plaintiff that it was the Masons' Hall Tavern Company that were desirous of purchasing. It appeared from the evidence that the plaintiff's solicitor advised him not to sell the property to a company, but to require a responsible person. On November 3 the defendant Nokes agreed to purchase the property for the sum of £14,000, and to complete the purchase according to the conditions of sale specified, which fixed January 31, 1866, as the time for completion. After considerable delay, the plaintiff filed this bill for specific performance of the agreement. Mr. Karslake, Q.C., and Mr. Frank Bush appeared for the plaintiff, and contended that, on the evidence, the plaintiff was entitled to a decree for specific performance of the agreement, and for an inquiry as to damages. Mr. Bacon, Q.C., and Mr. Horton Smith contended that it was established, as a fact known to the plaintiff, that the defendant was a mere agent for the Masons' Hall Tavern Company, and never intended to incur a personal liability. The Vice-Chancellor said the plaintiff was clearly entitled to a decree for specific performance, and for an inquiry as to damages, and the costs of the suit. After some discussion the defendant was decreed to complete on September 1 next.

General Items.

The eighth party of visitors to the International Exhibition at Paris, sent by the Paris Excursion Committee, left London on Tuesday *per* the Newhaven and Calais routes. There were in all about 160. One of the divisions was accompanied by Mr. M. Glazier, the secretary of the Prize Fund for Artizans' Reports, who has gone to Paris to superintend the arrangements for assisting workmen to acquire information respecting French industry and manufactures.

Slate of an excellent quality is found in several parts of Pennsylvania. A new deposit of slate has recently been found at Manheim, on the Reading and Columbia Railroad, six miles from the Pennsylvania Central Railway Junction, and is now quarried, it is said, to the extent of 30 tons a day.

The directors of the London and County Bank held their half yearly meeting yesterday, at which the usual report was presented. It states that the nett profits for the half year amount to £82,058 2s. 2d., which, added to £14,467 11s. 6d., brought forward from last account, makes a total of £96,525 13s. 8d. They have declared the usual bonus of 6 per cent. with a bonus of 5 per cent., together equal te 22 per cent. per annum, carrying forward £7,081 1s. 1d. to profit and loss new account. The balance sheet shows among liabilities a total of £12,032,334 0s. 10p. due to customers, and £1,397,18410s 10d. due on acceptances; while on the opposite side the bills discounted and advances amount to the sum of £10,334,327 15d., and the cash to £3,284,351 16s. 7d. The reserve fund is stated to be £380,864.

An American iron safe maker in the Paris Exhibition has wagered with an English manufacturer, to the amount of 15,000f., that the latter cannot pick the lock of a safe now shown in the Exhibition. The winner engages to divide the stakes between the charitable institutions of Washington, London, and Paris.

French local papers give a curious account of the result of sinking an artesian well in the department of Aude, near Narbonne. When the depth of 180ft. had been attained, a stream of carburetted hydrogen gas rushed up the tube, which, being lighted, has continued to burn steadily with a red flame. Along with this gas, water flows, which is stated to be extremely bitter and cold.

At a meeting of the Common Council of the City of London, on Monday last, Mr. Deputy Fry brought up a report from the Improvement Committee, which recommended that the professional services of Mr. Heywood, the engineer for the City, should be obtained to assist in carrying to a successful conclusion the Holborn Valley Improvements. This recommendation was opposed on the ground that Mr. Heywood's appointment would clash with the duties of Mr. Horace Jones, the City architect. After a lengthened discussion, the reception of the report was negatived by a majority of 14.

The report of the Improved Industrial Dwellings Company (Limited), to be presented at the meeting at the Mansion House, on August 3, states that the total subscribed capital is now £81,225; that six blocks of buildings, to accomodate 168 families, are being erected upon the Britannia-street estate, and that at Greenwich, two blocks of buildings, to accommodate 40 families, are also very near completion; but that the directors have been unable to proceed with the erection of the contemplated buildings at Lambeth, in consequence of a defect in the title adduced by the vendors of land, which will require to be settled by a court of law. Further, that an agreement has been entered into for the purchase of a valuable freehold estate, comprising nine acres of land, at Bethnal Green, at present partly covered by some hundreds of old dilapidated houses and cottages, and where there is ample opportunity for the expenditure of from £100,000 to £150,000, with the certainty of profitable returns, and of great benefit to the district. The whole of the company's dwellings, it is added, have been fully occupied during the past half-year, and there is still a constant pressure on the part of applicants for vacancies.

The great tabernacle of the saints at Salt Lake City is now finished. It is 250ft. wide, and furnishes comfortable sitting room for 10,000 persons.

The *Melbourne Argus* says:—During the month a party of Chinese, accompanied by a European, have been busily engaged visiting cemeteries in the country districts, exhuming the bones of deceased Chinamen, for the purpose of transmission to China. The bones, after exhumation, are carefully counted, to ascertain that none are absent, and are then tied up in parcels, labelled, and enclosed in boxes with a quantity of written papers, and a pack of Chinese playing-cards. Incense and perfumed papers are kept burning during the ceremony. The number of skeletons which have been thus taken up is very great.

Mr. Ward has just completed another, the last but one, of the series of pictures he is commissioned to execute for the corridor in the Parliament House. This represents William and Mary receiving the Lords and Commons in the Banqueting House, Whitehall, an event which happened a short time before their coronation.

The *Siecle* mentions that the subscription list for the erection of a statue to Voltaire, to which 150,000 persons have already subscribed, will be closed on September 80. The commission to decide on the character of the monument includes some of the most eminent literary men in France. Amongst them are M. de Sainte-Beuve and M. Prosper Mérimée, both senators, and M. Coquerel, jun.

Jasper is now procured, to almost any required extent, at St. Gervais, in Savoy, where the quarry has a surface of at least 24,000 square yards, and a depth of about 22 yards.

Mr. B. J. Talbert, in answer to Mr. Robert Phillips's letter in our last number, says:—"My illustrations, which you published in the Building News, were certainly not intended as imitations of old examples. But surely Mr. Phillips has not paid any great attention to the subject of old wood-work, or he would not state that the ancients did not use dovetail tenons, and that they always 'sloped' their mouldings, or finished with a mason's mitre, this being decidedly incorrect."

It is a remarkable and a gratifying circumstance, says the *Telegraph*, that, in an open competition for a design so important as that of the freedmen's monument to Abraham Lincoln—a work which must interest, not only every American citizen, but every thoughtful human being—the successful candidate should be a woman. Art, in all ages of all nations that have given it a home, has been strangely poor in the number of its female votaries; and it is a fate reserved for the new world to find a worthy na-

tional sculptor in that sex which, to their honour among the peoples of the earth, Americans delight to raise, to shield, and to respect. Miss Hosmer, indeed, does not depend for recognition of her abilities exclusively on the country which is justly proud to claim her as one of its children. Her fame has extended to Europe, and the circle of admiring friends among whom she is even now an honoured and welcome visitor, is not less distinguished by critical judgment than by generous readiness to encourage the efforts of genius.

"Gentile," whose letter on the West London Synagogue appeared last week, sends us the following:—"I am afraid you misunderstood my meaning regarding Mr. Hardwick's connection with the above. I did not imply any doubt as to the impartiality of that gentleman's decision. I merely wished to convey that I could scarcely believe his advice (if asked) had been acted upon. In this opinion I am now confirmed, as from subsequent enquiries, I have ascertained that Mr. Hardwick's opinion relative to the merits of the designs was not appealed to."

The following may be classed among the many cheap modes for purifying water which have from time to time been suggested in our pages:—Take a large sized garden pot, and, having plugged the aperture in the bottom with a piece of clean sponge, break up a few sticks of charcoal into small pieces, which strew over the bottom to the depth of 1½in. or 2in.; place the pot over a pitcher or other clean vessel, and let all the water used for culinary purposes be filtered through it. By ordinary attention in keeping the garden pot constantly dripping, a considerable quantity of water in a perfectly pure state may be thus be obtained. Fresh charcoal should be used every other day, and the sponge cleansed. If despatch is required, strew charcoal over a very fine sieve or milk strainer, and let the water be passed through it; this will answer the same purpose, but the water will not be quite so clear.

The following letter has appeared in the *Times*:—Sir,—Mr. Palgrave proposes to increase the usefulness of the new court of the India Office, and to preserve its decorations by glazing it. I venture to express a hope this commonplace proposition may be entertained. At the present time, even in bright, clear Paris, the court of the Beaux Arts is being covered in. The glazed roofs over courts at the Grand Hôtel, and at the Hôtel du Louvre, are thoroughly successful all the year round, and enjoyed. The ventilation is good, the temperature is equalized, and plants and flowers flourish at all seasons. If glazed courts are useful in Paris, they are much more necessary in London; and it is certainly quite possible to erect glazed coverings over courts without any damage to the architecture. It is mere prejudice not to do so. I wish architects would remember the effects of the dirt, the fogs, which Charles Lamb called 'meat, drink, and clothing,' the rains, and the smoke of London, and provide against the discomforts of them. —I am, Sir, your obedient servant, Henry Cole.

In the House of Commons, on Wednesday last, Sir Harry Verney asked the Secretary of State for the Home Department whether he would endeavour to devise means for the preservation of ancient monuments, many of them belonging to pre-historic periods, and some to the Roman occupation of Great Britain, which existed in different parts of the country, and many of which have been injured and partially destroyed, owing to the ignorance of their value and want of care of their owners. Mr. Hardy said he had not seen the notice of the hon. gentleman's question until he came down to the House. It was, no doubt, extremely desirable that these remains should be preserved, but he thought the growing intelligence of the country was the best means on which they could rely for securing that end. He certainly did not see how the Home Office could be turned into an archæological department. There was, too, a difficulty in the way of any Government interference, arising from the fact that the monuments in question were private property.—Mr. Tite obtained leave from the House of Commons, on Wednesday last, to bring in a bill to regulate the construction and use of buildings, and the formation of streets and of sewers, and of drains in the metropolis, and for other purposes connected therewith.

A correspondent of the *Pall Mall Gazette*, says:—To those who take an interest in the art decoration of London it will be a bitter disappointment when they come to inspect the commonplace vulgar rails with which the park is about to be surrounded. A portion has just been set up near Grosvenor-gate. They are admirable in construction, strong, useful, deeply set in masonry; in short, for those who "own no argument but force" they are irreproachable. But for a touch of art, for the least symptom of original thought, for any attempt to combine beauty with usefulness, you look at them in vain.

At the present time, it is said, says the *Pall Mall Gazette*, that painters in Rome draw far too little from the life, and especially from the nude; and this, not by any means because good models are scarce, but because it pays better to go on manufacturing third and fourth rate sentimentalities for the supply of the market, than to undergo the labours necessary to make a man a true painter or sculptor. The buyers are almost exclusively tourists, chiefly American and English, the Americans at present being by far the best customers to the dealers in pictures and works of art of all kinds. They have plenty of money, and about the same real knowledge of art as our newly-made rich men in the north, who buy pictures, as they buy upholstery, for the furnishing of their houses in the approved fashion of the day. There is, perhaps, not a city in the world where art is more thoroughly a manufacture than it is beneath the shadow of the walls that were raised and painted by Michael Angelo and Raffaelle.

A correspondent of the *Journal of Horticulture* asks whether sawdust, when used as a manure, breeds wire worms, and whether there is any objection to the use of such manure? He is answered as follows:—There is not even a shadow of truth in the objection, and if the sawdust employed be that from any of the fir tribe, the turpentine in it is very obnoxious to insects. We know of many gentlemen who have the floors of the stalls of their riding horses constantly covered 3in. or 4in. deep with sawdust, as it is soft and moist for their feet. They never use any other bedding, and no farmer that we ever heard of before objected to purchase the manure. Professor Johnston, in his "Lectures on Agricultural Chemistry," says, "Sawdust decomposes slowly when ploughed into the soil in its dry state, but it nevertheless gradually benefits the land, and should not, therefore, be permitted in any case to run to waste."

Trade News.

TENDERS.

Stanoate.—For new St. Thomas's Hospital, Stangate. Mr. Henry Curry, architect. Quantities by Messrs. Strudwick and Co.:—

Names.	Red brick facings and stock brickwork.	Red brick facings and gault brickwork	Portland stone and stock brickwork.	Portland stone and gault brickwork.
	£	£	£	£
Ashby and Horner	382,100	384,960	400,400	402,450
Hill and Keddell	381,050	383,950	400,300	402,150
Piper and Wheeler	377,060	379,784	395,106	397,637
Brass	367,021	381,617	383,826	397,334
Lee and Sons	364,000	371,000	390,000	392,700
Gammon and Son	362,664	366,755	395,566	398,276
Thorne and Co.	353,745	353,745	362,645	362,645
Webster	353,654	353,654	375,306	375,306
Higgs	349,260	352,909	367,276	370,653
Mansfield, Price, and Co.	347,168	350,132	364,173	366,918
Holland and Hannen	344,252	348,995	364,488	368,878
Myers and Son	340,946	344,996	362,540	366,370
Lucas Brothers	339,160	342,443	351,455	360,494
Perry and Co.	332,748	334,596	356,780	358,409

Enfield.—For new stables at Enfield, for Mr. H. W. Draper. Mr. Thomas J. Hill, architect:—Webb and Sons, £459.

Kent.—For the erection of a pair of semi-detached villas at Eltham, Kent, for Mr. A. F. Timothy. Messrs. Tolley and Dale, architects:—Ritso and Capps, £4,000; Langmead, £3,550; Fawcett, £3,550; Blake, £3,300.

London.—For repairs, alterations and painting, at London Mission House, Blomfield-street, Finsbury. Mr. E. C. Robins, architect:—Laing, £285; Staines and Son, £276; Pritchard, £255.

London.—For alterations and additions to a warehouse, Noble-street, City. Mr. Herbert Ford, architect:—Cole, £700; Perry, £648; Beeton, £640; Gordon and Co., £588; Sabey, £580; Crabb and Vaughan (accepted), £467.

London.—For five houses, Norman's-buildings, St. Luke's. Mr. Thomas J. Hill, architect:—Perry (accepted), £2,000.

London.—For alterations to Messrs. Dudley, Rolls, and Co.'s envelope works in Goswell-street. Mr J. W. Dennison, architect. Quantities supplied by Messrs. Franklin and Andrews:—Patman and Fotheringham, £6,395; Brass, £6,235; Rider and Son, £6,044; Downs, £5,985; Little, £5,978; Newman and Mann, £5,914 10s.; Henshaw, £5,883; Myers and Sons, £5,757; Browne and Robinson (accepted), £5,553.

Norwood.—For works at Central Hill, Norwood, for Mr. D. Miller. Mr. Thomas J. Hill, architect:—Webb and Sons, £1,424; Wood and Co., £1,365; White, £1,249; Sabey, £1,100; Anley, £1,073; Corbeldick, £1,005; Perry, £997.

Paignton (Devon).—For the erection of a sessions' house, police-station, public offices, and assembly room, for the local board, Paignton, Devon. Quantities supplied. Mr. J. Tarring and Son, architects, the Lodge, Cary Parade, Torquay, and 26, Bucklersbury, London, E.C.:—Perrett and Sons, Paignton, £4,732 8s. 6d.; Roberts, London, £4,290; Stevens, Paignton, £4,216 10s.; Call and Pethick, Plymouth, £3,975; Weeks, Paignton, £3,779; Evans Brothers, Paignton, £3,653 8s. 10d.; Bragg and Dyer, Paignton, £3,417 15s.; Piller, Torquay, £3,212.

Strand.—For alterations and repairs to No. 7, Adam-street, Strand, W.C. J. Tarring, 26, Bucklersbury, E.C., architect:—Jameson and Hobson, £409 10s.; Clemence, £326; Richards, £307 10s.

BATH STONE OF BEST QUALITY.

Randell and Saunders, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[Advt.]

PROPERTY SALES.

July 25.

At the Mart.—By Messrs. Debenham, Tewson, and Farmer. Leasehold residence, No. 41, Cumberland-street, St. George's-road, Pimlico, annual value, £65, term 74 years from 1859 at £8 per annum—sold for £600.

Leasehold four houses (in carcase), Nos. 5 to 8, Rye Hill-road, Peckham Rye, term 99 years from 1866 at £10 per annum—£600.

Leasehold premises, No. 2, Queenhithe, City, let at £250 per annum, term 17 years unexpired at £100 per annum—£830.

By Mr. Newbon.—Leasehold five houses, Nos. 8, 10, 12, 13, and 14, Alexandra-road, Holloway, let at £34 each, terms 99 years from 1859 at £6 each per annum—£320 to £340 each.

Leasehold six residences, Nos. 1 to 6, Stanley-terrace, Holloway, annual value £40 each, term similar to above at £6 6s. per annum—£340 each.

Leasehold residence, No. 163, Hemingford-road, Barnsbury, annual value £60, term about 75 years unexpired at £1 per annum—£615.

By Messrs. Ellis and Son.—Leasehold residence, No. 8, Fitzroy-street, Fitzroy-square, annual value £100, also a building in the rear, No. 7, London-mews, term 90 years from 1890 at £14 14s. per annum—£470.

Leasehold two residences, Nos. 60 and 62, Hill-street, Peckham, term 70¾ years from 1818 at £12 per annum—£400.

At the Guildhall Coffee-house.—By Mr. F. Chapman.—Leasehold eight houses, Nos. 1 to 8, Elizabeth-buildings, Hogarth-lane, Chiswick, let on lease at £40 per annum, term 500 years from 1800—£610.

July 26.

At the Mart.—By Messrs. Farebrother, Lye, and Wheeler.—Leasehold four residences, Nos. 297, 309, 313, and 315, Vauxhall Bridge-road, producing £263 per annum, term 57 years unexpired at £10 each per annum—£2,570.

By Messrs. Norton, Trist, Watney, and Co.—Freehold residence, with stabling, garden, orchard, and cottage, situate at Hillington-end, Uxbridge, Middlesex—£1,670.

Freehold and copyhold two residences with gardens, situate as above, producing £75 per annum—£1,440.

By Mr. W. G. Gray.—Freehold estate known as Swig's Hole Farm, in the parishes of Horsmonden and Brenchley, Kent, comprising farmhouse, oasthouse, cottages, buildings, and 161a. 0r. 35p. of land—£6,000.

By Mr. A. Booth.—Leasehold improved ground rent of £19 per annum (for about 75 years), secured upon Nos. 24 and 25, Stock Orchard Villas, Holloway—£305.

Leasehold house, No. 9, Malvern-terrace, Park-road, Tottenham, let at £22 per annum, term 99 years from 1862, at £4 15s. per annum—£185.

By Mr. J. Cayley.—Leasehold manufactory and stabling, situate in Charles street, Albany-road, Camberwell, annual value £200 per annum, term 40 years unexpired at £6 per annum—£1,050.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Samuel Cruttenden, Battle, plumber, August 8, at 2—Lawrence Field, Lower Tottenham, zinc worker, August 8, at 11—Joseph Newton, Oxford-terrace, Paddington, builder, August 13, at 2—Joseph Davis, Fratton, builder, August 15, at 12—F. H. E. Le Bihan, Westminster Chambers, engineering draughtsman—William May, Charlton, mechanical engineer, August 13, at 2—William Standing, Seaford, builder, August 14, at 12.

TO SURRENDER IN THE COUNTRY.

William Betts, Norwich, bricklayer, August 8, at 11—Edward Davies, Birmingham, engineer, August 9, at 12—Thomas Dove, Marske, Yorkshire, joiner, August 5, at 11—Thomas Rudkin, Leicester, plasterer, August 6, at 11—G. Shepherd, Saint Woollas, Monmouthshire, painter, August 6, at 12—John Small Wilkes, Darlaston, builder, August 9, at 12—Thomas Bailey, Sunderland, ironfounder, August 13, at 3—Henry Dancy, Woolston, carpenter, August 14, at 12.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

October 18, W. W. Redgrave, Grove-street, South Hackney, builder—October 25, H. J. Dover, Upper Norwood, builder—November 8, J. E. Gray, Tividale, ironfounder—September 2, T. L. Jones, Everton, painter—August 30, W. Eddy, Gosport, plumber—August 19, T. Aston, Hereford, carpenter—August 8, H. Perry, Hayle, Cornwall, plumber—August 3, W. Stoakes, Newchurch, carpenter—October 8, W. Cooke, Chippenham-terrace, Harrow-road, sub-contractor—October 9, Peto and Co., Great George-street, Westminster, contractors—October 9, A. K. Wheeler and R. Dolling, Sherborne-place, Blandford-square, plumbers—August 23, J. Moore, Blackburn, builder—August 23, T. Rose, Buxton, plumber—August 22, R. A. Ellis, Chelmondiston, builder—August 12, G. Read, Islip, brickmaker.

THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 9, 1867.

THE PARIS EXHIBITION.—No. XI.

WOOD WORK.

WOOD, as we have mentioned in our notices of the various buildings which stud the four quarters of the Parc, plays a most important part in the Paris Exhibition, and the carpentry is very commendable. Carpentry as a science is becoming rapidly obsolete in this country. The facility with which large spaces can be roofed over in iron, and the great increase in the price of labour, combine to render this once important branch of construction less cultivated day by day, and as a natural consequence the carpenter becomes less and less an intelligent workman, his work becomes more slovenly, and a really good sound piece of English carpentry is scarcely to be found now-a-days out of a shipbuilder's yard, and but seldom there. We are, therefore, glad to renew our acquaintance with the science in Paris, where it and the art of joinery are much more studied than with us; and we advise those workmen who avail themselves of the cheap excursions now organized to well and carefully examine the Russian, Swedish, and Austrian buildings in the Parc. Woods from all parts of the world are here exposed, but we do not find anything which is new and useful; some few contributions of "fancy woods" for furniture are worthy of being inquired after, but the timber sent from the Baltic, Canada, and our other timber-producing sources is all of well-known character, but, as might be expected, of an unusually fine quality, and of very large dimensions. Amongst the most notable improvements in the conversion of wood for building purposes are the machine-made articles in joinery; and we have in the Exhibition excellent illustrations both of the machines themselves and their work. Shortly the steam joiner will only need his human colleague to fix his work for him, and it is impossible to look upon the very admirable doors and window frames sent from Vienna without being impressed by the fact of the extreme impolicy of setting man's life to do that which a machine can do so much better. These products of the Vienna Joinery Company are worthy of the notice of all engaged in building; they are admirable in construction, and extremely moderate in price, and we should hail with pleasure their large importation into this country. They are not merely machine transcepts of good hand work, but are incomparably better and truer than any hand work used to be; it would be but faint praise to say better than it now is, for the rage for cheap labour and no brains has ruined joinery in these latter days, and the wretched four-panel door which haunts us everywhere, with its thin panels and sprigged-in mouldings, is a weary travestie on the joinery of that best abused portion of our history—"the last century," when men took pains with their work and Trades' Unions were not. The doors from Vienna remind us of what joinery used to be, and the old fashion of making the mouldings a portion of the framing, fixing the panels into them, and wedging all up together with the styles, is most welcome to behold again. We would particularly call attention to the doors framed in various coloured woods, where both construction and decoration are so carefully attended to, and also to the French casements made by the same company. Norway exhibits some excellent joinery, but of much simpler character and of a ruder build than the Viennese. There is room for the products of both these countries in our own, and we trust they will speedily find their way. Norway is already attempting it, and we shall give Austria a ready welcome. The woodwork of Belgium belongs almost more to the cabinetmaker's than the joiner's craft. Her wonderful pulpit, which seems to be everywhere, so frequently does it encounter our view, is an excellent piece of workmanship, and reflects the highest credit on all concerned, and the figure carving is worthy of any period of art history. M. Goyers deserves the highest praise for this work; for although many English architects will doubtlessly exclaim against its crocketting and cusping, we must recollect that the modern translation of Gothic takes a different form on the Continent than with us, and perhaps their translation is a more accurate rendering of it than our slangy polyglot, after all. There is such a thing as being too wise in our own conceits, and the drawings for the New Law Courts are rather startling, and quite disabuse our mind of the hope for unity we once indulged in. Scarcely less beautiful is the high altar of M. Pickery, of Bruges, in oak and plaster, but in remarking upon it we are drifting rather into the region of sculpture, and must return to the less enticing works of joinery proper. Chiefest in these are the many works of marquetry which are exhibited, and it is very gratifying to find them being so largely introduced into our own country. From Wirtemberg and Austria come some admirable examples; those from the latter country, exhibiting an inlay of bent woods, are of great beauty of design, and, considering their low price, of wonderful manufacture. Of the marvellous inlays in furniture we cannot now speak. Our articles on the constructive portions of architecture have prolonged themselves too much to allow us here to indulge in the luxury of describing the many beautiful and wonderful exhibits of this class, and we can only in passing allude to the marvellous work in M. Fourdrious' exquisite cabinet, and the charming pictures in parquet of M. Leimer. Perhaps on some future occasion we may revert to these and their kindred works; and we trust in our next article to conclude our remarks on the works directly connected with architecture in the Paris Exhibition.

STRENGTH OF STEEL BARS AND PLATES.

THAT steel is destined to ultimately supersede iron in all the more important branches of construction to which that material is applied, is as certain as that iron has effectually taken the place of timber. Some time will probably elapse before the substitution becomes general, owing chiefly to two causes. The one is that we have not yet succeeded in producing a uniform description of steel; and the other is that we have not been able to quote a standard price for it per ton. When we purchase iron of a certain brand and of a certain quality, we are sure of what its working capabilities are; but the case is otherwise with steel, which presents as great a diversity in its resisting powers as in the methods of its manufacture. It has been urged by those who are partizans of the employment of iron in preference to steel, and there are always some who are averse to improvement and progress, that steel is more liable to fracture than iron, and that it partakes of the brittle and treacherous nature of cast iron. Let us examine this objection, and test its validity. Undoubtedly there are some descriptions of steel more liable to fracture than some descriptions of iron, but there are also others affording not only superior ductility to the softest iron, but endowed with much greater powers of resistance. The true way to profit by the diversity presented by steels is to study their individual peculiarities, to apply each to that particular duty for which it is most appropriate, and not to be deterred from availing ourselves of the services of so valuable an adjunct to the constructive arts by any ill-founded fears of its capabilities. Steel similar to iron presents considerable difference in the appearance of its fracture, which may be classed under five distinct heads—1, fibrous; 2, granular; 3, fibrous and granular; 4, fibrous and crystalline; 5, crystalline and granular. Experience has abundantly shown that the principal distinction between the appearance of two fractures is due—and solely due—to the manner in which the fracture is produced, and not caused, as has been erroneously supposed, by the nature of the strain to which the specimen may have been exposed during the time of its working. If the fracture be gradual and prolonged the section will present a fibrous appearance. If, on the contrary, it be sudden and violent, the exposed surfaces will have a granular aspect. Almost any intermediate degree of fineness or coarseness may be produced by varying the mode of determining the rupture. There is one important distinction to be observed between the granular fracture of steel and the crystalline appearance of wrought iron when broken in a similar manner. In the former, there is a total absence of all those brilliant crystals which are so largely distributed over the surfaces of the latter metal when fractured.

At the Paris Exhibition a gold medal was awarded to Mr. Christian Aspelin, of the Norberg and Fagersta Works, Sweden, for the excellent quality of his steel bars and plates. A large number of these have been experimented upon by Mr. David Kircaldy, of Grove, Southwark-street, with the view of testing their resistance to a tensile, compressive, shearing, and torsive strain. All trustworthy experiments, when they relate to a material long recognized, and whose powers of resistance are well known, are valuable; and, therefore, any bearing upon a comparatively new material are of a double value in the eyes of those desiring to avail themselves of its use. The experiments commenced by subjecting twelve hammered bars of Fagersta steel, of various degrees of hardness, to a tensile strain, the length of the bars being nine times their diameter. Of these twelve, nine fractured suddenly, and the remaining three slowly; and we shall find that the different manner in which they broke indicates a considerable discrepancy in the results obtained. The mean ultimate strain per square inch of the first nine was 98,148lb., or nearly 44 tons; while that of the latter was but 61,312lb., or barely 37½ tons. At the same time, the mean ratio of elasticity to rupture was in the former case 63 per cent., and in the latter 70·3. Looking at the relative "contraction of area at fracture" and ultimate permanent extension we find a wide discrepancy. The figures for the mean results in the first nine experiments were 7·73 and 4·5 per cent. respectively, while in the three latter they were 61·52 and 16·5 per cent. We must warn our readers against supposing that the steel which bears the greatest tensile strain is consequently the most advantageous to employ. A steel that would stand a maximum tensile strain would be very unfit for application to a railway axle, or in any situation where it would be subjected to incessant jar and vibration.

Passing on to the experiments upon the compressive strength of the bars, there were forty-eight tested in all, in sets of twelve, the length of each twelve being respectively once, twice, four, and eight times the diameter. The influence of an increase in length in the specimens upon their ultimate resistance is well illustrated in these experiments. The mean ultimate strain per square inch of the twelve bars, the length of which equals the diameter, is 200,000lb., or about 89¼ tons. It should be noticed here that every one of these bars gave exactly the same ultimate strain, which is a very curious coincidence. A falling-off in the ultimate power of resistance is at once apparent in the bars whose length equals twice their diameter, since the corresponding mean figure per square inch is 155,132lb., or close upon 70

tons. With a length equal to four times the diameter, the mean strain was 109,496lb., or nearly 49 tons, and when the length reaches to eight times the diameter the ultimate resistance per same unit falls to 36·8 tons. Without going into elaborate calculations, it is clear that putting L for the length of the bar the resistance to compression varies as $\frac{1}{L}$. It is also to be observed that the proportion of length affects the manner of fracture or yielding to the strain. The first twelve bars all failed by bulging, the next two sets by distortion or skewing, and the last twelve by buckling. The ultimate permanent depressions appear to follow no particular law, since the minimum, 0·331 of an inch, is given by the first twelve bars, and the maximum, 0·673, by the second series. From the experiments upon resistance to shearing, the strength of steel is manifestly inferior in that respect to its tensile resistance. Thus the shearing stress of the bars that bore a tensile strain of 44 tons and 27½ tons respectively, was only 31·6 tons and 20¼ tons per square inch. Some idea of the necessity for giving a large amount of extra material in cases where a violent strain of torsion may occur, may be gathered from the fact that with a length of lever equal to 12in., the mean ultimate resistance of twelve bars whose length equalled eight times the diameter was barely one ton. In order to investigate the resistance to transverse strain the bars were placed upon supports 20in. apart, and the force applied in the middle. With the exception of one specimen the bars were all fairly broken across, the mean breaking weight being 15½ tons. In addition to the trials already described four Fagersta steel wire billets were tested both for tensile and compressive strain. The mean ultimate stress per square inch in the former case was 187,509lb., and in the latter 200,000lb. It must be borne in mind that in the first number is represented the ultimate strain per square inch of the fractured area, and not of the original area, which amounted only to 49,963lbs. The experiments concluded with the testing of nine rolled plates of various degrees of hardness. Their mean tensile strain per square inch of fractured area was 123,074lb., and their compressive, or resistance to bulging, was 109,844lb. The mean ultimate strain per square inch developed under a punching force was 74,217lb., which is much less than the previous results, but the impactive element in a punching strain must be taken into account when instituting a comparison. In fact, our knowledge of the actual force of impact is far too limited to enable us to deduce any rules or formulæ of a reliable character respecting its action. Considerable importance has always been attached to the quality of Swedish iron and steel by engineers and architects, and the results of the above experiments are excellent proofs of what their peculiar system of manufacture is capable of producing.

INVENTORS AND INVENTIONS.*

MR. DIRCKS is deeply impressed with the conviction—a conviction shared in by most persons—that the present patent law of England does not work by any means so satisfactorily as it might and ought to work. It is in a very confused and anomalous state indeed. Perhaps no other law is so little understood, or regarding the result of which similar diversity of opinion exists even among inventors and patentees themselves. If proof of this were wanting we find it in the late "Report of the Patent Law Commission," a very voluminous document, particularly noteworthy for the conflicting character of its contents. The question, "Have you any reason to suppose that public inconvenience is caused by the multiplicity of patents?" is answered by twenty-four witnesses in the affirmative, and by eighteen witnesses in the negative. Again, to the question, "Do you consider that patents ought to be refused on the ground of the trifling and frivolous nature of the inventions for which they are claimed?" The reply is "Yes" by eight witnesses, and "No" by twenty-one witnesses. The very terms used in the discussions relating to patent cases in our law courts are constantly being confounded and misapplied. For example, how frequently is the question asked, "What constitutes an invention?" How often do we hear a petty improvement spoken of as an invention; while the terms discovery and invention seem to be regarded as synonymous by persons who certainly ought to know better. Then, again, there can be no doubt whatever that inventors as a class are subjected to grievous wrongs, and their interests demand that they shall be properly protected. To suggest some such remedial measures for the sake of inventors, and to endeavour to solve some of the most striking difficulties that surround the question of patents generally, is the object of Mr. Dircks, in the work before us. It is in three parts—namely, first, the philosophy of invention, considered strictly in relation to ingenious contrivances tending to facilitate scientific operations, to extend manufacturing skill, or to originate new sources of industry; second, the rights and wrongs of inventors, particularly as affected by the influence of patent monopoly legally and politically examined; and, third, early inventors and inventories of secret inventions employed from the thirteenth to the seventeenth century, in substitution of letters patent. Much curious information is contained in this last part; the former may be considered the more important and practical portions of the work. While we may not be inclined to agree with Mr. Dircks in everything that he has advanced, still we must admit that he discusses the important questions of patents in an able, painstaking, and impartial manner. It is a question upon which, remembering his lengthened experience as an engineer and an inventor, very few are better fitted to pronounce. His familiar acquaintance with the whole subject is especially well shown by the clever manner in which he critically examines several articles in the *Times* on patent right monopoly, and exposes the foolish—we might say mischievous—statements of the leading journal. The *Times* has persistently denounced the patent monopoly of inventions—it would sweep away the whole system. Its arguments are not likely, we fancy, to affect the judgment of more practical minds. Mr. Dircks shows, and he is supported by Jeremy Bentham, Mr. Mill, and Mr. McCulloch, that while it might be of some advantage for a limited period, to manufacturers, if monopoly were disallowed, since they would have fewer conflicting interests to contend with, the public, on the other hand, would gain nothing by such a step. With these great economists, Mr. Dircks believes that "in new inventions protection against imitations is not less necessary than in established manufactures protection against thieves;" and that, "of all methods of exciting and rewarding industry this (of granting patents for a limited time) is the least burthensome, and the most exactly proportioned to the merit of the invention." His objections are entirely directed against the loose manner of granting patents, and his suggestions on this head are well worth serious consideration. He says, "A patent granted to an inventor differs widely from a patent of nobility, the one being disputable, the other indisputable. An inventor's patent is granted to him on the grounds that he is the true and first inventor, that he describes his invention fully, and that, if needful, he furnishes an exact drawing of his mechanical arrangements. But he is otherwise helpless. He has a property without enjoying absolute possession of it, and the next man he meets, if richer, may deprive him of it, or attempt to do so, if he chooses. . . . . No one doubts the tricks and chicanery that are attendant on great patent law cases in our courts of justice, and yet no active measures are taken to lessen the evil. A fortune has very often to be spent in law to realize a fortune through the medium of a patented invention, which could not occur under any system with a semblance of justice in it. In the case of a patent trial, science itself appears a very Janus in court, and the whole legal process seems like a case of life and death between rival patentees. All this mockery of justice and mere parade of scientific knowledge might be avoided by some more judicious mode of granting patents in the first instance. A committee of examination would be one means. But a patent might graduate, and undergo examination, at the end of six, nine, or twelve months (or even later, if it appeared desirable to the patentee) in order to decide its right, either to confirm its acceptance, or its being decisively annulled. . . . . And why not even require an income tax on their produce, in return for rendering it unnecessary to litigate their validity as at present, and in liquidation of the extra process that might be incurred. When settled thus, after sufficient time has been allowed to all interested opponents, a patent certified and sealed should be as clearly evidence of the right of an inventor as are the deeds of the landowner of his right to his possessions."

Mr. Dircks would have a scale of years dependent on the nature of the patent, distinguishing "the original novel scheme significantly and correctly called inventions, from the class flowing from them, which are properly designated improvements." To the first he would give protection for fourteen years, to the other not more than five years, which period, however, might be extended should it appear that the presumed improvement, on further consideration, was found worthy of taking a place as an invention. "The alarmists," says the author, "who would become destroyers of patent protection form a class which may well rank with the bygone destroyers of machinery. The patent, like the machine, places at our disposal labour-saving processes, increased supply at diminished cost, and with articles of consumption both cheaper and better in quality than those previously known." Mr. Dircks' work is really an able argument in favour of patent law reform, and as such we commend it to the attention of all who are interested in the question, which is undoubtedly one of vast public importance. We may add that the book contains an excellent portrait of the author, the work itself being dedicated to Mr. Henry Bessemer, the well-known inventor.

* "Inventors and Inventions." By Henry Dircks, C.E., &c., Author of the "Life of the Marquis of Worcester." E. and F. N. Spon, 48, Charing-cross. 1867.

MEETING OF THE ARCHÆOLOGICAL INSTITUTE, HULL.

ADDRESS BY THE ARCHBISHOP OF YORK.

ON Tuesday week the inaugural meeting of the present anniversary of the members of the Royal Archæological Institute of Great Britain and Ireland was held in the reception room at the Townhall, Hull. There was a very numerous assemblage of members and ticket-holders, a fair proportion of those present being ladies. The mayor (Alderman Loft) presided, and had on his right and left Lord Talbot de Malahide, his Grace the Archbishop of York, the Right Rev. the Lord Bishop of Lincoln, the Dean of York, Archdeacon Long, Rev. Canon Brooke (vicar of the Holy Trinity), W. Wright, Esq., deputy-lieutenant of the East Riding, &c., &c.

In the course of a very able and interesting address, his Grace said:—In reading the transactions of the sister society, to which I happen to belong, I am struck with the moderation of the present race of archæologists in fixing the limits of their science, and in the method which they pursue within those limits. Archæology is a science of the remote past, but this general description would include ethnology, the history of languages,

and the study of ancient written records, or palæography. Archæology, according to one authority, should be content to separate herself from all these tempting subjects, and to confine herself to the study of the works of human skill, which indicate the growth and social condition of man. A boundary line so artificial as this is likely to be transgressed from time to time. The charter, the chronicle, and the will are often appealed to, although the object of the science is not the written documents, but they are used not so much for the written thought as for some tangible monument on which they may throw light, not so much for the development of mind they contain as for their account of things produced by manual skill. The charter illustrates for us some church, castle, or abbey; the will with its inventory of household possessions admits us to the interior of a dwelling which we can by no other means reproduce, as it was upon the day when the possessor left it never to return. The main business of archæology is with the work of men's hands. For my own part, I would venture to submit that, in taking for its materials all the materials of history, archæology would do better still. I am glad to see a department of history connected with this institute. Now this boundary is a very narrow and artificial one, but within it the archæologist has learnt to prescribe to himself rigid rules of method. You know that every science consists of two parts, the collection of facts, and the grouping of the facts when collected under some idea, or law, or principle, call it what we will. A French writer tells us that in the course of their history sciences passes through three stages—the theological, and the metaphysical and the positive. I prefer to say that sciences are found in three conditions—the first, where facts are scanty, and theory too active; the next, where facts have been industriously collected, but theory has not been applied for their due interpretation; and the last or perfect condition, where facts have been abundantly supplied, and theory has been used with soberness, and yet with bold sagacity, for their explanations. Now the greatest peril to science has always been on the side of the tendency to theorize overmuch. The hypothesis, too swift of foot for the laggard experience, has left her behind. Bacon, in the sixteenth century, usually has the credit of awakening the world of science from a speculative dream to a sober experience; but the remarks of Leonardo da Vinci and others show that this was felt by other minds. Bacon was the spokesman for his generation, of an intuition which perhaps no one else could have expressed so well or with so large a result. Now, the temptation which besets all physical sciences perhaps assails archæology with the greatest force and success. Over the restored building or the exhumed relic, the feelings of wonder, reverence, respect, and curiosity are aroused; who can wonder that the theory, or rather guess, is prompt, or that it is ambitious? Dr. Stukeley wrote in 1740 that the church at Driffield was very old, and contained an effigy of Paulinus, the first Archbishop of York. I probably do him no wrong in saying that the only evidence connecting the basso-rilievo which still exists in the church with my great predecessor was that Paulinus was the first and most illustrious Archbishop, and that there was no particular reason against fixing his name to the ecclesiastic with a crosier whom he found at Driffield. Stukeley was a wild and speculative inquirer, and in such hands archæology had not advanced very much beyond the monks of Meaux, who record that in the reign of Henry the Second "the bones of King Arthur and of Guinevere, his Queen, were discovered at Glastonbury," and were distinguished by most unmistakable marks, for Arthur's thigh-bone exceeded by three fingers the length of the tallest man's thigh bone that had ever been found when measured down to the knee. Moreover, the space between his eyebrows was of the breadth of the palm of a man's hand. One understands the mistake which makes artless monk and credulous doctor hasty to make over to saint and hero the first great and worthy thing that imagination can manage to connect with their names. But guesses of this kind are not archæology, and it makes little difference in our estimate of them whether they happen to be right or wrong; they tend to bring the whole subject into ridicule and disrepute. Many people think to this day of a museum of antiquities as a collection of stones and potsherds ticketed into dignity by falsehoods, and divide collectors into two classes—those who deceive themselves, and those who would deceive other people. Modern archæologists do not, upon the whole, deserve this harsh estimate. In the transactions of both our English societies there is a remarkable caution and sobriety. To avoid a groundless theory seems to have become, as it were, part of the moral code of the archæologist. The time for theories, it seems to be admitted, begins when the collection of facts has been large and general, and as exhaustive as the subject seems to admit. Archæology has passed through the same stages as the other sciences. Once astronomy and chemistry were bare of facts but full of dreams. But she was born late; and her earlier trips and stumbles took place amongst her grown-up sisters, who make merry with her failures, yet the ridicule has stimulated her efforts, and no science walks more firmly or more truly along the line of induction. But ever and again the ardent curiosity and impatience for symmetry will lead us again into hasty generalizations. The theory of three periods—the stone age, the bronze age, and the iron age—has been carried too far; and in assigning a place to any weapon or other implement, people often forget that long after bronze and iron were discovered, stone might continue to be used among the poorer and less civilized, whilst in our own country it is very probable that the iron instrument preceded the composite metal bronze, which was in use on the continent. At present one cannot help thinking that many of those who explain to us lacustrine dwellings of early times, and the buried flint implements, and the inhabited caves, have far outstripped the facts at their disposal. An enormous antiquity has been claimed for earthern vessels found about the lake dwellings, on the ground that the lake dwellings must be enormously old, but an archæologist sets them side by side with vessels known to be of the fifth and sixth centuries after Christ, of the sort known as Anglo-Saxon, and finds the form the same. Surely this marked similarity of form is worth more than any mere speculation as to what the age of the lake dwellings ought to have been. And this brings me to consider a little more closely the work of the archæologist, and to recognize its dignity and worth. Archæology might be called the microscope of history; and we know that without the microscope neither geology nor physiology could have reached its present exactness. Ehrenberg computed that every cubic inch of a stratum of Tripoli powder, at Bilin, in Bohemia, contains 41,000,000,000 of the Gallionella distans, and this bit of stone or pinch of powder, a thousand times more populous than this island of men and women, would have kept its wealth of life a secret only for the microscope. One may say that without this instrument the science of physiology could not exist. The services which archæology render to history are of the same kind, and in the end they will probably not be less. To take an English example, not foreign, perhaps, to this moment, when one finds in the time of Edward III. memorials addressed to the King by the inhabitants of a town, demanding justice against some sheriff for having conferred the enfranchisement on them, saying that they were "maliciously compelled to send men to Parliament," our notions receive a certain shock. It is plain that we have possessed representative institutions longer than we have appreciated them. History repeats itself. Can it be that that mysterious entity, the compound householder, will hereafter turn round and revile the able leader of the House of Commons for having maliciously compelled him to send men to Parliament, and for having as part of the machinery of his measure permitted the cold shadow of the rate collector to darken his doorway? My Lords and Gentlemen, yours is a young science in a rich world; upon the face of this country we find marks of two primeval races, and the monuments of the Roman power abound, and York itself is called a "second Rome." Anglo-Saxons, Danes, and Normans, have written their names upon its page. Almost ninety religious houses received those who sought peace in flying from an unquiet world, instead of doing battle with its trials. Its churches are marvellous for their grandeur. Ten or twelve that are fit to be cathedrals might easily be counted. More than one great national struggle has steeped the soil in blood. These successive strata of our social and religious development have been very imperfectly examined as yet, and before a systematic history of their formation is written, patient, plodding, self-denying observation will have much to do. That much is being done at this moment, we are all aware.

On Wednesday, the proceedings were resumed by the Historical Section meeting in the theatre of the Royal Institution. Lord Talbot de Malahide opened the business of the section. His lordship then called upon Mr. Councillor Symons (Hull) to read his paper—"An Early Sketch of the River Hull." Mr. Symons said:—The name of the river was derived from the Gaelic "Hol" or "Ol"—water—as in some ancient documents the word was spelt Hul. Formerly the river was called Sayer's Creek, after Lord Sayer, of Sutton. It had undergone many alterations in appearance since the time when King Edward was charmed with it, and the street which runs parallel with it, and which was formerly called after it—now High-street—had also altered with the march of time, as far as appearance goes, for the worse. The diversion of the course of the stream to the eastward, about the year 1256, was alluded to, and ascribed to the inundations to which the town was at one time subject. The remainder of the paper was devoted to a sketch of the rise and progress of the trade of the town, more particularly with respect to that portion of it transacted on the river Hull and in its immediate vicinity. Mr. G. P. Green, of London, read a paper "On the Siege of Hull, 1642;" and papers were read by Mr. Tindale, of Bridlington (descriptive of his collection of stone flint implements found by him on Sir J. V. B. Johnstone's estates in the neighbourhood of Bridlington), and by Mr. J. Burtt, the secretary, on the Yorkshire tumuli. In the evening a meeting was held at the Royal Institution, at which a paper was read "On the Roman Station at Slack." One of the most interesting features in the list of special attractions provided for the members is the temporary Museum of Antiquities, which has been arranged in the long room of the Music-hall, Jarratt-street. The bulk of the articles exhibited are flint and stone implements of ancient manufacture, the principal part of which have been collected by Mr. E. Tindale, in the neighbourhood of Bridlington, and are exhibited by him. Prominent in this part of the museum is a portrait of Flint Jack, a well-known maker of spurious "antiquities." Next to the flint implements are placed a number of early British urns, all in good preservation. Here also are three huge stones which were taken out of a tumulus upon an elevation of land named Rudda. These stones are supposed to have been used by the ancient Britons for the purpose of mooring their "coracles" to. Mr. W. Warden, Hull, exhibits a Roman amphora or wine holder. The utensil is in good preservation, and has capacity for holding eighteen gallons. The collection of bronze implements is not so large as the one which precedes it, but some excellent specimens are shown. The museum is further enriched by several specimens of ancient carving, and water-colour drawings of celebrated ruins, painted by Mr. B. R. Green. The Huddersfield Archæological Society send for exhibition a collection of red tiles from Roman sepulchres. Mr. W. D. Keyworth, the honorary secretary of the local museum committee, contributes a fine alabaster basso relievo, "The Taking Down from the Cross," which was found under the high altar at Walsingham Abbey, and which is supposed to be of the time of Edward I. Andrew Marvel's bible, in good preservation, has been forwarded by Mr. S. W. Kirke, Hull. On one of the silver clasps is an anagram on the name of the original owner, "Reward Emanuel." Councillor Symons exhibits some specimens of home-spun silk, found in the rafters of a house in High-street, and which are supposed to be at least 200 years old.

The Architectural Section met for the first time on Thursday, under the presidency of Sir. S. Glynn, Bart. Archdeacon Trollope read a paper on "Certain Sculptures Found in Lincoln Cathedral." He remarked that he should probably be able to throw more light upon these sculptures, through the circumstance of a scaffolding having recently been erected under them, than many previous inquirers had been. The sculptures in question formed a band along the western front of the Cathedral, and they were attributed to the time of Remigius, about the twelfth century. The Archdeacon then explained the circumstance of some of the sculptures being apparently of more recent date than that which he ascribed to them, and then went on to describe *seriatim* the several sculptures, of which photographs were exhibited. They commenced with the earliest scenes described in the Bible, and closed with those which were yet to be enacted. The first was "The Expulsion of Adam and Eve from

Paradise;" the next "The Curse of Man"—"By the sweat of thy brow thou shalt eat bread;" No. 3, "The Building of the Ark;" No. 4 was apparently composed of two distinct subjects, both, however, having reference to the "Rising of the Flood;" and the lecturer remarked that they bore out the generally conceived idea that the waters rose gradually. No. 5 also referred to the Flood, in which subject the series was particularly rich. It depicted "Noah's Family Entering the Ark," and it was remarkable that the group of animals following them were not, as in the scriptural record, walking in couples, but singly. The right hand portion of the stone seemed to allude to Noah and his family after they had left the Ark, and the patriarch communing with God. As to the meaning of No. 6 the speaker invited the opinions of those present. He thought they alluded to passages in the life of Samuel. No. 7, "Daniel in the Lions' Den." No. 8 apparently began the New Testament series, and referred to "Our Lord Communing with a Disciple." No. 9 had been very beautifully preserved: it depicted "The Lord's Supper." No. 10 had puzzled most writers on Lincoln Cathedral. He described it as representative of "The Fate of the Redeemed and the Unsaved." No. 11 represented a portion of "The Torments of Hell." No. 12 is an interesting continuation of this subject, and one part of it attempted to depict souls issuing out of the jaws of Hell, and being received by our Lord—"He descended into Hell." No. 13 represents "The Saints in Happiness," and also referred to the different orders of men. No. 14 also depicted "Christ Receiving the Souls of Men."—Mr. Freeman (York) would like to believe that the sculpture was as ancient as it was said to be, but he hardly could, for the representation of foliage seemed of more recent date than the time of William the Conqueror. He should be more inclined to ascribe the work to Alexander than to Remidius. The English were not barbarians when the Normans came over to them, and therefore he did not see what special instruction they could receive from the Norman bishop alluded to. —A discussion ensued, during which several suggestions were offered as to the probable meaning of the picture No. 6, but they were disposed of as inapplicable.—The usual vote of thanks was accorded to Archdeacon Trollope.—Mr. E. Sharp next read a paper on Selby Abbey Church and other churches in the East Riding, the latter part of the subject being introduced as the means of affording a contrast to the first portion, and of elucidating difficulties which might arise if the subjects were taken separately. Mr. Sharp first alluded to the grand scale on which Selby Church was designed. It was a conventual church of the first class, but not lofty. It exhibited three periods of our national architecture—the Norman, the Transitional, and the Decorated, or curvilinear, period. The Transitional period, which occurred between 1145 and 1190, and of that particular style of architecture there were many remains pointing to the fact that during these forty-five years building was carried on with great rapidity. Mr. Sharp remarked that the Transitional period was distinctly marked, and could be readily identified by a small circular ornament at the corner of the capitals, which he might call the Transitional volute. This ornament appeared to only have been in general use for about twenty years, but examples of it were found in many countries. He next alluded to the great beauty of the western doorway of Selby Church, and remarked generally on the splendour of the conventional foliage of the Transitional period. The grand feature, however, of Selby Abbey Church was its choir of the Curvilinear period, embracing a seven-light window of the same order of architecture, one of the finest in the kingdom. Speaking generally, Mr. Sharp contended that in 1145 the Saxons struck out for themselves a new order of English architecture of great beauty, and in advance of the Norman style, which had been practised in France for many years. At Beverley Minster they had an extraordinary instance of copyism. The whole of the nave was not of the Lancet period, although in that form, for the whole building was of later date; it belonged to the Curvilinear period. They had there a design continued throughout the building of an earlier date than was being practised at the time of the erection of the work. The fact, however, was discovered by the builders being so wedded to their own styles of mouldings. Mr. Sharp, in conclusion, alluded to the principal architectural points of interest at Bridlington Priory Church, Howden Chapter House, Trinity Parish Church, Hull, and the Minster at Beverley.

On Friday the excursions were made on the other side of the Humber, and the noble Abbey of Thornton, and the antique Saxon church at Barton, formed the great attractions. At Thornton, the ruins of the gatehouse, or more properly in this case, guest-house, are singularly picturesque. There is an unusual, but not excessive, breadth of walls, notwithstanding, the front face is considerably ornamented with many niches and sculpture of life-size dimensions. Over the entrance the remains of the sculpture show in the upper tier a martyr with a crown of glory, and in the lower, the three figures are perfect, the central one being the Saviour, surmounted by a descending dove; the one on the right being St. John. At the back of the gatehouse, over the refectory, is an oriel window, the recess of which formed the "chapel over the gate" for early mass for travellers. In the interior there are passages in the walls, and guard-rooms all round the building, with loopholes for defence. By the side of the altar is a hagioscope through which the guards and servants could view the elevation of the Host. The ruins of the abbey church remain some considerable distance in the rear, and there is to be seen a vaulted recess between the chapter house and the transept, which Mr. Parker explained as being a sort of mortuary house in which the bodies of dead priests were laid whilst prayers were being given over them. The architectural date of the edifice would appear to be, from the evidence of style and documents preserved, from the reign of Edward III. to that of Richard II., and in the discussion which took place upon it, Clee Church, in the neighbourhood, and Lincoln Cathedral, were referred to, eliciting from Mr. Parker the positive statement that it was now proved that Lancet Gothic is certainly of English origin. St. Hugh built the quire of Lincoln—the earliest Gothic—in 1190 to 1200. Clee Church was consecrated by him in A.D. 1192, as shown by an inscription still remaining, and that church is in the same style. These examples are twenty years in advance of anything of the kind on the Continent.

St. Peter's Church, at Burton, possesses a thoroughly well preserved tower of pre-Norman age. The arches, if they may be so termed, of the windows are formed of flat lean-to stones, and the central pillars of the double ones have that chubby round balluster form which characterizes the stone architecture of the eleventh century, antecedent to A.D. 1066, whether we call it Saxon or Romanesques. The Saxon tower proper consists of four storeys; the lower has five round wall arches, the second five angulated heads, then comes a stringcourse above, which is a double window with angulated top, then a stringcourse surrounded by another double window, which has round arches. The remarkable manner in which the masonry was put together attracted much notice, and was more like the work of carpenters than of masons. Indeed, we know the Anglo-Saxons were timber builders, and of their want of knowledge of stone construction we have singularly conclusive negative in the absence of any proper word in their language. The nearest approach of the verb to build in Anglo-Saxon is "to timber."

On Saturday; during the visit of the institute to Selby, the remains of one of the abbots was brought to light. Mr. E. Sharpe, of London, had desired the churchwardens to lay open the ground outside the south porch for the purpose of searching for any remains of the old Norman transept which were supposed to exist, and to which Mr. Sharpe had drawn attention in one of the sectional papers at Hull. The foundations were discovered, and at the same time a wooden coffin containing a perfect skeleton. The wood was completely decayed and black. The coffin was about 4ft. below the surface, and upon it was laid a stone slab of about 5ft. or 6ft. long and some 18in. in width. It was bordered by a dog-tooth moulding of about the date of 1220, and was inscribed lengthwise, the Roman letters giving the word "Alexander." The history of the church gave the name of an Abbot Alexander, appointed in 1214, and who resigned in 1221. Mr. Sharpe therefore supposed that this was the abbot who had built the work which partook of the Lancet character.

On Monday, the members visited Driffield, Bridlington, and Flamborough. On arriving at the first-named place, the party was placed under the guidance of Mr. J. Browne, who conducted them to the church of All Saints. This is a building of grand proportions, the tower of which is a remarkably handsome erection in the Perpendicular style, surmounted with crocketed pinnacles. The other portions of the structure are of the Norman and Early English periods. On the chancel door there are fine bold leaved capitals, which were inspected with considerable interest by the archæologists. At the east end of the south aisle, there was examined a sculptured figure in full pontificals, with crosier. In the opinion of Dr. Stukely, this is a statue of Paulinus, the first Christian Archbishop of York. The church at Little Driffield was also visited. It is supposed that Aldfrid, the Saxon king, was here buried. Aldfrid died at Danesdale, in the year 705. The tower of this church is of the thirteenth century, and the structure is embellished with floriated crosses and coats of arms. At Bridlington the party went to the venerable Priory church. Mr. Parker described several styles, viz., the Early English, the Decorated, and Perpendicular styles, of which this church is composed. The splendid west window raised by subscriptions, and the equally beautiful east window, given by Mr. Clayton, formerly of Blessingby, were greatly admired. Mr. Parker then gave an elaborate description of the exterior of the church, and what it had been at different periods of time. The different styles of architecture of which the building is composed, showed that it, or part of it, was in being as early as 1270, or probably as early as 1100. The archæologists next visited Flambro', which was the birthplace of Sir John Puckering, Kt., a judge, one of the Privy Council, and keeper of the great seal of England in the reign of Queen Elizabeth. Here there are small remains of an old tower or castle, which appears to be of the Norman style, though tradition asserts that it was erected by the Danes. Many of the archæologists expressed the opinion that it is a Saxon relic. The church of St. Oswald was next visited. It is a stone structure, erected about the middle of the eleventh century. The chancel is separated from the nave by a wooden screen, over which are the remains of an ancient rood loft. The workmanship of this screen was said to belong to the fifteenth century, and is extremely rich.

The proceedings of the Institute terminated with a business meeting in the Townhall, Hull, the Mayor in the chair. There being no definite invitation to visit any place during the forthcoming year, no choice was come to by the committee, but several towns were mentioned favourably, especially Lancaster and Exeter, and it is generally understood that at one of these two places the meeting of 1868 will be held.

FAILURES IN CONSTRUCTION.

A VERY important adjourned discussion took place at a recent meeting of the Royal Institute of British Architects, on a paper read before the Institute some time ago by Mr. Edwin Nash, Fellow, "Upon Failures in Construction." The paper has already appeared in our pages. Mr. Charles Barry, Vice president, was Chairman, and the discussion was opened by Mr. William White, Fellow, who called attention to the failure of the nave pillars of the church at Lyndhurst seven or eight years ago. It was explained that the arcade was supported on chamfered brick pillars, surrounded with small slate shafts. Those brick pillars were only 14in. square, and some might say no wonder they failed, being of so small dimensions. But he had surrounded them with slate shafts, which he knew would so distribute the pressure as to make them substantial, if properly constructed. In the drawing it would be seen that the pillars were divided in their height by a band of stone, connecting the slate shafts together, and thus distributing the pressure. Now, in the construction, those slate shafts were not put in when the weight came on the pillar, and therefore the pillar did prove unequal to the weight thrown upon it; and one of the pillars yielded in the beginning of December, 1856, before the centres were fully struck. There was a crack vertically upon the four sides of the stone band to the whole width of the band, showing its fracture into four pieces, and, from this, the fracture began gradually to extend to the brickwork also. That band was formed of Bath stone, only 6 inches thick. There was, of course, great pressure in proportion to its thickness upon the heart of the stone, entirely unrelieved in its outer bearings, the joints being kept free on the outside to prevent flushing. Mr. White went down and made a further careful examination of the work; but he had already, after his first visit, made calculations from such standard works as he had at hand as to what the bearing weight ought to be—that

was to say, whether the pillars ought properly to support the superincumbent weight or not. He found, on calculation, the whole weight to be carried was 16¾ or 17 tons. He then took into account the pressure of wind upon the surface of the roof, which of course was considerable, though there might be also to some small extent a counteracting pressure upon the other side; and he found that when constructed, with the shafts, this pillar ought to carry at least 60 or 70 tons. The actual weight to come upon it was only one-third of that, which was the usually recognized standard for safe construction. He remarked that, in making the calculation, he consulted, amongst others, the formula of Telford, which gave, as the bearing weight of a brick pillar 12in. square, 320,000lbs., or equal to nearly 150 tons. This, again, plainly showed the failure to be in the stone, not in the brickwork. The necessity of cast-iron pillars was strongly urged upon him. But apart from the objectionable idea of such a mode of dealing with it, he felt that, if with this construction a cast-iron pillar were put up to carry the weight to be cased with an ornamental covering of bricks, it would stultify his own position as to the original construction, if properly carried out; and this position he felt to be strong and justifiable. The result was, that each of these shafts, one at a time, was taken out. He used some hard-pressed Staffordshire bricks, and a six-inch Portland band, in lieu of the Bath, was introduced in the middle of the pillar. This carried everything entirely, without the slate shafts which were put in afterwards. The best selected Portland was used for bands, projecting 2½in. (*i.e.*, beyond slate shafts), and chamfered. Peake's bricks for the pillars, and the shafts were bedded top and bottom with 5lb. lead and a thickness of felt. This banding had since been carved, and everything proved to be quite satisfactory.

Mr. Edward Hall, visitor, called attention to a failure which took place in the roof of the original Croydon Railway Station at London Bridge, and, as far as he recollected, it was a most important case of failure, inasmuch as that roof was an illustration of Tredgold's carpentry. Last time he saw it, it did not appear to be in use, but the tie beam, which was a very extraordinary one, was then shored up.

Mr. T. Roger Smith, Fellow, remarked that the roof mentioned as having been shored up, was not the original roof of Tredgold, but was one which was put up about ten years ago, a queen-post roof, of which he had numerous drawings in his possession. It was a timber roof of 90ft. span, and the trusses were nearly 20ft. apart; and to the circumstance of so large a span being attempted in timber framing, which was always liable to shrink, added to the trusses being so far apart, he believed the fact of its failure was attributable. It was, however, a good instance of a fairly constructed roof which had failed from having attempted too much. The roof in question spans that part of the South Eastern Railway terminus at London Bridge now known as the low-level platforms. It is a timber roof of a single span, and was erected about the year 1850, shortly after the fall of the roof at the Bricklayers' Arms station. That roof had partly rested on columns intermediate between the external walls, and one of these receiving a severe shock, which fractured or overturned it, the portion of roof immediately supported by it fell, and dragged the adjoining column after it, and so on till, bit after bit, the whole had fallen to the ground. In consequence of this disaster it was determined to have no intermediate supports at London Bridge. The clear span between the walls is 92ft. The trusses are queen bolt trusses; the scantlings are as follows:—

	ft.	in.
Principals	9 ×	12
Tie-beams (each scarfed at the centre)	9 ×	15
Collar	9 ×	12
Braces	9 ×	9
Purlins	11 ×	7
Iron queen rods, and one central rod intermediate between them, circular		1¾
Iron rod intermediate between queen rod and wall, circular		1½
Wall plate	6 ×	12

Trusses apart (from centre to centre) 19ft. 9in.

The principal rafter is held down at its feet by two straps, which also embrace a timber 9ft. × 12in. and about 11ft. long, fixed immediately under the tie-beam. This roof has partially failed; and to afford support to it two stout posts, placed 10ft. apart (5ft. each side of the central line), on solid bearings, have been introduced under each tie-beam. The most obvious defects of the roof, besides the lightness of the scantlings, as compared with the span, are, the extreme distance apart of the trusses, the want of a greater number of braces in the truss, the unsatisfactory placing of the purlins with relation to the braces, and the imperfection of the mode of securing the feet of the principals to the tie-beam.

Mr. J. P. Seddon, Hon. Sec., said in Rochester Cathedral he had noticed the following curious circumstance. The triforium of the nave consisted of an outer and inner series of small arches, resting upon columns, between and connecting which were transverse arches thrown across from column to column without the slightest tie or abutment, and the weight of the superstructure had dislocated them to a serious extent, in many cases forcing the columns to lean outwards, and the stability of the structure appeared to be much endangered through this extraordinary want of foresight in the original construction, and, in his opinion, the critical condition which some of the columns were in at present required immediate attention.

Mr. Octavius Hansard, Fellow, suggested that Mr. Seddon might be able to give them some information with regard to the extraordinary thrust in Yarmouth Church, which had thrown out the south wall of the south aisle to the nave so much.

Mr. Seddon said that this had been caused by the decay of its roof, which he did not believe was the original one at all, as it was a weak and badly constructed roof to cover so great a width; for the spacious aisles of the church were no less than 40ft. and had but moderate abutments in the shape of buttresses. He had no doubt that the original roof was of far better construction, with proper ties, but had been replaced at a comparatively modern period with the present one, which, though of oak, had never been well constructed, and consisted simply of couples of rafters, united by diagonal braces, and a collar crossing them as a species of tie, but from being placed so high it had little use for that purpose, and had now become decayed, and the pins connecting the timbers loose. It was a similar cause which had thrown out the walls of half the churches in the country, and rendered necessary their reconstruction or restoration at the present day.

Mr. Thomas Morris, Associate, remarked, that the diagonal pieces to which Mr. Seddon alluded were used as struts, and not as ties, which the mediæval architects never used; they considered the walls were sufficiently strong, and therefore built the roof upon them.

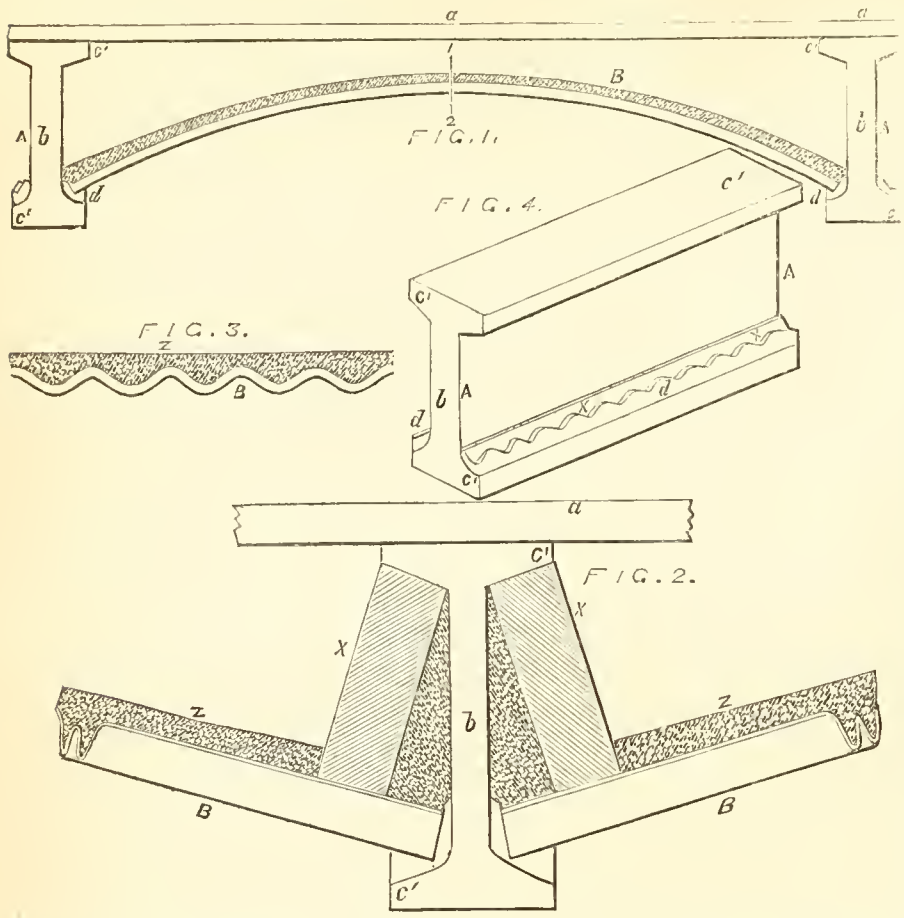
Mr. Seddon said that he could not agree with Mr. Morris as to mediæval architects not using ties. Occasional ties to such roofs were often put across from wall-plate to wall-plate, independently, as it were, of the roofs, but still to counteract their thrust, and in later times these had inconsiderately been wholly or partially removed, to the detriment of the structure. He (Mr. Seddon) knew of many such ties existing, which were evidently original from the character of their detail.

Mr. Charles Fowler, Jun., Fellow, alluding to concrete, said they had been told on good authority, the result of careful experiments, that concrete does not expand in setting, but he would mention one or two instances where the results seemed to have been deficient. One was an instance in which very thin concrete was used in small quantities to form the base for laying an asphalte floor. Many present would recollect the flooring in the Byzantine Court at the Crystal Palace, and the wavy surface that it presented. That floor was formed with joists considerably above the level of the ground, and in order to make a base for this ornamental asphalte floor, the space between the joists was filled in with concrete to a little above them; and as the work was done in a hurry, he had no doubt the floor was laid before the concrete had properly set, and the result was it blistered. In another instance a similar thing occurred. In a slate gutter, forming the upper member of a brick cornice, the two sides were grooved into the bottom, and at intervals there were slate ties dropped in, and a capping grooved on to the front. The same method of construction had been used in buildings erected many years before, and had stood well. In this instance an attempt was made to give a fall to the gutter by putting in a little fine concrete, tapering from nothing to more than three inches in the thickest part; and on this—perhaps rather too soon—asphalte, half an inch thick, was laid to form the bottom of the gutter. Within a month or two after the gutter was finished the concrete was found to have expanded with strength enough to crack the slate ties, and the whole thing gave way. To remedy this the concrete was taken out, and the bottom of the gutter left square. The small quantity used and the pure quality of the concrete were perhaps the causes of the failure. There was a large proportion of lime in the concrete. [A Member: Was there any cement?] It was nothing but a fine concrete. He thought the quantity of lime ordinarily used with concrete might not produce expansion, though used in the proportion that was done in the cases he referred to, it might have that effect; but in no case did he think the use of concrete for such purposes was perfectly safe, unless it was allowed to remain a considerable time before any superstratum was put upon it. In reply to inquiries, Mr. Fowler stated he did not know what description of lime was used in the Crystal Palace floor, but in the other case the ordinary grey lime was used.

Mr. C. F. Hayward, Fellow, referred to the use of bond timber, which was most fatal to all permanency in construction. If any quantity of wooden plates and bond timber were used in the walls of any building, it must eventually tumble down of its own accord, if it were not otherwise destroyed from any of the other causes, and in cases of fire it was peculiarly dangerous. In all buildings of his own, he made a point of not carrying the joists upon plates built in the wall, but to do away with plates, corbelled out the walls and inserted the joists without plates, in order to avoid having any of them in the building. One cause of failure not touched upon in the discussion, was the decay of iron structures from the continual wasting away of the material. He had an opportunity of noticing the dome of the Custom House in Dublin during its repairs a few years ago—which, although constructed of good Portland or similar stone, threatened destruction, owing to the rusting away of the iron banding which had been built into the circumscribed wall of that portion of the building. He thought some very serious questions would one day arise with respect to the great iron girder bridges of railways, when they began to get a little old. It seemed to him before very long they would have some great failures or heavy reconstructions of these railway bridges, for it was perfectly evident that they were wasting away, notwithstanding all the painting—which, indeed, hardly lessened the evil—as witness the tons of metal scraped away from the Menai and Conway tubes every year. Unless they repaired them extensively by adding new plates—unless continual reconstruction was carried on—he feared that accidents would happen to those and all similar large iron structures.

Mr. Joseph Jennings, Fellow, said with reference to risks of failure, it was important that everybody should anticipate any probable causes which might occasion failure in the works they undertook. This was particularly the case in London, especially in connection with foundations. It was stated in the paper that they could have no better foundation than chalk. No doubt; but it was seldom they were able to build upon chalk, and the only other really safe foundation was either rock or concrete. But they could not always go to the expense of putting in a concrete foundation when there appeared to be a good foundation without it. A large portion of the failures in London he had seen occurred in cases where people built upon gravel which appeared good. No architect would cut into and lower than what appeared a good foundation; and yet he had seen, in very short intervals of distance, a great difference in the depth of the bed of gravel, varying as much as from 6ft. to 6in. It must, therefore, be to a great extent a matter of judgment what they might expect. He strongly advised people not to build into that gravel without taking borings at moderate distances, but not in the line of the vaults, to ascertain the uniformity of the thickness of the bed; and even then there would be some risk of failure. Another cause of failure, not sufficiently mentioned, was from a layer of sand not being a horizontal layer. He had known an instance where a wall slid which had as much as 10ft. thickness of concrete under it, the ground having been taken out, and the concrete being all below the surface. No amount of precaution could have prevented that. He had no doubt the case was, there was a bed of sand lying below the surface of London clay. In the country he met with another instance of failure which arose

FIREPROOF CEILINGS AND ROOFS.



from the use of sandstone from a new quarry, which crushed. This showed the necessity of testing stone. The stone, judged by appearance only, should have borne double the weight without crushing. Mr. Thomas Morris, remarked that the ample use of concrete had been a great advance in modern foundations, and so was the utter disuse of timber. Concrete had another advantage, that in large works it was not very easy to substitute any other material for it; but it was not so in small works. Some time ago he was introducing a lofty internal wall into an old building, and knowing the great weight of the brickwork in his plan, he prepared a base of concrete. He was present when the trench was excavated, and again when the footings were to be laid. Something occurred which caused a doubt in his mind, and he insisted upon having the trench re-opened, when he found that, instead of concrete, the most worthless rubbish had been put in, and dredged over with a little wetted lime, that caused a rising of steam. Now, if he had not happened to detect this piece of "scamping," no doubt the wall would have given way as soon as it got to any height. He thought that was tantamount, on the part of the builder, to an attempt to obtain money under false pretences. The accidental suspicion in this instance had unquestionably prevented a disagreeable consequence; and failures possibly occurred as frequently from a want of moral integrity on the part of the builders, as from want of skill on the part of architects. It might be said that the attempt he had mentioned could only be made by a person of no reputation, but he feared that such practices reached to men of higher grade. A builder of some eminence had lately said it was the duty of the clerk of the works to see that the work was well done. But was it not the builder's duty to do it well? The man who could only be honest under the eye of a clerk of the works surely stood in no better moral position than one kept honest by the vigilance of the police.

Mr. C. Fowler, Jun., suggested that, with regard to the failure of the first tower at the Crystal Palace, which had reference to the question of concrete, Mr. Nash might be able to give the meeting some information. He believed the fact was, the concrete was considered to be imperfect, and after the tower had been carried up two-thirds of its height, it was taken down again, the foundations dug out, and a cement foundation laid with broken granite stone.

Mr. White asked Mr. Nash whether he did not find that very thin concrete was almost sure to go, and also whether concrete made with fresh lime was not sure to blow.

Mr. Nash said with regard to the expansion of concrete we know that it does expand before it has set, but not afterwards. Concrete used in little patches is not of much value, and the placing it upon a wood floor with the intention of its keeping a perfect surface is a misapplication of its use. The remarks as to the advisability of keeping wood bond out of walls have little force, because wood bond is the very bone and muscle of a weak building. I say of a weak building, where nevertheless it is the most objectionable, on account of its shrinkage and perishable nature. What has been said about iron structures is perfectly correct, and it will be seen that iron buildings are the most evanescent on the face of the earth.

The meeting then adjourned.

IMPROVED FIREPROOF CEILINGS AND ROOFS.

THE accompanying engraving illustrates an invention by means of which the destructiveness of fires will be much lessened, and at a trifling cost. This invention consists of a ceiling or roof composed of H girders, corrugated arched plates resting on certain socket bearers, the whole forming a light, cheap, and ornamental fireproof ceiling or roof. Fig. 1 shows an elevation of part of this improved ceiling. Fig. 2 is a detached sectional view of the same, drawn to an enlarged scale. Fig. 3 is a section on line 1-2. Fig. 1 and fig. 4 is a perspective view of a girder and sockets C′ C′.

A A are two of a series of parallel girders of ordinary H iron, the opposite ends of which project into the walls of a building, and on these girders rest the floor *a*. On each of the lower flanges c of each girder, and against the vertical portion *b* rests the bearer *d*, which has a corrugated recess or socket *x* at one side for the reception of one end of the corrugated metal plate B, the latter being arched, as shown in the drawing, and resting at its opposite end in the socket or recess of a similar bearer *d*, fitting on the flange and against the vertical portion of the adjacent girder. Against the sides of the upper flanges c′ of each girder bear the upper ends of inclined bricks or blocks X X, the lower ends of which rest upon the arched and corrugated plate B, the space between the bricks and the girders being filled with mortar or concrete, and upon the upper curved and corrugated surface of the plate B is deposited a layer of concrete, filling the corrugations and extending an inch or thereabouts above the same. The edges of the plates B may be arranged to overlap each other to a limited extent, and thus form a continuous corrugated arch extending the length of the girders. The bearers *b* are in short sections, which may be readily fitted to the girder so as to form a continuous socket and abutment for the ends of the plates B. In consequence of the facility with which the parts composing the ceiling may be applied without the necessity of using rivets or other fastenings, and the slight amount of manual labour, time, and skill required in fitting the parts together, a ceiling of this character will cost one-fourth less than those in which the arches are composed of bricks, at the same time the improved ceiling will resist the action of fire quite as effectually as one of brick. In consequence of the comparatively slight weight of the plates B, compared with that of a brick arch, girders A much lighter than those ordinarily employed may be used. The plates B, besides being greatly stiffened by their corrugations, are rendered still more rigid by the layer of concrete, and by the shape of the sockets, which, fitting the said corrugations in the plate, prevent the same from being distended laterally under pressure. Apart from the superior lightness and economy of a ceiling thus constructed, it will be seen that the corrugated arched plates present a much more ornamental appearance than the usual plain arches. Plates corrugated differently from those described may be used, and braces of cast iron or other material may be substituted for the bricks or blocks X X, or the blocks may be dispensed with, and the entire space above the plates may be filled with concrete. From the above description it will easily be seen that this invention answers all purposes for fireproof ceilings or roofs. The corrugated plates are light, cheap, and can be made as ornamental as desired. The space between the flooring boards and the layer of concrete resting on the corrugated plates will insure the needed ventilation, and in case of any water being poured into the floors it will fall into that space, thence run out easily through apertures to that effect. This complete and valuable system of ceiling was invented by Mr. Joseph Gilbert, builder and architect, of Philadelphia, United States. It in nowise will *prevent* conflagrations, because there is no rooms without wooden shelving, furniture, or the like combustible matters, but it will surely confine the fire to the place or room it has started in, and the building itself will thus suffer but little damage. Mr. Gilbert's ceiling was patented on May 14 last, and deserves, we think, the attention of all architects, builders, and house owners.

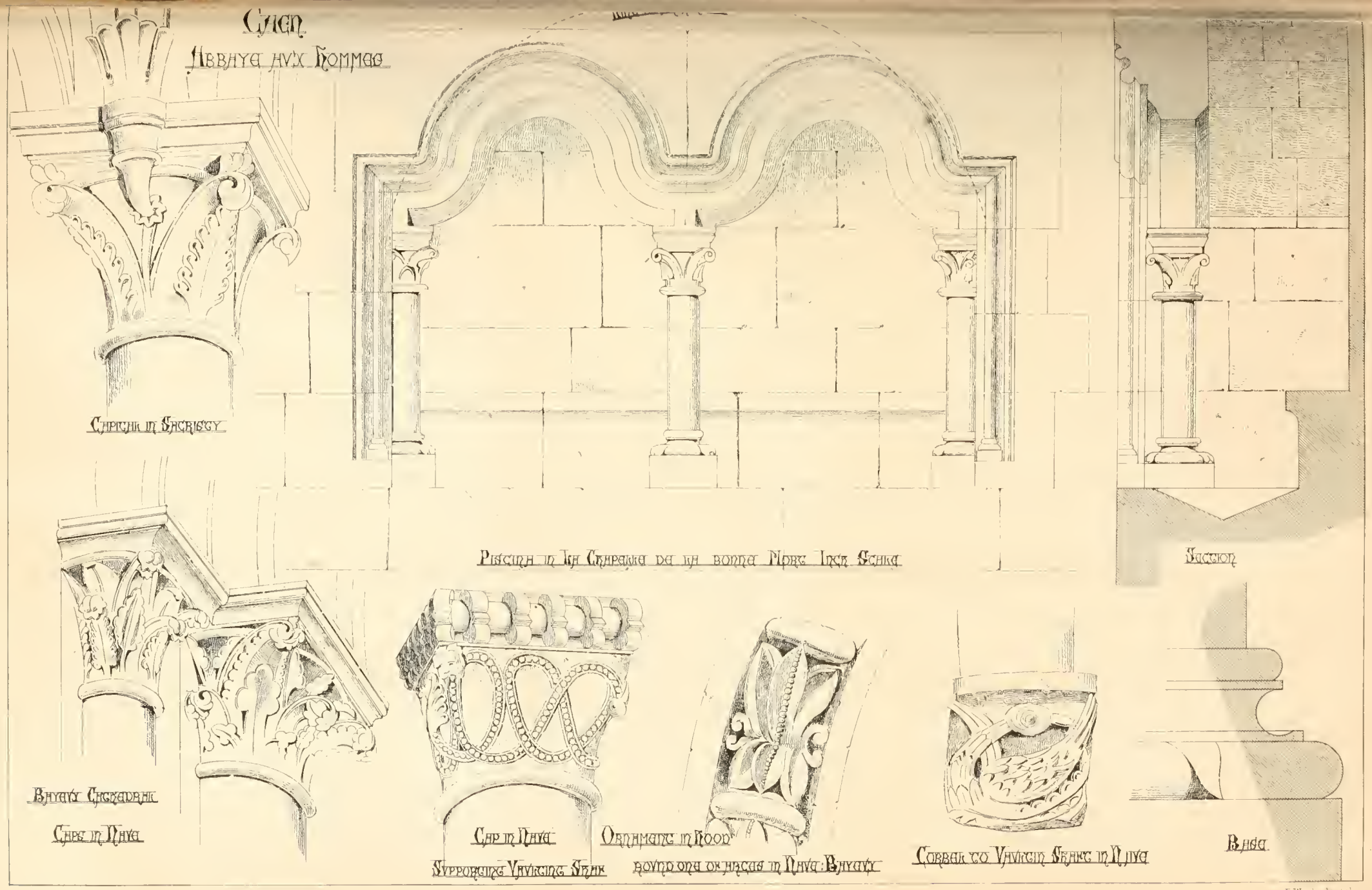
EARLY ARCHITECTURE IN FRANCE.

ONE of our lithographic sheets this week consists of details from the Abbaye aux Hommes, Caen and Bayeux Cathedrals, from sketches by Mr. Willcox, architect. The details are:—Elevation and section of piscina, capital in sacristy, capital in nave, and corbel to vaulting shaft in nave of the Abbaye; and capitals in nave and ornament in hood round one of the arches in nave, from Bayeux.

ST. STEPHEN'S CHURCH, HAMPSTEAD.

THIS church, which is to be erected on a site called "The Green," Hampstead, is composed of a nave 90ft. long by 26ft. broad, north. and south aisles and transepts, and a capacious chancel, capable of accommodating a large choir, extending, as it does, under the tower. This chancel is to be groined. Advantage is taken of the fall of the ground to construct a chapel underneath the chancel, to be used for small week-day congregations. The church is to accommodate about 1,000, and the chapel 150 persons. The architect is Mr. S. S. Teulon, of Craig's-court, Charing-cross.

The Synagogue of Cologne has just been almost entirely destroyed by fire. The artistic and material loss is very considerable.



Printed by Whiteman & Bass

E. Wimbridge lith

St STEVENS HAMPSTEAD S. S TEVLON ARCHT

THE NEW LAW COURTS.

After much time, and, let us hope, after much anxiety and thought, the judges appointed to decide on the relative merits of the competitive designs for the New Law Courts, have decided in favour of Mr. Barry and Mr. Street. These gentlemen divide the honours between them—the former for his plans and the latter for his architecture. Not having the official report before us, we can say nothing as to the particular reasons which influenced the judges. After the report of the joint committee of solicitors and barristers, no one need be surprised that Mr. Barry's system of planning should be selected as the best; but art opinion, though it regarded Mr. Street's architecture with much favour, decidedly pointed in the direction of Mr. Burges. This decision must not, as a matter of course, be taken as final, as the ultimate decision rests with the Government; and it is possible, though not probable, that the result arrived at will be disturbed. No doubt many will ask how can two architects so opposed to each other in education, feeling, opinion, and experience as Mr. Barry and Mr. Street work conjointly and harmoniously in the production of the most important architectural structure of this generation? For our own part, we see no insuperable difficulty in the way, and particularly in this instance, when all the designs and plans become the property of the Government. No one must suppose for a moment that the exact plan, as devised by Mr. Barry, and the exact æsthetical arrangement, as sketched by Mr. Street, will be carried out. If the Government should confirm the decision of the judges, in all probability these gentlemen will, as reasonable men, cull much benefit from the discussion which has taken place on this historic competition, and take many a useful hint and suggestion from the other designs.

THE MANCHESTER NEW TOWN HALL.

For some time past a considerable amount of interest has been felt in the Manchester New Town Hall Competition, and it was known that many eminent architects were preparing for it. One hundred and twenty-four sets of designs have been sent in, which are hung in the Town Hall, King-street. It is stated that Mr. Scott, Mr. Waterhouse, Mr. E. W. Godwin, Mr. Welby Pugin, Mr. Salomons, and many of the local celebrities, are amongst the competitors. It is, we believe, the intention of the committee to select twelve sets of drawings, and to submit them to the council for approval. The authors of the designs so selected will be paid £300 each, and be invited to enter in a second competition. So far, to all appearances, everything has been done by the local authorities to make this a *bonâ fide* competition. Let us hope that neither interest nor favouritism will prevail. The competition system has recently been dragged through the dirt, and it is now in the power of Manchester to do something to reinstate it.

ARTIZANS AND LABOURERS' DWELLINGS BILL.

This Bill has at length got into committee, and endeavours are being made to improve its details. Before, however, any measure of compulsory legislation be passed, the necessity for superseding the ordinary operations of commercial life should be clearly made out, and the extent to which they are intended to be so superseded should be more clearly defined than is attempted by this Bill. Believing, as we sincerely do, that the present wretched state of town dwellings of the poor is largely, though not wholly, to be traced to injudicious attempts for the past twenty-five years to mend matters by building upon philanthropic principles, we must confess that we look with fear upon any attempt to do the same work by legislative interference. If there were any prospect that the legislature would do the whole work—a work, be it remembered, requiring in the metropolis alone the expenditure of many millions, we might not hesitate. But no such thing will be attempted. A rate of 3d. in the pound will go a very little way. It will do scarce more than touch the outside of the evil, and erect, as the philanthropic societies have done, a few buildings, the commercial results of which will only scare capitalists away from like investments. Building for the poor by means of rates will, in all probability, begin and end with the erection of as many or as few buildings as the vestries will grant rates for, and when these are seen, as who expects them to be otherwise, to be unprofitable, the rates will cease to be granted, and the old cry of hopelessness will be raised louder than ever. But, say the proposers of compulsory legislation, "Building for the working classes is profitable." We grant it fully. None will advocate the profitable nature of this work more than we, but its profitableness depends very much upon the parties who perform it. A few figures will illustrate our meaning. The Corporation of the City of London has received much praise for its endeavours in this way. There is a handsome block of buildings in a fine situation in Farringdon-road. The cost of these buildings, divided by the number of rooms for occupation, gives a cost of £60 per room. The estimated value of the site in the same way gives a value of £30 per room. The Improved Industrial Dwellings Company, a commercial company, whose eighth half-yearly meeting is reported in another page, erected in various parts of London buildings on the self-same model, equally well or better finished, some within half-a-mile of the Corporation Buildings, and at the same time; but the cost of these houses was only £43 per room, and the company managed to get possession of ground which cost them (taking an average of various places) about £10 per room. Thus we have the remarkable contrast of a commercial company building for the poor at £53 per room, whilst a corporate body does a similar thing for £90 per room. What is the inevitable result? The Corporation makes 4 per cent. net rental. The Company makes about double as much. This is of the utmost moment as affecting the question of the supply of such dwellings. Any one having the example of the Corporation before his eyes declines to invest his money in similar buildings, and were it not for the better example shown by the Company there would have been no increase beyond the original erections, except out of the public funds. The Company has, however, we are delighted to see, doubled its capital, and thereby doubled its usefulness, within the past year, and no doubt will go on in an increasing ratio every future year, and become the parent of similar beneficent undertakings, until the day shall come, as doubtless it will (thanks, in the first place, to Sir Sidney Waterlow), when building for the poor will be found the most solid form for investment of a vast amount of capital. We very much fear that any attempt to do the same work by public funds will form a serious obstacle in the way of so desirable a result, while at the same time the attempt itself will go but a very little way. The Corporation of London is by no means more unbusiness-like than other public bodies, yet, with every desire to do good, it has managed in the case cited to erect a building which seems to have inscribed on its front, "Let no one attempt to build for the working classes unless he is prepared to sacrifice the fair return for his outlay." And this is by no means an isolated example. Public bodies are not constituted to undertake such operations; and until some reason be shown that they will wisely perform the work, we shall not cease to urge the propriety of keeping the poor man's dwelling from the domain of parish and corporation jobbery.

MR. STREET ON THE BRISTOL CATHEDRAL.

Mr. Street's report on the proposed restoration of the nave of Bristol Cathedral is now before us. We congratulate the Committee of Subscribers on the selection of Mr. Street as their architect, and it is very gratifying to find that both the Committee and Mr. Street are fully satisfied that what they now propose to do "will be felt to be worthy the dignity of the ancient city and diocese" of Bristol. Our readers will better understand this if we state briefly what it is which will be felt to be worthy, &c. At present, as most of us know, the little and unimportant building which, since the time of Henry VIII., has served as a cathedral church for the diocese of Bristol, is not more than 180ft. long, and 50ft. high inside,* and about 110ft. across the transepts from north to south, there being nothing westward of the transepts but the foundations and some fragments of the south-west angle of the nave, which show that were the entire structure standing as indicated by these remains, the length of the church, including Lady Chapel, would be about 300ft. It is proposed to build a nave, with aisles, of the extent just named, the western bays of the aisles to be occupied by steeples, and a north porch alongside the north steeple. The cost of all this does not appear, but as the first step is to erect the two eastern bays of the nave, and as Mr. Street proposes to carry up the wall of the third bay to the line of the window sills, that of the fourth bay to some ten feet above the ground, and that of the fifth bay and the western steeples to the level of the plinth, and as the nearest approach to cost we can get is that the Committee "feel justified in saying that with a subscription of £20,000, of which £13,000 is already promised, a contract might safely be entered into for the completion of two bays and the other portions" we have just mentioned, we should not be very far wrong in putting £150,000 as the probable cost of the proposed addition. We hope the men of Bristol have liberal minds. The histories of Redcliffe Church restoration, and Mr. Street's church at Clifton, are sufficient to show with what zeal Bristol can start a good work, and with what unexpected alacrity she can stop in its progress. When the Dean proposed to build two bays only, and finish off at once with a west front, we fancy he measured the old city and diocese very faithfully. When, too, the Bristol Corporation and Mr. Street together think £9,000 enough to expend on Assize Courts that shall be worthy, &c., we are very much afraid that Mr. Street is laying a very flattering unction to his soul in supposing his scheme will ever be carried out. "It is very probable," he says, "that individual donors may come forward to contribute important portions of the work," as "of one of the steeples, or of the north porch." We hope they will, because it would be more than a pity to disappoint such a sanguine, zealous, hard-working church builder as is Mr. Street. The very thought of his golden hopes failing in the years to come—of a two-bayed nave with no west front, no steeples, no porch—fills one with sympathy for him, and makes one shudder in expectation of the future which is so very, very possible.

Of the report itself we must first of all say that it is distinguished, as, indeed, all Mr. Street's reports are, for a clearness of language only equalled by perspicuity of argument. It contains, first, a masterly sketch of the history or archæology of the old Abbey church; and, second, a description of what the archi-

* It could be put into the nave of Westminster Abbey, and we should have, even then, three bays to spare.

tect proposes to do. The archæological portion sheds, as might have been expected, some new light on the subject. The old Norman nave and aisles, we are told, were only 56ft. wide within the walls, the length about 106ft. William, of Worcester, who actually saw and measured the old building, says, "Longitudo antiquæ ecclesiæ, 80 gressus; belfray, 2 (or 106ft. 8in.). Latitudo ejus continet, 64 gressus (or 85ft. 4in.)" Taking the last dimensions as outside the walls, and Mr. Street's width of 56ft. we have walls about 15ft. thick! or William, of Worcester, is not to be believed. This alternative is, of course, the one we must accept, for Mr. Street says "I have stated my views decidedly because I have not the slightest doubt as to their correctness." What charming freshness! What exciting discoveries might we not enjoy if Mr. Street could be persuaded to write a report on all our cathedral churches. How the old authorities, the eye-witnesses, perhaps even careful old Gervase himself, would be silenced for ever by the awful penetration of what the ancients would have called the godlike man. This discovery as to the width of the Norman nave and aisles is not the only one which gilds the archæological part of the report. "In A.D. 1311, when Abbot Knowles proposed to re-erect the choir, it is probable that the whole of the Norman church was standing, with the single addition of the Elder Lady Chapel." So that the chapel east of the south transept, corresponding in position to that of the Elder Lady Chapel north, has neither mouldings nor masonry of an earlier date than 1311, as hitherto vainly imagined by some. It is somewhat strange that in the fourteenth century men should have been found who could adopt mouldings of an earlier style, and construct arches "with such rare archæological knowledge," but then strange things are plentiful at Bristol. The strangest of all is, that, according to Mr. Street, the Norman builders in that town indulged in carving and jointing of masonry unknown to Norman builders anywhere else. The idea of the Norman work of the Abbey gateway being rebuilt at a later period and repaired is absurd. The fifteenth century architect "could not" have reconstructed it any more than his assistants could have reworked the enrichments, says Mr. Street. There is a slight vagueness about this which makes it scarcely up to the average mark, because if anyone should happen to be at all sceptical he might just as easily believe in the power of a fifteenth century architect's assistant to copy a Norman zigzag as in the power of a nineteenth century architect to "restore" a nave which never existed; for whatever may be said, it is quite clear that Bristol Cathedral never had any other nave than that "Antiqua Ecclesia" which Fitzhardinge built in the second half of the twelfth century. And this brings us to the proposed work, which is to build a nave and aisles founded upon Abbot Knowles' fourteenth century design, as carried out in the choir, and which was begun in the nave, but never carried on to any extent. Here also we are favoured with a new light on the question of "restoration." "In the general design," the architect writes, "I should propose to follow very closely the work in the choir, only I should wish to mark, by a few minor alterations, such, *e.g.*, as the sections of mouldings, the design of window traceries, and the character of the sculpture, the fact that this new nave is really a work of the nineteenth century." Now, at both the east and west ends of the nave are fourteenth century remains, with mouldings and details exactly like those in the choir; are these to be restored as far as these two bays are concerned? According to Mr. Street's ground plan, the western fourteenth century remains, with their Norman substructure, are to be demolished altogether, to make room for one of his new western steeples. With the demolition of this, the only evidence of the extent westward of Abbot Knowles' plan of reconstruction, is also included the removal of certain domestic buildings possessing remains of the thirteenth and fourteenth centuries, and which Mr. Street has chosen not to show on his ground plan. So far, then, the architect's nineteenth century detail (whatever that may mean) will not be in danger of comparison with the old detail westward. But how about the east end? The responds of the eastern bays and a portion of the arches yet remain built up in the modern buttresses of the tower. We here see the bowtell, the filet, the ogee, the hollow, in beautiful combination. We have a base with mouldings, a pier with mouldings, and what is called a continuous impost—the mouldings of the piers being also the mouldings of the arches. We have the mouldings and carvings of the small overdelicate caps of the vaulting shafts, and, finally, the mouldings of the ribs of the vaulting, the springers of which remain. Is all this to be kept or restored as an exceptional bay, a sort of scale by which we may be able to measure the superiority of the nineteenth century detail; or is it to come down, and Mr. Street, his mark, to be put in its place? The plan which accompanies the report shows an entirely different arrangement of vaulting to that we see in the old work, so that we must conclude, especially as the architect is ominously silent about it, that this evidence eastward of a fourteenth century nave, having been contemplated and commenced, is to follow the evidence westward, and be wiped out of existence altogether. Besides this, the north side of the cloister is to be removed 7ft. or 8ft. further south, making the cloister quite this much out of the square. If to all this grumbling archæologists may say—you are obtaining money under false pretences; this work at Bristol Cathedral is no restoration of anything, as we understand the word; but, on the contrary, every stone which at present tells us anything of the history of the old nave, if the Abbey of St. Augustine is to be removed, and in the place where now we see interesting junctions of style, where, as in a book, we can read off the story of the long, wearisome, and finally, as it turned out, vain work, Abbot Knowles set himself to do, we are to have nothing but modern imitations of some other buildings, which we are asked to swallow under the name of "nineteenth century" details, and we are to read nothing but the story of an egotism which choked all reverence. To such irate antiquaries we would merely say that they know nothing about the question. The architect has a much deeper knowledge of the subject than they can possibly have; he has studied all its bearings; he has sounded all its depths. To restore all our ruined churches, provided only you were careful to lose all their details, import your own favourite vaulting, and use detached columns everywhere, would be very "noble work"—there can be no doubt of it. The architect has stated his "views decidedly," because he has "not the slightest doubt as to their correctness." What business, therefore, have you to doubt their correctness? We grant you that in his plan he shades as "thirteenth century work" portions which every antiquary would assign to the fourteenth century. Some early Norman walls are shown as of the fourteenth century, as also are the sixteenth century cloisters. The shortening of the chapter house is shown also to have been done in the thirteenth century, in spite of the builder of the present modern wall, of William, of Worcester, and certain details of construction, whilst not a single bay of the old groining in the choir, aisles, or transepts is shown rightly. But again we would reply, these are trifles light as air. What earthly use can there be in an architect knowing, or caring to know, the right or the wrong of such things? Archæological societies may find amusement in them for a summer's afternoon, and ordinary antiquaries may show their patience, their research, their penetration, and the value of inductive philosophy, by their discourses and their endeavours to make clear apparent confusions. But such things are unworthy the attention of giants, the nature of whose penetrating gaze has been already instanced.

On what may be called the art-criticism part of the report we are grateful to its author for further instruction. The originality of Abbot Knowles' design, as carried out in the choir—viz., the absence of triforium and clerestory, and the equal height of choir and aisles, is explained at p. 8, as the result of, one, "lack of funds"; two, "the existence of a Norman central tower," the destruction of which he did not dare to contemplate, and the height of which did not allow of a clerestory and steep-pitched roof above it without the entire destruction of its proportions. But Mr. Street says, in p. 7, that Knowles proceeded "to destroy first of all the existing choir of the church, with the full intention, no doubt, of pulling down the transept and nave also. * * * In his new work he paid no regard whatever to the existing building." The assumption of a central Norman tower ever having been built any higher than would be sufficient to receive the ridges of the roofs, as at Westminster Abbey, is of course purely gratuitous, but a great Norman tower must have existed, or we should never have seen Knowles' design, for if it had not been a great tower the man who could dare to take down everything to the ground would scarcely have shrunk from taking down a low tower, or allowed it to dictate, as it were, the scale of his new constructions. But the church to which Fitzhardinge appended this wonderfully influential tower was, says the author of the report before us, distinguished for nothing but its simplicity, its open timber roofs, its low walls, and the absence of stone groining This view of the origin of Knowles' design may be hard to believe, but believe it we must, for its author has no doubt as to the correctness of his views. At the same time, we commend to the consideration of those interested in buildings where the centre and side aisles are of equal height, the church of S. Elizabeth, at Marburg, and that of S. Nazarius, at Carcassonne. That of S. Elizabeth, at Marburg, was founded in 1235, and we can quite understand some people agreeing with Mr. Fergusson, who thus writes of it:—"It is a small church, being only 208ft. in length by 69ft. in width internally, and though the details are all of good Early French style, it still exhibits several Germanisms, being triapsal in plan, and the three aisles being of the same height. The latter must be considered as a serious defect, for besides the absence of contrast, either the narrow side aisles are too tall or the central one too low."

But Mr. Street knows "of no English, and of scarcely any foreign church, the design of which appears to have sufficient analogy to this to make it necessary to refer to it." The work, he goes on to say, "must be judged by itself, not by comparison with the proportions of other churches." As a dictum in art criticism we commend this to all art critics, who will be good enough to remember that it is one of those views about the correctness of which there can be no doubt.

Of the proposed new nave we are told that the general design is to be copied from Knowles' work, and the details are to be of nineteenth century, "that in this way a grand work may be legitimately accomplished," that to preserve the old detail would be mere task-work to the architect (imagine the sufferings of Mr. Scott and all faithful restorers) and that no difference will be noticed between the two works. "There are some portions, however, which will require an entirely original design." The old Norman church had a north porch, so the nineteenth century church must also have one. The west front "was *not* intended to have steeples," so the nineteenth century front *must have* steeples projecting beyond the old line even of the fourteenth century scheme. Be-

tween these towers we are to have "a fine western doorway, with a rose window above it," and the piers of the nave, besides numerous other original and purely nineteenth century inventions, are to have detached shafts on each of their cardinal sides.

We have omitted many points of interest in this brief review, such as the argument about the position of the cloister and other equally erudite archæological notices. We conclude as we began, by congratulating Bristol on having secured for its cathedral restoration an architect who proves himself so eminently fit for the task, not only as an original thinker and designer, but as an equally original antiquary.

* * * *

As certain articles on the Bristol Assize Courts Competition, with which I had nothing to do, have been considered to be from my pen, I beg permission, in this instance, to subscribe my name.

Edward W. Godwin.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

The members of this association on Tuesday visited Bitterley Church and Middleton Chapel, ascended Titterstone Clee Hill, after which they repaired to the residence of Sir C. H. Rouse Boughton, the president, at Downton Hall, where they were hospitably entertained by Sir Charles. Mr. Southern, Deputy Mayor, in the absence of the president, took the chair at the evening meeting, when Mr. Roberts gave an account of the day's excursion, after which

Mr. R. Kyrke Penson, F.S.A., read a paper on Ludlow Church, taking Mr. Wright as his authority for the fact that, in 1199, the then existing Norman church was taken down and enlarged, and that the Early English church, exclusive of the side chapels, coincided in extent with the present building.

Mr. T. Wright, M.A., F.S.A., made some remarks upon early churchwardens' accounts, the materials for which he had obtained from corporation records. Church property, he said, was evidently at one time under the control of guilds, and this might account for the books being mixed up with the corporation records. The entries which he produced extended back to 1540, when the expenditure for repairs and cleaning of the church illustrated the manner in which the church service and ceremonies were performed in Roman Catholic times. Mending bells and chimes formed frequent entries in 1541-2-3. A short discussion followed, in the course of which the Rev. Sir F. A. G. Ousley expressed a hope that further search would be made in these records for entries relating to organs, organ building, and organ players.

On Wednesday morning Mr. Wright conducted the archæologists over the Castle, and described the different portions of this very interesting edifice. The party afterwards adjourned to the restored church of Ludlow, said to be the finest parish church in England, Mr. Kyrke Penson acting as guide. In the evening, Mr. Leiren, M.A., F.S.A., read a paper on the Barony of Burford. Rev. J. D. La Touche next read an interesting paper on Stokesay Castle, a small castle now disused, on the bank of the River Onney, about four miles from Ludlow.

On Thursday an excursion was arranged by road through Ludford, Woofferton, Ashford, &c., to Little Hereford, thence to Burford, and so on to Trubury. The first halting-place was at Little Hereford, where there is a quaint old church close to the river Trune, whose brawling voice is heard in the solemn quietude of the rural churchyard. Mr. Roberts, F.S.A., was the guide to the party, and described the archæological features of the church. The party, after spending a short time at Little Hereford Church, resumed their carriages, and proceeded to Burford, where they were courteously received by Lord Northwick and the Hon. Miss Rushout, and conducted over the mansion and church. Mr. Roberts here offered some remarks on Burford Church. The party next wended their way to Trubury, where Lord Northwick had ordered to be prepared for the travellers a most hospitable reception. A sumptuous *dejeuner* was laid out and duly honoured, after which the party (having first inspected Trubury Church) accepted the invitation of the Rev. Sir F. Gore Ousley to inspect an oriental collection at his residence. The proceedings of the evening were among the most interesting of the week. Mr. Wright presided. The Rev. W. Pirton gave a description of a very ancient originally Saxon church at Stottesden, near Cleobury Mortimer, which was illustrated by drawings. The front was the finest specimen in print of a Norman front, with bold carvings upon it. Some coats of arms in the windows were referred to in one of the Haarlem MS. In 1840, the church was restored (with emphasis), when the beautiful rood screen was pulled down, and most of it used for firewood, and a "three-story pagoda" was built for the parson and clerk; but a few fragments of the original rood screen had been rescued, from which he hoped to be able to restore the whole. Mr. Dillon Croker read a paper on Milton's "Masque of Comus," which was performed in Ludlow Castle in 1634. Mr. Cocking read some interesting remarks on the remains of the Austin Friars at Ludlow, which were accidentally discovered when digging on the site of the present cattle market in 1861.

On Friday the excursion programme was a very lengthened one. The excursionists set out in numerous carriages from Ludlow as early as nine o'clock, and did not return before seven or eight. The first object visited was Aston Church, and some ancient tumuli not far off. Semthall Starkes Church was then passed, and the church described by the Rev. W. Williams. The party next proceeded to Wigmore Castle, Abbey, and Grange. This retired and out-of-the-world spot was once, no doubt, a place of some importance. The Castle was given to Mortimer, who came from Normandy with the Conqueror. The Priory was founded by one of his heirs, about 1179. Only a small portion of the ancient Castle remains. Edward III. was entertained here on his journey into Wales. From Wigmore to Dounton Castle, the seat of A. Boughton Knight, Esq., was the next stage. This is a modern residence, built at the close of the last century. The scenery around is very beautiful. Mr. Knight entertained the party to luncheon, after which they were to visit other places on their way back to Ludlow.

The association brought its annual congress to a close on Saturday, although a supplementary gathering takes place this week at Wroxeter, for the purpose of visiting the excavated remains of the ancient Roman city of Uriconium. At Friday night's meeting Mr. G. P. Wright, F.S.A., read a paper on "Sir Philip Sydney in his Relation with Ludlow Castle." Mr. Blashell having made some remarks on certain figures carved upside down on the lintel of Stotterdon Church, various theories were advanced as to the origin of such reversed figures, which appeared in more places than one.

Mr. Goldsmid, F.S.A., observed that shields were reversed in the case of the last of a family, and also as a mark of disgrace.

The last excursion (on Saturday) was hardly as interesting as those which preceded it, and, moreover, its enjoyment was somewhat dashed by a sprinking of rain. Stanton-Lacey and Diddlebury churches were visited, and at Stokesay Castle the Rev. J. De La Touche pointed out its interesting features, which he had already fully described in a paper read on Wednesday night. Bromfield church and abbey were subsequently visited, and Lady Mary Clive entertained the party at Oakley Park. In the evening, on the return of the party to Ludlow, short papers were read by the Rev. Prebendary, H. M. Scarth, on "Roman Itinera Connected with Wales," and by T. Blashell, Esq., on "The Half-timbered Houses of Ludlow."

The usual vote of thanks were then passed to the mayor and corporation of Ludlow, the entertainers of the archæologists, and the majority of the party signified their intention to meet again at Uriconium.

IMPROVED DWELLINGS FOR ARTIZANS.

The half-yearly meeting of the company formed for erecting on a large scale in various parts of the metropolis improved dwellings for the working classes, was held on Tuesday at the Mansion House, Alderman Sir S. Waterlow in the chair. The report, which was taken as read, states that the whole of the £100 shares had now been allotted, and at the present date £31,225 had been subscribed in £25 shares, making the total subscribed capital £81,225, of which £17,450 has come in since the date of the last report. Six blocks of buildings, to accommodate 168 families, are being erected upon the Britannia-street estate. Two are nearly completed, and it is expected that they will be ready for occupation before the end of the year; the other four are being rapidly proceeded with. At Greenwich, two blocks of buildings, to accommodate 40 families, are also very near completion. The liabilities of the company upon the contracts for these buildings amount to £21,500. An agreement has been entered into for the purchase by the company of a very valuable freehold estate, comprising nine acres of land at Bethnal-green, which is at present partly covered by some hundreds of old dilapidated houses and cottages. Arrangements are in progress by which the company will be enabled to lay out the district upon an improved plan, and to erect upon part of the estate several blocks of buildings. The fee simple of the estate will be conveyed to the company upon the most advantageous terms, and the directors trust that the requisite capital will be forthcoming to enable them to develope the proposed undertaking in a suitable manner; the neighbourhood is very crowded and populous, and there is ample opportunity for the expenditure of from £100 000 to £150,000, with the certainty of profitable returns, and with great benefit to the large number of working people inhabiting the district. The directors have to report that a loan of £6,000 has been granted, and they expect to receive a further grant of £22,000 within a few days. The whole of the company's dwellings have been fully occupied during the past half-year, and there is still a constant pressure on the part of applicants for vacancies. There is a sum of £1,350 16s. 11d. standing to the credit of the profit and loss account after charging off the requisite sums carried to the reserve funds. The directors recommend that the usual dividend at the rate of 5 per cent. per annum should be declared, payable out of this amount, and that the balance be carried forward. The chairman, after a few congratulatory remarks upon the chief features of the report, concluded by moving its adoption. Mr. Edwards, M.P., in seconding the motion, expressed it as his opinion that they ought to get their loans from the government at a lower rate of interest than 4 per cent. The motion was put and carried *nem. con.* Sir John Lubbock moved the declaration of a dividend at the rate of 5 per cent. per annum for the half year ending June 30 last. The motion was seconded by Mr. Russell Gurney, and carried; and votes of thanks having been accorded to the chairman, directors, and officers, the proceedings were brought to a close.

COMPETITION.

Poplar Board of Works New Offices.—The premiums were awarded at the meeting of the Board on Tuesday, the 30th ult., as follows:—Design "Circinus," by the Assistant Surveyor of the Board,* first premium (£50); "Octagon," by Mr. Arthur Harston, East India-road, Limehouse, second premium (£30); "Cives," by Mr. A. Wilson, Bow, third premium (£20). The whole of the plans received will be publicly exhibited for one week at the Board's offices, 291, East India Dock-road, from Friday, the 9th inst., till Friday, the 16th inst, and at the Bow Vestry Hall for one week, from the 20th inst. till the 27th inst. Admission will be by tickets, to be obtained of any member of the Board, or at the offices of the Board.

OBITUARY.

The well-known ironmaster of Merthyr Tydvil, Mr. William Crawshay, expired at his seat, Caversham House, near Reading, on Sunday night, at the advanced age of eighty-two years.

Mr. Michael O'Connor, the well-known glass painter, of Berners-street, died on June 25, aged 66. The Reynell Memorial window in Chichester Cathedral, the Leeds windows, and the series in the chapel of the Royal Hospital of Kilmainham, were among his more important works, and are greatly admired. Mr. O'Connor was a native of Dublin, and began life as an heraldic painter.

At a meeting of the Gravesend Board of Guardians on Thursday, last week, Mr. Lilley Stone said that he had made a mistake of £200 in his tender of £4,225 for the proposed enlargement of the workhouse, and he declined to accept the contract at the latter sum. The guardians refused to allow him to amend the contract, and accepted the next lowest, that of Messrs. Crook and Son, for £4,767.

[* See letter signed "B.," Building News, May 31, 1867. Ed. B. N.]

"TRICKERY EXPOSED."

MR. PASSMORE EDWARDS, the proprietor of our excellent and well-conducted contemporary, the Building News, publishes a letter in that journal under the heading of "Trickery Exposed," which was loudly called for. It seems that there is another journal called the *Builders' Weekly Reporter*. This is published on the Monday, and Mr. Edwards states that the cause for such a day of publication is, that the contents of all the other professional journals can be rifled and dished up as original matter without the slightest compunction. He says that the practice has been of such long standing, and has become intolerable as a gross injury to both proprietors and writers, that in his own case he threatens an injunction. It appears that a well-written review, which I read myself, of Dr. Oppert's work "On the Construction of Hospitals," was reprinted in the *Reporter* as a leader, without the slightest acknowledgment whatever. From being well acquainted with the reputation of Mr. Edwards, for a wide margin of liberality in all literary proceedings, I feel certain that his paper must have suffered long and persistent wrong before he complained. It is a scandalous thing for a proprietor or proprietary to pay an educated gentleman to write special scientific matter for them, that is to form a standard of authoritative opinion hereafter, and then to find that within a few days some unprincipled Fagan springs with thievish claws upon it, and offers it for sale elsewhere, as his own honest production. "Better ash new, ma tears." When caught and convicted repeatedly they ought to be nailed alive to the barn door of honest journalism. The *Trade Circular*, on account of its correspondence being original and specially written for it, in all parts of the kingdom, must afford a peculiarly rich and tempting "diggins," weekly, to such pilfering. I have not seen this *Reporter*, but I will have a hunt through it, and look if any of our property is there without the name of the maker. Should I find any, I shall very likely try my hand at "gibetting pirates." Fair paragraph news that is open to anyone is one thing, and we all agree to give and take in that way; but, when a report, or a review, written as original matter, both to instruct the readers and sustain the reputation of the journal, is reproduced *in extenso*, and sent into the market from the "receiving-house," I think that no journalist should lay aside the "harmless, necessary cat-and nine-tails" until he has vindicated the rights of his property. Special journals spend large sums yearly in obtaining well-written, original matter, and, before they have had the benefit of a three-day circulation, down swoop the literary brigands, carrying off your property, resell it as their own, and grow fat, shameless, and insolent on the ill-gotten process. Mr. Edwards deserves our thanks, for we are all as much concerned as he is, and we must write up—"Poachers will be prosecuted to conviction."—*Builders' Trade Circular.*

Building Intelligence.

CHURCHES AND CHAPELS.

The great tabernacle of the Saints at Salt Lake City is now finished. It is 250ft. wide, and furnishes comfortable sitting room for 10,000 persons.

The new Roman Catholic church of St. Peter, at Doncaster, was opened last week with great ceremony. The style of architecture is that known as the First Pointed, and it is very simply treated. The material used in the work is brick, stone being sparingly introduced for the dressing of doors, windows, and other points of detail. Messrs. M. E. Hadfield and Son, of Sheffield, have been the architects, Mr. Rodley, Sheffield, being the contractor, and Mr. Heyball, of the same place, executing the woodwork. The building has accommodation for 400 people.

The foundation stone has been recently laid of a Wesleyan chapel at Old Swan, near Liverpool. The building will be in the Gothic style, of red sandstone, and will contain 478 sittings. It will have a large school room and minister's vestry at the back, and three class rooms on the basement. The estimate is £2,117 10s.; this includes the cost of heating, boundary wall, and fittings. The architects are Messrs. Green and Parslow, of Liverpool, and the contractor Mr. John Westmorland, also of Liverpool.

A new Wesleyan Methodist chapel and schools are now being erected at Crafthole, near Devonport. The architects are Messrs. Dwelley and Son, of Plymouth, and the builders Messrs. Jenkin and Hosking, of Devonport.

The Roman Catholic church, Fermoy, Co. Cork, has received considerable additions and improvements, under the superintendence of Messrs. Pugin and Ashlin, architects, Dublin. The new works have cost £2,500. The builder was Mr. Newstead, builder, Fermoy.

Accrington.—The foundation stone of a new Catholic church for Accrington and the neighbouring townships of Church and Oswaldtwistle was laid on Monday. The style is Gothic, of the thirteenth century. The church will have a nave and transept 112ft. in length and 28ft. in width. The transept will be 56ft. in length, and 24ft. 6in. wide, and the chancel will be 28ft. by 14ft. 3in. There are two side chapels, in which altars will be placed, each chapel being 13ft. 6in. by 11ft. 9in. The apse inside, in which an altar will be erected, is a semicircle, with a radius of 12ft. 9in. The timber to be used will be Riga, Memel, or Dantzic, and the ceiling of the transept will be flat. There will be a great deal of carved stonework about the building. The church will accommodate nearly 1,000 persons. The stone used for the church will be supplied from the local quarries. The architects are Messrs. Wilson and Nicholl, of London, and the estimated cost of the church is £6,300.

Bow.—The new Baptist chapel at Bow was consecrated on Tuesday. The erection is of the Byzantine order, is 80ft. long, 54ft. wide, and is fitted with lateral galleries and an end gallery. It is capable of seating 950 persons, and there is school accommodation under the chapel for 800 children. There are also ten vestries attached to the building. The pulpit is placed immediately over the baptistery, and is movable. The pews are arranged in semicircular order, giving the advantage that each person, when seated, faces the minister. The total cost of the building and bazaar room is about £6,500.

St. Andrews.—The foundation stone of a new cathedral church at St. Andrews, Scotland, was laid on Wednesday week, with full Masonic honours, by Mr. J. Whyte Melville, Grand Master Mason of Scotland, in presence of a numerous assemblage of persons.

The Cathedral at Queenstown.—The Roman Catholic Bishop of Cloyne intends at once commencing the new cathedral at Queenstown. The church will be upwards of 200ft. in length, and of an imposing height. The site is one of the finest in Europe, being opposite Spike Island, in the centre of the Cove of Cork. The building is to cost £25,000, and will be erected from the designs of Messrs. Pugin and Ashlin, of Dublin.

BUILDINGS.

In our notice last week of the Imperial Hotel, Southampton, we omitted to notice that Messrs. Turner and Allen had supplied and fixed the two ornamental cast-iron staircases, the balconies, roof, and exterior railings.

The contract for the new fort which is about to be erected upon St. Catherine's Rock, Tenby, has just been let, and the first expenditure upon it will be about £20,000. The fort will altogether mount eleven guns, five of which will be in casemates below the rock.

Kingsley, Staffordshire.—The new endowed school buildings at this place were opened on the 23rd inst. They are built of brick, with stone dressings and blue brick bands, and comprise boys', girls', and infants' schools, with class rooms, and separate playgrounds, with the requisite offices and residences for the master and mistress. The entrance lobbies to the schools afford accommodation for hats and cloaks, and are also provided with wash-hand basins in recesses in the walls. The roofs are open timbered, constructed with collars and curved braces, and covered with plain and ornamental tiles. At the intersection of the roofs is a tall spirelet, which acts as a ventilator, and one of the front gables is surmounted by a bell turret. The residences each contain sitting room, kitchen, pantry, scullery, and three bedrooms, with closets, &c., and separate yard and out offices. Open fireplaces are provided both to the schools and class rooms, but provision has also been made for the introduction, hereafter, of the warming apparatus of Messrs. Haden and Sons, of Trowbridge. Exteriorly, an expression of a domestic character has been given to the residences, which serves to distinguish them readily from the schools, but, without any disturbance of the unity of the combined group of buildings. The works have been carried out by Messrs. Henry Goldstraw, of Wetley Rocks, and George Tipper, of Kingsley. Mr. Sugden, of Leek, is the architect.

Tamworth.—The foundation stone of a new grammar school here was laid by the Marquis of Townshend on Wednesday. The Free Grammar School of Tamworth is of very ancient origin, dating back as far as the fourteenth century. The new building, the site of which is just outside the town, will be a neat and substantial erection. The architect is Mr. Joyce, of Stafford, and the builder Mr. Clarson, of Tamworth.

TO CORRESPONDENTS.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the Editor, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

Received.—J. M. S.—H. J., jun.—C. K.—W. B.—A. B. T.—C. and P.—R. W. C.—J. R.—W. and Son.—T. D.—J. H.—L. and B.—R. A.—W. B.—W. S. S.—T. T.—J. L. C.—S. W. and Co.,—H. D. and Co.—R. B.—J. R.—W. and Co.—W. T.—"Subways," by P. N.—"Chemical eology," by W. M.—E. W. P.—J. N.

F. S. S., Torquay.—The Institute of British Architects is a "Royal" Society. Hence the letters F.R.I.B.A. are correct. We know of only one architectural society in Bristol.

Alpha.—The Weales series being written by different persons are characterised by different degrees of merit.

"An Architect" throws no new light on Rough Sketches and Mr. Street, and his letter is inadmissible.

"Provincial" is thanked for his second letter.

"An Architect" should find no more difficulty in getting the Building News in Dublin than Belfast. There must be some mistake.

J. H., Huddersfield.—Next week.

Correspondence.

BRISTOL ASSIZE COURTS.

To the Editor of the Building News.

Sir,—Would it not have been as well for Mr. E. W. Godwin to have put his name, or his initials to your leading article of Saturday last, because the very words contained in it were used by him to a friend of his before it appeared in your paper And would not the insinuation made use of at the end of one of the articles apply to Mr. Godwin as a favourite with Mr. Waterhouse?

I am, &c.,

July 31. G. Sullivan.

[We beg to inform Mr. Sullivan, and all other whom it may concern, that Mr. E. W. Godwin did not write the articles on the Bristol Assiz Courts; and we feel sure that had we asked hin to do so, that, being a contributor, he would hav unhesitatingly refused. Our correspondent must we think, misunderstand Mr. Godwin's character as he is certainly mistaken as to the manner i which this journal is conducted. We make it a absolute condition that no one in any way cor nected with a competition should offer any ed torial remarks thereon. And in order to secur if possible, honest and impartial criticisms in suc a matter, the name of the writer is unknown eve to the other members of our staff.—Ed. B.N.]

Sir,—I have to-day been taxed with being tl author of the leading articles in your issues of t day and of the 26th ult., on the Bristol Assi Courts competition. Whatever my opinion m be of the decision of the architectural referee, should wish it to be known through your colum that I am in no way connected with their autho ship, nor do I know who is the writer.—I am, &

Edward W. Godwin.

197, Albany-street, Regent's Park, N.W.

August 2.

ANCIENT AND MODERN FURNITURI

Sir,—I shall not attempt to answer the p sonalities contained in the letter of "J. M. S The only argument in his letter is that of the d in the Sainte Chapelle, Paris. Now, he could r have selected a building which has been used so many purposes as this, and one from whi

I think, most people would require strong evidences before taking anything upon trust, of such a movable nature as a door. If this can be proved to have hung in its present position for the 620 odd years that the Sainte Chapelle has been standing, it is a remarkable specimen of the thirteenth century woodwork; but if, as I think most probable, restored since that time, to what period should we look for such restoration. If my memory serves me, I think the Sainte Chapelle was partially restored by Charles VIII., and this door was perhaps placed there at that time, or at the time it was used for secular purposes. The fact of a door framed in this way being at present in the chapel is not a convincing proof that my assertions are incorrect. My presumption in stating that the cabinets are at sea in construction, I think, will be shared by many of your readers, if they will take their drawing boards and make some working details from these sketches, and then test them by these threadbare truisms. And when gasfitters, smiths, tailors, and linendrapers design and manufacture Gothic furniture, I cannot see the great crime in criticising their efforts, even if I had been the mender of old furniture he, in his pride of place, imagines me to be. I will here correct a slight typographical error in my last letter; instead of sloped their mouldings, read stoped their mouldings. If this mode of construction, and this treatment of mouldings, were in general use, how is it we never see it in our roofs, and rood screens, and stalls, even though fifteenth century work, but find old doors, chests, pulpits, &c., of the seventeenth century generally constructed in this way, the framing thinner, and the mouldings generally scratched on the framing, the principal member only showing as it approached the rails or stiles, and generally worked nearly all on the face of the work. In Gothic joinery the mouldings generally work at an angle of 45 with the face, and where they work more on the flat, generally finish with a mason's mitre, as they would otherwise finish badly on the splayed or moulded stop generally used. I do not put these forward as original conclusions, but it is to be seen by any one that will visit and study our old cathedrals and churches; and though having great respect for Mr. Talbert's talents as an artist and designer of metal work, I have still to learn that he is an authority in Gothic woodwork. As a practical man, my remarks were mostly of a technical character, and with no wish to injure any one, or open any discussion.—I am, &c.,

Robert Phillips.

Dobroyd Castle, Todmorden, August 6.

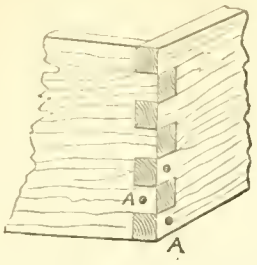
MODERN FURNITURE.

Sir,—Modern mediæval furniture stands self-condemned by its very name; we do not desire any return to the habits of the middle ages. In its forms it is offensive—the high pitched roofs, cuspings, arches, and architectural forms generally, are misapplied to woodwork. In the middle ages, and Renaissance, architectural forms were applied to woodwork with good effect, but this method of design has ceased. The furniture of the latter end of the last century developed a class of design purely suited to wood. All such rudeness as showing the pins at the joints, vanishing mouldings, and other peculiarities of early woodwork, disappeared then for ever for civilized people. To reproduce such rudeness is simply to show incapacity of appreciating the wants of modern times; under such rudeness development is impossible—it is simply return to barbarism. The great fault of modern furniture of the ordinary kind supplied by first-class houses is not any want of construction, but a certain coarseness in its mouldings, and other details, and also a generally pretentious character; if these faults were rectified, we should get something much more suited to our times than the sham mediævalism, with its coarse painting and decoration. Can anybody explain the extraordinary love of wood of the colour of putty which the pseudo-mediæval furniture revels in?—I am, &c.,

X. Y. Z.

MODERN GOTHIC.—THE DOVETAIL.

Sir,—On seeing in your two last numbers mention of the dovetail, it occurred to me that the following might interest some of your readers. In the construction of modern Gothic carcase work, from the fancy box to the more massive piece of joiner work, I never use the dovetail, but the following plan, illustrated by the figure:—The pins are all cut square and equal; the effect is ornamental. Pins may be added as at A A, if required, as an additional strength or ornament.



This cannot be said to be equal in strength to the dovetail, as in the drawer, where the pull is all on the front, yet sufficiently strong for all ordinary carcase work, costs no more, and is far more pleasing in effect.—I am, &c.,

P.

POPLAR BOARD OF WORKS NEW OFFICES COMPETITION.

Sir,—A short time since ten designs out of forty-five were selected by a committee of the Poplar Board of Works, and referred to Mr. Sancton Wood to report upon, but not in their order of merit, as the Board reserved to themselves the right of awarding the premiums, which they have now done, to three competitors who are intimately acquainted with the committee. The sum proposed to be expended, according to the instruction, was £5,000. Mr. S. Wood estimates the first premiated design, "Circinus," to cost £5,436; the second, "Octagon," £6,080; the third, "Cives," £6,995. There are, I understand, several designs sent in showing far greater artistic merit, at a less cost than those selected for premiums. The following extract from the local paper *(East London Observer)* is sufficient to show one of the most scandalous pieces of jobbery ever perpetrated in the history of competitions:—

We may state that it was reported that "Circinus" is no other than Mr. Fletcher, the late assistant-surveyor to the Poplar Board of Works; "Octagon," Mr. Arthur Harston, of East India-road; and "Cives," a son of Mr. A. Wilson, of Bow. Of course, the conduct of the members of the Board is unimpeachable, and there cannot be the slightest doubt but that they exercised their architectural knowledge to the fullest extent in the selection of the plans. But the fact that one of the three favourites has been connected with the Board, that another is about to form an alliance with a member's daughter, and that the third is a gentleman of considerable local influence, is so very remarkable, that we hasten to endeavour to remove any idea that there has been the faintest tinge of favouritism or collusion between the parties, more especially as the committee, to protect the public (and themselves from suspicion), employed a surveyor to guide them in their decision, and have awarded him the munificent sum of £25 to give an unbiassed opinion on the relative merits of the plans submitted to him.

I am, &c.,

Delta.

Intercommunication.

QUESTIONS.

[519.]—DELIVERY OF WATER IN PIPES.—I would ask to be informed the meaning of, and way of finding, H in the formulæ underneath, taken from "Molesworth's Pocket Book," page 52:—

D = diameter of pipe, in inches.
H = head of water, in feet.
L = length of pipe, in feet.
W = cubic feet of water discharged per minute.

$$W = 4{\cdot}72 \frac{\sqrt{D^5}}{\sqrt{\frac{L}{H}}}$$

$$D = {\cdot}538 \sqrt[5]{\frac{L \times W^2}{H}}$$

I trust some of your readers can assist me.—Head.

[520.]—OVERTIME.—I have been expecting to see a reply to Question 479, viz., whether an architect can keep his pupils till 8, 9, and 10 o'clock at night at the board. Whether the pupil can demand payment for the time he is kept by the master when he pays no premium, and, if so, at what rate per hour? Can the master have any power over his pupil if he refuses to work till that time? Some masters do not care whether their pupils have any recreation or not, and I think this is a point very important to pupils. I do not mind working any reasonable time after the office hours, but what is "good for the goose is good for the gander"—what is good for the master is good for the pupil. Will any of your correspondents kindly answer this question.—Alpha.

[521.] — ARCHITECTURAL EMPLOYMENT IN AMERICA.—Amongst your numerous readers there may be some who have visited the United States of America. I should feel obliged if they could inform me if a competent architectural assistant could without difficulty obtain employment in that country.—Centrolineal.

[522.]—DRAWINGS.—Can any of your readers tell me of a paste or glue which can be used with safety to lay down drawing paper for water-colour drawings on another paper? Common paste can be worked more smoothly and stands the subsequent wetting better than anything I have yet tried; but after the paper has been put aside for a time, the paste is apt to cause spots which are not visible until the washes of colour are laid on and cannot be remedied.—Draughtsman.

[Powder dextrine (mixed up as an ordinary paste) is much used by photographic artists for that purpose, and will answer very well.]

[523.]—SUBURBAN VILLAGE COMPANY.—I enclose a prospectus of the Suburban Village and General Dwellings Company, in which I and several others in this neighbourhood have taken shares and paid some instalments, but have latterly felt some doubt as to the genuineness of the concern: they are always just going to commence operations, but never do; there is always some very plausible reason why given, but the commencing having been put off so frequently makes us feel doubtful. If you are in possession of any information concerning it, and will kindly tell us in your next impression, we should be very much obliged.—J. J.

[524.]—FURNACE OVEN BUILDING.—I shall be much obliged if you or some one will give me a few hints on furnace oven building, or the title and publisher of a book treating on the same.—Clerk, Dippehall-street, Crondall, Farnham, Surrey.

[525.]—GREASING LEATHER BELTS.—What is the best substance for greasing leather driving belts to increase their adhesion to the pulleys, and the approximate quantity required for 50ft. of 4in. belting, and also the best means to apply it?—W. P. M.

[526.]—PRESERVATION OF TIMBER.—In your article on "Preservation of Timber" I saw no account of the sea worm which infects the wood in piers similar to that in this place, where I see some of the piles are nearly eaten through.—J. Williams, Royal Hotel, Southend.

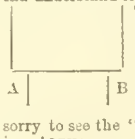
[527.]—R.I.B.A.—Is there a difference in the signification of the terms F.I.B.A. and F.R.I.B.A., or is it a distinction without a difference? If the former, what is the exact difference? are there two Institutes of British Architects?—F.S.S.

[The Institute is what is called a "Royal" society; hence F.R.I.B.A. is correct. There is, we believe, only one Architectural Society in Bristol.]

REPLIES.

[485.]—RAISING BUILDINGS BODILY.—As "Sceptic" and "Provincial" doubt many stories from America, relative to raising houses, I will for their edification mention that a few years ago I saw some 50 houses in All-street, Newark, New Jersey, U.S., bodily removed to various parts of the town, to make way for the Orange County Railway. These houses were of timber, three storeys high, and timber, brick, hogged, and had been built from thirty to forty years, with no idea of ever being removed. I also saw, in 1858, a first-class five storey stone and brick-built house in Fifth Avenue, New York City, raised from their level 14ft. and a shop storey inserted underneath. The building was raised by screwjacks.—Carduff.

[485.]—Out of four answers you have admitted to your columns only one has endeavoured to answer the question, viz., "Believer," who, I think, might have made a more open explanation. In the first place, a hole is dug at one corner of the building, and then all round the sides like trenches. Thick planks are then placed near the edge and round these trenches. Hydraulic lifts were then placed at each corner; the planks were placed on these lifts, which were made to work together and gradually, the building was raised to the required height. I do not know whether the building is undermined altogether, but from what I can understand from reading, the building is like sketch.



The planks extending from A to B and B to C and so on, and the lifts placed at each corner, as I said before, the planks resting on them. I did not answer before, as I thought some of your correspondents better up in such things than myself would be able to do so, but I am extremely sorry to see the "Intercommunication" column used as it is.—Alpha.

[503.]—ZINC FOR ROOFS.—I, as an architect having the direction and superintendence of works in London, have frequently and largely used zinc for gutters and flats, and find that under the following conditions of workmanship it answers admirably; the extremes of heat and cold have no apparent effect upon it. The conditions under which I use it are these—first, always use the No. 14 or No. 15 gauge malleable zinc, manufactured by the Vieille Montagne Zinc Company, and insist upon it being laid "strictly in accordance with the directions and regulations of that company" (as prepared by Messrs. Fisher and Edmeston, their architects) by a zincworker well acquainted with the method (Fox, of Limehouse). Second, I make a separate contract for the zincwork, and so deal direct with the zincworker. Third, I insist upon the zincworker refusing to lay his metal until the carpenters have complied with all his directions as to falls, drips, and boarding of the flats, &c. By these means I secure sound work. If the zincwork is included in the general building contract, the builder may employ a good zincworker, but, nevertheless, the work may fail in consequence of the zincworker not having the power to enforce his regulations upon his employer, and many flats and gutters fail on account of the carpenters' work being badly designed or executed. I would recommend all persons about to use zinc in buildings to obtain the published directions and thickness gauge of the company I have mentioned, and in designing the structural portions of the work to be covered, to adhere strictly to the regulations there laid down; consult the zincworker, and if considered advisable make it a part of his contract that he shall obtain a certificate from the architects of the Vieille Montagne Zinc Company before being paid. I may mention that it is a rule of the company to make no charge for such certificates, and to allow to all zincworkers who obtain such certificates an extra discount off the cost of the metal.—A. H.

[509.]—BRASS RUBBINGS.—In reply to "In Memoriam," I refer to three methods—First, using black paper and a metallic composition, which produced a perfect fac-simile of the brass. Second, and the most usual method, by using double-crown paper or paperhangers' lining paper and "heel-ball," a composition used by shoemakers. Third, the easiest and most expeditious method, by using thin tissue paper, and by means of a soft pad covered with wash leather, rub over the paper a thin mixture of blacklead and linseed oil. In all three methods the paper is kept tight on the surface of the brass, and the composition rubbed over the paper.—H. S. R.

[514.]—CHURCH, HOXTON-SQUARE.—"Ecclesiologist" is informed that Mr. E. Pugin was the architect of this church, which is known chiefly by the elegance of its nave piers and the novelty of its design and construction.

[515.]—OBTAINING PHOTOGRAPHS ON COPPER-PLATES.—Allow me to inform "Inquisitor" that a process for obtaining photographs on copperplates, is, according to the process of Mr. Mulerli-Beckuell, of St. John the Baptist, Louisiana, as follows:—The inventor takes a smooth and perfectly clean copper plate and dips it for 30 sec. into a bath composed of sulphate of copper 125 grains, common salt 75 grains, water 2oz., acidulated with a few drops of acid, any acid whatever. As soon as withdrawn, the plate is well washed, and then dried with a soft clean cloth. The plate is then ready for exposure in a frame under a glass negative. In good sunlight five or ten minutes' exposure is sufficient, but in cloudy weather a longer time is required. To fix the picture it is only necessary to dip the plate into a solution of hypo containing a little chloride of silver. A bath which has been used for paper proofs will do, but it must be filtered clear. After a few seconds' immersion, the parts of the picture that were reddish whiten, and at the same time the shadows take a violet tint, passing away to black. As soon as this occurs the plate must be taken out, well washed, and dried over a spirit lamp. As the blacks are formed of a very fine powder the plate must be varnished to preserve the picture. The author supposes that a layer of protochloride of copper formed in the bath constitutes the sensitive surface, and he thinks that in the hypo and chloride of silver bath the unacted-on protochloride is dissolved, and silver is deposited on the bare copper.—Photographer.

[518.]—MALT KILNS.—The best and most durable mortar for malt kilns is composed of two parts coal ashes, one of stone lime (boiled and run), with a good supply of cow hair, and put on as any other mortar, on double deal laths. A coat of whitewash every six months is a great preservative. I have done several with this, and have always found them wear well.—Builder.

STATUES, MEMORIALS, ETC.

A statue of Napoleon I. is to be inaugurated on the 18th inst. at Montereau. It will stand on the spot where the Emperor uttered the last words, "The bullet which is to kill me is not yet cast."

A bust of Mr. Cobden, which has been placed in the northern transept of Westminster Abbey, was formally unveiled a day or two since in the presence of Dean Stanley, of Mrs. Cobden, of Mrs. Seltzer, and of Mr. Woolner, the sculptor. The bust has been placed on that side of the transept which is adorned by monuments of Sir Cornewall Lewis, Charles Buller, and Francis Horner.

"Plassey and Pegu."—A monument to the memory of the officers and men of the Royal Bengal Fusiliers who fell at the Umbayla Pass, in 1863, has just been erected in Winchester Cathedral. The monument contains the words, "Plassey and Pegu," where the regiment gained honour. The names of the honoured dead mentioned on the monument are Lieut. Chapman, Ensign Sanderson, Surgeon Pile, Corporal Dix, Drummer Newby, and three of 22 private soldiers who fell at the Umbayla Pass.

COMPENSATION.

The New Law Courts.—A compensation claim on the part of Mr. Edward Robert Kelly, the publisher of Kelly's "Directory," in Old Boswell-court, for the business, premises, and loss by removal, against the Royal Commissioners, came before Mr. Scott Turner and a jury on Monday. The claim exceeded £20,000, and the case seemed to have created much interest. A special jury was summoned, and only "one" attended, and he took his seat in the box for more than an hour whilst the parties negociated to settle the matter for the property required for the New Palace of Justice. At length Mr. Hawkins announced that the matter was settled, and the solitary gentleman could give a verdict for £12,500, if he felt himself competent to give it alone. (A laugh). The juryman said, "Oh, yes, for twice the amount." (Laughter.) The common jurors came up to be discharged, and the high bailiff thought they should be sworn to give a verdict. The suggestion was acted upon, and a verdict by consent was recorded for £12,500, and the jurymen received their fee.

Stevens v. the Royal Commissioners.—This was another heavy compensation claim for the New Law Courts. It was a claim of £19,729 for premises required at Bell-yard, and for loss consequent on removal, as printer, from 35, 36, and 37, Bell-yard, and for other premises used as warehouses for printing, &c., known as a "cottage." Mr. Lloyd and Mr. Horace Lloyd appeared for the claimant; Mr. Hawkins, Q.C., Mr. Day, and Mr. M'Mahon were for the Royal Commissioners. On this occasion nine special jurors attended, and the parties consulted to settle the matter for some time. Mr. Hawkins said his learned friend Mr. Lloyd had been so pathetic that he had been more liberal than perhaps he ought to have been. The jury would give a verdict for £10,000.—A verdict was returned by the jury for £10,000.

Barnsley.—Nearly fourteen weeks have elapsed since the strike in the building trade at Barnsley commenced, and still no satisfactory arrangement has been arrived at, both masters and workmen appearing quite indifferent about the matter. Meantime great inconvenience is experienced by those masters who have large contracts on hand, but who up to the present time have been unable to supply the places of their old workmen. Very few of the men who originally struck work, however, are in the town, having obtained employment elsewhere.

LEGAL INTELLIGENCE.

Art Copyright.—At Guildhall, on Tuesday, Mr. Alderman Besley was occupied for five hours in hearing summons against printsellers for selling photograph copies of valuable prints and pictures belonging to Mr. Henry Graves, fine art publisher in Pall Mall. The first set of summonses were taken out against William Blin, a print-mounter, carrying on business at No. 7, Holborn. There were four summonses against Mr. Blin for selling photographs of different pictures at various dates, the copyright of which belonged to Mr. Graves. The defendant was convicted, and fined £5 in each case, with the alternative of fourteen days' imprisonment, the commencement of each to be at the termination of the preceding term.—William Ellis Gould and William Mansfield Gould, of 108, London-wall, father and son, appeared to answer four summonses for selling pirated copies of the same engravings. In the first case the defendants were fined £5 each, or in default thirty days' imprisonment; in the second, 50s. each, or fourteen days, to commence at the expiration of the previous term; in the third, 50s. each, or fourteen days, to commence at the expiration of the second term; in the fourth case the summons was withdrawn. There was a fifth summons against Mr. William Ellis Gould alone for selling two photographs with the name of Mr. Graves on them as the maker and publisher of them, whereas he did not execute or make such photographs. The case was proved against him, and he was fined £5, with the alternative of fourteen days' imprisonment, to commence at the expiration of the previous terms.—Edwin Yeates, a picture-frame maker, of 22, Goldsmith's-row, Hackney-road, was summoned for selling three photographs of Mr. Graves's paintings. He sold the three for 13s. 6d. The case was clearly proved, and Aldermau Besley sentenced him to pay £5, or in default to undergo thirty days' imprisonment. Mr. Graves said it occupied one department of his establishment to endeavour to protect his copyrights from piracy.

Two Hundred Chimneys on Fire.—About a dozen persons, chiefly of the lower class of Irish, were summoned at Birkenhead on Tuesday for having their chimneys on fire on the night of the 29th ult. This was the first evening of Mr. Murphy's lecture, and it being known that the police would be concentrated about the Town Hall, advantage was taken of the circumstance by many of the inhabitants to set fire to their chimneys, perhaps in order to save the expense of paying for their being swept. The police officer who proved the case against several said that about nine o'clock there were at least two hundred chimneys on fire in Oak-street, St. Anne-street, Edgar-street, and Cleveland-avenue. The flames were so great that at one time he was afraid the whole town would be on fire. It was clear the chimneys were purposely set on fire. One person succeeded in satisfying the bench that his chimney was fired from one of his neighbours'. The magistrate said all the rest were clear cases. They must each pay a penalty of 5s., and 2s. 6d. costs, or go to gaol for five days.

General Items.

It is proposed to construct at Marseilles a new port, at an expense of £2,400,000.

As showing the wonderful increase in value of property in the metropolis within three hundred years, it is stated that a plot of land containing about 40,000ft., purchased in the year 1566 for 1s. 6d. per foot, is now valued at £20 per foot, or £800,000 for the whole, being an increase of £2,657 per year on an original outlay of £3,000.

Messrs. Simmons and Co., of the United States, have just completed a fine organ for the Stone Church at Honolulu, being the first organ ever sent to the Sandwich Islands. The native congregation sent 1,500 dollars in gold as part payment.

A most interesting discovery, says the *Pall Mall Gazette*, has just been made in the library of the House of Lords, viz., of the original copy of the "Sealed Book of Common Prayer," which has been so long missing. It is found in the manuscript that the Bishops had ordered that the Communion Tables should stand at the east end of the chancel, and that the celebrant should stand eastward; but they subsequently erased the rubrics.

At a quarterly meeting of the Bristol Town Council, on Tuesday, the plan of Messrs. Popes and Bindon for the New Assize Courts, was accepted, an amendment proposing that a fresh plan, based upon all three of the premiated plans, should be prepared being negatived without a division.

It has been said that lychnoscopes are always found in the south wall of the chancel. A correspondent points out, that at Bradfield, Berks, there is an Early English lychnoscope in the north wall of the chancel, with a carved oak door. The lychnoscope, as the word implies, is a small door through which the paschal candle burning in front of the high altar used to be watched on the vigil of Easter. Lychnoscopes, although comparatively few, have escaped the desecration of the Puritans, are not so rare as is generallly supposed.

In the House of Commons, on Tuesday, Mr. Beresford Hope asked the First Commissioners if it was intended to move the statue of Canning from its present site, and to reinstate it in its former position. Lord John Manners replied, that when the railway works were being proceeded with through Parliament-square, the trees and shrubs which grew there were destroyed, so that it became necessary to consider the whole of the new arrangements for laying out the space, and how to dispose of the statue of Canning, which, it was perfectly clear, could not remain where it had been. His predecessor in office paid particular attention to that subject, and having consulted with Mr. Barry in reference to it, he came to the conclusion that the present site of the statue was the best that could be selected. A strong feeling, however, existed among the relations and personal friends of Mr. Canning, that his statue ought to be in immediate contiguity to the House of Commons. The matter was discussed a few nights ago in another place, and as that feeling was very strongly expressed, he consulted with some of his colleagues, and with Mr. Barry, but they had not, as yet, arrived at any final decision beyond this, that if the statue were to be again moved, it should be placed in the centre of Parliament-square.

We understand that a valuable offer has just been made by Mr. Whitworth to the authorities at South Kensington. That gentleman has offered to deposit at the Museum three original true planes and a measuring machine or instrument demonstrating the millionth part of an inch, and he proposes also to provide by endowment for the delivery of lectures to explain such instruments. We trust that Mr. Cole and his friends will have the good sense to see the value of this offer, and at once accept it.

The following is said to be a true copy of a record in Winchester Cathedral, dated A.D. 1182:—"To solderynge and repairynge St. Joseph, 8d.; cleanynge and ornamentiog ye Holy Ghost, 6d.; repairynge ye Virgin Marye before and behinde, and makynge a new childe, 4s. 8d.; screwynge a nose on ye Devyl, putynge a horne on hys hede, gluynge a byt on hys tayle, 5s. 6d.; total, 11s. 4d."

As already announced, the annual meeting of the Social Science Association will be held in Belfast from the 18th to the 25th inst. Among the special questions for discussion are the following:—What measures are necessary to secure efficiency and uniformity in the working of the sanitary laws throughout the kingdom? In what form, and to what extent, is it desirable that the public should provide means for the recreation of the working classes? The following are suggested as suitable subjects for voluntary papers:—Improvement of the dwellings of the labouring class? Town and domestic water supply? What legislative or other measures can be adopted to improve the relations between landlord and tenant in Ireland? Should the Local Government Acts be extended to Ireland? Can any measures be taken to develope and extend the manufactures of Ireland? What action, if any, ought the Government to take with regard to railways?

The plans for the new bridge across the Mississippi River at St. Louis have been accepted, and it is to be commenced without delay. The new bridge will be an immense structure. It will accommodate two double tracks of rails for street cars, besides side walks for foot passengers, and will consist of three arches, the central arch having a span of 515ft., and the two side arches 497ft. The central piers will be nearly 200ft. in height from the bed of the river. The estimated cost of this great bridge is 5,000,000 dollars.

At a meeting of the members of the Temple Bar Building Society on Thursday week, Mr. J. Glass, the chairman, after stating that the success of the society was mainly due to the indefatigable and untiring exertions of Mr. A. Jones (the founder and chairman), proceeded to present that gentleman with a very handsome ormolu time-piece, with candelabra to match; also a tea and coffee service, &c., with an inscription on vellum, altogether of the value of 60 guineas. Mr. Jones thanked the members for the very handsome manner in which they had appreciated his services.

On Friday last upwards of sixty of the members of the Society of Engineers visited the Millwall Docks, now nearly completed, preparations having been made for their reception by the engineers in charge of the works. The Society had every facility afforded them of inspecting the wrought-iron lock gates, bridges, hydraulic machinery, and other objects of interest. In the evening the members dined together at the Ship Tavern, Greenwich, H. H. Le Feuvre, Esq., president, in the chair; Alfred Williams, Esq., and James Hendry, Esq., the vice-chairmen.

The iron buildings at South Kensington Museum, so well known as "The Boilers," are now emptied of their contents, and will shortly be removed to the east of London, on a site provided for a local museum of science and art.

A week or two since we had to severely reprimand an obscure journal for stealing our articles. Yesterday, another journal of the same calibre was threatened with an injunction. Mr. Ince applied to Vice-Chancellor Malins to serve notice on the publishers of a weekly journal which goes by the name of the *World of Science*, for an injunction to restrain him from pilfering articles from the *Popular Science Review*, a well-known and respectable periodical. The Vice-Chancellor granted leave.

Mr. Cave, in reply to a question put by Mr. Hughes in the House of Commons on Monday, intimated that the Board of Trade had not reported against granting a charter of incorporation to the Society of Engineers; but it was not expedient that they should be incorporated under a designation so closely resembling that of the Institution of Civil Engineers. No instance existed of a Royal charter being granted to two associations for the same purpose in the same town, and under names so closely resembling each other. It was manifest that it would be extremely inconvenient, and lead to misapprehension and confusion. The system of granting Royal charters was very questionable, and one object of passing the Companies' Act, 1862, was to prevent the necessity for them by substituting a general law for an exceptional privilege.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

3188. D. S. CHATER. Improvements in Chimney Tops for the Prevention of Smoky Chimneys. Dated December 4, 1866.

This invention relates to the application of a double coned surface to the tops of chimneys whereby to prevent down draughts, and at all times maintain a free escape for the smoke from the chimney top. The inventor applies this double coned surface to revolving cowls, in which the smoke emerges in a horizontal direction; or it may be to fixed chimney tops in which the smoke escapes in a vertical or horizontal direction. The escape openings of chimney tops are usually circular, and he makes the addition to be applied thereto according to this invention also circular, in accordance therewith, and somewhat larger in diameter; it is, as before indicated, in the form of a double cone of metal or other material, the apex of the one cone pointing towards the centre of and just entering the orifice of the chimney top, while the other points in the opposite direction; it is fixed in position by three stays (more or less) near the periphery, each of three or four inches in length, which will be somewhat varied according to the incline of the cone, leaving a like distance between it and the mouth of the cowl or chimney pot. In whichever direction the wind strikes this top it is thrown off and prevented entering the chimney; this top at the same time provides a free escape for the smoke. *Patent abandoned.*

3199. V. VANDROY. Improvements in Cast-Iron Sash Windows to be adapted to Purlin, Tile, or Slate Roofing. Dated December 5, 1866.

This invention consists of an improved system of cast-iron sash for skylights or roof windows of the styles known as the "Tabatière" and the "Belle Voisine," for pantile, slate, tile, lead, and zinc roofing, and generally for all the forms of material used to cover roofs. This system is essentially based on the various forms to be given to the contours of sashes, such forms or shapes being similar to the covering of the roof on which they are to be placed. The result of the identity of form of sash and roof is an equal multiplicity of points of contact, and an equal security against leakage. For pantile roofs the sashes are composed of cast-iron pantiles cast together to accord with the fitting and arrangement of those of the roof. They are, in fact, parts of roofs in the middle of each of which is made an opening, in which is raised a skylight or "tabatière." It is the result of a casting of pantiles in a mould taken in plaster from the pantiles themselves. For slate, tile, lead, and every other form of roof the inventor proceeds in the same manner, following the same principle of opening and adopting the same means. *Patent completed.*

3200. J. TOWARD. Improvements in Machinery for the Manufacture of Bricks. Dated December 5, 1866.

The patentee claims the improved arrangement of machinery described and shown in the drawings, wherein a hollow rotating moulding wheel is employed, formed with an even number of moulds, recesses, or matrices, the movable bottoms of each opposite pairs of moulds being connected together and actuated by an excentric shaft or bearing in the manner described. *Patent completed.*

3420. A. J. ADAMS. Improvements in Locks and Latches. Dated December 29, 1866.

This invention relates to locks and latches for fastening doors. The bolt, by preference, works pendulous from a centre, maintaining its position from gravitation or a spring; the latter the inventor prefers. This bolt or catch may be acted on by a handle and spindle so arranged that it may be adapted for the various thicknesses of doors to which they may be applied. In order to keep the bolt extended as in the condition of a lock, a series of tumblers, which may be varied in quantity to any given or indefinite number, is so arranged that when elevated and retained by a toothed lever an opening is formed in the tumblers for a portion of the bolt or catch to fall in, when the catch or lock will be in a condition of being unfastened: but this portion may be varied in its shape to suit any variation of form desired in the series of tumblers; and, as additional security, the projection on the key for actuating the tumblers may be transposed at pleasure, the tumblers being arranged accordingly. Thus the condition of the lock as a secure fastening may be varied at the caprice of owner. *Patent abandoned.*

Trade News.

TENDERS.

Anerley (Surrey.)—Tenders for new receiving wards, North Surrey District Schools, Anerley. Mr. J. Berney, architect. Quantities supplied:—C. and J. Bowler, £2,409; Munday and Hutchinson, £2,031 12s.; Little, £1,930; Simms and Martin, £1,790; West, £1,734; Hart, £1,698; Nightingale, £1,647; Lose, £1,618; Jarrett, £1,590; Chappell, £1,540; Poxon and Smith, £1,495; Holledge (accepted), £1,495; Hazel, £1,320.

Berners-street.—For building workshops for Messrs. Howard and Son, Berners-street. Mr. Schofield, surveyor. Quantities supplied:—

	Contract A.	Contract B.	Total.
Roberts	£1,820	£440	£2,260
Gammon	—	—	2,087
Simpson	1,230	485	1,715
Conder	1,298	415	1,713
Mills	1 290	—	—
Nightingale	1,262	379	1,641
Lawrence and Co.	1,223	414	1,637
Longmire & Burge	1,197	399	1,596

Belfast Cemetery.—For the excavation, drainage, metalling roads and walks, boundary walking and entrances. Messrs. Gay and Swallow, Bradford, architects:—John Taylor, Stacksteads, £12,300; Kent and Smith, Belfast, £9,632; Benjamin Lupish, Shipley, £9,500; James Taylor, Tranmere, £9,399; Monk and Co., Belfast (accepted), £8,700; C. Cliff and Co., Bradford (accepted), for the ironwork and gates, £695. Architect's original estimate, £8,850.

Brentford.—For building St. Paul's Church, Brentford. Messrs. Francis, architects. Quantities supplied by Mr. Joseph Robson:—Catts and Sons, £7,780; Adamson, £7,345; Myers and Sons, £7,277; Gibson, £7,000; Dove Brothers, £6,985; Nye (accepted), £6,740.

Ellesborough.—For villa at Ellesborough, Bucks. Mr. F. Preedy, 13, York-place, Baker-street, architect. Quantities supplied:—

	House.	For old materials.	Total.
Turner and Sons	£1,821 0 0	£73 0 0	£1,748 0 0
Thomas Haddon	1,529 7 8	59 7 8	1,470 0 0
Jones and Sons...	1,490 0 0	39 0 0	1,451 0 0
A. Espley	1,465 0 0	35 15 9	1,429 4 3
Chas. Selby	1,430 0 0	60 0 0	1,370 0 0
Geo. Cooper	1,208 0 0	40 0 0	1,168 0 0

Gravesend.—For additions to Gravesend Workhouse:—First contract—Nightingale, £6,173; Henshaw, £5,950; Cobham, £5,294; Sollett, £5,270; Naylor, £5,145; Blake, £4,900; Crooke and Son (accepted), £4,767; Lilleystone, £4,225. Second contract—Nightingale, £4,987; Henshaw, £4,660; Cobham, £3,947; Sollett, £4,094; Naylor, £3,850; Blake, £3,700; Crooke and Son (accepted), £3,627; Lilleystone, £3,532.

Hanley.—For the erection of ragged schools, in Bryan-street:—Ellis, £536; Steele, £513; Fox, £497 10s.; Matthews (accepted), £489 10s.

Hanley.—For the erection of earthenware manufactory for Messrs. Ashworth. Messrs. R. Scrivener and Sons, Hanley, architects:—Naden and Son, £17,130; Hilton, £15,440; Bailey, £13,998; Wooldridge, £13,997; Steele, £13,985; Barlow, £13,300; Matthews, £12,960.

Hammersmith.—For alterations and repairs to the Bell and Anchor Tavern, Hammersmith. Messrs. Bird and Walters, architects:—Stimpson, £1,340; Eyles, £1,275; Whittick, £1,224; Newman and Mann, £1,185; Williams and Son, £1,133; McLachlan (accepted), £1,072.

Kent.—For additions to house at Chislehurst, Kent. Mr. Gloyn, architect. Quantities supplied:—Contract A—Little, £1,870; Randle and Co., £1,770; Thomas, £1,671; Allen, £1,608; Payne and Co., £1,587; Nightingale, £1,850; Wade, £1,220. Contract B—Little, £1,180; Randle and Co., £1,140; Thomas, £1,085; Allen, £1,030; Payne and Co., £1,004; Nightingale, £916; Wade, £813; Watkins, £2,881.

Kilburn.—For completing 20 houses, Alexandra-road, Kilburn. Mr. Thomas J. Hill, architect:—Wood and Co., £11,450; Cushing, £10,220; Colls, and Son, £10,020; White, £9,120; Eydmann, £8,972; Wills, £8,874; Anley, £8,740; Henshaw, £8,676; Webb and Sons, £8,675; A. S. Smith, £8,652; Taylor (too late), £8,501; Salter, £8,204; A. and J. Smith, 8,096; Corbeldick, £7,710; Perry, £7,686; Sabey, £7,216.

Lambeth.—For altering No. 18, Palace New-road, Lambeth, into public-house, for Messrs. Prichard. Mr. T. Brooks, architect:—Contract No. 1—Langmead and Way (accepted), £525.

London.—For repairs to St. John's Chapel, for the Marylebone Vestry, St. John's Wood:—Spencer, £95; Poole, £88; Routen, £86 10s.; Brown, £85 10s.; Smith (accepted), £64 10s.

London.—For alterations to Nos. 2 and 3, Honey-lane Market, City. Mr. Lewis H. Isaacs, architect. Quantities supplied:—Ashford, £860; Walker, £859 15s.; Bamford, £750; Prince (accepted), £725.

London.—For the erection of a house and shop, Newington-causeway, for Mr. Hughes. Mr. Henry Jarvis, architect:—Turner and Son, £2,639; Piper and Wheeler, £2,548; Myers and Sons, £2,525; Browne and Robinson, £2,420; Lawrence and Baugh, £2,349; Thompson, £2,236; Henshaw, £2,205; Higgs, £2,173.

London.—For additions to No. 3 and 4 Wharves, Regent's Canal, for the Honourable Commissioners of City Sewers. Mr. W. Haywood, C.E., engineer. Quantities by Mr. F. Warburton Stent:—Mowlem and Co., £2,460; Gammon and Son, £2,331; Newman and Mann, £2,247; Hill and Keddell, £2,229; T. Crook and Son, £1,687.

London.—For erecting five warehouses in Commercial-street, E.C., for Mr. M. Moses. Mr. N. S. Joseph, architect. Quantities by Mr. Thomas Pearson:—Axford and Co., £9,142; Piper and Wheeler, £8,490; Newman and Mann, £8,147; Brass, £7,987; Browne and Robinson, £7,980; Higgs, £7,936; Conder, £7,932; Ashby and Horner, £7,880; King and Son, £7,760; Hill and Keddell, £7,348.

Leominster Drainage and Water Supply.—The local Board of Health in this town have at length agreed upon the adoption of plans by Messrs. Gotto and Beesley, of 35A, Great George-street, Westminster, for the drainage and water supply. The water supply will be derived from an artesian well, the water from which is said to contain less magnesia than the famous St. Ann's Well at Malvern, and a very small per centage of organic matter. The drainage will be on the irrigation principle. The following are the tenders:—Coker, £14,162 8s.; Dowell, £11,879 7s. 6d.; Mackenzie and Abell, £11,339 1s. 6d.; Buybird, £10,861; R. R. and W. Miles, £9,610; King and Godwin (accepted), £9,155; Welch and Son (withdrawn), £8,770.—The following are the tenders for a pair of high-pressure horizontal steam engines with boilers and pumps:—J. H. Gwyn, £1,997; Handyside and Co., £1,630; Brydges and Brydges, £1,450; J. Watt and Co., £1,350; Easton, Amos, and Co., £1,300; Astbury and Son, £1,300; Burton, Sons, and Waller, £1,250; Claridge, North, and Co., £1,226; Lilleshall and Co., £1,095; Worcester Engine Works (accepted), £1,080; Fielding and Platt, £1,060; Mackenzie and Abell, £1,050; Birrell, Rotheroe, and Co., £952; Berrington, Hopham, and Co., £900; Ginson and Co., £860.

Plaistow.—For the erection of a tavern at Upton Manor, Plaistow, Essex, for Mr. E. J. Ward. Mr. J. F. Newman, architect. Quantities supplied:—Lugg, £1,850; Mathews, £1,770; Allen, £1,651; Holgate, £1,588; Bunn, £1,582; Wicks, £1,555; Henshaw, £1,471; Aldous (accepted), £1,460.

Reigate.—For additions to house, Woodlands-road, Reigate. Mr. Matthews, surveyor. Quantities supplied:—Barnes, £685; Nightingale, £679; Penfold, £675; Cook, £626 13s. 6d.; Holdworth, £617 10s.

Renhold (Bedfordshire).—For erecting three pairs of improved labourers' cottages on this plan, for Miss Raine. Mr. John Day, architect:—Freshwater, £273 per pair. Each cottage has a living room, scullery, and good pantry on the ground floor, and No. 3 bedrooms above, ditto all private. The estimate includes a barn and watercloset for each cottage, and an oven and bakehouse for the whole. Grates, coppers, sinks, and all fittings are included in the estimate, which amounts in the whole to £829, with well and pump included.

St. John's Wood.—For alterations and additions, &c., at No. 30, Upper Hamilton-terrace, St. John's Wood. Messrs. Bird and Walters, architects:—McLachlan, £739; Ebbs and Sons, £686; Morsman, £642; Williams and Son (accepted), £617.

Upper Norwood.—For erecting house and shop in the Anerley-road, Upper Norwood, for Mr. W. H. T. Wright. Mr. S. H. Hope, of Penge, architect. Quantities supplied:—Wood, £1,397; Jennings, £1,263; King and Hipwell, £1,238; Thorpe, £1,190; Cressell, £1,150.

Wilcox-road.—For additions, &c., to the Friend in Hand beerhouse, Wilcox-road, for Mr. Hewit. Mr. Dangerfield, architect. Quantities not supplied:—Partrick, £369; Nightingale, £368; Quennell, £351 6s. 6d.; Wittick, £218.

BATH STONE OF BEST QUALITY.

Randell and Saunders, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[Advt.]

PROPERTY SALES.

August 1.

At the Mart. By Mr. Newbon.—Leasehold two houses, Nos. 18 and 19, Hanley-road, Holloway, term 90 years from 1859, at £12 12s. per annum—sold for £695.

Freehold plot of building land, situate at New Malden, Surrey—£210.

Freehold plot of building land, situate in Durham-road, Holloway—£202.

Freehold house, No. 5, Woodbine Cottages, Highbury-vale, annual value, £32—£350.

By Mr. Henry Thomson.—Leasehold residence, No. 4, Rochester-terrace, Rochester-road, Camden-road, annual value £60, term 77 years unexpired at £5 per annum—£650.

Leasehold improved ground rent of £15 per annum (for about 59 years), secured on Nos. 5 to 8, Nelson-grove Wandsworth-road—£200.

By Messrs. Hards and Vaughan.—Freehold residence, with stabling and garden, known as Rosedale House, Forest Hill—£1,300.

Freehold ground rent of £37 10s. per annum, secured upon twelve houses, two with shops, situate in Church-street and Church-place, Greenwich—£775.

Freehold ground rents of £48 per annum, secured upon 12 residences, Nos. 1 to 12, Elgin-terrace, Catford-bridge, Lewisham—£1,020.

Freehold ground rent of £22 per annum, secured on four houses in King's-road, Chelsea—£375.

Freehold ground-rent of £35 per annum, secured on eight houses in Stratford place and Lea-street, Stratford—£620.

Leasehold ground rent of £7 per annum for 76 years, secured upon four houses in Garden-street and Garden-place, Stepney-green—£80.

Freehold ground rent of £22 per annum, secured upon four houses in Stratford-place and River-street, Stratford £360.

Freehold ground rents of £60 per annum, secured on 19 houses in Ford's-place, Battersea Bridge-road—£11,100.

Leasehold six houses and shops, Nos. 2 to 7, Turnpin-lane, Church-street, Greenwich, producing £150 10s. per annum, term 63 years from 1832, at £18 per annum—£1,310.

Leasehold house and shop, No. 15, Greenwich Market, let on lease at £30 per annum, term 61 years from 1830, at £20 per annum—£85.

Leasehold house and shop, No. 5, Nelson-street, Greenwich, term 61 years from 1820, at £55 per annum—£180.

Leasehold ten houses, Nos. 1 to 10, Norfolk-place, East Greenwich, producing £177 12s. per annum, term 85 years from 1827, at £38 15s. per annum—£1,485.

At the Guildhall Coffee-house.—By Mr. J. Robins. Leasehold residence, No. 114, Denbigh-street, Pimlico, annual value £120, term 62 years unexpired, at £10 10s. per annum—£610.

Three renters' shares, eight proprietors' shares, and one personal life admission to and in the Theatre Royal Drury Lane—£60 each.

August 2.

At the Mart.—By Messrs. Driver and Co.—Freehold the manor and estate of Evercreech, Somersetshire, comprising mansion, farmhouse, homesteads, cottages, common rights, &c., in all about 900 acres; also the advowson to the vicarage, the whole producing nearly £2,415 per annum—sold for £64,000.

By Messrs. Norton, Trist, Watney, and Co.—Freehold the Rochford estate, Essex. Lot 1. Rochford Hall Farm, with residence, extensive farm buildings, and 407a. 3r. 23p. arable and meadow land—£25,000.

Lots 2 and 3. Brick-kiln Farm, 121a. 1r. 17p. and 68a. 3r. 39p. arable land—£9,000.

Lot 4. Three enclosures of arable and meadow land, 27a. 2r. 17p.—£1,300.

Lot 6. Plot of meadow land, 2a. 2r. 10p.—£370.

Lot 7. Plot of meadow land, 1a. 3r.—£250.

Lot 8. Plot of meadow land, 5a. 1r. 39p.—£660.

Lot 9. Plot of meadow land, 10a. 3r. 7p.—£1,300.

Lot 10. Dwelling-house, cottage, &c.—£180.

Lot 11. Enclosure of meadow and garden ground, 4a. 3r. 12p.—£600.

Lot 12. Meadow and garden ground, 2a. 3r. 17p.—£700.

Lot 13.—Plot of garden ground, "California," 3r. 6p.—£120.

Lot 14. Enclosure of meadow and garden ground, 3a. 0r. 33p.—£400.

Lot 15.—Enclosure of meadow land, "Brush Close," 8a. 0r. 33p.—£180.

Lot 16.—Meadow land, "Workhouse Mead," 9a. 2r. 34p.—£1,240.

Lot 17. Great Doggett's Farm, with residence, buildings, cottages, &c., and 335a. 0r. 21p. arable and meadow land—£18,000.

Lot 18. Little Doggett's Farm, 121a. 1r. 16p. arable land—£7,500.

Lot 20. Part of Swaine's Farm, 98a. 2r. 36p. arable and meadow land—£5,000.

Lot 21. Enclosure of arable land, "The Fourteen Acres," 13a. 3r. 8p.—£1,050.

Lot 22. Enclosure of arable land, "Tapes," 6a. 0r. 31p.—£260.

Lot 23. Enclosure of arable land, "Six acres," 6a. 0r. 30p.—£260.

Lot 24. Enclosure of arable land, "Long Four Acres," 4a. 3r. 16p.—£200.

Lot 25. Enclosure of meadow land, with cottage, &c., 5a. 3r. 11p.—£760.

Lot 26. Little Hambridge or Rochford Mill, comprising water and ward-mills, house, farmyards, &c., and 37a. 2r. 12p. meadow and arable land—£4,500.

Lot 27. Coombes, or Blue House Farm, 91a. 0r. 7p.—£4,500.

Lot 28. Enclosure of arable land, "Long Ten Acres," 9a. 2r. 24p.—£600.

Lot 29. Enclosure of arable land, 10a. 0r. 22p.—£550.

Lot 30. Enclosure of arable land, "Lodge Field," 9a. 3r. 1p.—£600.

Lot 32. Enclosure of arable land, 16a. 1r. 3p.—£600.

Lot 33. Sutton Temple Farm, comprising farmhouse buildings and 353a. 0r. 33p. of meadow and arable land.—£18,000.

Lot 34. Enclosure of arable land, 35a. 0r. 19p.—£2,200.

Lot 35. Enclosure of arable land, 1a. 3r. 34p.—£150.

Lot 36. Enclosure of arable land, 2a. 2r. 29p.—£140.

Lot 37. Enclosure of arable land, "Stopit Piece," 2a. 3r. 6p.—£150.

Lot 38. Clement's Marsh Farm, comprising a cottage, with garden, and 197a. 2r. 31p.—£5,500.

Lot 39. Enclosure of arable land, "Little Hoyles," 9a. 1r. 33p.—£780.

August 5.

At the Mart.—By Messrs. Norton, Trist, Watney, and Co.—Freehold property, known as "Coombe Lammas," Esher, Surrey, comprising a residence, with gardens, and about 22 acres of meadow land—£7,500.

Freehold plot of building land, fronting Anerley Park, Anerley, Surrey—£380.

A ditto ditto, fronting Thicket-road, Anerley—£500.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Alfred William Balls, Westbourne Park-road, decorator, August 15, at 1—George Godfrey, Park-street, Dorset-square, carpenter, August 15, at 2—Emilie Sabbathé, Leicester-square, civil engineer, August 20, at 1—Timothy Wythe, Elizabeth-place, Kingsland-road, builder, August 20, at 1—William Rose and Joseph Newton, Chislehurst, builders, August 22, at 1—James Starkey, Anthony-street, Commercial-road East, builder, August 22, at 12.

TO SURRENDER IN THE COUNTRY.

W. Bover, Burnham Westgate, Norfolk, bricklayer, August 22, at 3—W. A. Boorman, Harrietsham, Kent, blacksmith, August 12, at 3—Lawrence Sbiel, Liverpool, ironmonger, August 13, at 11—Jabez Beddow, Darlaston, screw manufacturer, August 17, at 12—William Seddon, Manchester, glass and lead merchant, August 19, at 12—Benjamin Stone, Eastbourne, painter, August 26, at 11—George Trigg, Longton, joiner, August 17, at 11—Mary Ann Wilkinson, Mapplewell, Yorkshire, nail maker, August 17, at 11—Thomas Yeatman, Liverpool, paint manufacturer, August 16, at 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

November 1, M. Cubitt, Middleton-road, Dalston, builder—November 1, H. Newman, Teddington, builder—September 16, M. Giles, Bromsgrove, builder—August 21, J. Hooper, Shepton Mallett, carpenter—September 5, R. Davies, Neath, engineer—August 16, W. and J. Hall, Bolton, slaters—August 21, J. Moon, Plymouth, surveyor—August 14, E. Boothroyd, Hanley, builder—August 14, T. Warner, Hanley, carpenter—October 15, W. Morgan, White Horse-street, Commercial-road East, stonemason—October 15, S. Smith, Woolwich, journeyman joiner—October 16, W. Winch, Turin-street, Bethnal Green-road, timber merchant.—September 19, J. Pope, Kingswear, Devonshire, engineer—October 15, J. Scriveus, Truro, painter—August 24, B. Brooker, Ipswich, bricklayer.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

Timber, duty 1s per load, drawback, 1s.

Teak .....load	£9	0	£10	10	Archangel, yellow ..	£11	10	£12	10
Quebec, red pine	3	0	4	10	St. Petersburg, yel...	10	10	11	0
,, yellow pine..	2	15	4	0	Finland	8	0	9	0
St. John N.B. yellow	0	0	0	0	Memel.....	0	0	0	0
Quebec Oak, white ..	5	5	6	0	Gothenburg, yellow	8	10	10	10
,, birch.....	3	10	4	10	,, white	8	0	9	0
,, elm	3	10	5	0	Gefle, yellow.....	9	0	11	0
Dantzic oak	3	10	6	0	Soderham	9	0	10	10
,, fir	2	0	3	0	Christiania, per C.,				
Memel fir	3	0	3	10	12 ft. by 3 by 9 in.				
Riga.....	3	0	3	5	yellow.....	16	0	22	0
Swedish	1	15	2	2	Deck Plank, Dantzic,				
Masts, Quebec red pine	6	0	7	0	per 40 ft. 3 in.	0	15	1	4
,, yellow pine..	5	0	6	0	Pumice Stone pr ton	6	0	8	0
Lathwood, Dantzic, fm	4	10	5	0	Oils, &c.				
,, St. Petersburg	6	10	7	10	Seal, pale....per tun	39	0	0	0
Deals, pr C., 12 ft. by 3					Sperm body 100	0	105	0	
by 9 in., duty 2s per					Cod	39	0	0	0
load, drawback 2s.					Whale, Sth. Sea, pale	39	0	0	0
Quebec, white spruce	14	10	21	10	Olive, Gallipoli.....	64	0	0	0
St. John, white spruce	13	10	16	10	Cocoanut, Cochin, ton	55	10	57	0
Yellow pine, per reduced C.					Palm, fine	40	0	0	0
					Linseed	39	0	0	0
Canada, 1st quality.	17	0	19	10	Rapeseed, Eng. pale..	41	0	0	0
2nd do.....	12	0	13	0	Cottonseed.....	33	0	39	0

METALS.

Iron:—								
Welsh Bars in London .. ..per ton	6	7	6	6	10	0	3	
Nail Rod ..... do	7	10	0	8	0	0	2½	
Hoops ..... do	8	10	0	9	0	0		
Sheets, Single ..... do	9	15	0	10	0	0		
Staffordshire Bars ..... do	7	10	0	7	15	0		
Bars, in Wales ..... do	5	15	0	8	0	0	3	
Rails ..... do	6	6	0	0	0	0	nett	
Foundry Pigs, at Glasg. No 1 .. do	2	14	0	3	5	6	2½	
Swedish Bars ..... do	10	5	0	10	10	0	nett	
Steel:—								
Swedish Keg, hammered .....per ton	15	0	0	15	10	0	2½	
Swedish Faggot ..... do	10	10	0	12	10	0	2½	
Copper:—								
Sheet & Sheathing, & Bolts ....per ton	79	0	0	83	0	0		
Hammered Bottoms ..... do	89	0	0	92	0	0		
Flat Bottoms, not Hammered .. do	84	0	0	87	0	0		
Cake and Tough Ingot ..... do	70	0	0	71	0	0	3	
Best Selected ..... do	77	0	0	79	0	0		
Australian ..... do	82	0	0	86	0	0		
Yel. Metal Sheathing & Rods ....per lb	0	0	7	0	0	0		
Tin:—								
English Block .....per ton	91	0	0	0	0	0		
do Bar ..... do	92	0	0	0	0	0	2½	
do Refined ..... do	94	0	0	0	0	0		
Banca ..... do	92	0	0	0	0	0	nett	
Straits ..... do	87	0	0	0	0	0		
Lead:—								
Pig, English .....per ton	21	15	0	0	0	0		
,, Spanish Soft ..... do	19	5	0	0	0	0	2½	
Shot, Patent ..... do	23	0	0	0	0	0		
Sheet ..... do	20	15	0	0	0	0		
White ..... do	30	0	0	31	10	0	5	
Spelter:—								
On the Spot .....per ton	21	0	0	21	3	6	net	
Zinc:—								
English Sheet .....per ton	26	10	0	27	0	0	2½	
Devaux's V. M. Roofing Zinc .... do	28	0	0	0	0	0		
* And 5 per cent. discount if laid upon the new system.								
Quicksilver .....per btl	6	17	0	0	0	0	3	
Regulus of Antimony								
French ..... per ton	28	0	0	0	0	0	2½	

MARGATE.—To be LET upon BUILDING LEASES, or PLOTS will be SOLD, valuable FREEHOLD LAND on the sea-coast, contiguous to Westgate and Marsh Bays. Excellent brick earth and chalk on the estate. Great advantages to parties taking the first 40 Plots. Advances made.—Apply to Mr. Charles N. Beazley, architect, 96, Guilford street, London, W.C.

TO ARCHITECTS and BUILDERS.—LIME GROVE PARK, PUTNEY HILL.—Very Desirable SITES on this Estate to be LET for building respectable private residences. It is situated on elevated ground, between the railway station and Wimbledon and Putney-heaths. There is a great demand in this locality for good villa residences, and a ready sale for them. For particulars apply to S. Wood, Esq., Architect, 10, Craig's-court, London, S.W.; or to Messrs. Baxter, Rose, Norton and Co., Solicitors, 6, Victoria-street, Westminster, S.W.

CRYSTAL PALACE.—FIRST-CLASS BUILDING LAND to be LET in immediate proximity to the Palace, on advantageous terms. For particulars apply to Mr. Hart, Accountant's Office, Crystal Palace; or to R. R. Banks, Esq., 1, Westminster Chambers, Victoria-street, Westminster.

STREATHAM.—BUILDING LAND to be LET, at moderate ground rents, on the Crooke-Ellison Estate. Houses from £40 to £50 per annum are in great demand in the neighbourhood. A limited area at the south part of the estate, near Hermitage-bridge and Croydon road, to be Let for houses of £25 per annum value. Plans and particulars of Mr. Gilbert, at the Estate Office, Streatham Common, or of Mr. Wales, surveyor, 8, Great Saint Helens, E.C.

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THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 16, 1867.

COMPETITION FOR NEW OFFICES AND BOARD-ROOM, POPLAR.

HERE is one instance more of a competition resulting in gross injustice. To begin with, we know nothing whatever of the competitors except from the local public print; we never were at Poplar before this week; and we have heard nothing of the scheme except from a young lady and gentleman who were in the room where the plans are exhibited, who were evidently strangers, and who evidently belonged to what may be called the high art section of society. The exclamations of this lady, as her companion led her from one design to another, assumed, at last, a lulling character from the monotony of the repeated echo. Two sharp monosyllabic words, one savouring strongly of the other hemisphere, was the only criticism which reached us. At the risk of plagiarising, and at the still greater risk of being charged with not taking a grave view of the profession, we, too, cannot help exclaiming, "What rot!"

There are forty-three competitors for four prizes, three of £50, £30, and £20, and the chief prize, £250, or 5 per cent. on £5,000. Out of these there are five designs just worth looking at. Of the rest, some look like practical jokes, and remind us of the brown paper design sent in for Mr. Spurgeon's Tabernacle; others are evidently the efforts of very young pupils; others, again, look like the wretched offspring of some Government school of art. Mortar boys, who could just use pencils and rulers, might have given us better designs and better drawings than some, and we have known British school children under ten years of age do better work in architecture than that exhibited by two of the competitors. The least objectionable designs are:—1. "Incognito"; 2. Two concentric circles; 3. "Alpha"; 4. "Bow Pen"; 5. "Octagon." "Circinus" and "Cives" have been awarded the first and third premiums respectively, but on what grounds we found it impossible to determine. If the Board wanted any particular arrangement of their hall, if Mr. Edinger, or Mr. Anybody-else, wanted to have a more than usual accommodation in respect to lavatories, &c., they could easily have satisfied themselves through their surveyor, so that we entirely demur to any plea which may be set up in favour of these gentlemen having met the wishes of the committee more thoroughly than the others. It is, of course, quite another question whether a committee has any right to have any peculiar views. But we make the Poplar Board of Works a present of their peculiarities, and we will go so far as to grant that "Circinus" (*i.e.*, Mr. Fletcher, late assistant-surveyor to the Board), knowing, perhaps, more members of the committee than any other competitor, managed to give expression to the greatest number of crotchets.

But, we ask, and not we think unreasonably, if crotchets were to settle the matter, why were not all the crotchets discussed and embodied by the surveyor in sketch plans to accompany the instructions? We do not suppose that external appearance had anything to do with the decision. No one would expect to find in a Poplar Board of Works a brain capable of making the difference between Westminster Abbey and the Strand Musick Hall, and therefore one cannot be very much surprised to find the only few modest and earnest designs set aside for stuff about which it would be an insult to architects and their art were we to write one word of criticism. But then the disappointed competitors may ask what has the referee, Mr. Sancton Wood, done for his fee of £25? We should certainly have thought Mr. Wood would have known better than to have overlooked "Incognito" and the two concentric circles—designs which we hope may grace the walls of the next exhibition in Conduit-street, and not be allowed to pass with the Poplar Board of Works into the oblivion which certainly awaits all such bodies. We hope this is the first and last we shall hear of Mr. Sancton Wood as an architectural referee. That committees, and boards, and town councils should keep up their old characteristics, that the Poplar Board, like most other corporate bodies, should still cling to the delights of jobbery, are things which everyone can understand; but that a respectable architect, whose name has stood upon the Royal Institute's books for more than a quarter of a century, should be found to be so ignorant of his art as to be incapable of judging between "Incognito" and "Circinus," or two concentric circles and "Octagon," or "Alpha" and "Cives" is a very painful discovery. Spiteful people may assign other causes for the judgment, but we cannot for a moment think that Mr. Sancton Wood has been actuated by anything save the sheerest ignorance or neglect of the work he had to do. When men men like Mr. Sancton Wood are called upon to undertake the duties of a referee in an architectural competition, the profession feels at first that a great weight is taken off its shoulders, and that there is hope yet for hard work and earnest study; but when such miscarriages of justice take place as those we have lately had to report, we begin to lose confidence even in respectability, and the last state of this much-vexed question of competition becomes worse than the first.

IRRIGATION IN FRANCE AND SPAIN.

THE demands of human and domestic consumption, the requirements of irrigation, sewage and drainage, navigation, and motive force, comprise the five purposes to which water can be applied. Indispensable in some of them, it is manifestly optional in others. Confining our attention, in the present article, to its application to the purposes of irrigation, it is evident that we must look abroad before we shall discover even any attempts made to utilize so valuable an aid to the productions of the soil. In all wet climates like our own, we drain, but we have, as a rule, no irrigation in the shape of canals, constructed with that especial object in view. We do not require them, and it is in those countries lying under a hotter sun, where the supply of water is precarious and intermittent, where a stream, or river, one day is carrying its contents along with all the rapidity of a torrent—and the next, is capable of being traversed dry shod—that the construction of irrigating canals becomes an absolute necessity. A canal may serve all the purposes which we have mentioned, and many do; but no canal that is used for the purpose of navigation, much less for sewage and drainage purposes, is fit to be applied to the use of human consumption. Undoubtedly, numerous large towns, both at home and abroad—Dublin, for instance—are supplied with water by canals upon which a very filthy description of traffic is carried; but no one will, for a moment, concur in the propriety of such a plan. So soon as a canal is intended to serve as a means of conveying traffic that is to be applied to the requirements of navigation, it assumes dimensions and proportions beyond those demanded for mere irrigation, and the expense becomes commensurately increased. Recently, France has given much attention to what may be termed the internal water supplies of a country, and a complete system of canalization has been devised by the Ingenieurs des Ponts et Chaussées, in conjunction with those of other departments. Numerous canals have been commenced, and the courses of the Loire, the Rhone, and other principal rivers, submitted to a searching examination, in order to improve the size, depth, and capacity of their channels.

With the intention of improving the productive qualities of certain districts, four canals, some time ago, were commenced, and the works are drawing near completion.* The principal of these is the Vérdon Canal, which is fifty miles in length, not including any branches. It starts near Quinzon, where the foundations of the river wall at the water-lake, as it is technically termed, were a source of some difficulty. Eventually, by the aid of concrete—which is fast becoming an almost universal building material—the difficulty was overcome, and a sound and permanent junction effected. At Ginnasservis, the construction of a tunnel was rendered necessary, which was more than once flooded during the progress of the works, but it is confidently hoped that, by the end of the year, the canal, with its accompanying branches, will be opened throughout. About 2 per cent. of the earthwork remains to be excavated; 33 per cent. of the tunnels, including shafts and galleries; 9 per cent. to be finished in bridges and culverts; 16 per cent. in river walls' together with the superstructure at the water-lake, and a small portion of the works in connection with the great syphon. In addition to the purposes of irrigation, it is intended to apply these canals as sources of water for domestic purposes, and a proposal has been made for a branch to the towns of Martigues and Bouc, in order to afford the inhabitants a continuous supply. There is also some chance of the town of Marseilles applying to the company with a similar object in view. Some delay has occurred in the progress of the works upon the Siagne Canal, owing to the refusal of some of the landowners to come to terms, and, consequently, compulsory measures were obliged to be resorted to. This canal has a branch near Mongirs, running into Cannes, a town upon the Mediterranean coast, and the service pipes are already being laid in anticipation of the coming water. A partial suspension of the Lagoin Canal has occurred in consequence of financial difficulties, which, however, will be removed in sufficient time to enable the works to be ready for the next irrigation season in 1868, commencing about the middle of April. Much importance attaches to this canal in connection with the lands of Pont Long, which are being systematically irrigated through its means, although the full execution of the project cannot be carried out until the works are completed. The whole of the canals include a length of nearly 450 miles, and the manner in which the works have been conducted up to the present affords the best promise that ultimate success will attend their completion, both in an engineering and financial point of view.

Turning our attention to Spain, we come to a country which may be pronounced as one of the most suitable for demonstrating the need of irrigation, and developing to the fullest extent its great utility and productive influence upon a parched and arid soil. Its principles have, in fact, been understood and practised for ages in that land, although many of the appliances are of a very rude and barbarous character, and nearly as much water is lost as is utilized. Notwithstanding that irrigation has been used in Spain for so long a period, it has been so imperfectly developed that that country is in as much need of new canals and means for storing its water supplies as any country in the world.† As a proof of the enormous value of a well devised and well executed system of irrigation, when applied to a soil similar to that of Spain, it may be mentioned that non-irrigated land is only worth from 9s. to 12s. per acre, when the same land effectively watered will rent for the yearly value of

* *Vide* the Irrigation Company of France (Limited) report presented to the shareholders at the general meeting held at the London Tavern, on Thursday, August 8, 1867.

† See an excellent little pamphlet "Irrigation in Spain"; being a paper compiled from information collected during a residence of several years in that country. By J. P. Roberts, C.E. London: E. and F. N. Spon, 48, Charing Cross. 1867.

£10. The value of the land in the neighbourhood of Madrid depends altogether upon the condition of its irrigation. Thus first-class non-irrigated land, worth £32 per acre, has its value increased to nearly £130 when properly irrigated. Second-class land rises in value from £20 per acre to £100. Third-class, from £12 to £75; and fourth class, usually very poor land, from £6 to £60. A serious error committed by the earlier constructors of the weirs necessary for damming up the water, was not carrying them down to a good foundation, but founding them with loose blocks of stone, so that the water instead of finding the dam an obstacle to its progress, percolated through it almost without impediment. It is calculated that, in some instances, so much as nearly 50 per cent. of the water was lost by this rude and unscientific plan of constructing the foundations of the weirs. In all the weirs at present in construction by English engineers it is hardly necessary to add that this evil is most carefully guarded against. Although we have more to do with modern than ancient irrigation works, yet among the latter the Imperial Canal deserves a word of notice. It was originally intended as a navigable canal, but is now only used for purposes of irrigation. The weir near Tudela is a very fine example of construction, and a splendid piece of masonry. Most of the earliest irrigation work, anterior to the time of this canal, were built by the Moors, who were excellent hydraulic engineers. Two large and important canals are in course of construction at present in the provinces of Henares and Esla, and will irrigate an extensive tract of country. They are under the superintendence of Mr. Bateman, C.E., of London, and of Mr. Higgin, of Madrid; and that running through the district of Henares has some very formidable difficulties to contend with in the shape of weirs and tunnels. Taking the concessions granted, and those *in transitu*, the total quantity of land required for irrigation canals in Spain at present amounts to half a million of acres There is a difference to be observed in the irrigation of Spain contrasted with that of other countries. In France and in our own country the water is allowed to flow over the meadows, and the principal object is to manure the land with the sediment deposited, whereas in Spain the object sought is simply to moisten the ground, and evidently a much smaller quantity of water will suffice than in the former instance. The absolute quantity of water required per acre per minute will, of course, vary with the nature of the soil and the crop to be raised upon it, but the mean of seven different quantities, authorized by the same number of recent concessions, is 3·2 gallons per minute per acre. We may conclude our present article with a few remarks upon the granting of concessions for irrigation works in Spain. The term is ninety-five years, and the rates are fixed *à priori* for each district. Any mills constructed by the company remain their property, and do not revert to the Government. Subsidies not exceeding £20,000, as a rule, are granted in three payments. The first takes place upon the completion of the earthwork of the canal: the second, upon that of the bridges and culverts; the remainder when all the works are finished.

THE PARIS EXHIBITION.—No. XII.

DE OMNIBUS REBUS.

Of all the other things pertaining to the art and science of architecture contained in this huge international bazaar we must speak but hurriedly. Many are the useful notions those who travel with their eyes open will discover, many the lessons those who go to learn will find worth remembering, and the only fear we have is, that where there is so much to distract the attention it will cease to be attracted. We have done our best to point out the chiefest objects of importance and interest to those whom we especially study to direct, but to indicate all that is good would be a task too long to be pleasant to us or welcome to our readers, and extended as has been our review it is by no means exhaustive. The workman will find an abundant source of interest in new tools of strange character, each trade presenting some fresh peculiarity; the contractor will discover in the many labour-saving machines new fields for enterprise, and the models of cheaply-constructed scaffolding and hoists will teach him much; and the professional director of both of these will find a thousand minor beauties and utilities our space has not permitted us to notice; yet, as a valedictory direction to all of these, we would point out a few more things which have not ranged themselves under the general heads our various notices have divided themselves into. In an article which recently appeared in our columns, we noticed the great use of concrete and "béton" now prevailing in Paris, and we would urge upon all who may visit the Exhibition to carefully study the works of M. Coignet, who has more than any other developed this species of construction, and his small annexe indicates much future progress. We have before adverted to his greater works in the foundations of the building itself and elsewhere in Paris, as matters of pure construction, and the visitor will here see much which will enable him to judge of its artistic application. Other cementitious substances are also well worthy of note, and there are here exposed cements of such hardness as to retain the most obdurate pebbles, concreting the mass thus formed into a conglomerate capable of taking a polish fully equal to any of Dame Nature's attempts in this line of business; and we would especially direct attention to some samples of the Cement Vicat, exhibited in the machinery gallery, where some specimens of paving of this character are shown. Another *rôle* played by cement in France is its application to flooring surfaces in various colours, and some very excellent examples of this treatment are shown by MM. Fontenelle, the executors of the well-known pavements of this kind in the S. Chapelle and S. Denis, whilst as exhibiting the tenacity of the material we would point out specimens of the so-called "Portland cement" of MM. Demarle and Co., of Boulogne, a portion of which four inches square sustains a weight of 1,160lb. in strain. Many other illustrations of the excellent qualities of French cement are exhibited, but we are happy to say chiefly as a constructive material, as a stucco for "decorative" (?) purposes, and as an imitation of stone its use is chiefly confined to the intelligent British public.

Of a somewhat kindred nature are the decorative adjuncts in carton pierre and similar substances, of which there are many exhibitors. France has a special aptitude for this class of production, and the very finest illustration of the finish it is capable of taking we ever recollect to have seen is the pair of doors by MM. Delapierre and Co., which are as good and refined in design as they are in execution. MM. Rasetti and Baillif have also some very good examples of the popular revived Louis Seize decoration, not, however, equal to the work of MM. Delapierre, which is, in truth, too good for its material, inasmuch as the cost of producing such work as this would be almost the same if executed in wood. We must give the S. Gobain Company high praise for their admirable glass, sheets of which are exhibited in sizes fit for the windows of Brobdignagian palaces, and of such clearness that hundreds who pass them by never notice their existence. The evenness of their manufacture is shown by a wonderful silvered plate of enormous size and great purity. The works in stained glass strike us on the whole as being poor; some rise to excellence, but they are very few, and as we cannot now criticise them individually, we must content ourselves with the expression of regret at finding such a general weakness of design and want of harmony of colour in this class of architectural adjuncts. Drawing has much improved, and in few do we find the caricatures and burlesques of the reflection of God's image in the human form once so common. Still, in almost all there is an absence of any character whatever, and a feeling that glass painting is a trade and not an art is the most prominent one we experience when we examine the exhibits in this class. Perhaps the greatest improvement in the decorative branch of glass work late years have produced is the enlarged application of mosaic work of this material. Dr. Salviati has an interesting and admirable collection, and Russia sends from her imperial manufactory some exquisite specimens, and South Kensington, from her more than imperial shop, sends some also.—Poor Phidias! if he were as ill-shaped as his pseudo portrait here we cease to wonder at his power of form. Man is a continuous antithesis, and this is a notable illustration of the fact.

Of the other branches of wall decoration we must not now speak. Paper-hangings, Wall painting, and glorious Tapestries all demand attention, but we must leave these subjects to a possible future, and conclude our remarks with a general *résumé* of the position held by our own country and our own art. To an Englishman the Exhibition is a huge sorrow. Our country has not put forth its strength, and that which it has exerted is so fettered by the bonds imposed by the Commission, which has strangled it, that it labours under great disadvantages The best places are devoured by the great Cole and his satellites, the rewards appropriated by his and their friends, and the feeling that it would be useless to struggle against this Kraken-like monster has been so universal that independent men have declined submitting themselves to its influence. That this should have been so we deeply regret. English art and English commerce need all the aid they can obtain to help them to hold their own in these days of universal competition, and the quasi kindness of our stepmother at South Kensington is like such delicate attentions generally—of rather more than doubtful good.

To an architect the Exhibition is one of the greatest interest, and the admirable works of our foreign brethren afford us the greatest pleasure. We regret we have not here been able to show them the present condition of our art in England. Our small selection is neither choice nor wise; and restricted as it is to so small and so unfit a space, we are tempted to regret it exists at all, and wish English architects had, like English sculptors, declined to be misrepresented. One thing it proves, that whatever progress we may make it certainly is made in spite of, rather than by the aid of, the powers that be, and it is a proof of our vitality that we exist at all. To the archæologist and the historian of art, the wonderful collection of works illustrative of "human labour" is of the deepest interest, and the glorious enamels and metal work, the beautiful illuminated books of the middle ages, and the innumerable other works which make up this portion of the collection, all more or less bear upon our art, and demand close and painstaking study. And here we are glad to be able to praise the authorities of South Kensington. In this they do great good. Their contributions to this portion of the World's Fair are very excellent, and the increase of knowledge they have caused in this branch of art history is the one green leaf in that crown they are so anxious to impose on their own head. May it flourish, and —it is almost hopeless to say it—may they be vouchsafed that degree of knowledge to learn in what way their mission lies. They *may* have power to collect and arrange the records of the past, but the power to control the present or to direct the future is not theirs, and their efforts in this direction not only fail

to reach the end they would attain unto, but are harmful and obstructive. Of Painting and Sculpture we dare not speak; there is so much that is good that if we commenced to comment we should have to do so more largely than our space will allow. One work there is which combines somewhat of both arts in an architectonic manner. We refer to the marble mosaic of Baron Triqueti, for the mausoleum of Prince Albert, at Frogmore. This is a very remarkable piece of inlay, spoiled, however, with too much labour. The hatching and filling overrides all else, and quite destroys the simple, grand, and monumental effect which should be patent in such works. With this notice of the decoration of the tomb of him who first rendered international exhibitions a success, we close our remarks on this, the latest—we almost wish we could use the adjective in a positive form and say the last. None have equalled the one he inaugurated. Each one strives to be bigger—not better—than its predecessor, and becomes too encyclopædaic to be thorough. Special exhibitions, though not so ambitious, would be of more real good, and we can conceive nothing more conducive to our own art progress than an international exhibition of architecture and building appliances—it might not make much noise. Emperors would probably not get prizes, and Mr. Cole would not know what it meant, but the real good which would arise from it would be active in times to come when Napoleon would be but a name and Cole would be no more. General exhibitions can never be conducted on equal principles. The knowledge that they are but shows prevents the earnest worker caring for them, the best work is eclipsed by the showiest, and, as a rule, the greatest reward obtained by the possessor of the greatest impudence. The notice of the discriminating few in each man's particular walk and work would be more valuable to the gainer of it, and more conducive to general advancement than a gross of gold medals or than honours by the hatful. Progress cannot be made in a multitude, and crowds but breed confusion; and good, earnest, thoughtful comparison can only be made by selection, and yet, in spite of all our growls, we say to every one, Go. Where there is so much there must be much that is good, and we can only wish there had been less and better. Still we would urge upon each one to go and glean for himself. Our aim has been to indicate the reaper's course. The Harvest is a fruitful one, and Industry and Intelligence may bring home sheaves well-eared and full of seed for future fructification.

CONSTRUCTIVE AND ÆSTHETIC DESIGN.

LOOKING back from our present standpoint, it must be accounted an anachronism that our predecessors of the last century—incapable of comprehending the spirit of a previous age, and the principles upon which its architecture was based—should have been so fond of reproducing in mimetic perfection the classic temples of Greece and Italy, and the cathedrals, castles, halls—besides a thousand exploded features—of long antecedent periods. There was a pretentiousness of scope, if not of decoration, in most of the pseudo-classic churches and houses of the eighteenth century quite incompatible with an age of enlightened thought and the printing press, and only to be satisfactorily explained by the existence of a fictitious romance, and its influence on the sentiment of the period. What else, indeed, could have induced the erection of churches to imitate the Doric and Ionic examples of Greece, such as the Erechtheum, which the late Mr. Inwood reproduced in the modern St. Pancras; or the no less absurd idea of adopting the most florid and extravagant features of the Pointed style in ordinary parish churches? The contrast becomes stronger if we compare this age of reproduction with the present one, in which novel effects are aimed at, and a bold and free eclecticism has taken the place of slavish copyism. What, may it be asked, does this change indicate? It would be illogical to suppose it a mere sport of fancy, and that a return to the reproductive spirit is as reasonable a probability as the wearing of modern crinoline, or the substitution of false for natural hair, after nearly three centuries' disuse, or any other of those countless freaks of fashion our fair friends indulge in. The tide of taste, unlike the tide of fashion, cannot so easily be turned back with impunity; and although we have ultra-mediævalists, pre-Raphaelites, and antiquity-loving sentimentalists, the spirit of modern improvement is as irreconcilably opposed to them as science is to superstition. If we only turn our eyes about us, we cannot fail to recognise the indication of this change in the spirit of unlimited toleration that generally prevails. Hotels, insurance offices, and other large financial establishments vie with our ecclesiastical buildings nearly everywhere, more especially in large towns. Art is forced into various channels rather than becoming the exclusive aid of a particular sect or class, and hence our feeling for it is not restricted to one set of examples or types, a departure from which is deemed heterodox. The spirit of the change is not confined to the sphere of art; it is seen in all the multifarious occupations of the intellect; our literature and religious convictions are considerably modified by it. By a slow but sure process it is giving us principles for facts—the spirit of art for its lifeless forms. From mere translators and copyists we have become eclectics—a law unto ourselves.

This leads us to inquire into the most apparent manifestations such a spirit has produced upon architecture. A better understood connection between the arts of construction and design is, perhaps, the most important characteristic of our present position. It is not uncommon now to witness a decided divergence in the conception and aim of features once deemed unalterable or inflexible in their treatment. Nearly every modern roof proclaims the fact. Hidden altogether beneath huge parapets, or so flat as to be scarcely visible, the roofs of our forefathers were probably the most unobtrusive lies of a sham age that could be conceived, while their concealment was bought dearly at the expense of construction and comfort. Middle and concealed gutters and flat pitched roofs were resorted to simply for the sake of obtaining height for the façades, or allowing an orthodox entablature—architrave, frieze, and cornice—to crown them. An increasing regard for economy has, I believe, tended much to simplify construction, and bring about a more rational and less fictitious architecture, in which economy of material and the legitimate value of each constructive element are taken into account. In marked contrast to the concealed roof, our modern buildings display that feature so ostentatiously as often to create a wonder how they are utilized internally. But making due allowance for an extravagant license, roofs now-a-days are really what they pretend and ought to be—sensible coverings, adding to the height and effectiveness of a building. In noticing roofs, as, after the walls, the most important feature of constructive design, it may be as well to note that they are, in large erections, at least, no longer mere coverings, but interiorly an important accessory in design. Our church open-timbered roofs display perhaps the most decisive of our advances in æsthetic construction, particularly when we compare them to the lath and plaster waggon vaults and ceilings seen even now here and there in village churches. Nowhere more than in our large, open station and hall roofs is the alliance between construction, materials, and design so palpably manifest, because we get conjointly the *summum bonum* of material and æsthetic excellence. The very timber and iron used in their construction perform a two-fold office: they support the covering, and administer to our sense of beauty.

It is interesting now to trace the steps of this roof transformation. A desire for constructive truth in ecclesiastical art, urgently advocated by Pugin and his school, was the first impulse which helped to strip our church ceilings of their lath and plaster disguisement. Next followed the abandonment of the tie beam, a clumsy expedient, as it was a main stay of counterfeit ceilings. From that time till the present, collars, braces, diagonal ties, curved and laminated ribs have assumed decorative as well as structural functions, thus economizing space and utilizing material. It may, indeed, be urged that an inner ceiling or double roof was advantageous in preserving a more equable temperature, and that, therefore, our groined and flat ceilings were not valueless; but against this I think we may put a counter objection, namely, that the double roof impedes that free circulation so necessary to perfect ventilation. Moreover, an excess of heat under the roof surface, or more than is required to produce a proper displacement in the lower and breathing stratum of air, can be obviated by felt or other non-conductive material, while it is often easily and effectually prevented by boarding the back of the rafters, thus allowing an air space to intervene. We thus see that these structural advantages more than compensate for the loss of an inner ceiling, while an element of effect is obtained at comparatively less cost. It may not be out of place to mention here the irrational and anomalous restitution of tie beams and king-posts of bedstead likeness in some recent church roofs designed after old French examples, and the no less freakish notion of placing rafters flatways upon the purlins, thereby losing all advantage of the golden rule that the transverse strength of beams is directly as the square of their depth—notions sadly at variance with common sense, and only worthy of a rude carpentry. Enough has been said to show the alliance æsthetically to be effected between timber roof framing and the more permanent materials of our buildings; and the custom of staining and varnishing our timber, instead of disguising its nature with paint, still further shows to what an extent constructive reality has been carried as synonymous with good taste.

Another instance. In the same period of quasi-constructive taste, the external and internal treatment of windows was sadly subjected to the reigning taste for mock porticoes and façades. If considered at all in elevation, they were only employed to balance the sides of a composition, or to give it an uniformity of appearance. Every detail was made to conform, in position, size, and shape, to a pedimental and columnar front, itself a mere mask, in which columniation became paramount. Similarly, the same subjection of essentials was found inside. Under the idea of squareness, light itself was obstructed by the inner projecting jambs or shutter boxings, which were invariably brought to a square angle instead of being freely splayed for the ample divergence of the solar beams. How different has the treatment of windows become now! Exteriorly we have them where we most desire them; we treat them no longer as necessary evils, but enlarge and extend them as valuable features under a thousand varied forms—semicircular, segmental, pointed, cant and trefoil-headed; we run them as in connected arcades, and vertically superimpose them.* G. H. G.

A correspondent says:—"The Englishman's objection to adopt as the title for the proposed new buildings in the Strand the 'Courts of Justice,' appears to arise from his intuitive knowledge that he may obtain therein and therefrom any amount of law, but that the proportion of justice granted may be extremely small, and by no means at his command."

* To be continued.

AN ARCHITECTURAL NOTICE OF ST. JOHN'S PRIORY, CLERKENWELL.*

By W. Pettit Griffith, F.S.A.

THE story of the religious Knights of St. John of Jerusalem (as well as that of the Knights Templars) has been so often told, and is so well known, as to render are petition unnecessary. Some authors have entered so enthusiastically into the exploits of the Knights as to lose sight of the buildings belonging to the Priory, and allude to them in a very cursory manner. Beyond the mention of the church by old John Stow, the tailor, in 1598, who, naturally raises curiosity by his statement that "the great bell tower was a most curious piece of workmanship, graven, gilt, and enamelled, to the great beautifying of the city," there is not much reliable information on the subject. The object of the present paper is to place on record certain facts and data connected with the Priory buildings, the result of discoveries and observations made during a residence of many years on the site of the Priory. The Priory was founded about A.D. 1100, by Jordan Briset, and Muriell, his wife, near "unto Clarke's Well" (now Clerkenwell), in the reign of Henry I. Ten acres of land were purchased for the above purpose of the adjoining Priory of St. Mary, and for those ten acres twenty acres were given in his lordship of Willinghale, in the county of Kent. The two principal objects of interest connected with this once important religious military institution are, the southern entrance, known as St. John's Gate, and the Church. These are both situated in St. John's-square, which latter, in old maps, is called St. John's Priory. St. John's-square was the Priory court, and bounded by the ancient buildings. In Robert Seymour's survey, 1735, it is named "St. John's-court, *vulg.* St. Jone's, St. John's-square." The enclosure walls can still be traced on the north, south, east, and west sides, and the modern dwellings in St. John's-square are mostly built upon the old rubble walls of the hospital. Fragments of the ancient buildings are frequently discovered.

The north boundary comprised the north postern, and the Priory buildings and walls extending from the north postern westward, towards Red Lion-street; and from the north postern eastward, towards St. John's-street. The foundations of the Priory buildings and walls form the foundations of the cellars under No. 19, and the basements of Nos. 21 and 22, on the north side of St. John's-square. An opening was made in the basement wall between Nos. 19 and 20, St. John's-square, on September 12, 1851, and the wall was found to be 7ft. thick, and formed of squared stone on the outer or north side, and chalk rubble within. Some of the stones had been used for windows, &c.; one stone was exactly similar in nature to the mantel stone found in the cellar by St. John's Gate, and was covered with black, shining, flinty particles, as if it had been subjected to fire. This wall was close by the northern postern. There are still in existence, beneath the houses on the east side of the above postern, walls 7ft. in thickness, and containing splayed openings. In tunnelling beneath No. 46, St. John's-square, for the main drainage, in August, 1863, solid concrete foundations of Priory buildings had to be cut through. The distance from the surface of St. John's-square to the bottom of the concrete was 26ft.

We are informed from the Minute Book of the Commissioners for Paving, &c., the parish of St. John, Clerkenwell,† that permission was granted on May 19, 1780, to Mr. Gabriel Gregory, the proprietor of the house adjoining (then about to be rebuilt) at the south-west corner of Jerusalem-passage, to take down the north postern, and thereby leave the south entrance to the above passage "open from the ground to the sky." The north postern was, therefore, covered; and, by the plan in the Commissioner's book, it appears to have been 17ft. 10in. long (inside measure), and 10ft. 1in. wide at the south end, and 10ft. 9in. at the north end, and enclosed next St. John's-square by a light enclosure, with a gate 10ft. 7in. high, and at the other (north) end, by a gate 5ft. 5in. wide, and 8ft. high. This was an outer gate in the north boundary wall, which latter was 3ft. 6in. in thickness at this part. The Priory was enclosed on the south side from St. John's-street (eastward) to towards Red Lion-street (westward), with St. John's Gate in the centre. Of the southern boundary there are St. John's Gate, and 67ft. of wall, extending westward from the gate, remaining. Of the eastern boundary, Hollar has given a view as it appeared in 1661. It portrays the east end of St. John's Church, with the hospital gardens and boundary wall, all of which faced St. John-street. Regarding the westward boundary, there are remains of the old Priory wall in Ledbury-place, being also the west garden wall of Bishop Burnett's house; and in the west garden wall of Dr. Adam Clarke's house, which adjoins Burnett's house southward, and in Red Lion Mews or Yard;—all these portions remaining formed a continuous wall, and was the western boundary. Cromwell mentions a circumstance which occurred in November, 1826, that seems to establish the probability that, previously to 1381, when the hospital was destroyed by Wat Tyler, its buildings extended southward beyond the present gate.

In excavating the ground on the east side of St. John's-lane, for the purpose of making a new opening into the sewer beneath, the workmen came to a wall between 4ft. and 5ft. thick, which crossed the lane from east to west; and, there can be little doubt, both from its situation and strength, formed part of the original erection of the hospitallers. This idea receives confirmation also from the discovery of a similar wall in digging out the ground for the foundation of the houses in Albion-place (formerly George-court), the direction of which appeared to be north and south. Of the early buildings, which were of the semi-Norman and Early English style, there are, besides the crypt, a few remains in the south wall of the present church next Jerusalem-court, and fragments have been found built in the basement walls of St. John's Gate; the latter I exhibited to the Society of Antiquaries in 1856.

ST. JOHN'S GATE.

St. John's Gate was originally built at the foundation of the Priory about the year 1100, and was rebuilt by Prior Docwra in 1504. This prior was the immediate predecessor of the last Superior of the House, Sir William Weston, and retained his office from 1502 to 1523. In Hollar's view of the gate, the effect produced by the battlements, then complete, is shown to advantage. In some respects, Hollar is not correct, the windows on each side of the large central arch, and window in both fronts, are in one light, while in the view they are shown in two lights. In alluding to the great multitude of prints of St. John's Gate, which have been issued on the exterior of the *Gentleman's Magazine* during the last 115 years, the editor of that publication remarked, in 1845, that they probably, in all, exceeded ten millions of copies, and presented, in succession, a considerable variety, arising from the respective taste or talent of the draughtsmen employed, whenever a fresh engraving became requisite. Hollar's view of the gate is the earliest extant, and is the most picturesque, but not the most accurate. It gives an undue altitude of proportions to the whole structure, and to its parts. In 1856, a view of the gate as restored superseded the old cut. I must now concisely allude to a few well-known events which have rendered St. John's Gate immortal, and will then return to the more immediate subject of the paper. In the reign of James I., 1604, the gate was inhabited by Sir Roger Wilbraham, and afterwards, it was the residence of Edward Cave, the printer, who in January, 1731, first published one of the oldest and most respectable of our monthly periodicals, the *Gentleman's Magazine*. Among the numerous visitors at that time were Goldsmith and Dr. Samuel Johnson (Cave being his friend and early patron). Dr. Johnson's pen was continually at work, and his pamphlets, prefaces, epitaphs, essays, and biographical memoirs, were continually published in the old gate, either by themselves, or in the *Gentleman's Magazine*. In 1740, and for more than two years afterwards, he wrote the Parliamentary speeches in the same magazine, and these were followed by his life of Savage, English dictionary, "The Vanity of Human Wishes," "The Rambler," and many other literary productions.

The debates penned by Johnson were distinguished from the reports which had preceded them by a greater energy of language, a more polished style of expression, and a closer attention to the relative bearing of the arguments advanced by the speakers on either side. They were written with great rapidity, and at times when he was able to raise his imagination to such a pitch of fervour as bordered upon enthusiasm, to indulge which without interruption his practice was to shut himself up in a room assigned to him at St. John's Gate. Here, no one was suffered to approach, except a compositor, or Cave's boy, for the manuscript copy, which, as fast as he wrote it, he put forth at the door. Boswell says that "when Dr. Johnson first saw St. John's Gate, he beheld it with reverence;" no doubt, referring to the edifice itself, with its chivalrous memories, and not, as has been supposed, in allusion to the magazine. Johnson himself was oftener to be found at St. John's Gate, where the *Gentleman's Magazine* was published, than in his own lodgings.

Cave died in 1754. The *Gentleman's Magazine* was continued by David Henry,* his brother-in-law, and Richard Cave, his nephew. The latter died in 1766, when Henry relinquished his business of a printer, and employed, as his agent at St. John's Gate, David Bond, who was so continued until the end of 1778. At that date a considerable share of the proprietorship of the magazine having been purchased by Mr. Nichols, it was, for the next two years, printed partly at St. John's Gate, and partly in Red Lion-passage, Fleet-street. In 1781 (just fifty years from its commencement), the magazine entirely left its native spot. It was printed for nearly forty years in Red Lion-passage, and afterwards for thirty-six years in Parliament street. In 1856 the magazine was published by John, Henry, and James Parker; and now Bradbury and Evans have undertaken the care of it. The walls of the present St. John's Gate are about 3ft. thick, of brick faced with stone 9in. thick, brought from Rye-gate. This stone was also used in building Henry VII.'s Chapel, in 1502.

Rickman considers the style of architecture of the gate to be Perpendicular work of pretty good character. On the ground-floor is a central arched entrance, with rooms on the east and west sides. On the north front, next St. John's-square, is a projecting tower on each side, and on the south front is also a projecting tower on each side, and as the rooms above-mentioned project beyond the centre, they form in appearance double towers, which give an imposing aspect to the south front, and constitute the front by which the hospital was approached from the City. In Hollar's view of the gate is shown an inner wooden erection for carriages and foot passengers, which was succeeded by a billiard room, which filled all the upper part of the gateway from the springing of the arch. This was purchased by St. John's Paving Commissioners for £62, and cleared away in 1771, and the arch repaired and restored to its original dimensions. Sir William Staines restored the masonry for £25.

In 1856, Mr. B. Foster, the occupant of the gate at that time, discovered one of the original stone chimneypieces, and a singular secret communication from the groined archway to the large room above. The chimneypiece is neatly moulded, with spandrils containing cruciform gilt ornaments; the opening of the fireplace is 4ft. 6in. by 4ft. 2in., and the stone is the same as that of which the gate is constructed. Over the chimneypiece is a relieving arch. The chimneypiece is restored and preserved, and also the chamber. The secret chamber or communication occurs in the inner side wall; the latter is 3ft. 4in. thick, and the former is 1ft. 11in. wide, and 2ft. 9in. in length; at the base of the chamber or shaft is an arched opening (now filled up) communicating with the open archway beneath the gate, and the top of the shaft is immediately under the floor of the hall. This communication may have been formed for the purpose of entering the billiard-room, although its appearance is not modern. In the room over the bar of the tavern, on the east side of the gate, another original chimneypiece similar to the one above described, has been laid open. In the interior of the gatehouse remain several stone arched doorways, recesses, &c., with ancient hook-and-eye hinges. The ceilings are mostly divided into compartments by large and boldly carved oak rib mouldings. On the south front of St. John's Gate are sculptured five shields in foliated panels. The central panel contains the arms of France and England, surmounted by a crown. The panels on each side of the above have the cross, the ensign of the Priory. On the next adjoining panels are a chevron engrailed between three roundels, and the cross in chief (Docwra's arms). And the next or outer panels have the chevron and three roundels, cross in

* Read at the Charterhouse, before the London and Middlesex Archæological Society.

† The first meeting of this Commission was held on May 13, 1771, Sir George Booth, Bart., in the chair.

* He possessed the freehold of St. John's Gate at his death, in 1792; he married Carr's (the architect's) sister, in 1736.

chief impaling a bugle horn stringed between three goats' heads erased. Beneath the above panels was the following inciription:—"tomas × Docwra × Prior Anno dni 1504—Sans × roro." The north front has three shields in cinque-foiled headed panels. The central one has the cross. On the left-hand side are the chevron roundels and cross in chief, and on the right-hand side the same, but with the cross moline as an impalement. Beneath the shield was "Anno dni 1504." In the groining beneath the gateway are sculptured bosses (and moulded ribs) ornamented with shields; on two are the Priory cross, and on two are the chevron, roundels, and cross. Upon the centre boss or keystone is the Paschal lamb.

The arms of the Priory were gules, a cross argent. The arms of Docwra were sable, a chevron engrailed argent between three plates, each charged with a palet or. In each angle of the gateway is a slender attached column, with moulded capital and base, from which the groined ribs spring. In the spandrils of the door head to the north-west tower are the Priory cross with a cock and a hawk, and Docwra's arms, with a hen and a lion. Shields with the arms of the Priory and of Docwra are also very sharply carved in an oak doorhead formerly on the south side of the north-west tower, in the ground storey of the gate. It was discovered in 1813, when this part was converted into a watch-house, and then used in a partition, which was taken down in 1866, and the room restored to its original proportion. The doorhead is preserved in the gate. The staircases were constructed in the towers on the north side next St. John's-square. They were spiral, of solid stone from the ground storey up to the first storey, and of solid oak from thence to the top. The stone staircase in the north-west tower was removed in 1814; the solid oak steps still remain, also the inner stone Tudor-headed doorways leading to the floors.

Numerous discoveries have been brought to light during the last thirty years through excavating for drains, foundations to new houses, &c. Among these may be cited the original pavement beneath the gate, which was 3ft. 1in. below the present level. St. John's Gate had a narrow escape in 1845. The new Metropolitan Building Act then came into operation, and the old gate was condemned as being dangerous, and it was proposed to compo it, and had I not formed a committee to restore it to its present condition the gate would have been destroyed. In 1846-7 the stonework was reinstated, the embattlements added to the north front and partly to the south front, and the angular turrets partly rebuilt, with new windows, &c., under my superintendence, by public subscription. St. John's Gate has been at various periods spoliated and modernized to serve the requirements of a tavern. The projecting tower in St. John's-lane, on the east side, was cut through and supportrd by a cast-iron column, which has disfigured the south front. The original stone mullions of the windows in the large room over the gateway have been removed, and miserable deal mullions substituted. All these alterations were effected many years prior to the restorations of 1846. In 1865 the freehold was purchased by Mr. Wickens, the present occupier, in whom the old gate has found another friend anxious to retain the fabric, as far as possible, in all its integrity. With this view, in 1866, £350 was expended upon its further restoration. The modern staircase on the west side was cleared away, and the oak staircase in the north-west tower (this staircase winds from top to bottom with solid oak steps and an oak newel) was restored; also the old stone doorway, formerly the entrance to Cave's printing office, in the same tower, was raised 3ft. in height, the continual raising of the street paving having shorn this doorway of its fair proportions.

Although not one of the City gates the Court of Common Council responded to the public appeals made for its restoration, and more recently in a stained glass window in Guildhall pourtraying Edward IV. making four citizens of London Knights of the Bath, is a representation of St. John's Gate. At the base is a label bearing the following inscription:—"Presented, 1866, by Samuel Wilson, Esq., Alderman of the Ward of Bridge Without, Aldermau of the Ward of Castle Baynard from 1831 to 1853, Sheriff of London and Middlesex 1833, Lord Mayor of London 1839." The tracing surmounting the whole contains in two separate compartments the arms of the City of London and those of the donor.*

* To be continued.

Archæology.

The Rev. Mr. Kell, the Southampton antiquary, states that upwards of 1,800 coins of Roman emperors were dug up recently at the Military Hospital at Netley, on Southampton Water; that more than half of them were Tetricuses, senior and junior; and that a great many belong to Victorinus and Claudius Gothicus. Mr. Kell thinks this confirms the opinion that these emperors assumed the sovereignty of Britain, and that the head quarters of Tetricus were at Clausentum, about four miles from Netley. At Clausentum, at Cadenham (in the New Forest), and at Sholing, three miles from Netley, Roman coins have been found, the majority of which have been Tetricuses. At Farringford, in the Isle of Wight, the seat of the Poet Laureate, Tetricuses have also been found.

In October last a man named Christian, in the employ of Mr. Woolston, builder, while digging at the rear of a house near St. George's Church, Stamford, bared an earthen vessel containing nearly 3,000 mediæval silver coins. They were claimed, under a recent Act of Parliament, by the Lords of the Treasury, in whose possession they have since been. On Wednesday week, Christian received a letter from the Treasury, stating that their lordships had resolved to allow him the bullion value of the coins, and if he would send an attested receipt for the amount the money would be at once forwarded to him. Christian will thus receive £95 3s. The remittance has been delayed in consequence of a claim having been made in behalf of the late Marquis of Exeter, on whose property the coins were found.

Leicestershire Architectural and Archæological Society.—A meeting was lately held in the Town Library, Guildhall, Leicester, the Rev. J. H. Hill in the chair. After the transaction of business in committee, Mr. Thomas Barwell, of Leicester, was elected a member. The following antiquities, &c., were exhibited:—By the Rev. E. Tower.—A small mortar-shaped metal vessel, 3½in. high, diameter at the top 4½in., at bottom 3¾in.) with cover, recently found in Peckleton churchyard, in this county. By Mr. Henry Goddard.—A Roman bowl of light red-coloured clay, turned on a lathe, 7in. in diameter, 4in. high. It was ornamented by a band of tool-marked impressions; a Roman ampulla or bottle (with one handle) 7in. high and 4½in. wide at its present greatest diameter; also a Roman vase of light brownish red coloured ware, 4in. high, and 2½in. at its greatest diameter. These were all found about 6ft. below the surface, in Belgravegate, Leicester, in 1866. By Mr. J. H. Thompson.—A handsome eighteenth century seal bearing a coat of arms, with crest on separate seal attached or detached from the coat of arms by means of a spring. By Mr. North.—A key found on Naseby battle field, by John Fitzgerald, Esq., previous to the year 1827. It is about 5in. in length, with intricately formed wards. By Major Knight.—A large photograph (which he presented to the society) of Saxon antiquities found last year at Glen Parva, in this county, and which were exhibited, soon after their discovery, at a meeting of this society.

Cambrian Archæological Association.—The opening meeting of the annual congress of this association was held at the Shire Hall, Hereford, on Tuesday night. The Rev. Archer Clive took the chair, in the temporary absence of the president, Lord Saye and Sele. He said their object in meeting at Hereford was to trace, as well as they could do, the vestiges of the various peoples that, at different times, had exercised sway over the county. With regard to British remains, he did not think they could point to anything, as certainty of this origin, but encampments. There were other remains, possibly British, besides encampments, and especially he referred to a small cromlech—a miniature Stonehenge, at Mirvage Point, where there were two upright stones, with a cross piece on the top. The next race that had been over that county were the Romans, but, except in the neighbourhood of Kenchester, there did not appear to be many Roman remains in the district. At that place a tesselated pavement, and other evidences of a Roman villa, had been found, but he was not aware of anything having been discovered on the other side of the Wye. There was a Roman road called Stoney-street, leading from Kenchester towards Longtown, at the foot of the Black Mountains, but it did not reach as far as Longtown. The Saxons hardly penetrated so far as to settle in the county. Offa's Dyke was pretty nearly the boundary of their power, and he thought they had not effected any permanent settlement to the west of it. Domesday Book showed that there was a mixed population at Archersfield—a considerable number of Welsh, and perhaps some Saxon families. After referring to the Norman castles and churches erected in the county, and the rebellion of Owen Glendower, he spoke of the gradual disappearance of the Welsh language. Round the Black Mountains Welsh was spoken in Herefordshire to a late period. He read a letter from Colonel Nehemiah Wharton, who commanded a detachment of the Parliamentary army sent during the civil war from Worcester to take the city of Hereford. He wrote to his superior officer from Hereford that "many of the people speak Welsh," and he described them as a stalwart people, "totally ignorant of the ways of God, much addicted to drunkenness and swearing, so that the very children swear stoutly." The chairman had heard, when a boy, from Mr. Scudamore, M.P. for Hereford many years ago, that he could recollect people who spoke Welsh in the neighbourhood of Kentchurch. The Welsh language, however, had gradually receded, and it was not now spoken on this side of the Black Mountains, but within 25 miles of Hereford they would still find families who speak Welsh.

PURCHASES AT THE PARIS EXHIBITION.

The Commons' select committee on the subject of making purchases from the Paris Exhibition, whose report was lately published, had the testimony of several gentlemen of high authority. Mr. Robinson, of the Science and Art Department, recommends the purchase, for the South Kensington Museum, of some of the important typal works made expressly for the Exhibition, expressions of the industrial art of the period; also, for our schools of art, some specimens of oriental art, in particular those that would teach in point of colour; and, lastly, specimens of manufacture, to be given to our manufacturing towns. He points out, too, the importance of the prompt acquisition of great works of ancient art, in view of the increasing competition for them. His colleague, Mr. Redgrave, represents the necessity for placing before our artisans objects best calculated to educate the eye and the hand, that we may raise the power of the English artisan to design and execute noble work, and not be obliged to send for French workmen for this purpose. Mr. John Webb says that the strides of France now are collessal, and, next to France, Russia is improving more than any other country:—"The French have so many examples, which they can see in the public palaces, of great State furniture, from the time of Francis I. down to the Empire that their eye gets accustomed to these things, and they can take models or drawings, and have every opportunity to bring their work to perfection." In this country, says Mr. Huxley, the museums are only open on week days, which are not the holidays of the working classes. Mr. Webb is certain that we have some lost ground to make up. He considers that between the Exhibitions of 1851 and 1862, this country made greater progress, relatively, than France, but since 1861 France has made much greater progress than this country. He never saw anything like the profusion of fine furniture the French now exhibit. Mr. Cole represented to the committee that this great assemblage of remarkable things in Paris gives us an opportunity of helping industrial progress in this country in every direction, and he holds that £100,000 might be well invested in purchases, not merely to obtain a supply for South Kensington, but to help all our large towns, now so eager for improvement, to assist in elevating the thousands now about to have the suffrage, and to aid us in holding our own in the competition of the world. Various purchases are specially recommended by one and another—the Meymar collection of Arabian ornament, the Fourdinois walnut-wood cabinet, a collection of national costumes, the Castellani collection of peasant jewellery (typal specimens of "Democratic art"), of which last collection Mr. Cole says that if the Government will not purchase it, he would go down on his knees and beg Birmingham to buy it. He proposes that the vote to be granted should be laid out under the direction of a committee, not of technical men, for it only requires common-sense judges, who sympathise with the object, and take advice as to

the articles to be purchased. Although many precious things at the Paris Exhibition may now have been sold, reproductions of them might be secured. Mr. Cole thinks there are signs that most of the princes of Europe will come into a sort of bund to allow each other to make reproductions and casts from the treasures of any of their number. He mentions that this last year a remarkable work has been obtained from Spain. Mr. Robinson went to Santiago, and obtained a cast of the "Glorious Gate of Santiago." There were many difficulties; the convent and the ecclesiastical authorities had to be solicited, but they allowed a cast to be taken, which has never been done before. "They said mass for the man who made it, and gave him a testimonial that he had done no damage when he came away." In regard to the collections at South Kensington, Mr. Webb offers to purchase the whole from the nation at an advance on what was given for them; and Mr. Cole calls attention to the beneficial influence of that institution upon the taste and upon the trade of the country. Its specific object is to improve the industrial manufactures of the kingdom, by bringing art principles into direct relation with them, and other countries are establishing similar museums. He mentions that Mr. Whitworth has just offered to deposit at South Kensington three original true planes, and a measuring machine or instrument demonstrating the millionth part of an inch, and he proposes, also, to provide by endowment for the delivery of lectures to explain such instruments.—*Pall Mall Gazette.*

PROPOSED DESIGN FOR THE NEW LAW COURTS.

OUR lithographic illustrations this week represent views of Lockwood and Mawson's proposed design for the New Law Courts. Having, on a preceding occasion, fully noticed this design, it is not necessary to make any further observations on it now.

FRENCH WORKMEN AND THEIR WAGES.

A REPORT rendered to the Foreign Office this year by Mr. Julian Fane, secretary of embassy at Paris, speaks of wages of skilled artizans in various towns in France as ranging from 5f. to 10f. a day; for inferior workmen, from 2½f. to 3½f.; for workwomen in a clothing establishment, from 2f. to 4f. or 5f.; for children, from 1f. to 2f. The *Society of Arts Journal* thinks that the general rate of money wages in France may be said to have increased about 40 per cent. in the last fifteen years, but the rise in money wages has been accompanied by a very considerable rise in the price of the ordinary articles of consumption and in rent of lodgings, so that the improvement in the position of the labourer, meaning his power to supply himself with the necessaries and comforts of life, has been far from commensurate with the rise in the money value of his labour. Still, the relative proportions in which money wages and the price of commodities have risen leave a margin in favour of the former, and to this extent there has been a rise in real wages, enabling the labourer to feed, lodge, and clothe himself somewhat better than he could fifteen years ago. This has been the natural consequence of the rapid development of industrial enterprise and the increased demand for labour; and it may also have been affected by the greater facilities afforded to the labourer by the influence of opinion, and recently by legislation, to claim a larger share in the profits of production. It is difficult to estimate the relative price of labour in England and France. The rate of money wages may be higher in one country than in the other, but no just comparison can be instituted unless the quantity and quality of labour supplied in each case are fairly appraised. It is a question which only experts can decide, and they differ upon it. Combinations to influence the rate of wages were formerly punished in France as misdemeanours, but three years ago a law was passed, under which they are not illegal unless accompanied by violence (including insults), or menace, or fradulent manœuvres, including false representations. Ample advantage has been taken by the workmen of this change in the law. There is scarcely a trade in France whose members have not combined in the last three years for the purpose of increasing the rate of wages and diminishing the duration of labour, and their efforts to this end have usually met with success. The employers, for the most part, assert that the law has proved to them an unmitigated evil, submitting them to the tyrannous coercion of the employed. Various forms of the co-operative system are in course of trial in France, with a view to prevent or lessen this collision of interests. The association of masons, for instance, is one that has met with remarkable success; some of the workmen are shareholders, and others are engaged as ordinary labourers, and have no share in the profits, while some members of the association are simply holders of capital. In other establishments the workmen are allowed to share in the profits of the business by means of rewards or prizes allotted to them, or to the more worthy among them, by the proprietors at the end of the year, or by facilities for procuring food, clothing, lodging, and education for their children on advantageous terms. Mr. Fane gives it as his judgment that the fault in the organization of the co-operative societies has been generally too much faith in the combination of skill and labour, and too little regard for the advantage of capital; and that the workman should aim at becoming, in some measure, a capitalist himself, by the aid of societies of consumption enabling him to effect savings in expenditure, before he seeks to become a co-operator with the capitalist in industrial enterprise.

PROTECTION AGAINST FIRE.

THE report was issued last week of the Select Committee of the House of Commons appointed to inquire into the existing legislative provisions for the protection of life and property against fires in the United Kingdom, and as to the best means to be adopted for ascertaining the causes and preventing the frequency of fires. The committee advise a general building act for all towns and places in the United Kingdom governed by municipal corporations, &c., similar to the Metropolitan Buildings Act and to the Building Acts of Liverpool, the suggestions of professional witnesses as to the thickness of walls and other details being taken advantage of in passing such an act. In all buildings composed of shops below and dwelling-houses above, the committee recommend that the floor immediately above the shop should be made fireproof, and that there should be a ready means of escape from the roof; also, that the floors of all large lodging-houses for the poor be made fireproof, and that there should be ample means of escape. It is a somewhat singular fact that the architects, builders, and district surveyors who were examined before the committee, deposed that when a fire takes place in a warehouse, iron is of little use in stopping its progress. Generally speaking, they prefer wood well plastered for fireproof purposes to iron, and some of them gave a preference to wooden stairs instead of stone, as the latter crumble with the heat. It seems that bills for the supply of water by companies or local authorities containing clauses providing that the water need not be constantly laid on, have been allowed to pass without investigation, and the committee recommend that it should be made a standing order of the House that such bills shall be referred to the referees to inquire whether sufficient reason exist for such provisions. Where it is proved in an investigation that the fire was caused by culpable carelessness, the person or persons implicated should be deemed guilty of a punishable offence. As to fires that are wilfully caused, on referring to the evidence the committee find that these are to be traced to several sources. 1. To individuals and organized gangs of men who make a trade of it to defraud the insurance companies. 2. To parties who have been unfortunate in business, and who cannot meet the claims made upon them. 3. To persons in warehouses to conceal theft of goods made by them on the warehouses. 4. To malice. The witnesses concur in the belief that an inquiry made into all fires would reduce the gross number of them. The police, or fire brigade, should initiate the inquiry and report to an authorized officer, whom the committee think should be the coroner, anything that appears in the least suspicious; the officer should examine witnesses, or, if he thinks proper, impanel a jury; and any person shown to be implicated should be prosecuted at the Central Criminal Court. The coroner should be paid partly by fees and partly by salary out of the rates. The committee specially recommend that no claim should be settled by any insurance company without a certificate from the police or fire brigade, or officer appointed to conduct the investigation into the origin of the fire; but this certificate should not debar the insurance officers from opposing the claim if they think proper.

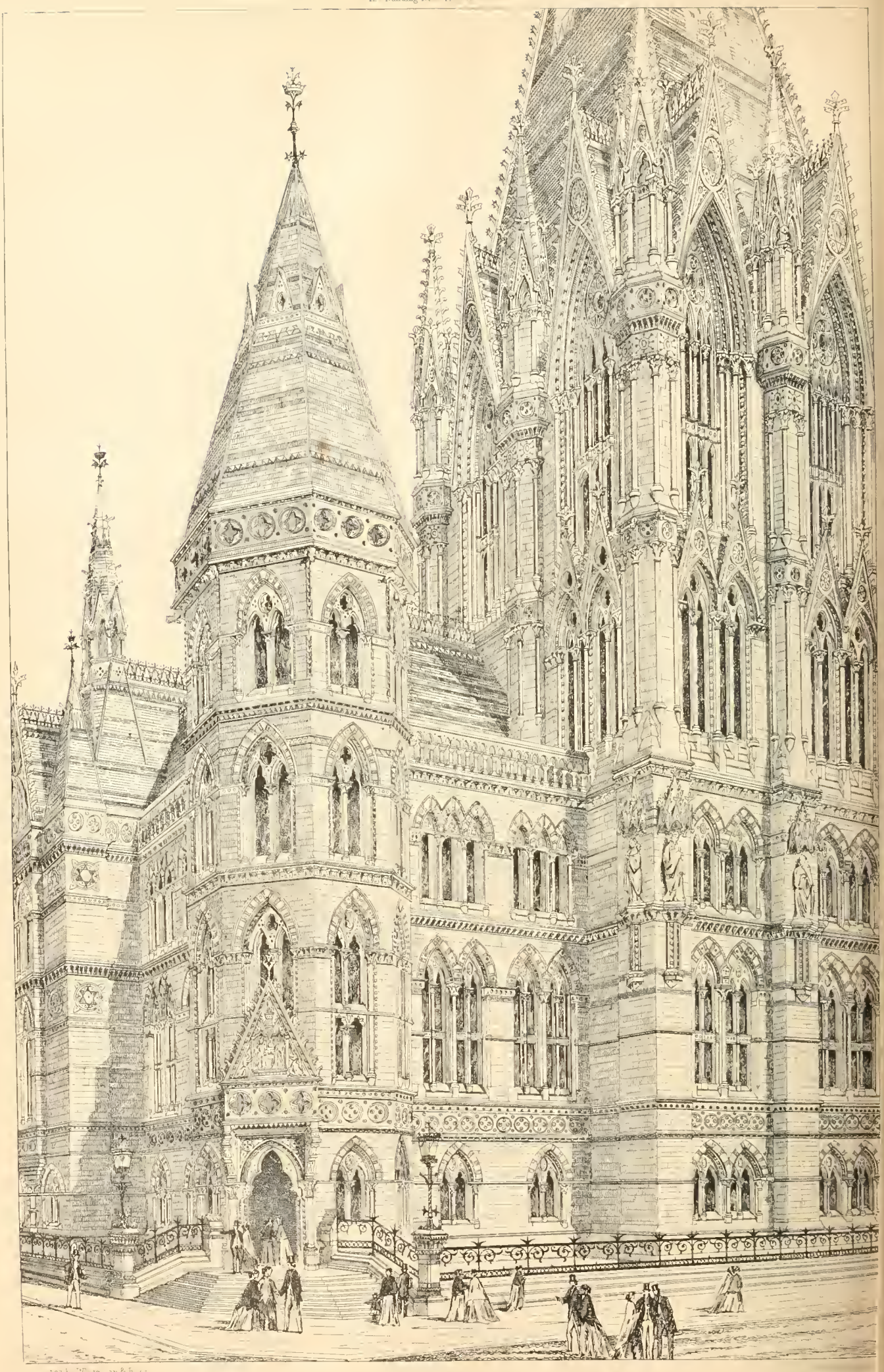
A GIGANTIC TREE.

IN travelling from La Victoria, a small town in the province of Aragua, towards Puerto-Cabello, in Venezeula, the road leads, in part, along the northern shore of the Lake of Valencia, situated in a longitudinal valley nearly 1,500ft. above the level of the sea. This valley is of unsurpassed fertility, and Humboldt, the great traveller, calls it one of the most charming realms he has ever seen in all his travels. In the middle of the road above mentioned, three miles west of Turmero, stands the famous Zamang, an enormous tree, belonging to the sub-order Cæsalpineæ. It is not so much on account of the height or the dimensions of the trunk, for which this tree is celebrated; but it is the size, and especially the horizontal diameter of its head, that attracts our attention. Its head is somewhat of the shape of an open umbrella, and covers very nearly an acre of ground. In 1857, Mr. A. Fendler, an American, measured the head in its greatest diameter, from E.S.E. to W.N.W., most carefully, and found it to be 206ft. 11in. Fifty years preceding it was found by Humboldt to measure, in its greatest diameter, 192ft., French measure, which is equal to about 204ft. 6in. English. Hence, we see, that this extraordinary tree has, within fifty-seven years, increased the horizontal diameter of its head only by 2½ft., from which we may infer that it is of a good old age. The natives assert, moreover, that as far back as the discovery of the country by the Spaniards, three and a-half centuries ago, the Zamang was, even at that early day, reputed for its enormous size. At the time Mr. Fendler saw it, it was but thinly covered with leaves, and seemed to lack vigour of growth. The natives hold it in high veneration, and it was against the law to break even the smallest twig. Besides their own enormous weight, the branches sustain the additional weight of an astonishing mass of succulent heavy epiphytes and parasites, such as bromeliads, orchids, cacti, mistletoes, and fleshy piperaceæ.

SCHOOLS OF ART.

IT is reported that 99 schools of art are now in operation, 5 of which are new during the last year. Upwards of 17,000 students are receiving instruction in art in these central schools, and the total numbers taught drawing in all central schools, schools for the poor, and night classes, are over 105,000. The fees received exceed £18,000. These figures, after due allowance made under recent minutes, indicate some slight increase on previous years. It is also reported that the art scholarships lately instituted for the purpose of making the art schools of the country and the art collections at South Kensington bear more directly on manufactures and industries, have attained the end contemplated. It appears that two national art scholars are engaged in carrying out the decorations of the Kensington Museum, and two more are also now modelling decorations in terra-cotta for the Wedgwood memorial in the Potteries. Students in the etching class are under the instruction of Mr. Lane, A.R.A. Thirty-nine art schools throughout the country, that is, more than one-third of the total number, have borrowed works from the Kensington Museum as aids to study. Under recent minutes 32 night art classes have been established for pupils above 12 years of age in parochial schools and working men's institutions, which number is after the rate of nearly one night class for three towns possessing central schools throughout the country. Schools for the poor have now control over the art instruction of their pupils, and assist in the conduct of annual examinations. It appears that 560 of such schools have already availed themselves of recent provisions made in furtherence of national art education, and that 80,084 children in these schools have been taught drawing during the past year. The number of prizes awarded to art schools and classes generally has considerably diminished; the department, it was understood, considered that prizes had of late been in excess.

The fine organ at St. Mary Redcliff Church, Bristol, has been removed to the chancel from the west end, at an expense of £800.



Portion of Design for Proposed New Law Courts. — LOCKWOOD & MAWSON, ARCTS

Proposed Design for the New Law Courts. Strand Front.
LOCKWOOD & MAWSON, ARCHTS

CHEMICAL GEOLOGY.

DR. PERCY has delivered a course of twelve lectures on this subject, at the Museum in Jermyn-street, and the series, though necessarily condensed and adapted to popular acceptation, yet enabled the lecturer to interest an attentive if not very numerous audience by adverting to, and to some extent exemplifying, certain of the leading phenomena of this the most scientific branch of geological inquiry. It is not with the order and stratification of rocks, or with their mineralogical characteristics, that this subject deals, but it embraces a contemplation of the elementary constituents of the several substances, and of the conditions under which their respective combinations must have taken place. As the letters of the alphabet admit of all the transpositions of the dictionary, so do the sixty atomic elements supply all the forms in which mineral, fluid, and organic bodies exist. The elements are few, but the combinations numberless. As an example of the chemist's mode of reasoning, and the force of his conclusions, let us take the rock "granite." This consists of particles of mica, felspar, and quartz, varying in proportion, but always presenting the quartz in a crystalline form. Now, the prevailing theory is, that granite has always been originated by the fusion of the components at an intense heat. But the chemist says it was not so, for at a very high temperature quartz loses its crystalline character, and becomes amorphous or formless. Thus, one of the most generally accepted opinions of the physico-geologist is challenged and laid open to further investigation.

Silicon is never found alone, but in conjunction with oxygen it becomes silica, and silica is everywhere. The number of minerals into which it enters is more than two hundred. Flint is the typical substance, but it is also associated with stones of great beauty and value. Silicious clay mixed with lime produces excellent bricks, the silicate of soda is an ingredient in soap, and butter is supposed to be commercially imitated by water glass and train oil.* With regard to dolomites, so much esteemed for building purposes, Dr. Percy conceives that in some at least there has been a secondary action—that is to say, when one material has been first deposited, another has been combined with it by a process of percolation or infiltration. Many very interesting changes are thus wrought out by secondary action, continued not merely for years or even centuries, but vast immeasurable epochs.

Such processes have been experimentally imitated in the artificial production of gems, such as the ruby and sapphire, and, in a ruder way, by Ransome's patent stove. The value of peroxide of iron as a cementing agent was pointed out, and the advantage of mixing iron borings with gravel for concrete suggested. Pounded bricks or burnt clay always formed a constituent of Roman mortar. Zinc paint, though possessing less body than lead, and therefore not a favourite with painters, was recommended on account of durability and other favourable qualities. The lecturer adverted to many points of great interest, and we may notice that upon a subject of such vital import as the exhaustion of the coal measures the opinion he expressed was most satisfactory and reassuring.

* From Dr. Percy's information, coupled with that derived from a recent application to Sir R. Malins, to restrain the use of a label on bottles containing "anato," a yellow dye used for colouring butter and cheese, it seems possible that as science advances the production of butter may become wholly independent of the dairy.

THE LATE SIR ROBERT SMIRKE, R.A.

CONSIDERING the great eminence which he attained in his profession, something more is due to the memory of Sir Robert Smirke, R.A., than the brief notice which appeared in our pages at the time of his death, in April last. An affectionate tribute by Mr. Edward Smirke, read before a recent meeting of the Institute of British Architects, furnishes us with many additional particulars of the life and labours of his late distinguished brother. It has been previously stated that the father of Sir Robert Smirke was an historical painter of considerable repute in his day. He (the son) was born in the year 1780; at the age of fifteen, as we gather from this memoir, he was, on the recommendation of Mr. George Dance, received as a pupil in the office of Mr. (afterwards Sir John) Soane, who was then engaged on the works at the Bank of England. For reasons unknown, young Smirke did not remain with Mr. Soane more than twelve months. The same year (July, 1796), he became a student of the Royal Academy, and shortly afterwards obtained a medal from the Academy for architectural drawing. In the following year he received a like medal from the Society of Arts; and, in 1799, his talent and diligence won for him the gold medal of the Royal Academy for design. The next four or five years were spent in visiting the principal cities in Europe, including Athens, where he met Lord Elgin, then busily engaged in those researches which eventually secured to this country those inestimable treasures of art with which we are all now familiar. It is not generally known that Robert Smirke was the author of an illustrated manual on infantry drill. This work was written on his return home about the year 1805, he, along with his two brothers, and father, having meantime entered the volunteer force which was raised for the defence of the country in those stirring times. The fact that "A Review of a Battalion of Infantry" remained in use in the regular forces as late as 1840, is no small proof of the value of this manual. About this time also, Mr. Smirke announced a work on continental architecture, the first part of which consisted of coloured engravings of Italian buildings and interiors. The series, however, was soon discontinued. His first important commission was Lowther Castle, in Westmorland, erected about the year 1806. From that date down to the period of his final retirement from professional engagements in 1845, "it may be said with truth," remarks his brother, "that there never was any interruption in his continuous employment." It would be a difficult task to enumerate all the works, public and private, of which Sir Robert Smirke was the architect. His earliest employment on public works was in connection with the Board of Trade in 1807, and the new Mint in 1809. As one of the architects of the Board of Works, he erected the General Post Office, the British Museum, King's College, the Custom House, and Millbank Penitentary. He completed one of the most magnificent sides of Somerset House, which Sir W. Chambers had left an imperfect fragment. He designed for Mr. John Kemble Covent Garden Theatre, burnt down in 1856, and which was greatly admired by many judges; and he was the restorer, on two occasions, after its destruction by fire, of grand old York Minster. Lowther, Eastnor, and Kinfauns Castles are important examples of his domestic architecture on a princely scale. We must pass over a host of minor works executed by this eminent architect. Apart from pure design, he possessed great original constructive ability, and architects owe much to the late Sir Robert Smirke on this score. The French engineers, it is well known, used concrete before it was used in this country as a substitute for the large baulks of timber which fifty years ago was the usual mode of giving stability to walls in soft foundations, but Sir Robert Smirke was the first to apply concrete systematically for architectural purposes in this country. It is also worthy of note that no architect before his day thought of the use of cast iron as a building material until Sir Robert introduced it.

As regards estimates, another important service was rendered by Sir Robert Smirke to his profession. "It was he who initiated the present system of taking out quantities, by employing surveyors on either side, in order that proper estimates might be given. Formerly it was left to the builder only to take out his own quantities; but, having surveyors on the part both of the architect and the builder, and they agreeing as to quantities, the matter resolved itself into the mere putting the amount to those quantities." Sir Robert was the recipient of numerous honours during his long and successful career. In 1808, he was elected an associate of the Royal Academy, and became R.A. in 1811. In 1831 the Office of Works was remodelled, and his services dispensed with, as an attached architect, he received the honour of knighthood. In 1853, he was honoured with the gold medal of the Institute of British Architects, of which he was one of the original founders. He held the treasurership of the Royal Academy for more than thirty years. This office he resigned on going to reside at Cheltenham in 1850, and subsequently finding that his declining health interfered with the efficient discharge of the duties of the Royal Academian, Sir Robert resigned its honours, that they might be conferred upon a younger and more active man. In private life very few men have been so highly esteemed. "I can undertake to say," remarks his brother, "that I do not recollect a single client with whom he had important transactions of a professional kind who did not in the result become his fast personal friend." It is not of every one in whatever profession of life that the same could be said. We make the following extract from Mr. Edward Smirke's paper, as it has reference to a question of considerable interest to architects. "It is well known that he (Sir R. Smirke) never prepared designs for public works in competition with any of his professional brethren. It is true that, on two occasions, he was invited, at the instance of the Government, to prepare designs. The Houses of Parliament may be cited as an instance of this, where the design and execution were eventually intrusted to another gentleman, a most distinguished architect, in consequence of the subsequent adoption of the principle of competition by order of the House of Commons. On such occasions, my brother withdrew wholly from the arena, not in dudgeon, but for reasons which will readily suggest themselves to those who may have themselves been placed in the like position. With respect to architectural works, founded on special votes of the Commons, it seems probable that this sort of qualified commission will, at this day, be generally resorted to. In such cases it is not likely that gentlemen who occupy the position in which Sir Robert Smirke then stood, will usually consider the terms of such a conditional engagement acceptable, for their time would be too valuable to tempt them to the possible loss of it. With others, and especially younger practitioners, the state of things is different, and the invitation may naturally and reasonably induce them to embark in an adventure that may perhaps terminate in a lucrative and creditable engagement. This principle of competition can, as we all know, plead very orthodox precedents in the best days of Italian art. We know that Cosmo designed to invite the emulation of all the sculptors of the academy to provide models of statues in competition for the Sacristy of Lorenzo; but we also know that he looked to one of the greatest of them all, then eighty years of age, to guide and direct him in his judgment, and thus the real difficulty was, in that case, surmounted,—namely, the selection of such judicial referees as may at once secure the public from a lamentable failure of judgment, and obtain for the competitors a fair, unbiassed consideration of their claims. Whether the former of these objects has always been practically secured, at least in architectural works, is, I fear, still open to question. It must be obvious that, in architectural rivalry, even the most attractive designs and admirable drawings do not neces-

sarily imply competent constructive ability to direct and superintend the execution of the work."

The late Sir Robert Smirke was emphatically the architect of his own fortune, and his distinguished career ought to stimulate all the younger members of that profession of which he was so great an ornament to "go and do likewise."

LOCH KATRINE WATER.

If we are to believe Drs. Wauklyn, Chapman, and M. H. Smith, of the London Institution, Finsbury-circus, a great deal of what has been written about the purity of the Loch Katrine water has been pure romance. In a recent letter to the *Lancet* these gentlemen say:—"We have recently made an examination of the Loch Katrine water as supplied to Glasgow. The water was taken from one of the mains in Glasgow. The result of the examination is calculated to surprise many persons, for the Loch Katrine water has often been cited as a model water. We find that 1,000,000 parts of this water contain putrescible organic matter corresponding to 0·13 parts of ammonia. The numbers for the New River water which supplies some parts of London, are 0·09, and for the Southwark and Vauxhall Company's water, taken from the Thames, high up the river, 0·20. The Caterham water, and also a spring in the Greensand, near Dorking, contain no putrescible organic matter. These facts point to the propriety of seeking for a supply of drinking water from springs, and not from rivers and lakes."

RENDERING PAINT UNINFLAMMABLE.

A new method of rendering paint uninflammable has been invented by Mr. J. B. Harris, of Germantowo, Kentucky, U.S. The invention consists in the combination with ordinary oil paints of calcined schist, shale, or mineral coal, which is reduced to a chalky and pulverous condition, and freed from all hard and gritty particles. The schist, shale, or coal is subjected to heat in a retort or kiln till all the bituminous and volatile substances have been expelled therefrom and the residuum has been reduced to a friable and pulverous condition of a light grey or pearl colour. This pulverous residuum is then bolted through a fine sieve, to free it from all hard lumps and gritty particles, and is then mixed with the paint and ground in boiled linseed oil. The quantity of the calcined schist or shale required to render the paints uninflammable will depend in some degree upon the body or other qualities of the various paints employed. For white and red lead the following proportions may be used:—Three parts (by weight) of the calcined schist, shale, or coal to one part of the lead; and for ochres and umbers four parts of the calcined material to one part of ochre or umber; for other paints the proportions should be about the same as those last mentioned. No turpentine is used as a dryer, but japan, litharge, or dryers of a thin material should be employed. The prepared schist, schale, or coal being, as before stated, of a light grey or pearl colour, may be added to any paint without materially changing its hue, but a paint without this ingredient may be used as a finishing coat if desired. The chalky calcined residuum may be produced from nearly all kinds of mineral coal, but the slightly bituminous schists or shales found in coal mines are the best. When this improved composition is applied to wood it will resist the action of flame, sparks, and live coals, so that floors painted with the composition will not be liable to take fire from the falling upon them of burning coals. Roofs of buildings will also be protected from the danger of being ignited by sparks escaping from chimneys or burning shingles and other light-burning substances carried by the wind from burning buildings in the vicinity.

PARLIAMENTARY NOTES.

The Canning statue was again the subject of discussion in the House of Commons on Saturday. On the report of Supply being brought up, Mr. Beresford Hope availed himself of the opportunity to call attention to the proposed removal of the statue from its present position; and to the general arrangements of Parliament-square. The honourable member for Stoke intimated that in his opinion the present site is a perfectly appropriate one. If they moved back the statue to its old site they would, he warned them, destroy the perspective effect of the locality. Colonel Wilson Patten replied on the part of Lord John Manners. He referred to objections alleged to be entertained by Mr. Canning's relatives to the removal of the statue from its former site, and explained that when a discussion took place respecting a site for a statue to the late Sir R. Peel, the persons engaged in the consideration of the subject declined to interfere with the statue of Canning lest it should be objected to by his friends; whereupon the late Lord Canning remarked that he had no objection to the statue of his father being removed. After some further discussion the report was received.

The select committee appointed to consider the defective construction of the House of Lords in reference to hearing examined Professor Tyndal, Mr. Barry, and Dr. Percy, and then agreed to a report stating that owing to the near approach of the close of the Session the Committee found it impossible to complete the inquiry, and recommended that the consideration of the subject should be resumed at an early period of the next Session.

The Traffic Regulation (Metropolis) Bill, was opposed, on the order for its second reading, on Wednesday, by Mr. Alderman Lawrence. The objections of the hon. gentleman, however, applied chiefly to questions of detail, and on the assurance of Sir J. Fergusson, on behalf of the Government, that these should be duly considered in committee, the bill was, after some discussion, read a second time. The order for reading the Metropolis Improvements Bill a second time was discharged, and the bill withdrawn. The Hours of Labour Regulation Bill was considered, as amended, read a third time, and passed. The Artisans and Labourers' Dwellings Bill, which stood for committee, was withdrawn, Mr. M. Torrens intimating that he should bring it in again early next session.

Building Intelligence.

CHURCHES AND CHAPELS.

The little church of All Saints, West Barkwith, has been restored under the superintendence of Mr. Withers. It now comprises a nave and chancel of equal breadth, viz., 15ft. 9in., and 46ft. long, with a north-eastern vestry, a south-western porch, and a western tower. The east window is an unequal triplet of trefoil headed lancets; the aisle windows are small couplets. There is a good Third Pointed tower with angle oblique buttresses of four stages, a good belfry storey, and a three-light Third Pointed window at the west end. The total cost was about £600.

A reredos has been added to the village church of All Saints, Holton, Lincolnshire, by Mr. Withers, at a cost of £300. The design consists of two sides of mosaic with angels in lozenge-shape figures, and in the centre a composition of a marble cross, in an aureole of mosaic flanked by rich mosaic panels. There is a strong Italian feeling in the whole. The cartoons and stonework were executed by Messrs. Bell, Redfern and Co., the actual mosaic by Salviati.

The commencement of the new Congregational Church, West Cliff, Whitby, was celebrated on Monday. The foundation stone will be laid on September 11, by Mr. S. Morley, of London, who has contributed £300 in aid of the building fund. The architect is Mr. Pritchett, of Darlington; and the builder, Mr. R. Robinson, of Whitby. The total cost of the building, including land, will be about £4,000.

A new Wesleyan chapel has been begun at Winlaton, near Gateshead. The building will be in the Gothic style, with a frontage of 60ft., and will give sitting room to 250 persons. The architect is Mr. Thomas March, of Blaydon.

The first portion of the contract for the restoration of the nave, and other enlargements and renovations of Bristol Cathedral, has just been taken by Messrs. Rogers and Booth, of Gosport, at the sum of £14,270.

A new church at Leighton Buzzard has just been consecrated. The style is of the latter end of the thirteenth century, with a French element introduced. The extreme length of the building is 110ft., the width being 74ft., and consists of nave, north and south aisles, chancel, vestry, organ chamber, and north-west porches. The materials used in the construction are the local sandstone, with Bath stone dressings. All the columns are of blue Pennant. The floor is laid with Staffordshire squares, and the sacrarium and chancel with encaustic tiles manufactured by Messrs. Dering and Hargreaves. The tower is placed at the north-west corner of the building, and, with the spire, is 110ft. high. Messrs. Garridge and Holderstock, of Leighton, were the builders, and Mr. J. E. Neate the architect. The total cost was about £3,000.

Easthampstead.—The church of St. Mary and Michael, Easthampstead, has lately been rebuilt. The present building comprises a nave 56ft. long by 27ft. broad, a chancel, a north aisle, separated by an arcade of three from the nave, a vestry to the south of the chancel, a short quasi-transept on the south-eastern side of the nave, a south-western porch, and a baptistry at the west end, the latter being an unusual arrangement. The architectural style of the church is severe Early Pointed, with plate tracery. The east window has three trefoiled lights, the middle one being lower than the sides, with a sexfoiled circle above. The chancel arch has triple-shafted piers in coloured marble, and the tower arch has corbelled shafts of marble. The works, on the whole, have been successfully and thoroughly carried out under the care of Mr. J. W. Hugall.

St. Andrew's (Scotland.)—In our last we notified the fact that a new cathedral church (St Andrew) was about to be erected here. Mr. R. Anderson, Edinburgh, is the architect, and the following are the principal features of the building. Total length, 122ft.; nave, 176ft. long and 25ft. broad; aisles, 10ft. broad; choir and sanctuary, 35ft. long and 22ft. broad; height to eaves of nave walls, 31ft., and to ridge of roof, 57ft.; the tower is 10ft. square at the base, exclusive of the buttresses, and the height to the top of the spire is 160ft. The style of architecture adopted is that of the thirteenth century. Internally, the nave is divided from the aisles by a row of five arches on each side, and from the chancel by a lofty moulded arch springing from corbel shafts. The roofs of the nave and chancel have inside ceilings of wood, their tranverse section being a pointed arch; the ties and king posts are the only constructional parts seen longitudinally. The ceilings are divided into panels from ridge to eaves, which will be filled with appropriate coloured decorations. The whole of the nave and aisles will be seated with open deal benches for a congregation of 600, and the choir will be furnished with a throne for the bishop and stalls for the clergy and choir.

BUILDINGS.

The local board of health for the district of West Ham are about to build, at Stratford, a new vestry and contingent offices, at an outlay of £12,000, exclusive of site. No designs have been sent in as yet, but a plan of the ground can be obtained from the surveyor, at the offices of the District Board, Stratford, on payment of 5s.

Earl Grosvenor, M.P., laid the foundation stone of a new infirmary at Macclesfield on Thursday week. A gentleman connected with the trade of the town has endowed the building with a bequest of £30,000. The architect is Mr. Stevens, and the contractors are Messrs. Mill and Son, of Manchester.

The new plans in reference to the new grammar school at Ayr, Scotland, will cost about £1,200. The contractors for the mason work are Messrs. Andrews and Monkton, and Mr. J. Mitchell for the joiner work.

A handsome new bank has just been completed at Newcastle, Staffordshire, for the Manchester and Liverpool District Company. It is in the Italian style, the lower part of the façade, which is of bold character, being built of Hollington stone, and the upper part of bricks, with stone dressings, and surmounted by a prominent cornice. The builder's work has been executed by Mr. W. Sutton, from the designs and under the superintendence of Mr. T. Lewis, architect, who designed the interior fittings, which have been made by Messrs. Edwards.

Johnstone.—Some months ago, several architects were asked to submit plans to a committee of gentlemen in Johnstone, Renfrewshire, who were chosen by the subscribers to select the most suitable design for their proposed new public hall. Mr. Lamb, of Paisley, was the successful competitor, and the building has now been contracted for,

and will be commenced immediately according to his designs. The principal elevation of the building faces Ludovic-square, in a frontage of 50ft., and it has an elevation to Church-street of 90ft The large games room will be the principal feature in the entrance floor of the building. It is 61ft. 8in. long, by 23ft. 5in. broad, with a ceiling of 17ft. It is well lighted and ventilated. It will give ample space for from 100 to 150 persons to be engaged at any kind of in-door game, from billiards down to dominoes. To the left of the entrance hall is placed the reading room, which is 45ft. 4in. long, by 16ft. wide, and is also a well-lighted and comfortable room. Next it is the library, 16ft. square, and further on is the directors' room, which is 16ft. long and 11ft. 4in. wide. On the ground floor are all the necessary conveniences, including bath room, lavatories, urinals, and water closets. The upper floor is all taken up as a public hall, with the necessary appurtenances. It is 62ft. long and 46ft. wide, and will be seated for about 600 people. The ceiling is 26ft. high, and the hall is well lighted and ventilated. The elevation to Ludovic-square is a handsome one in the modern Italian style, the walls pierced with large Venetian enriched windows. The door-piece, which is a prominent feature, is surmounted by an ornamental balcony, entered from the upper entrance hall, from which speakers can address the people assembled in the square. The elevation to Church-street is plain.

Rhayader.—The foundation stone of the new schools was laid a few weeks since. The structure when completed will be a considerable ornament to the town and will accommodate 120 children. The architect is Mr. E. H. Lingen Barker, of London and Hereford, and the contractor for the works Mr. William Evans, of Rhayader.

TO CORRESPONDENTS.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the Editor, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

Received.—J. H.—R. P.—R. A.—K. and Sons.—B. C.—D. J. N.—H. H. V. (large photo)—H. and Co.—T. D. R.—T. P., Bradford (answered by letter).—J. W. B. (with photo)—W. O. L.—F. H. L.—T. P.—B. F. O.—J. C.—J.—G. R. E. H. L. B.—E. W. G.—E. W. P.—T. B.—J. A.—F. F. M.—J. H.—F. R. and E. W.—W. T.—J. W.—A. L. W.

"A Non-Competitor" ought to send his name and address.

T. P., Bradford.—The proportions of old stone altars with illustrations will appear.

X. Y. Z.—We shall be glad to receive a statement of facts from our correspondent.

J. T.—We think your plan will work exceedingly well. Why not make a model?

W. Young.—Apply at the office in Great George-street, they will give you every information you may require.

P., Sheffield.—You must write again giving full name and correct address.

Correspondence.

NEW VESTRY HALL FOR STRATFORD.

To the Editor of the Building News.

Sir,—May I ask you to insert the accompanying letter?—I am, &c., E. W. Godwin.

197, Albany-street, Regent's Park, N.W.
August 3, 1867.

Sir,—I observe in the Building News this week an advertisement, signed by you, the object of which is, I presume, to secure good designs for the premiums you offer.

Permit me to make four remarks on the terms of your advertisement. 1. "The premiated designs will become the property of the Board." This, in other words, means that you wish to secure something more than a good architect. As the cost is to be £12,000, the usual charge for the drawings alone, if you employed an architect in the usual way, would be £300; three sets of drawings, illustrating three different designs, would therefore be valued at £900. For these you offer £175. But even were you to employ an architect, in the usual way, his plans, for which you would pay £300, would not become your property, unless by special agreement. Is it, therefore, too much to ask you to reconsider this, and strike out the clause I have quoted?

2. "The Board do not guarantee to carry out any design thus submitted." As the only prize in a competition which can in any adequate way repay a good architect is the work itself, it strikes me that you exclude, by this clause, all chance of obtaining amongst your competitors men of experience and of any professional reputation. Moreover, the two clauses, taken together, read somewhat like this:—We want designs for a building to cost £12,000, but, instead of paying the architects the fair, recognized commission, we will get designs by way of competition. We will pledge ourselves to nothing, secure the drawings of three architects for £175, and our surveyor can cook the three up into an architectural *rechauffé*. As this cannot, I presume, be your meaning, why not avoid the impression produced by this clause by striking it out, and in its place affirm that the first premium *will be* granted, under professional advice, to the best design, *and that the architect of the best design will be employed to build your hall*, which, of course, by no means pledges you to build the design which you premiate?

3. "In the event of one of the competing architects being employed the premium will merge in the commission." This, again, is unusual, except in those cases which are distinguished for what is called sharp practice. The premium is an honorarium for the trouble taken in competing, when the competition is decided. Your architect has just as much trouble as if there had been no competition, so that by "merging the premium" you get the labour of the competition, as regards the best man, for nothing, and, therefore, the whole labour of those in the profession who choose to compete is thought by you to be only worth £75. This clause also, you will, on consideration, I hope, strike out, and so give yourself a chance of getting plans sent you by others than pupils and assistants.

4. "Further particulars, &c., may be obtained *upon payment of 5s.*" So that, with three hundred applicants, you may really manage to make the competitors themselves pay the premiums. As the first is to merge in the commission I cannot but trust that you will amend this clause by omitting the part I have underlined.

I have been thus bold to write you in the hope that you may follow the example of Manchester, and, by correcting your terms of advertisement, give some confidence to the profession, and, at the same time, some chance—nay, a certainty—of a good building being secured for your town. I may add that I know no one who would compete on your present terms, and who could be regarded as in any way fit to design such a building.

That you may get plenty of designs from crude, half-educated youths, who are just able to draw, is quite possible. They have nothing to do, and they may as well practise drawing and designing in competitions as in schools; but, by altering your terms, as suggested, you would get designs from men who have been in practice for years, who have built public buildings, and whose works are known to be more or less meritorious.—I am, &c., Edward W. Godwin.

Charles Wilson, Esq.

POPLAR NEW OFFICES.

Sir,—The letter of your correspondent "Delta," in your last number, clearly sets forth this disgraceful affair in all its glaring injustice, and proves that your correspondent "B," whose letter appeared in the number for May 31, was a true prophet. It is no unusual thing to see local genius (?) rewarded with the first premium, but in this case the committee throw aside all regard for justice or propriety, and we find the first, second, and third premiums awarded to men of local influence, who are connected by ties of friendship or relationship yet unformed (as we learn) with members of the board. Can it be that in Poplar and its vicinity only that true architectural taste is fostered? If so, happy the architect whose lot is cast in this place. But the judgment which former experience has led us to form of the working of the Poplar board would suggest that the reputation they have acquired for partial dealing and jobbery has lost nothing of its lustre in this new instance. The architect who has laboured to keep his design within the limitation of cost prescribed by the instructions stands no chance whatever when premiums are awarded to others whose designs are estimated to cost £1,900 more than the sum therein named. You have done much to cry down these abuses, but I fear that while architects are obliged to enter into competitions like this, it will be very long before these things are arranged in a straightforward honest manner.—I am, &c., Fairplay.

August 13.

ANCIENT AND MODERN FURNITURE.

Sir,—I was very much pleased to see a letter on ancient and modern furniture by "J. M. S." in your last week's impression, having read a letter by Mr. Phillips in the previous week's number. I could not help thinking that Mr. Phillips had written in a very sneering spirit in reference to Mr. Talbert's designs. To me, those designs appeared clothed in the true spirit of Gothic work, divested of the rudeness of construction found in most of the old work. To all men like Mr. Talbert, who are publishing sketches with a view of improving the style of our furniture, our best thanks are due, and if either Mr. Phillips or any other gentleman can offer suggestions, by all means let them do so in a kind spirit, and with the view of helping the movement onwards. If not encroaching upon your time, I may mention that one great objection to Mr. Talbert's designs is the expense, so far as the public generally are concerned. At the same time, I do not see how that class of furniture could be designed with a greater regard to economy than has been already shown, but it appears to me that if Mr. Talbert and gentlemen who, like him, have turned their attention to Gothic furniture would design furniture which could be produced, in a great measure, in the lathe, they would be doing great service. Take, for instance, the "Cromwell" chair, with its turned legs. Why not carry out the same treatment in tables, cabinets, bookcases, and the like? Such furniture could be produced at a small cost by any cabinet-maker, thus giving truthfulness of construction, and at the same time lead the public on to an appreciation of the class of furniture which Mr. Talbert and others have set before us from time to time. The fact is, we want furniture for the middle classes, cheap, good, and useful, with a shade of the Gothic spirit thrown into it, if I may so express myself.—I am, &c.,

Daltonian.

Dalton, Huddersfield, August 7.

WEST LONDON SYNAGOGUE.

Sir,—The absence of Mr. Hardwick from London has necessarily caused a delay in replying to Mr. H. H. Collins's letter in your paper of the 2nd inst. The writer there states that "Mr. Phillip Hardwick was not (I am informed on undoubted authority) ever consulted, either directly or indirectly, nor was his advice asked or given with regard to the merits of the designs submitted." We have now the authority of Mr. Hardwick to state that he was consulted, and that he did advise the committee upon the merits of the designs submitted. With respect to the latter part of the letter, in which Mr. Collins modestly denotes what might have been the selection if Mr. Hardwick's advice had been acted upon, we can only say that the writer is, if possible, still more inaccurate than in his previous assumption. —We are, &c., The Successful Competitors.

32, Moorgate-street, August 12.

PRESERVATION OF TIMBER.

Sir,—My friend, Mr. T. Matthews, resident engineer of the North London Railway, having to-day kindly sent me your publication of the 26th ult., with special reference to your article on the above subject, and having received in June, 1865, a silver medal at the Cologne Exhibition for creosoted sleepers, I beg to offer you in loan, for using in any way you think proper in your well-known journal, two printed papers with the reports and awards of the jury, and also translations of same. The Count of Westphalia's report is a very able, exhaustive, and interesting one, and cannot fail to command your attention.

The North British Railway Company have just decided to discontinue creosoting their sleepers, after having had opinions from the engineers of the leading railways in the kingdom, the majority of these gentlemen having expressed themselves in favour of not creosoting, not, however, *per se*, but as applied to railway sleepers for use in this country, where comparatively few decay from rot, but the large proportion from wear and tear, such as splitting, and the chairs cutting down into them, from the chair base being too limited in area. The latter is being gradually put an end to by increasing the area, and if 6in. or 9in. were

added to the length of the sleepers, splitting would be of much less frequent occurrence. Still, with Baltic red pine sleepers at their present price of from 2s. 2d. to 2s 6d. each, and the cost of creosoting 6d. to 8d., each bearing such a high proportion to that price, it will no doubt be less and less the practice of railway companies under the present financial depression to creosote or otherwise preserve their sleepers. I speak only of railway companies in this country, where the improvements in ballasting, which for some years have been extensively carried on, have given the sleepers a dry bed and greater freedom from "working." In India and elsewhere abroad where damp, dry rot, and insects destroy unpreserved sleepers so rapidly, I say by all means creosote, and for all soft wood timber used in the construction of piers, bridges, and similar works—I say, do the same.—I am, &c.,

James Deas, M.I.C.E.

North British Railway Company,
Engineer's Office, Glasgow,
August 12.

WOOD-WORKING MACHINERY IN THE PARIS EXHIBITION.

Sir,—An official report of English Wood Working Machinery has been published in the *Illustrated London News* of August 3rd, in which commendation has been accorded to several exhibitors of the above description of machinery, and to which no doubt they are entitled. Without imputing any motive, I think justice has not been done me by the total omission of my name from this report, as it is to me that the only silver medal (the highest prize in this section) has been awarded. The expense and pains on my part of contributing to the English display of machinery (mine being all in motion) has, of course, been very great, and it certainly is not unnatural for me to expect to be at least mentioned in connection with the others; and, moreover, it appears to me a very poor compliment to the jurors "to make conspicuous by its absence" the name of the recipient of the highest award.—I am, &c. S. Worssam.

London, August 13.

WROUGHT-IRON GIRDERS AND JOISTS.

Sir,—It has often occurred to me that as, in the present age, the employment of wrought-iron girders and joists is carried to such an extent, that some one does not get up a work giving practical rules for calculating their strength. It is true there are works that treat slightly on the matter, but they are of no earthly use to a man of plain education. It is rather late in the day for a man of forty years of age to go to school to learn how to work the first four rules of arithmetic, by A. B. C. I find that most writers on the subject adopt, to me, an unknown jargon, when simple multiplication, division, &c., might be used so that a man with a very little learning might solve the dimensions of any required girder or joist, without troubling his neighbours. What is wanting is that some person would give plain tables and rules for wrought iron girders, same as Turnbull has given in his valuable ones, for cast-iron girders, columns, &c.

There is a case represented by "Head," in "Intercommunication," in the last week's Building News, which I firmly believe that I would be able to learn navigation before I could answer his question. I look forward with great interest to the questions and answers in your paper, and in which so many useful hints are from time to time given to practical men.—I am, &c.,

Francis Hansom Luscom.

Intercommunication.

QUESTIONS.

[528.]—MEDALS.—I have heard it frequently asserted that architects ought, among the multifarious items of information they are expected to possess, to understand ancient medals, or at least to study them. This seems to me, however, to be a branch of knowledge not absolutely essential, although not without interest. Perhaps some one or other of your correspondents may feel disposed to indicate what may be considered the strongest claims that ancient medals have upon the attention of architects, sculptors, and others. —A. C.

[529.]—RESONANCE.—It has often puzzled me to understand exactly what is meant by resonance. Some say it is "reciprocated vibration," but the explanation is not satisfactory, or even clear. It has been said that two watches lying upon the same table take the same rate of going, though they would not agree with each other if placed in different departments—and this is attributed to "resonance." I must confess it passes my comprehension. Can anyone explain the phenomenon of reciprocated vibration?—Aleph.

[530.]—SEWERAGE.—What do you recommend as the best mode of constructing sewers in the lower parts of large towns, and where the sewers are likely often to be quite full of water, &c.? I have tried Roman cement for two-thirds of the height of the inverts of egg shaped drains, but this has not always been successful. A hint or two upon this subject would be most valuable.—Sub-stratum.

[531.]—WEIGHT OF ANGLE IRONS.—Will some of your correspondents inform me where I can obtain a table showing the weights per foot run and sectional areas of angle and T-irons used in the construction of iron roofs and girders for bridge work, &c.? I find that none of the pocket books used amongst engineers give this information. —T. W.

[532.]—POLISH FOR TURNED WORK.—I should be obliged if some one would inform me of the best polish for turned work, and the best way of applying it when in the lathe.—J. P.

[533.]—SUNK CHURCH.—There is on the hill side below Sawcliffe, in North Lincolnshire, a huge mass of travertine, of serpentine form, about 40 yards long, and rising above the surface 7ft. or 8ft. in some parts of it, the water from which it was deposited being now carried down by an under drain. It has been called out of memory "Sunk Church" or "Sunken Church." According to a note in Wordsworth's "Sonnets on the Duddon," there is a "Druidical circle about half a mile to the left of the road ascending Stoneside from the vale of Duddon; the country people call it 'Sunken Church.'" Can I be informed of other antiquities, natural or artificial, bearing this appellation?—J. F.

[534.]—INCORRECT QUANTITIES.—A gentleman is about to build a house. If he employs an architect and he misrepresent the quantities to the contractor, is the gentleman liable for the amount that the architect may make, if he receives the benefit?—A. B.

[535.]—DUTCH TILES.—I would feel obliged if some kind subscriber could inform me where Dutch tiles are sold, and the price; also, what are the usual sizes, and if they are decorated, and in fact as durable as British tiles? —B.

536.—LEAD PIPES.—Can anyone inform me if water passing through lead pipes, from a deep well (say 40ft. deep) be poisonous, and, if so, what is the best substitute for lead?—Life.

[537.]—PERIODS OF GOTHIC ARCHITECTURE.—I wish some one versed in the history of architecture would tell me the exact periods when the different styles of Gothic architecture began and ended. For instance, when did the "Early English" begin and end?—W. Williams, Llandudno.

[538.]—BRIDGEWATER TILES. — If some of your readers who are acquainted practically with Major's Patent Angular Corrugated Bridgewater Tiles would inform me, through your "Intercommunication," in what their advantages or disadvantages consist, he will confer favour on—A Subscriber.

[539.]—ART COPYRIGHT BILL.—Can any of your readers inform me if this Bill has ever passed into law, and, if so, whether by any of its provisions architects have protection in the buildings as well as in the designs from which they were erected?—Subscriber.

[540.]—MOUNTING TRACINGS.—Will some of your readers inform me, through your "Intercommunication," the best method to mount tracings on linen or drawing paper? Also what kind of paste is most suitable for the purpose?—Ignoramus.

[541.]—ARCHITECTS' PUPILS. — Would some one kindly inform me whether an architect is bound to take his pupils to the several buildings he may be superintending, to give them a practical knowledge of the profession? I happen to have a master whose sole object is to get all the work he possibly can out of me, and he never takes the least pains to instruct me; and I have been in his office nearly three years, and he has never once taken me out to any of the buildings, or taught me to take levels, or anything. Is there no redress? I am articled to him, but paid no premium.—Articled Pupil.

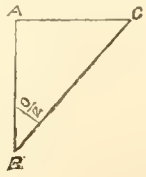
REPLIES.

[460.]—BATH STONE.—The coloured part of the stone will stand the weather equally well with the rest, and is, like all discolorations in building stones, due to the presence of iron. Bath Box, being an oolite, contains more than one per cent. of iron upon an average, and the presence of it in larger quantities at any particular spot gives rise to the darker appearance in the stone. The only method of having stones without these streaks upon the face is simply to reject them for facework and put them in the backing.—Clerk of Works.

[466.]—SURVEYORS' CHARGES.—Will you allow me to inform "Surveyor" that the usual commission for taking out quantities for builders to estimate their tenders from is 2½ per cent. upon the cost of the works. I would recommend to the notice of "Surveyor" a little book, "Student's Guide for Measuring and Estimating Artificer's Work," where he will find much valuable information upon the subject he alludes to.—Apprentice.

[467.]—DISSOLVING SHELLAC.—By far the best substance to dissolve shellac in is alcohol. As that substance is one of the chief ingredients of sealing wax, the experiment may be made by putting a small piece in some of the spirit. Sealing wax reduced in this manner to a liquid state is an excellent material for putting lines in various colours upon large railway maps for committee and parliamentary purposes.—An Engineer.

[470.]—RETAINING WALLS.—As the writer of the article in question, in the Building News of April 26, I beg to give "J. J." the information he requires. The word "area" is a misprint for "pressure," since the pressure varies as the area into the tangent of the angle θ. The expression is obtained as follows:—In the triangle ABC let A equal the area or cubical contents for the unit



of length, then the pressure is a maximum as already shown where the angle ABC equals $\frac{\theta}{2}$. Consequently, putting P for the pressure, we have $P = A \times \tan.\frac{\theta}{2}$. Calling AB the height of the triangle = H and AC the base = V we know that $A = \frac{H \times b}{2}$. But from the trigonometrical solution of right-angled triangles we have $b = H \times \tan.\ \frac{1}{2}\theta$, and substituting this value in the equation for A, we have $A = \frac{H^2 \times \tan.\ \frac{1}{2}\theta}{2}$, and finally, since $P = A \times \tan.\ \frac{\theta}{2}$, we have $P = \frac{H^2}{2} \times \tan.^2 \frac{1}{2}\theta$, the equation given in the article. —Writer.

[475.]—ARCHITECTS' PUPILS.—The case of "One of Them" may be truly said to be "One of Many." Both in the offices of engineers and architects the pupils are left very much to themselves, and, in fact, it all depends upon themselves whether they leave the office at the expiration of their "time" with a fair knowledge of their duties or with none at all. At the same time, where there are regular indentures, in which the master promises to teach the apprentice his business, he is undoubtedly bound to do so. It would, however, be difficult to draw the line, and to dete mine what constitutes "teaching an apprentice his business," or how much of his time an architect is bound to devote to his pupils.—S. G.

[476.]—VEGETATION.—Stones upon which vegetation has been once allowed to appear will never look so clean and uniformly coloured as if they had not been allowed to fall into that state. The vegetation can be killed by the application of a solution of any of the ordinary corrosive acids, such as sulphuric or nitric, and the stone can be cleaned afterwards by scrubbing in the ordinary manner in which way all facework in stone is always cleaned before the scaffolding is taken down. It is the last operation before the work is "stripped."—Assistant.

[479.]—OVERTIME.—With your permission, I will give "T-square" a little practical advice touching his complaint. No pupil can demand remuneration from a master, and such an idea would not be entertained by any magistrate or court in the kingdom. There is also no absolute rule respecting the time of pupils, as the time varies in different offices, and in parliamentary time the pupils in an engineer's office, for instance, work night after night until a late hour. At the same time, it is very questionable whether a master could compel his pupil to return to the office in the evening, at least certainly not systematically, although in the case of emergency he would doubtless be justified in so doing.—M. M.

[482.]—FILTERS IN PUMPS.—It may be possible to filter water, as suggested by "J. W.," because the water could be pumped up through a filter which would allow the water to pass up as well as down through it. Strainers are always attached to pumps, and filters being nothing else than very perfect strainers, there is evidently no reason against the practicability of the plan, but, at the same time, I never heard of such a method. The filter beds of waterworks are arranged to filter water something after the manner proposed by "J. W.," but a system that would pay very well upon an extensive scale would be exceedingly costly when applied to insignificant cases, such as the one proposed.—Waterworks.

[485.]—RAISING BUILDINGS BODILY.—When I wrote the reply to "Sceptic's" question as to whether it was true respecting the tales told of moving houses bodily in America, I found that I should trespass too far upon your space to have given a reply to his last question as to how it was done, thinking also that other writers would have written more fully upon that part of the subject. As "Alpha" has remarked that we have, none of us, acquitted ourselves properly, and he has endeavoured to remedy this deficiency from his reading, I will, with your permission, give my experience as seeing it practised in New York and elsewhere. If the house is to be lifted only for the purpose of putting another storey underneath, they commence by knocking three or four holes through the foundation on each side of the house, a foot or two below the first floor, as they call it, but which would be our parlour or ground floor. These holes are large enough to admit baulks of timber to go through from end to end and project each side 3ft. or 4ft. The timbers are larger that pass from front to back; those going from side to side are smaller, and rest upon the larger ones, the holes in the foundation being cut accordingly. These timbers being levelled, and screw-jacks placed underneath, the walls are made good by wedges being driven in on top of the timbers, and the house braced up to them, when the remaining portion of foundation wall is taken away, and the house is left standing upon its new timber foundation, and this upon the jacks. The rest is simple enough, the only thing being to take proper precautions that one jack has no more strain than another, and upon this one point lies successful house moving or lifting. If the house is required to be moved bodily away to another site the same operations are observed, excepting the holes in the foundation are large enough in the direction of the move to admit of two baulks of timber, one on top of the other, with the surfaces in contact with each other, made very smooth and well greased, identically the same as the ways of a ship's launch. The house being lifted, and the foundation upon the new site being built to the same height as the old, the house is then launched along the said ways of timber by the aid of screw-jacks to the new foundation, care of course being taken of the jacks, precisely the same as in lifting. When over the new site, the house can be raised to any height thought proper; or, by substituting fresh ways in the direction to which the move is required, it can be turned round upon its foundation (as cited in my former letter), as was done in the case of the one on the corner of Hick and Atlantic-streets, Brooklyn. Apologising for the length of my communication, I beg the favour of its insertal. Of course, these details vary according to circumstances, but this is what is substantially done in all cases.—Thomas Burgess, Bristol.

[494.]—WEIGHT OF LIME.—The average weight of stone lime per bushel is 70lb., unless it be of an hydraulic character, when it will average fully 10lb. more.—Mortar-board.

[495.]—PIGEONS.—I do not think it would be a safe plan for "G. W. F." to proceed to violent means to relieve

himself of his enemies. Let him try and get some of his neighbours to join him in indicting the birds as a nuisance, and if he succeeds a magistrate will make an order for their removal.—Law.

[500.]—MICROSCOPE-PERSPECTIVE.—In answer to "J. S." he may blacken the inside of all tubes of optical instruments with powdered lampblack, mixed with a weak solution of gum or shellac. With respect to his attempts at drawing, he is evidently making his lines too fine, which is a common mistake. If he will make them a little stronger he will find that after being rubbed once or twice with the india-rubber they will come out sharper. Experience will teach him how to keep his paper clean. Dirty paper is inevitably the accompaniment of the productions of all young draughtsmen. As a rule, let him use the rubber as little as possible, and spread a sheet of tissue paper over the drawing, only uncovering the part he is working at, and, above all, never lean the elbow and arms upon the drawing unless it be covered.—Draughtsman.

[502.]—ADMIRALTY SURVEYORS.—Your correspondent may rely upon one fact, that if there is one department in the whole of our red tape and inefficient system of governmental management that is more rotten than another it is the Admiralty, and to dream of obtaining any appointment or situation in connection with it, unless one has good interest, would turn out like all dreams, a miserable delusion.—A Competitor.

[503.]—ZINC FOR ROOFS.—Will "A. H." be so good as to name the building where the Vieille Montagne Zinc Company have done a job under his supervision, and how many years since it was done. I quite concur with him that either for lead or any other material sound carpentry work is most essential. I would also feel obliged to know what the thickness of the material in question is, and the weight per foot superficial, and price for laying same.—Research.

[512.]—MUIR'S VENTILATOR.—In answer to your correspondent 512, I give him the address—Mr. C. Reece, plumber, &c., Bradford. He is both maker and seller of Muir's ventilators by right.—Wm. Hoolt, 4, North Brook-place, Bradford, August 13.

[519.]—DELIVERY OF WATER IN PIPES.—From the W equation "Head" will find

$$H = \frac{W^2 L}{4{\cdot}72^2 D^5}$$

and from the D equation

$$H = \frac{{\cdot}538^5 W^2 L}{D^5}$$

These are plainly equivalent, and may be expressed thus:—

$$H = \frac{W^2 L}{22 D^5}.$$

—E. L. G.

[524.]—FURNACE OVEN BUILDING.—If "Clerk" could get the loan of Peter Nicholson's "Builder's Director," or buy it, he will find out what he requires. As for getting hints on such matters, I would say that any common village mason could furnish him with the information he requires, as far as regards furnaces or coppers. The side walls of an oven should not be more than 12in. high, and the arch of a very low segment. The plan should be oval shape.—Research.

WATER SUPPLY AND SANITARY MATTERS.

It is intended, we believe, by the Corporation of Halifax to apply to Parliament next session for increased water powers, the new supply to be drawn from Wadsworth Moor.

Aberdeen.—The Town Council at their last meeting, approved of a report by one of their committees on a scheme for the irrigation of certain sandy meadows with the sewage of the city. To carry out the scheme a low-level sewer will require to be constructed, from which the sewage of the low-lying part will be pumped up to a reservoir, the quantity requiring to be lifted being estimated at 100,000 gallons per day; and the committee was instructed to call for tenders for the construction of 600 yards intercepting sewer as a beginning. The pumping lift will be 7ft., and the engineer calculates that 10,000 gallons of water per day, taken with a fall of 120ft., will supply the necessary power to the turbines and pump. £8,500 is stated as the probable cost of the limited scheme, and the council, with the oft-quoted Craigentinny Meadows, at Edinburgh—which rent at £27 8s. per acre—before them, anticipate it will be a remunerative one.

Greenock.—The new Gryfe Waterworks were inaugurated last week, and an abundant supply of pure water will be insured for the future for this town. The reservoirs, tunnels, and filters have been taken by responsible and first-class contractors for £67,500; but in this sum there is nearly £10,000 for filters, leaving £50,000 for the other works, which include two reservoirs with an aggregate capacity of 1,200,000,000 gallons, and a tunnel about 1½ mile long. The engineer of the works is Mr. R. Forman.

STATUES, MEMORIALS, ETC.

The long expected monument to the Duke of Wellington, upon which Mr. A. Stevens has been engaged for several years, is now nearly finished, and in all probability will ere long be publicly shown.

The Late Bishop of Hexham.—During last week a memorial to the memory of the late Dr. Hogarth, Bishop of Hexham and Newcastle, was erected in the Darlington Cemetery. The memorial is composed of a basement of Park Spring stone (polished), on which stands an obelisk of polished granite, the plinth being in colour dark red, the base dark grey, with mouldings of light grey, and a red shaft, with a carved capital of light grey, surmounted with a gilt cross. The monument stands about 31ft. high. It is from the design of Mr. E. W. Pugin, architect, London, and is estimated to cost about £300. The contractors are Messrs. Priestman, of Darlington.

The Carlisle Memorial.—The corner stone of this memorial at Castle Howard was laid on Tuesday. The design is by Mr. F. P. Cockerell, architect, London. It is a Grecian column standing on a square platform, and rising from a flight of steps on one side, with pyramidal ornaments at the four angles. The column, which is 120ft. in height, has a rich capital with a pendant wreath, and supports a metal tripod, holding an urn. The stone used will be from the Whitby neighbourhood. The cost of the column will be over £2,000, and of the memorial Gothic chapel about £1,000 more. The contractor for the work of art is Mr. Bailey, of York; and the erection will be under the supervision of Mr. John Chick, of Whitwell.

LEGAL INTELLIGENCE.

Infraction of Copyright.—Edwin Gates, a printseller, carver, and gilder, 33, Goldsmith's-row, Hackney-road, answered to a summons before Mr. Newton, issued at the instance of Messrs. Graves, the well known picture dealers, of Pall Mall, for having infringed the provisions of the Copyright in Works of Art Act, 25th and 26th Vict., by selling four copies of prints, respectively called "The Railway Station," "Ordered on Foreign Service," and "A Piper and a Pair of Nutcrackers," well knowing the same to have been unlawfully made. He was fined £3, or a month's imprisonment.

AMERICAN ITEMS.

The State of North Carolina now offers for sale all her public swamp lands, amounting to about 1,500,000 acres. These lands are said to be very fertile and well adapted for grazing purposes. Some of them have already been drained, and the remainder are susceptible of drainage at a moderate expense. The lands are sold to aid in developing State resources, and to support the common schools.

The *Mobile Tribune* says:—"The State of Alabama alone is capable of supporting 15,000,000 of white people. Its iron is equal to that of Sweden; its coal-beds, in extent and quality, surpass those of Pennsylvania; its marble rivals that of Carrara. With proper cultivation its soil can be made to feed and clothe an immense population."

The *Muscaline* (Iowa) *Journal* records the discovery of an ancient brick, supposed to have been made something more than ten centuries ago, on the bank of the Cedar River, near Lord's Ferry, 4ft. below the surface of the ground. Further investigations are to be made, in the hope of finding ancient ruins.

Co-operation is established in Canada, co operative associations having been formed in Montreal, Toronto, Hamilton, and London; and steps have been taken to form a co-operative society in Ottawa. The various trade societies formed in New York are in a flourishing condition. The Operative Bricklayers' Association in that city has a membership of 1,600, and a balance of 4,000 dollars in its treasury. The Painters' Protective Association, in the same city, has 1,300 members, and 1,800 dollars in cash. At a recent meeting this society voted 100 dollars to help the caulkers in Chicago, who are now on a strike.

Table Rock, at Niagara Falls, was successfully blown away from the main rock on the 26th inst. by a second blast of powder, which removed what a first blast had left. Visitors can now reach the sheet of water at the base of the Falls without danger from falling rock.

Eastern visitors to Chicago were formerly astonished by the accounts of the great feat of raising the Fremont House. This immense structure was elevated several feet, to make it correspond with the raised grade of the street. This operation was carried on so quietly that the boarders and transient guests of the hotel were not disturbed in the least. Now, however, a larger "raising" is going on in Milwaukie. The greatest wheat-elevator in that city is to be raised some feet. The elevator is 280ft. long, 86ft. wide, and 130ft. high. It was built on a marsh, on piles. Since its erection, it has settled over a foot, and it is supposed that it has now reached a solid foundation. As the building is estimated to weigh 10,000 tons, the task of raising it would seem somewhat difficult, but a responsible firm have undertaken it, and there seems no reason to doubt their success. Four hundred holes have been cut through the foundation, through which timbers are placed, and, under them, 1,600 screws are to be put, which will easily raise the immense structure. The cost of this operation is estimated at 30,000 dollars.

General Items.

The Corporation of Halifax has decided to ask for tenders for the re-erection of the North Bridge there. The cost will probably amount to some £15,000 or £20,000.

The three first turnpikes established in England to collect tolls were at Stilton, Hunts; Caxton, Cambs; and Wadesmill, Herts. These were erected in the reign of James II., and gave so much discontent that many lives were sacrificed in the riotous attempts to put them down.

A curious experiment has been decided upon at Liverpool. About 500 dwellings are to be erected for working men at a rental of 5s. per week, which would include not only all taxes but a free pass morning and evening for the workmen from a station to be established in connection with the London and North Western Railway.

Mr. Welby Pugin, in a letter addressed to the *Globe*, in which he condemns, as is his custom, almost everybody and everything connected with modern architecture, says:—"Take the Palmerston Buildings for the City Office Company, which for emptiness and flatness of feature, gaudy show, and the utter absence of any worth whatever, can only be compared to a petrified and enlarged edition of the waistcoat of a Whitechapel clo'man out for the Sunday. (It is not, however, improbable, that this front is, after all, a true external sign of the internal condition of affairs.) Or, again, turn to the new Government buildings in Burlington-gardens, and what do we find? Masonry ridiculed—in fact, reduced to the level of Tunbridge ware. Coloured stones placed in juxtaposition, as though they were coloured woods ingeniously assorted to look pretty, not legitimately introduced in bands when they would become an architectural feature, but inserted vertically merely for the sake of effect, to produce which the quoins have had to be split, and thus reduced to half their proper size. This is contrary to every principle of true construction, and forcibly reminds one of the Carpenter's Gothic, of which we had hoped we had seen the last. In fact, this building inaugurates, with all the appearance of authority, another phase of the decay with which we have long been threatened. This is a case so palpable and absurd, that there is not a mason in any country village who would not know better."

It is proposed to present a "substantial testimonial" to Mr. Robert Thompson, of the Royal Horticultural Society's Gardens, Chiswick, who for more than forty years devoted himself to the cultivation of horticulture and meteorology with marked success. When we state that upwards of 2,000 pages of the Society's various publications have been written by Mr. Thompson, the public may form some idea of the extent and utility of his labours. For a long period Mr. Thompson has devoted much attention to meteorology. The *Meteorological Journal*, which was commenced in 1826, and which has been carried on by him since 1830, gives the readings of the barometer (corrected for temperature, &c., morning, noon, and night), of the thermometer, maximum and minimum, in sun and shade, and of the hygrometer; comparatively with averages of forty years deduced from 219,000 observations of the various instruments. Such broad averages afford what must be considered as true means with which extremes may be compared as regards heat, pressure, and moisture. Among other papers from Mr. Thompson's hand, connected with this branch of science, is a table of temperatures for the use of gardeners, published in the *Journal of the Horticultural Society*, which furnishes an idea of the climate of some 900 places, situated in different latitudes. Subscriptions will be received by the Secretary of the Royal Horticultural Society, South Kensington.

Among the wonders now visible at the Exhibition, there is an enormous Brazilian topaz, weighing 4lb. 9oz. and 206gr. troy. It was bought in a rough state by the Neapolitan Government under the reign of Ferdinand I., who conceived the idea of getting the figure of Christ cut upon it. Three Neapolitan artists were employed to execute the work, who failed to complete it after twelve years' labour, and an expenditure of £2,000. The cutting was ultimately accomplished by M. Carriello, who spent eight years in performing his portion of the undertaking.

M. Champy, a lieutenant in the French navy, has invented an ingenious arrangement to enable persons to approach the centre of a conflagration in order to suppress it, or to save other persons from the flames. The principle of his invention may be stated in a few words—the wearing of a dress continually saturated with water. He places over his head a conical woollen hood, with eye-pieces, dresses himself in woollen garments and gloves, and fastens a strong belt round his waist, from which depend the branch in connection with a fire-engine, and a tube with a stop-cock, by means of which he can saturate the conical cap and all the rest of his equipment. Some faggots saturated with benzine were set on fire, and in a few seconds M. Champy put on his dress, saturated it with water, and, approaching close to the burning mass, extinguished the fire without difficulty.

In the construction of the New Opera House at Paris, M. Garnier, the architect, has, it is said, made no fewer than 30,000 plans, and the calculation is that if they were laid end to end they would reach to Versailles and back. For the completion of the interior and the details of the building there still remain 10,000 more to be designed.

A law has been enacted in Canada directing that the doors of all public buildings should open outwards.

Artists are just now rejoicing in the discovery of a new paint. Mauve, though it has for some years existed as a dye, has not until now been available for pictures. "Aniline," as it is called, was discovered simultaneously by two gentlemen of the Agricultural College at Cirencester.

A remarkable statement was made at the meeting of Sir Sydney Waterlow's Company for erecting improved dwellings for artizans last week, and which was accidentally omitted from our report. Mr. H. Edwards, M.P., the deputy chairman of the company, said, "that the doors, windows, and other carpenters' work used in the buildings now in course of erection were made and brought from Stockholm at a cost of 25 per per cent. less than they could be produced in this country."

An important discovery of iron has been made in Yorkshire. For some months past the search for ironstones has been prosecuted on both sides of the Derwent, and for nine years past the adventure has proved of varying success. The company, however, fortified by the opinions of Professor Phillips and other geologists and mineralogists, have steadily prosecuted their investigations, and the result is that a royalty of 800 acres at Kirkham, in the East Riding, and 1,100 acres at Welburn, in the North Riding, the two being separated only by the navigable river Derwent and the York and Malton Railway, have been leased on favourable terms for a period of sixty-three years, as from the date of the first adventure in 1858.

Upon lifting one of the flooring deals in an old house about to be pulled down and rebuilt at Linlithgow, paintings of a remarkable and interesting kind were discovered on the under side of the floor and across the oaken joists. The names of "Lord Fleming," "Erle Demaz," "Lord Letoun," "Erle de Argyle," &c., have been found apparently in connection with their coats of arms. The house, whose walls are above 4ft. in thickness, is said to have been a great resort of the nobility in the time of Queen Mary; and tradition has it that each nobleman sat under his coat of arms before proceeding in a body to the palace.

The Sewage Utilization Act for 1867, facilitating the distribution of town sewage for agricultural purposes, has just been printed, as passed by the House of Commons. Local boards may provide any works for receiving, storing, disinfecting, or distributing sewage within their respective districts, and in districts where no local boards exist a special authority may be created for the purpose. Such boards or authorities may purchase any requisite lands, and, for agricultural objects, may lease land for a period not exceeding seven years, or may contract to share the produce, or farm it and dispose of the produce. Different districts may unite for these ends. Authorities, under the Act, may also agree to contribute to any outlay on the part of private capitalists or public companies for carrying sewage plans into execution, and, as regards companies, may become shareholders. All assessments under the Act are to be included in the poor-rates.

The *Glasgow Herald* understands that, on the recent malicious damage to the Baird Memorial window in the Glasgow Cathedral being brought under the notice of the conservators of that venerable building, the Government notified their intention of repairing the broken window, and also of so protecting the three west windows that a recurrence of the late mischief may be prevented.

The Commissioners on Trades' Unions have held two sittings since the 1st inst., and have now adjourned until November. On Tuesday week, Mr. James Matson, of Glasgow, the secretary of the Operative Joiners of Scotland, was examined, and Mr. James Proudfoot, the secretary of the Trades' Council of Glasgow, was subsequently heard. Mr. Thomas Prowse, a non-society mason of London, gave evidence at a previous meeting of the Commissioners.

The Central Exchange, one of the finest buildings in Newcastle, was entirely destroyed by fire on Sunday. The damage done is said to be under-estimated at £70,000, a considerable portion of which is covered by insurance. Steam fire-engines do not appear to have travelled so far north, and the feebleness of the mechanical appliances available for the extinction of fires appears to have been lamentably conspicuous on this occasion.

An extensive fire broke out at 2 o'clock yesterday morning in the Cathedral of Frankfort, and the entire sacristy, with some adjacent buildings, were burnt to the ground. Three lives were lost.

The report of the Royal Insurance Company to its shareholders, presented at the annual meeting on the 9th inst., shows a continuance of the rapid advance characteristic of the company's operations. Its fire revenue, in 1866, attained the large sum of £447,271, being an increase on the preceding year of £32,538. Although from numerous and severe fires at home and abroad, this branch, in common with the experience of most of the fire offices in the same period, did not yield a profit, yet the large amount of undivided profits, prudently retained from last meeting, enabled the directors to declare the usual dividend of 7s. a share, without touching the reserve fund, a position which forms a striking contrast with many kindred institutions in the past year of calamity. The life branch appears to have been very prosperous. After paying all claims, no less a sum than £124,165 has been added in the single year to the life reserves, the present amount of which has reached the large total of £899,746; and at each of its quinquennial declarations of life profits we believe this company has divided one of the largest bonuses ever given by any similar institution.

"Under the water-closet system," says the Registrar-General, in his report, "every house is put into communication with every other house, so that the zymotic volatile stuff of disease has a chance of finding its way from house to house through this artificial channel, the only barrier being, in the most favourable circumstances, a film of a few inches of water. This system is an improvement on that of cesspools; but it deprives houses of the safeguards of isolation, the utility of which is evident to the grossest observation in such cases as the cattle plague. The chief security against the evils incidental to this system is to be sought in an abundant supply of water, with a fall sufficient to carry off the refuse beyond the limits of the towns, where it is still liable to infect the rivers, or to surcharge the air with impurities. The earth is one of the best known disinfectants, and, in the dry state, it has some of those physical properties of water which led to the invention now so common."

A correspondent of one of the morning papers, after expressing his regret at the contemplated dissolution of the British Institution, which, for "more than half a century has been of the greatest service to art and its highest development in the sister studies of painting and sculpture," gives the following particulars—"On referring to a carefully-compiled handbook, entitled 'Recollections of the British Institution,' by Thomas Smith, published in 1860, we find that, since the foundation of the Institution to the year 1859, no less a number of original paintings by British artists than 23,150 have been exhibited in the gallery, and that the sales arising from such exhibitions, without any expense to the artists, have amounted to more than £150,000; and, on looking through the catalogues of these various exhibitions, many then comparatively unknown names occur in the early ones which, in later days, became famous and celebrated all over the world. Amongst them may be mentioned Beechy, Bourgeois, Callcott, Copley (father of Lord Lyndhurst), Daniel, Fuseli, Howard, Lawrence (a future president of the Royal Academy), Northcote, Opie, Reinagle, Smirke, Stothard, Bird, Turner, Ward, Benjamin West (another president of the Royal Academy), Westall, Shee, and Eastlake (two other future presidents of the Royal Academy), Linnell, Haydon, Wilkie, Collins, Etty, Constable, Hilton, Martin, Jones, Hayter, Landseer, Briggs, Mulready, Ross, Stark, Jackson, Stanfield, Danby, Leslie, Uwins, Roberts, Herbert, Pickersgill, &c. In donations to artists, and complimentary premiums, by way of encouragement to the young and meritorious, the Institution has given some £15,000; and in the purchase of pictures and sculpture, which in most instances have been given to the nation—as may be seen by a visit to Greenwich and Chelsea Hospitals, the National Gallery, and many of the metropolitan churches—some £13,000 in addition."

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

3264. T. JONES. Improvements applicable to Window Sashes and Frames. Dated December 12, 1866.

This invention consists in novel arrangements for opening and closing windows, and retaining them in any desired position, the object being to dispense with weighted sash lines. *Patent completed.*

3267. J. ROBINSON and J. SMITH. Improvements in Applying Motive Power to Saw Frames. Dated December 12, 1866.

This invention relates to those saw frames which are driven by the direct action of steam or air, and consists, first, in so regulating the motion of the valves of such steam or air cylinders or the laps thereof, that the induction passage is opened before the piston has completed its stroke, and the said fluid therefore opposes the piston and acts as a cushion for it to abut against. Second, the invention consists in a method of giving motion to such valves as aforesaid. For this purpose the inventor employs a link connected at one end to the saw frame, and adapted at the other end by a centre pin to a slot within which the said pin can slide. To this link is jointed another which is connected to an arm turning upon a fixed centre, and carrying the rod of the slide valve. As the saw frame moves upward and downward, the centre pin of the link carried thereby moves in the above-mentioned slot, and they make this centre pin adjustable in order to determine the motion of the valve, and thus the first part of the invention may be accomplished. Third, the invention consists in another method of giving motion to the valves of such steam and air cylinders. *Patent abandoned.*

3327. W. R. LAKE. An Improved mode of rendering Paint Uninflammable. (A communication.) Dated December 18, 1866.

The nature of this invention consists in the combination with ordinary oil paints of calcined schist, shale, or mineral coal, which is reduced to a chalky and pulverous condition, and freed from all hard and gritty particles. *Patent completed.*

3328. W. R. LAKE. Improvements in Nails and in Machinery for Manufacturing the same. (A communication.) Dated December 18, 1866.

The first part of this invention relates to an iron or steel nail in which the head is left substantially in that condition of softness produced by hot working, while the shank is left in that condition of hardness, smoothness, and rigidity which is produced by rolling it substantially throughout while cold. The second part of the invention relates more particularly to mechanism for producing these nails from the blanks, and consists in so arranging and operating each pair of a series of pairs of die rolls, with reference to the other pairs of the said series, that the nail blank shall have its sides and edges acted on alternately without turning the said blank on its axis, and that the nail shall be passed onward by each pair of die rolls, and shall be by them delivered to the action of the next succeeding pair, by which pair it is seized before being released by the preceding pair, and so on through the series of pairs of rolls. *Patent completed.*

3376. H. GOODFELLOW. Improvements in Machinery or Apparatus for Grinding Clay and such like Substances. Dated December 22, 1866.

The object of this invention is to grind clay and strong marls, so that a great deal of labour now necessary in the ordinary manner of preparing clay for the pugging mill may be saved. The object is also so to place the apparatus for grinding the clay that when in a proper condition the material may fall into the pug mill beneath, and so by the practical combination of the two, the finished material may be prepared at a very great reduction in cost. *Patent completed.*

3369. S. JACOBS. An Improved process for Preparing Wood and other Materials preparatory to Ornamenting or Graining the same. Dated December 21, 1866.

The material to be ornamented or grained is coated with a composition made of gum and naphtha, or other spirit, in the proportion of about one part of gum to five parts of spirit. The inventor has found these proportions answer well when shellac and naphtha are used. The composition may either be applied with a brush or rubbed in on as in polishing; and the said composition may be used either with or without colouring matter, according to the ground required. The material thus prepared may be grained in the ordinary way, then coated with spirit varnish and afterwards be French polished. *Patent abandoned.*

332. S. BUXTON. AN IMPROVED STENCH TRAP. ed December 19, 1866.

carrying out this invention, as applied to a kitchen c. the patentee uses a receiver (which may by prefer- be made of cartheuware) of cylindrical form, having ranch tube formed upon its lower end for the purpose connection with the pipe from the sink. The lower end he receiver has the form of a cone, being reduced in meter for the purpose of connection with the sink pipe. internal formation of the upper orifice of the ejection e is adapted (being lined with a seat of copper, or other able non-corrosive material) to receive a conical plug by preference of copper) which fits well into it, and is nected to a wire, which may be of non-corrosive mate- , and which passes through a hole in the cover placed the top of the receiver. A float (also by preference of -corrosive material) is placed upon this wire at a suit- distance from the conical plug before-named. In some s he prefers to make the lower portion of the float it- of conical formation, so as to fit into the metallic seat he ejection pipe, constituting, in fact, a combined float plug, the plug portion being "ground" into the seat s to make a good and close fit, in the manner of ordi- y watercocks; or he sometimes prefers to affix a conical -corrosive ring on the lower portion of the float, and t" it in like manner to the seat. The branch tube ing, therefore, been fixed to a part of the sink pipe in venient proximity to the sink itself, and the lower part he receiver connected to the continuation of the sink e upon water or other fluids or fluid, and solid matters ng admitted down the sink pipe through the branch the receiver, the float is raised, and, consequently, conical plug. The admitted contents are thus permit- to pass away, the supply ceasing, the plug descending its place, and stench is prevented. *Patent completed.*

366. G. ALLIX. IMPROVEMENTS IN APPARATUS FOR ISING AND LOWERING WINDOW BLINDS, WINDOWS, Dated December 21, 1866.

This invention relates to the use of chain in raising and ering window blinds mounted on rollers, and consists in construction and employment as described, in combina- with a chain, of a slit or cut, into which the chain ers when left to itself, so that the chain is held in the slit the blind roller prevented rotating; also in the combi- ion with the slit or cut of other parts described. *Patent pleted.*

338. J. TOUSSAINT. IMPROVEMENTS IN THE MANU- TURE OF CEMENT. Dated December 24, 1866.

This invention consists in manufacturing cement by com- ing together the following ingredients, matters, or sub- nces, viz., freestone, sandstone, marble, and other non- gillaceous stones that have not been burnt or baked. e inventor reduces these to a fine powder by any suitable ans, and mixes one or other, or several of them, with y kind of lime and plaster in about equal proportions: e plaster is to be baked. In using the cement, it is xed with water in a similar manner to other known ments. *Patent abandoned.*

3441. H. ALLMAN. CERTAIN IMPROVEMENTS IN THE NSTRUCTION OF LOCKS AND KEYS. Dated December , 1866.

These improvements relate to the form of locks com- only called lever or tumbler locks, and to the keys used erewith, and may be detailed as follows: First, the in- ntor forms the levers and tumblers in a way and of such configuration that the key in making one revolution and the drill pin comes more than once in contact with e said tumbler or levers. Second, he uses spring or ain washers between the said levers or tumblers, so as to nable the tumblers to work free one of another, and nable them to retain the position which may be given em by the action of the key, but when the tumblers are ithout springs. Third, he uses in the construction of the id levers or tumblers, or other parts of the said locks, the aterial commonly known as yellow metal or Muntz's etal. Fourth, he coats or electrotypes sheets of metal with n, zinc, copper, brass, or silver, and presses the herein escribed tumblers from the said sheets of metal so pre- ared. Fifth, he makes one or more of the said levers or mblers longer from the centre of rotation to the stamp ce than the remainder of the said levers, so that, when e "stamp" is pressed against the levers, it will reach e longer ones first, compelling such long levers to be djusted for the passage of the stamp first or before the thers. Sixth, he forms one or more of these said longer vers of such a shape or configuration that when they are fted or adjusted by the key or picklock to admit of the assage of the "stamp," they will then assume or occupy ch a position as to close or block the keyhole. Seventh, he mploys two or more sets of tumblers or single tumblers earing into each other, so that the action of the one moved y the key or picklock shall cause the other or others to lose the keyhole, or otherwise impede the action of a icklock. Eighth, he constructs the key tubes of steel ube and solders thereto the "bits" and "bows." inth, he employs a spring or pressure on the levers, so hat they will remain under the influence of friction in the osition into which the said levers may be moved by the ey or picklock. Tenth, he polishes, scours, or burnishes he plates of sheet metal, and of which he presses the various arts of the locks previous to or before such act of pressing r cutting. Finally, he stamps the keys in some instances ut of the before specified yellow metal. *Patent abandoned.*

Trade News.

TENDERS.

ADDLESTONE.—For the erection of two houses at Addle- stone, for Mr. Thorn. Mr. Benjamin Tabberer, architect:—Dove Brothers, £1,385; Knight, £1,285; Foister, £1,172 14s.; Prince, £1,147; Keys (accepted), £1,115.

ACTON (MIDDLESEX).—For making up Avenue-road and or other works, for the Acton Local Board. Edward Monson, C.E., surveyor to the Local Board:—Thomas Wainwright, £1,600; Philip Pounds, £1,161; Richard Hubbard, £973; Moxon and Mutton, £973; Wm. Goodair, 925; Henry Parsons, £894; J. and S. Williams, £850; John Brewer, £825; Peter Porter, £788; William Steggles (accepted), £780; James Pizzey, £752.

DUNSTABLE.—For restoration of Priory Church, Dun- stable. Mr. G. Somers Clarke, architect:—White, Dun- stable, £8,000; D. King and Sons, London, £6,490; Myers, Lambeth, £6,283; Huddlestone, Lincoln, £5,912; Garside, Leighton Buzzard, £5,837; Chappell, Sussex, £5,822; Pattinson, Sleaford, £4,687.

HAMPSHIRE.—For Hinton House, near Cosham, for Mr. H. W. Tooker. Mr. Ewan Christian, architect:—Long- mire and Burge, £6,976; Stevens, £5,453; Fletcher, £5,430; Jackson and Shaw, £5,328; Barnes, £5,060.

ISLINGTON.—For parochial infant schools, St. Mary's, Islington. Mr. Edmeston, architect:—Watts, £1,132; Thorpe, £1,090; Taylor, £984; Dove, £955; Carter and Sons, £940.

PLUMSTEAD. — For the erection of a detached family residence, boundary walls, &c., for Mr. J. Flagg. Messrs. W. Gosling and Son, architects. Quantities not supplied:—Brett and Bradbury, £987; Smart and Pinegar, £980; Wise, £898; Vickery, £875 9s.; Ledbitter, £761; Wicks, £750; Fenn, £695 6s.

ST. HARMONS (RADNORSHIRE).—For the erection of national schools and teacher's residence. Mr. E. H. Lingen Barker, architect:—W. Evans, £399 11s.; E. Woolley, £395 13s.; J. Edwards, £394.

WADHURST.—For the erection of farm buildings, Dew- hurst Lodge, Wadhurst, Sussex, for Mr. Thomas Geo. Mr. John Wimble, architect:—

Names.	Farm Buildings.	Cottages.	Lodge.	Total.
	£	£	£	£
Killby	7,516	2,289	794	10,599
Mann	7,140	2,565	831	10,536
Piper and Wheeler...	7,310	2,316	820	10,446
Axford and Whillier	7,259	2,350	789	10,398
Brass.....	6,795	2,222	760	9,777
Myers and Sons.....	6,476	2,240	842	9,558
Anscombe	6,316	2,186	778	9,280
Punnett and Son ...	6,437	2,180	653	9,270
Willicombe and Co.	5,930	2,100	735	8,765

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Mer- chants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

PROPERTY SALES.

AUGUST 7.

AT THE MART.—By Messrs. Norton, Trist, Watney, and Co. Freehold seven acres of building land and two cot- tages, situate in the parish of West Ham, Essex—sold for £1,510.

Leasehold improved rental of £49 per annum, secured upon business premises, No. 2, Old Dorset-place, Clapham- road, term 19 years unexpired—£470.

Freehold five acres of meadow land, known as The Withies, Leatherhead, Surrey—£660.

Freehold meadow, containing 2a. 2r. 22p., also a cottage and garden, situate as above—£400.

By Messrs. Farebrother, Clark, and Co.—Leasehold two houses and shops, Nos. 1 and 2, Jones-street, Berkeley- square, producing £115 per annum, term 53 years unex- pired, at £19 5s. per annum—£1,100.

Leasehold shop and premises, No. 16, Kenton-street, Brunswick-square, let at £42 per annum, term 38 years unexpired, at £13 13s. per annum—£350.

Freehold ground rent of £9 per annum, secured on No. 2, Roman-road, Old Ford, term 50 years—£150.

Freehold ground rent of £22 per annum, secured on Nos. 3 and 4, Roman-road, term 10 years—£375.

Freehold ground rent of £15 per annum, secured on Nos. 6 to 8, Roman-road, term 50 years—£270.

Freehold ground rent of £15 per annum, secured on Nos. 10 to 12, Roman-road, term 50 years—£250.

Freehold ground rent of £13 per annum secured on Nos. 13 to 15, Roman-road, term £50 years—£200.

Freehold ground rent of £13 per annum secured on Nos. 16 to 18, Roman-road, term £50 years—£200.

By Messrs. Chinnock, Galsworthy, and Chinnock.—Free- hold building land, fronting the Grand Esplanade, West Worthing, Sussex—lots 1 to 16 sold for £7,200; lots 17 to 25, £1,860; lot 26, £90; lot 27, £90; lot 28, £110; lot 29, £140; lot 30, £180; lot 31, £170; lot 32, £170; lot 33, £180; lot 34, 150; lot 35, £140; lot 36, £160; lot 37, £185; lot 38, £285; lot 39, £280; lot 40, £285; lot 41, £190; lot 42, £220.

AUGUST 8.

AT THE MART.—By Messrs. Debenham, Tewson, and Farmer. Freehold plot of building land, situate between Whitecross-street and Golden-lane, St. Luke's.—£2,2 0.

Leasehold two houses, Nos. 1 and 2, Prince of Wales's- place, Hampstead road, with workshop in the rear, annual value £58, term 14 years unexpired at £27 per annum—£110.

By Messrs. Wood, Langridge, and Co.—Freehold resi- dence and 26 acres of land, with stabling, pleasure-grounds, four tenements, &c., situate at West Malling, Kent—£6,860.

By Messrs. C. C. and T. Moore.—Leasehold six houses, Nos. 1 to 4, Robert-street, and 6 and 7, Richardson-street, Mile End, term 34 years, ground rent £9 per annum—£720.

Leasehold two houses, Nos. 3 and 4, Walburgh-street, St. George's East, and ground rents of £6 2s. secured upon Nos. 4 to 6 in the same street, term 21 years, ground rent £8—£239.

Leasehold three houses, Nos. 10 Charles-street, and 17 and 33, Vincent-street, Commercial-road, producing £56 2s. 4d. per annum, term 26 years, ground rent £11—£255.

Leasehold house and shop, No. 5, Sun Tavern Fields, and two messuages, No. 1 and 2, Cowley-street, St. George's East, producing £71 12s. per annum, term 47 years, ground rent, £10 per annum—£545.

Freehold residence, known as "Kirk House," Tredegar- road, Bow, annual value £65—£930.

Freehold, two houses, Nos. 10 and 11, Plough-alley, Great Hermitage-street, Wapping, producing £30 per an- num—£218.

Freehold residence, known as "Rose Cottage," Leyton- road, Stratford New Town—£400.

Leasehold two houses and shops, Nos. 32, Wardour-street, and 13, St. Ann's-court, Oxford street, producing £161 10s. per annum, term 15 years, ground rent £81 per annum—£210.

Leasehold two houses, Nos. 2 and 4, Clyde-terrace, Grove- road, Mile-end, term 71 years, at £7 per annum—£610.

Leasehold house, No. 17, Beaumont-square, Mile End, term 61 years, at £4 10s. per annum—£270.

AUGUST 9.

AT THE MART.—By Messrs. Norton, Trist, Watney, and Co.—Freehold house and premises, No. 96, St. John- street, Smithfield, let at £36 per annum—sold for £800.

Freehold house and premises, No. 55, St. John-street, let at £21 per annum—£410.

Freehold house and shop, No. 34, John's-lane, Smithfield, let at £48 per annum—£1,100.

Leasehold improved rental of £54 per annum (for 13 years), secured upon Nos. 28 and 30, High-street, Strat- ford—£340.

Freehold plot of building land, situate at Tunbridge Wells, Kent—£325

By Messrs. Winstanley and Horwood.—Leasehold estate, known as "Mount Hill," Bexhill, Sussex, comprising about twenty acres of land, with farmhouse, buildings, &c., term 800 years unexpired—£1,990.

Freehold "Ingram's Farm," Bexhill, Sussex, comprising farmhouse, yard, buildings, and 87a. 2r. 14p. of land—£2,500.

Freehold "Acton's Farm," Bexhill, comprising cottage, buildings, and 46a. 1r. 1p. of land—£1,050.

Freehold "Lem's Farm," Westfield, Sussex, comprising farm, cottage buildings, and 40a. 2r. 8p. of land—£1,540.

Freehold, "Buckhurst Farm," Westfield, comprising cottage buildings, and 29a. 3r. 39p. of land—£1,020.

By Messrs. Rushworth, Jarvis, and Abbot, freehold house and business premises, No. 80A, Dean-street, Soho, let on lease at £75 per annum—£1,360.

Leasehold business premises, Nos. 163, 165, 205, and 217, Regent-street, let on lease, and producing £363 per annum, terms 53 years unexpired, at £133 per annum—£3,760.

By Mr. F. Lewis, leasehold, two carcases, 1 and 2, Broadlands, Lawrence-road, South Norwood, term 97 years, at £18 18s. per annum—£415.

Reversionary legacy of £450, receivable on the death a lady aged 60 years—£200.

By Messrs. Fuller and Horsey.—Freehold waterside premises, situate at Greenwich—£10,000.

By Messrs. Sedgwick and Son.—Freehold 39a. 2r. 6p. of arable land, in the parish of Sarratt, Herts—£1,340.

Freehold eight cottages, situate at Sarratt Bottom, Herts, producing £43 11s. per annum—£400.

AT THE GUILDHALL TAVERN.—By Messrs. E. and H. Lumley.—Freehold estate known as Marchfield House, Wokingham, Berks, comprising residence and outbuildings, park, orchard, and 17a. 0r. 38p. of land—£5,360.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

George Capper, Clarendon-place, Judd-street, Euston-road, railway contractor, August 20, at 1—John Collins, King's- place, High-street, Southwark, builder, August 24, at 11—Abraham Newland, Cobham, builder, August 21, at 12—R. Parker, Gladstone-street, Battersea-park, builder, August 28, at 12—Felix Walbs, Northfleet, Kent, builder, August 22, at 12—Walter Dawes, Tabernacle square, Finsbury, saw merchant, August 29, at 1.

TO SURRENDER IN THE COUNTRY.

William Geddon, Horwich, Lancashire, joiner, August 21—George Lewis, Hawarden, Flintshire, brickmaker, August 21—James Phillips, Kimbolton, mason, August 26—J. Taylor, Wednesbury, Staffordshire, gas-fitting manu- facturer, August 26—W. Tyson, Wavetree, near Liverpool, joiner, August 20—Thomas White, Whitchurch, black- smith, August 24—John Burrow, Plymouth, marble mason, August 28—Henry Dodd, Monks Coppenhall, journeyman plumber, September 19—John Mee, Belper, nail manu- facturer, August 24—Alexander M'Kay, Hakin, contractor, August 24.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

October 22, J. T. Carr, Douglas-road, Canonbury, tim- ber merchant—August 27, H. Walker, Ulverstone, plas- terer—August 27, G. Garnett, Barrow-in-Furness, brick- maker—September 20, J. Wigley, Leeds, builder—Septem- ber 20, J. and G. Walker, Heckmondwike, stonemasons—September 20, T. Dove, Marske, Yorkshire, builder—Sep- tember 20, B. Ord, Middlesborough, slater—September 18, J. Wilson, Sheffield, millwright—August 29, W. Lumley, Liverpool, builder—September 6, E. Dixon, Bourton, Berks, blacksmith—October 8, F. J. Ames, Dorchester, painter October 7, J. S. Wilkes, Darlaston, builder—September 17, T. Aberdare, carpenter.

PARTNERSHIPS DISSOLVED.

Job Richards and Co., Soho, near Birmingham, iron manufacturers—Jenkins, Hill, and Jenkins, Birmingham, iron wire manufacturers—J. Moseley and Son, King- street, and Bedford-street, Covent Garden, tool makers—Bowden, Edwards, and Forster, Manchester, joiners—J. M. Dunlop and Co., Manchester, engineers—Catton, Son, and Beaumont, Berkly, near Huddersfield, masons—Best and Corkhill, Manchester, plasterers—Wilkinson and Harker, Leeds, engineers—Tapp and Aston, Hull, brick- makers.

DECLARATIONS OF DIVIDENDS.

Watkiss and Jones, Stansty, near Wrexham, iron mer- chants, first div. of 9d.—F. W. Mowbray, Leicester, en- gineer, div. 7s.

DIVIDENDS.

August 19, W. Stoakes, Newchurch, carpenter—August 29, J. Bell, Penrith, plumber.

BANKRUPTCIES ANNULLED.

Samuel Clarke, Bemerton, Wilts, architect, August 12—John James Warren, Bristol, builder, August 9.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9	0	£10	10	Archangel, yellow ..	£11	10	£12	10
Quebec, red pine	3	0	4	10	St. Petersburg, yel...	10	10	11	0
,, yellow pine..	2	15	4	0	Finland	8	0	9	0
St. John N.B. yellow	0	0	0	0	Memel.....	0	0	0	0
Quebec Oak, white..	5	5	6	0	Gothenburg, yellow	8	10	10	10
,, birch.....	3	10	4	10	,, white	8	0	9	0
,, elm	3	10	5	0	Gefle, yellow.....	9	0	11	0
Dantzic oak	3	10	6	0	Soderham	9	0	10	10
,, fir	2	0	3	0	Christiania, per C., 12 ft. by 3 by 9 in. yellow	16	0	22	0
Memel fir	3	0	3	10	Deck Plank, Dantzic, per 40 ft. 3 in.	0	15	1	4
Riga.....	3	0	3	5	PRICE STONE per ton	5	0	8	0
Swedish	1	15	2	2	OILS, &c.				
Masts, Quebec red pine	6	0	7	0	Seal, pale....per tun	40	0	41	0
,, yellow pine..	5	0	6	0	Sperm body .....tun	103	0	105	0
Lathwood, Dantzic, fm	4	10	5	0	Cod	38	10	39	0
,, St. Petersburg	6	10	7	10	Whale, Sth. Sea, pale	39	0	40	0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Olive, Gallipoli.....	64	0	0	0
Quebec, white spruce	14	10	21	10	Cocoanut, Cochin, ton	56	0	57	0
St. John, white spruce	13	10	15	10	Palm, fine	40	0	0	0
Yellow pine, per reduced C.					Linseed	38	10	0	0
Canada, 1st quality.	17	0	19	10	Rapeseed, Eng. pale..	40	10	0	0
2nd do.....	12	0	13	0	Cottonseed.....	33	0	39	0

METALS.

IRON:—								
Welsh Bars in London .. ..per ton	6	7	6	6	10	0	3	
Nail Rod ..... do	7	10	0	8	0	0	2½	
Hoops ..... do	8	10	0	9	0	0		
Sheets, Single ..... do	9	15	0	10	0	0		
Stafordshire Bars ..... do	7	10	0	7	15	0		
Bars, in Wales ..... do	5	15	0	6	0	0	3	
Rails ..... do	6	5	0	0	0	0	nett	
Foundry Pigs, at Glasg. No 1 .. do	2	14	0	3	5	6	2½	
Swedish Bars ..... do	10	5	0	10	10	0	nett	
STEEL:—								
Swedish Keg, hammered .....per ton	15	0	0	15	10	0	2½	
Swedish Faggot ..... do	10	10	0	12	10	0	2½	
COPPER:—								
Sheet & Sheathing, & Bolts ....per ton	79	0	0	83	0	0		
Hammered Bottoms ..... do	89	0	0	92	0	0		
Flat Bottoms, not Hammered .. do	84	0	0	87	0	0		
Cake and Tough Ingot ..... do	70	0	0	71	0	0	3	
Best Selected ..... do	77	0	0	79	0	0		
Australian ..... do	82	0	0	86	0	0		
Yel. Metal Sheathing & Rods ....per lb	0	0	7	0	0	0		
TIN:—								
English Block .....per ton	91	0	0	0	0	0	2½	
do Bar ..... do	92	0	0	0	0	0		
do Refined ..... do	94	0	0	0	0	0		
Banca ..... do	92	0	0	0	0	0	nett	
Straits ..... do	87	0	0	0	0	0		
LEAD:—								
Pig, English .....per ton	21	15	0	0	0	0		
,, Spanish Soft ..... do	19	5	0	0	0	0	2½	
Shot, Patent ..... do	23	0	0	0	0	0		
Sheet ..... do	20	15	0	0	0	0		
White ..... do	30	0	0	31	10	0	5	
SPELTER:—								
On the Spot .....per ton	21	0	0	21	2	6	nett	
ZINC:—								
English Sheet .....per ton	26	10	0	27	0	0	2½	
Devaux's V. M. Roofing Zinc .... do	26	10	0	0	0	0	3	
* And 5 per cent. discount if laid upon the new system.								
QUICKSILVER .....per bll	6	17	0	0	0	0		
REGULUS OF ANTIMONY								
French .....per ton	28	0	0	0	0	0	2½	

TO BUILDERS.—In consequence of the Retirement of the Builder on a large Estate, a SUCCESSOR will be REQUIRED in the course of a few months. He must have a thorough practical knowledge of his business, especially as regards agricultural buildings and the conversion of timber; he must prepare plans and estimates, take up, measure work, and have the general supervision of the workmen. Age not to exceed 40.—Application to be made to Messrs. J. and W. Mickleburgh, land agents, Montgomery.

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GOUT and RHEUMATISM.—The excruciating pain of Gout or Rheumatism is quickly relieved and cured in a few days by that celebrated medicine, BLAIR'S GOUT and RHEUMATIC PILLS.
They require no restraint of diet or confinement during their use, and are certain to prevent the disease attacking any vital part.
Sold by all Medicine Vendors, at 1s. 1½d. and 2s. 9d. per box or obtained through any Chemist.

GOTHIC FORMS APPLIED TO FURNITURE, METAL WORK, &c., for INTERIOR PURPOSES by Mr. B. J. TALBERT, of London. The above work has especial reference to the Manufacturers of Furniture, Metal Workers, and Decorators, as suggestive of Work applied to Buildings erected in the Gothic Styles. The sketches will be designs adapted to the modern requirements of the library, dining, drawing and bed rooms, halls, &c.; this includes wood, metal, and decorative work. To be published in six monthly parts, price 5s. per part, containing five plates and letter press: or when completed, bound up, £1 15s.
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NEW DESIGN BOOK of MEDIÆVAL FURNITURE SUITED for MODERN GOTHIC VILLAS. Designed and Lithographed by R. CHARLES. Price 4½s., in wrapper, half-bound, 50s. The book contains 60 pages and about 200 original designs of various articles of Furniture, and of Window Drapery, all coloured.
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ROYAL POLYTECHNIC. — SEE the PARIS EXPOSITION for ONE SHILLING. Professor Pepper's LECTURES on the PALAIS DE L'EXPOSITION, daily at 3 and 8. Amongst the other attractions are, the "Wonderful Leotard," the great optical surprise, called "The Effigy of the Dear Defunct," and the musical entertainments of Damer Cape, Esq.

ACCIDENTS WILL HAPPEN.
Everyone should therefore provide against them!
£1,000 IN CASE OF DEATH,
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ACCIDENT OF ANY KIND,
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JOHN WALDEN
(Late Shop Foreman to Mr. W. SANDS, retired),
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Estimates on application.

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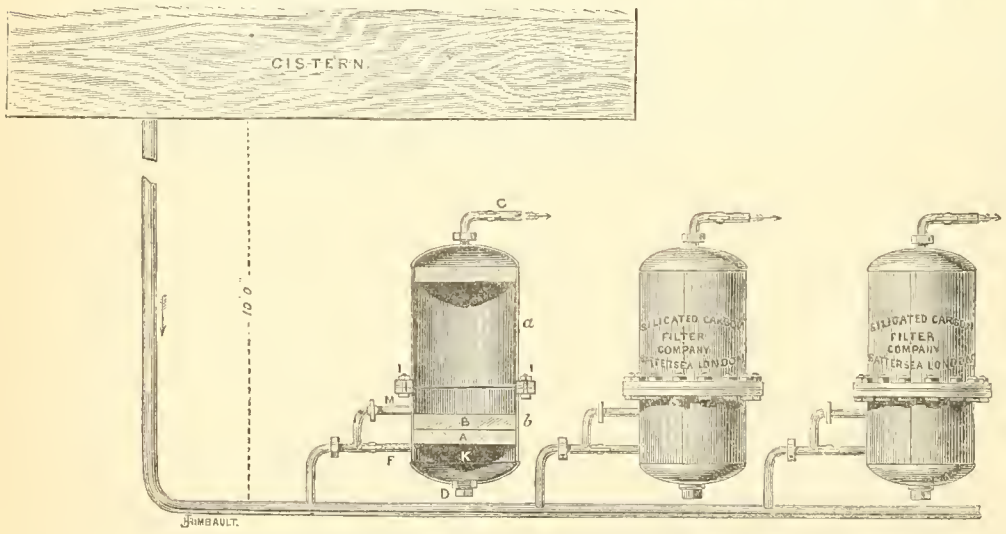
Nos. 33, 34, 35, 37, and 38, OXFORD STREET, LONDON, W.

Silicated Carbon Main Service Filter No. 30.



This Filter shown in section, consists of a metal case in two parts, A and B, fastened by nuts and screws, I I. The water enters by the pipe F, passing first through the coarser filtering medium A, then through the finer B, and flowing off pure through the pipe C. The coarser impurities are thus arrested by A, and do not interfere with the action of B; they also accumulate in the cavity K, and may be removed when requisite, by allowing the water to pass into the filter through M. This is done in a few seconds by opening the tap M and closing F, at the same time shutting the exit pipe C, and unscrewing the nut D. The water entering the upper cavity at E, will thus be forced downwards, carrying off all impurities which have been arrested by the filtering medium A. These filters are used by the General Post office, the London Hospital, the County Prison, Swansea, and many Noblemen's, Gentlemen's, and other large Establishments.

Prices in Tinned-Copper Cases,
£6 6s., £8 8s., £12 12s., £18 18s.

"General Post Office, Medical Department, Oct. 23, 1860.
"This is to certify that, having inspected and examined the filtering apparatus erected by the Silicated Carbon Filter Company at the Money Order Office, where it supplies filtered water for about 130 officers I am perfectly satisfied with its action. The water is filtered with considerable rapidity at the same time that this is efficiently done. I recommend this system to Government, and other large offices, in preference to any other with which I am acquainted. "WALLER LEWIS, M.D.,
"Medical Officer, G.P.O."

THE SILICATED CARBON FILTER

Has been tested by the "Lancet" Commissioners with water mixed with milk, which passed through perfectly bright and clear,—a result obtained with no other filter. It also has the power of entirely separating lead from water containing it in solution.

From the "LANCET," *March* 23, 1867.

"The water which had passed through the Silicated Carbon Filter, sent in for examination, was free from colour and opalescence, though before being sent through the filters it possessed both to a marked extent.
"The water from the *Main Service* Silicated Carbon Filter at the *London Hospital* was free or very nearly so from colour. The organic matter in the water (after filtration) gave no unpleasant character to the water, and was perfectly harmless."

Effect of the Silicated Carbon Filter upon Thames Water obtained near Battersea Bridge at High Water.

	UNFILTERED.	FILTERED.
Total Solid contents of an Imperial Gallon	33½ Grains.	5·7 Grains.
Hardness as determined by Clark's Test	9 Degrees.	6 Degrees.
Earthy Carbonates deposited by boiling one Gallon	11 Grains.	None.
Organic Matter contained in an Imperial Gallon	3·8 Grains.	0·6

The unfiltered water was of a greenish yellow colour, and during evaporation gave out a most offensive odour, the residue being a dark brown mass of organic and saline purities. When passed once through a Silicated Carbon Filter it became perfectly colourless, sweet, and drinkable; during the evaporation not the slightest odour was perceptible and the residue was quite white and consisted of little more than Chloride of Sodium (Common Salt).

SILICATED CARBON FILTER COMPANY, BATTERSEA., LONDON, S.W

THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 23, 1867.

CONSTRUCTIVE AND ÆSTHETIC DESIGN.—No. II.

WALLS, like our roofs and windows, have undergone considerable modification in their treatment. Here, too, sham appearance has given place to constructional design. Instead of the fictitious dress of stucco or compo jointed to imitate large blocks of stone, which during the supremacy of mock architecture concealed the natural and available material, we now prominently display the latter, and make capital out of those very constructive features we were wont most sedulously to conceal. It is only when we cannot obtain good hard burnt and moulded bricks, and the cost of stone precludes its use, that we fall back reluctantly upon compo as an exterior facing. But even when we do—and we must not overlook the fact—we use it distinctively rather as a non-absorbent facing than as a counterfeit dress. There are comparatively few architects who use cement merely as a cheap way of obtaining ornamental effect. Constructive merit has so completely taken its place that we often witness constructive means obtrusively paraded even to a fault. The practice of using cement dressings, such as weatherings to buttresses and copings to gables, &c., is frequently superseded by the substitution of brick, even where stone is obtainable and decidedly more judicious. Such illimitable use of brick, however, will speedily correct itself; and the employment of terra cotta in lieu of stone for weather and other dressings has already assumed a position in our buildings of great architectural importance. The porosity of bricks, especially those manufactured in some counties, as in the southern districts of England, has led to the adoption of hollow external walls in those parts—a plan obviating the necessity of internal battening, while it interferes but slightly with structural or æsthetic considerations. Walls thus formed are built in two thicknesses of half a brick, one brick, brick and a-half, or two bricks, as the case may require, with an intervening space of 2½in. I believe these double walls will eventually become general, as advantages besides their security against the absorption of moisture from without will easily suggest themselves to the scientific practitioner.

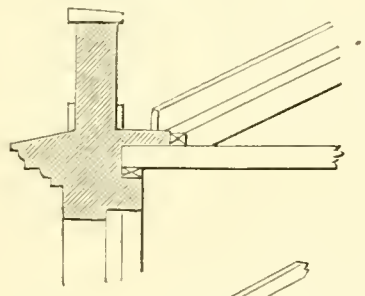
In connection with the structural aspect of modern walls, perhaps the feature which above all others has contributed to give them a distinctive character is the visible arch whether over windows or doorways. Before the general revival of the mediæval style such openings were—in the absence of stone—spanned by lintels or compoed arches. At any rate, the arch itself was rarely seen or made a prominent feature, and, with the exception of that remnant of a false constructive taste, the finely rubbed skewbacked or gauged arch, apertures were surrounded externally by architraves and entablatures. Mr. Bartholomew was among the first who called attention to the pernicious "French arch," and exposed the structural defect of such an arrangement of bricks misnamed an arch. Of course, the horizontal treatment of the classic styles, where trabeated forms are preferred, rendered square-shaped apertures desirable, and the arch proper—the visible voussoir arch—became to be regarded as an indirect mechanical means—a secondary substitute for the lintel. But still it is worth notice, as showing the taste for concealing construction, that our pseudo-classic forefathers did not adopt more generally the joggled systems of constructing flat arches seen in many Roman examples, as in Diocletian's palace at Spalatro, and even in a few English examples, instances of construction Mr. Bartholomew drew particular attention to in his invaluable work—a work, it must be admitted, that has exercised no inconsiderable influence in correcting the pseudo-constructive tendencies of his day.

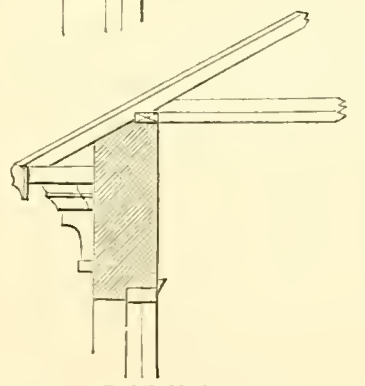
These abuses in construction are here only recalled to remind the reader of the wonderful change our present constructive brick system has brought about. Openings are spanned no longer by such sham expedients—false to their very core—but by arches whose merits lie in their visible constituents. If square heads over our windows and doorways are required, we do not hesitate to expose a stone lintel underneath a semicircular or pointed arch as the visible means of securing our wooden frames; indeed, we sometimes glory in such expediency too boastfully.

Methods we often used as palliatives are now frequently adopted with a zest which would make the pseudo-classicist smile. Who, for instance, would have dreamt of exposing relieving arches in a blank wall fifty years ago?

Another distinguishing feature of modern brick and stone design is its avoidance of unbroken flatness in wall surfaces. Slight breakings or projections of chimneys, gable ends, &c., are much more commonly resorted to than formerly, when buildings were erected on the simplest quadrangular plans. While external relief is obtained by these projecting features, manifest advantage is often gained in the internal economy by avoiding altogether, or lessening to a minimum, the common and unsightly projections of chimney breasts, thereby saving room internally, and pleasingly adding to otherwise monotonous wall surfaces. A little difficulty arises sometimes in the interruptions these external projections give to cornices and eaves gutters, but this is

SHAM PARAPET AND CORNICE.

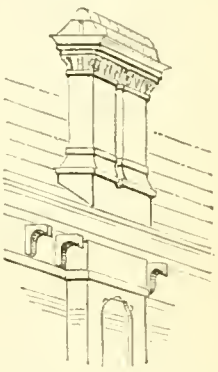




EAVES CORNICE.

not insuperable. In buildings of horizontal character the most protuberant members of the cornice, including the guttering, can generally be continued past such projections when these are slight, the bed mouldings and under members only stopping against the projecting work. Chimney projections may sometimes be drawn in just underneath the cornice, either by splays or weathered back by moulded cappings. In either case, where thickness of wall is sufficient, recesses or panels formed in these projecting features add considerably to exterior relief. The simple necessity of every case in which utility and effect can both be served, however much in discordance with preconceived ideas or methods, sufficiently sanctions the adoption of any treatment; and it is absurd to deny to a particular style any feature which has become by mere usage the peculiar property of another.

In speaking of wall construction there is no portion of a structure so generally prominent, and upon which a successful result so much depends, as the upper treatment of the walls. Parapets and balustrades, at one time the crowning features of façades and mock frontispieces, were by common consent recognized as the only legitimate finishings to them. It was quite in unison with the mock architecture of the period to consummate the work of deceptive construction by making the walls masks, without any apparent roof to carry. The concealed gutter was by far the greatest abuse that this mode of construction created. By discarding the parapets, we have, on the other hand, considerably gained, both



in security of construction and appearance. Instead of a sham cornice, which really required the parapet as a counterpoise, we now obtain a bold one at less than half the cost—one which is strictly a reality, forming the eaves, and its upper member serving as guttering. There is only one practical disadvantage in the projecting eaves cornice, but one, nevertheless, that can be easily overcome in some cases: it is the increased depth of dead walling it entails over the upper windows by reason of the sloped roof being continued over wall and cornice. Sometimes, however, the necessity of employing roof trusses considerably mitigates the difficulty by lessening this otherwise lost space internally; or the difficulty may be palliated by a sunk gutter on the sloped part of roof just over the wall, thereby allowing the external cornice to be raised to the required height to obtain the window heads at a proper level. It will be observed that the difficulty is in proportion to the angle formed between the wall and rafter—the steeper the pitch of the roof the greater this dead wall space becomes.

In another paper we will briefly bring under notice a few other instances where the constructive defection of the last century has been replaced by thoroughness and simplicity, and how in every case æsthetic design has improved by the change. It is true that in the instances already adduced we have only returned to the works of our mediæval ancestors, and it may be asked, with a plausible show of reason, in what have we advanced? But there is an element in our modern art that must not be overlooked. The mediæval builders spontaneously developed from experience their constructive excellence—theirs was the result of necessity, ours of choice. In an age of fanaticism—the necessary reaction of a sudden change of thought—we discarded their experience and art, whereas now we readopt it, not in its essence nor from necessity, but from a rational spirit of eclecticism, itself the prescience and prelude of the evolution of an organic law. G. H. G.

A FEW WORDS ON SOUND IN ITS ARCHITECTURAL RELATIONS.

WE are, it seems, to have a Hall of the Arts and Sciences, intended at once to serve as a memorial of Albert the Good; but, to show the world how Englishmen can

combine the *utile* with the *dulce*, it is to be, if possible, converted into a paying speculation. It cannot but be gratifying to the national mind that we should in these memorials have so often accomplished the feat hitherto supposed to be unattainable—of eating one's own cake and yet having it. A memorial is to be raised, and money is subscribed for the purpose. The shape it is to take is undecided until it suddenly flashes across the mind of some local genius that a new pump or a set of wash-houses is wanted. The originality of the idea is striking, and all men are straightway impressed with its beauty. They have the merit of subscribing to a memorial, but this is further to take a shape which will permanently benefit them. In the name of the prophet, a memorial if ye will, or a Hall of the Arts and Sciences if ye will, only let us have no nonsense about the one or humbug about the other. But even apart from such considerations, Mr. Dion Boucicault has in his letters directed attention to a most important point—will the Hall when finished be of any use, say, as a lecture-room, or will its acoustic properties be such as to render anyone's voice audible, except in close proximity to the orchestra? Nothing is more common than to hear the acoustic properties of one hall praised, those of another blamed, without any definite reasons being assigned for this variation. If one turns to books on architecture he will learn but little more, for it would seem that the acoustics of a building are too often left to chance, other matters being held of greater importance. Were it not so, and were the principles of the production and propagation of sound better understood among architects, we would hear less of the failure of buildings to fulfil intended ends of this nature, and of the expensive alterations sometimes thus rendered necessary. Two distinct things are hereby understood, a knowledge of the laws of acoustics, and of the nature of building material with regard to sound. We take this opportunity afforded by the discussion above referred to, and the publication of a series of lectures delivered by Professor Tyndall,* which our readers would do well to consult for an exposition of the laws of sound, to say a few words on the application of acoustics to architecture.

Much has of late years been done towards elucidating the laws of natural phenomena, especially with regard to the co-relation of the physical forces; and the conversion of heat, chemical force, &c., into motion is now well understood. Light and sound have long been held analogous, but their exact similarity could not be admitted whilst the doctrine of particle was entertained with regard to light. When, however, the wave theory came to be generally received, the identity of the laws regulating the phenomena of the two became readily appreciable. Sound originating in the vibrations of some body or bodies, such as the vocal cords, the vibrations of which give rise to motion of the particles of air, which, being transmitted to the ear, causes the sensation of hearing. When, for instance, a tuning-fork, a reed, or other body of a like nature, is made to vibrate, or move alternately backwards and forwards, its motion in one direction must cause the particles of air to become more closely approximated and so impinge the one upon the other, whilst its withdrawal and motion in another must give rise to a corresponding recoil. The two, the condensation and the rarefaction, constitute a sonorous wave, which thus consists of a certain number of particles more closely packed than ordinary, and a certain number of particles less so. It is not, however, to be supposed that the particles thus set in motion make their way directly to the ear, pushing all intermediate bodies out of their way, but rather that the amount of motion among them is very slight, the impulse given to one being immediately transferred to its neighbour, and thus propagated from particle to particle, just as when a number of billiard balls lying close together are struck at one extremity of the line, the whole group is not thereby moved, the force being transferred directly to the last ball of the row, which is thrown from its place with a force exactly proportioned to the initial impulse. Now, if the particles are allowed to move freely among themselves, this will to a certain extent be an advantage, provided always that when one impinges against another, the recoil is prompt and complete. This last depends on the elasticity of the body, a word unfortunately employed with too many significations, and in this case in a way almost the reverse of the idea ordinarily attached to it. Thus, for instance, such substances as glass are said to be highly elastic: in ordinary language they would be termed brittle. When a stone is dropped into water the ripple resulting tends to spread uniformly in every direction: so with sound, other things being equal; but as a rule sounds have a tendency to propagate themselves in one particular direction, their initial velocity being greater in that than in any other. Sound, like light, tends to travel in straight lines, unless it be bent or deflected from its path. When it is so the laws which regulate its divergence are identical with those which govern light, both as to reflection and refraction, for it is a curious fact that, by a lens adapted for the purpose, sounds may be brought to a focus in the same way as light can.

If, now, we try to apply these principles to the human voice, we find that the particles of air caused to vibrate by the vocal cords, and projected from the lungs through the mouth and throat, communicate their impulse to those external to the body. By these the vibrations would be propagated equally in every direction were it not for the original impulse of the air projected from the chest, which has thus acquired a tendency to move in one particular direction; hence it is that one hears a speaker far better when seated in front of him, than if placed behind or to either side. But as there is this tendency to radiate, the vibrations which ordinarily reach the ear are comparatively scanty, and their intensity comparatively small, contrasted with what they might be were they confined within certain limits. We see the daily application of this fact in the speaking tubes now so extensively employed both in public and private life. Were the interiors of these tubes rough, the particles of air vibrating within them would have a certain amount of their force wasted on the projections; hence the smoother they are the better. Not only so, but as a certain amount of velocity is lost at each curve where the particles of air must impinge and their force be converted into heat, and so lost, it is of importance that these tubes should be as nearly straight as possible. Their material, except when very long, may be made a matter of convenience.

We have seen that, when confined within certain limits, sound is transmitted farther, and with greater intensity, than ordinary. There is another simple application of the same fact. When a speaker is placed in the middle of a room, the initial velocity of the sound will tend to its propagation in the direction in which it is propelled from the mouth: hence those situated behind him will not hear as well as those in front; whilst, on the other hand, should none be placed behind, the sound which passes in that direction is wasted, and the assembly will not hear as well as if the speaker had something behind him to prevent the sound passing in that direction. From this fact may be deduced the importance of placing pulpits as near a wall as possible; or, if the building be large, of placing behind them some body which will reflect the sound. The reflection of sound should never be overlooked in the construction of halls, theatres, concert-rooms, &c.; and it is chiefly to a neglect of this rule that the bad acoustic qualities of certain buildings are due. Were a man standing in the centre of a semicircular building to give utterance to a note, it would reach all portions of the wall at about the same time, and be reflected back to an extent varying with the nature of the materials and construction of the wall. When the building is small, the reflection of sound is of little moment: it only goes to strengthen the voice; but if large, then the reflection or the echo may come in after the note is finished, and entirely destroy the effect. When the shape of the room is irregular, a great many echoes will be produced; and even when it is regular, sound may again and again be brought back to its starting point if the resonant qualities of the walls be good. Hence the tendency to echoes in cloisters and empty rooms. This resonance, which might prove extremely troublesome, is generally completely destroyed by the presence of a large audience; and a hall in which one could not make himself heard for echoes may thus become easily spoken in. But several things are herein included which should be discussed separately. First, then, the shape. The shape of the ancient Roman theatre, that of a semicircle with the seats rising tier above tier, was probably the best adapted for hearing; but various circumstances, particularly the introduction of scenic illustration, and the consequent necessity for diminishing the width of the stage, have rendered a departure from this plan necessary. The horse-shoe shape is that which is now most frequently adopted. Many years ago now, Mr. Russell wrote a paper on the best plan of arranging seats in such buildings, so that the whole audience could see and hear with ease. He came to the conclusion that those nearest the speaker should be somewhat more elevated than those a little behind, whilst those far back again should have their seats in a regularly ascending series; this, however, apart from the shape of the theatre. It has been suggested that an orchestra should always be built in the form of a parabola, so that the reflected sounds might proceed in straight lines to the audience. But as the whole orchestra cannot occupy the centre of this parabola, and the reflected sounds cannot reach the audience in the same time as those proceeding directly from the instruments, this shape is not better than another. In reality, says Sir John Herschel—and no one is better qualified to speak on the subject—the shape does not so much matter, provided it be of a regular outline. All projections, all retiring angles, niches, and such like, are to be avoided.

Sound, though readily transmitted through air, is still more so through fluids and solids. Produce a noise at one extremity of a long iron rod, so as to cause it to vibrate, two sounds will reach the ear at the other—one transmitted directly through the solid, the other following the previous one through the air. The particles of the iron possess greater elasticity than those of the air, and transmit the vibrations more rapidly. Should it, however, happen that the iron was not composed of a single piece, still more were it interrupted at different intervals by substances of different elasticities, this might not be the case. As with light, which, when it passes from one medium to another, is refracted, so it is with sound; and were the process repeated often enough it might be entirely dissipated in this manner. Practical illustrations of this are abundant enough. Sound, as a rule, is better transmitted by night than by day, the reason being that the density of the atmosphere is then more uniform—no warm patches here and cold patches there, the air being thus rendered of different densities. All know the effects of woollen cloth in deadening sound, as seen in a baize-covered door. Feathers are still better for this purpose, a feather bed being almost impermeable by sound. The *rationale* is simple

* "Sound." A course of eight lectures delivered at the Royal Institution of Great Britain, by J. Tyndall, LL.D., F.R.S., Professor of Natural Philosophy in the Royal Institution, and in the Royal School of Mines. London: Longmans and Co., p. 235.

enough. The cloth and the feathers consist of a great number of fibres, not closely approximated, as in a piece of wood, but loosely applied to each other with layers of air between. The vibrations might be transmitted through the fibres themselves; but in passing from fibres into air, and back again into fibre, they become totally extinguished. The use of sound boards is perfectly familiar to builders, when it is desirable to prevent sounds passing from one floor to another. Small boards—the smaller the better, the more will they break up the sound waves—are nailed down transversely to the joists, and some pugging material laid down over them. This material may be of various kinds, the less uniform its consistence the better. Hair having qualities similar to those of feathers, mixed with some coherent material, as plaster, suits well. Unfortunately, the process often gives rise to dry rot, but this can only be owing to carelessness; indeed, it would be easy to render the pugging material highly conducive to its prevention. The same fact seems to explain the different acoustic properties of an empty room and one containing a large audience. The audience breaks up the sonorous waves; but people being clothed in a non-resonant material, instead of reflecting them, they are dispersed and lost. So it is with carpets, and so it is with hangings, only these not only disperse the sonorous waves, but also prevent the floor and walls from returning the vibrations which may reach them. They are thus utterly destructive of the acoustic properties of a room. When the string of a fiddle or wire of a piano is struck, as it is tightly stretched between two points, it gives rise to little or no sound, except the points to be connected with a resonant structure, as the body of the fiddle or the sound board of the piano. The vibrations thus communicated are reinforced, and the intensity of the sound is augmented. So, to a certain extent, should it be with the walls of a room. If not too large, and the walls be lined with sound, well-seasoned timber, the sound of the voice will be sent back, and tend to reinforce the original note. Should, however, the size of the room exceed 112ft. in length, the echo of the end wall may come in after any note sounded as often as five times in a second, thus producing awful dissonance. When the hall is empty it usually happens that the note is bandied about, as it were, long after it is has been emitted, there being no audience to break it up and absorb it, so that discord or perfect confusion of sounds is the result. When, however, the audience is present, a certain amount of resonance is necessary. For securing this, as we have hinted, wood seems of all substances the best adapted, and it has been noticed in operatic singing that wooden boxes without curtains greatly improve the hearing of the inmates. Not only so, but unpainted wood seems to suit better for this purpose than painted; its particles can then more freely influence one another. Who, for instance, would think of painting a violin? Hearing in the ancient and roofless theatres must have been extremely difficult, for, from experiments made by Dr. Hutton, it would seem that the voice at its ordinary reading-pitch only penetrates about 75ft. in a straight line, whilst the size of these theatres in some cases enormously exceeded these modest limits. Vitruvius tells us that empty jars were distributed in various parts of the building for strengthening the sound of the actors' voices. It must, however, be remembered that the actors sang rather than spoke, and the notes used in the one way are more penetrating than in the other. Still, it has been a vexed question ever since ancient architecture came to be studied, how these vessels acted, and even now the matter is not easily understood. It has, however, been ascertained that if a cylindrical vessel of a certain calibre and depth be held near a vibrating musical body it may be made to reinforce the note of that body by altering the depth of the cylinder in accordance with the note. This, however, does not explain how vessels could be found to reinforce all the varied notes of the human voice. If the hall be too large to reflect the sound in time to reinforce the original note, an echo will be the result. Multiple echoes are tolerably common, and their *rationale* admits of easy explanation. If, for instance, a sound be produced at a point opposite a cliff, the sonorous waves are propagated until they rebound from its face; if another cliff be situated opposite, the reflected wave will be again thrown back, and so on, the sound diminishing in intensity each time, part being lost in each reflection, until it ultimately dies away. Most buildings are, however, too small to exhibit this phenomenon, and the surfaces of reflection are too numerous not to interfere with the simplicity of the initial sonorous wave. The case of one echo mentioned by Sir John Herschel will serve to illustrate the danger of adopting the style of roofing with open rafters in very large buildings, intended for speaking or singing. When one of the pillars of the Menai Suspension Bridge is struck a series of echoes are heard, one for every one of the transverse beams on which the pathway rests, then one strong and well defined for the opposite pier, followed by innumerable reverberations between the bridge and the water. So in a large hall with open rafters, if the speaker be placed at one end, his voice will be reflected by each transverse beam, until it reaches the opposite wall, which in its turn will throw back the sound, the whole giving rise to a confused note, very unlike that which issued from the speaker or singer. If the building be small, the resonance of the wood, instead of confusing, will intensify the sound. Intimately connected with this department of the subject is the phenomenon of whispering galleries. Of these there are two kinds, one (falsely so called) being neither more nor less than an imperfect pipe or speaking tube, in which sounds can be heard at an unusual distance, but all the better the nearer its origin. This kind may be noticed wherever high walls run parallel for any distance; the sonorous waves are prevented from spreading, and hence penetrate an unusual space. Indeed, alongside of a single wall, especially if it be smooth, the sound of the voice will reach further than it will do in an open space, for the sonorous waves are confined in two directions by the ground and by the wall. But in true whispering galleries other conditions have to be fulfilled. Sound must not only be propagated to an unusual distance, but be inaudible in the middle passage. A well-known illustration is supplied by the dome of St. Paul's Cathedral; here, if a sound be started at one point, it is reflected by the circular walls of the hemispherical dome, and all the waves are brought together at an opposite point with greater force than if impelled directly towards it. One of the best examples of this kind is to be found in the Conservatoire des Arts et Metiers, in Paris. The room is square, and the roof is elliptical. If two persons stand in the foci of this ellipse they can converse in extremely low tones, but this does not prove any extraordinary virtue in such a form of roof or building. All the listeners cannot stand in one focus, and the speaker in the other; and, as has been seen, those in intermediate or other situations obtain no advantage from the peculiar arrangement. As was said before, any simple outline will do. No angles, no buttresses, no recesses; if possible, let the walls be lined with well-seasoned wood, and covered with nothing to diminish their resonant properties. These, in a moderate sized building, with no barricades or obstructions to the sonorous waves, will secure its possessing good acoustic properties. When a hall exceeds a certain size much may be done by art to secure hearing for all it will hold, but it can never be perfect in this respect.

DRAINAGE OF THE ZUIDERZEE.

To alter—many would say to deface—the natural features of a country, appears to be the principal duty of the engineer and the contractor. If the course of a river is not conducive to the interests of mankind, it is changed immediately and remorselessly. Should an isthmus obtrude itself where it is not wanted, it is cut through, and the waters of the ocean traverse it from one extremity to the other. Nay, more, if a mountain rears its primæval summit in defiance of all human efforts to overcome the natural obstruction it presents to international communication, it is undermined, sapped in its very vitals, and an artificial artery, piercing its entire system, supplies that life blood previously denied to those, between whom it constituted an almost impassable barrier. That a large portion of not merely cultivated but inhabited land in every country is below the mean sea level is well known, and it only obtains its immunity from destructive floods either through the intervention of natural or artificial protection. An instance of the former is to be found in many an inland sea and lake, which, surrounded by hills, is completely severed from the influence of external inundations, although the level of its surface may be many feet below that of the nearest ocean. Physical geography, a most interesting and instructive, and, for that very reason, a much neglected science, reveals many curious facts relating to what are termed "depressions" of land and water. It has been found, by a series of accurate levelling operations, that the Caspian Sea, with an area of 24,000 square miles, and an average depth of 500ft., is nearly 84ft. below the level of the adjacent main. Passing into Asia Minor, we find the seas and lakes there presenting still more remarkable depressions below the mean sea level. Thus, the Lake of Tiberias, otherwise known as the Sea of Galilee, rolls its placid waters at a depth of 470ft. beneath the surface level of the Mediterranean, while the lethal waves of the Dead Sea, well to and fro nearly 1,400ft. below those of their tideless neighbour. The tides of the Mediterranean are so very small and variable, that, like the Baltic, it is often termed a tideless sea.

The draining of the Lake of Haarlem undoubtedly imparted a stimulus to the labours of the inhabitants of those "depressed" regions, and demonstrated what could be done, in an engineering point of view, with masses of water which served merely to hide from view and utilization thousands of acres of rich food-producing land. For ages past, the flats of Holland have presented, upon a large scale, a continual scene of warfare between the power of the elements and the industry and skill of the human race. The sea, incessant and irresistible in its encroachments, has for centuries endeavoured to engulf a portion of that kingdom, and man, equally persevering and indomitable, has not only put a limit to its depredations, but has even succeeded in driving it back far beyond its ancient landmarks. Thus the war goes on; the sea occasionally vindicating its elemental power by making devastating forays, if we may so express it, into the enemies' country, and the enemy retaliating by throwing up embankments and entrenchments against the approach of the foe. Amsterdam is a city virtually built upon the sea, similarly to Venice upon its hundred isles, and one of its principal buildings stands upon 14,000 piles, the last of which was driven in 1650. In earlier times the depredations of the sea were considerably more extensive and more fatal in their consequences than in modern days, when the laws of science became more generally diffused, and were applied in practice by those who had combated the fury of inundations in a somewhat primitive manner. To go back to the records of the national disasters of Holland, we find that in the year 840 a frightful hurricane burst the protect-

ing banks, inundated the whole of the Frise district, and utterly swept away 2,500 dwellings. Again, in the fourteenth century, the waters engulphed a vast area of land containing upwards of seventy villages, and gave the name of Verdronkenland or "drowned land" to the territory submerged, and was the cause of the river Escaut entering the sea by a new embouchure. There is, however, every reason to suppose that the original mouth of this river, the Zwjn, was due to a previous inundation, the more especially as it was of vast dimensions and depth, and its capacity and accommodation was unquestionably the real source from which sprung the important traffic and commerce of the cities of Flanders, which in the middle ages had scarcely a rival for wealth and stability. It was also by this embouchure that vessels of war reached the sheltering arms of the roads of the fine port of Dam, which in the seventeenth century extended its protection to the fleet of Philip Augustus, numbering some 1,800 sail. If it were asked where are those river mouths and sea roads now, the answer would be, that their site must be sought for in that of the cultivated lands and farms occupying the same locality. The Zwjn itself has dwindled down to a mere dyke, and the once famous port of Dam is situated several miles inland. The succeeding century witnessed another triumph of the sea in the destruction of the town of Reimersvale, and of over twenty villages and hamlets situated upon the eastern side of the island of Beeweland.

There is very little question but that the first idea of opposing an impediment to the encroachments of the ocean was suggested by the effect of the waves themselves, and the natural barrier they oppose after a time to their own destructive action. Aided by the winds, they form natural embankments or dunes, as they are termed, and the first efforts of man were evidently directed to extend and improve these existing protecting barriers. These dunes are continually pushed forward by the united action of the winds and waves towards the interior, generally presenting a slope and a steep side. The wind first raises the loose sand up a slope to a certain height until it falls over by its own gravity, and accumulates upon the other side, where it is again pushed up to fall a second time, and this operation of forming small sand hills with one flat and one steep side continues for years until checked by some rising ground. Under favourable circumstances the annual advance of these dunes has been known to amount to so much as 70ft., and there are not wanting instances where villages have been almost buried beneath the accumulating masses. As an extreme case, may be quoted the rapid advance made by dunes near Cape Finisterre, off the coast of Spain, where, in the period of half a century, they have advanced nearly sixteen miles inland, being at an average rate of about 1,700ft. per annum. Another peculiarity attending the formation of dunes is that they sometimes become completely indurated, owing to the presence of lime, iron, silica, and other salts and minerals in the water, and when these exist in conjunction with the roots of plants, such as the *Arundo arenaria*, the whole mass becomes of a consistency at once solid, immovable, and watertight, forming a perfect dam against future inundations. By thus taking advantage of a natural barrier, and aiding nature by science, an excellent specimen of a dam was constructed in Zélande, named the dam of Westkappel, which has a total length of five miles, and retains the sea at high water at the level of more than 15ft. over the adjoining lands. At present a more important undertaking than the drainage of the Lake of Haarlem is occupying the attention of the Hollanders. It is nothing less than the reclamation of the land occupied by the waters of the Zuiderzee, and its extent may be imagined when it is borne in mind that the portion in contemplation of reclamation exceeds half a million acres, whereas the area of the Lake of Haarlem was but forty-five thousand acres. This magnificent plan, which is estimated to cost about 10,000,000, is projected by M. Beijerinck, and the particular part of the Zuiderzee to be reclaimed is that lying to the south of Keteldiep, in the direction of the island of Usk, and bearing towards Enkhuisen upon the west, so as to leave that town and its roads outside the embankment. The total length of the enclosing dam will exceed twenty-five miles; and experienced as the Dutch engineers are in protecting their territory from its ruthless foe, it will need all their skill to maintain staunch and durable so extended a line of defence.

AN ARCHITECTURAL NOTICE OF ST. JOHN'S PRIORY, CLERKENWELL *

By W. Pettit Griffith, F.S.A.

St. John's Priory Church.

The dedication of the original church by Heraclius, Patriarch of Jerusalem, is recorded to have been in the year in which the Temple Church was also dedicated, and by the same Patriarch. "In ye yere of Christ 1185, ye vj. Ides of Merche, ye domical lettre being F, ye Chyrche of ye Hospitall of St. John's, Jerusalem, was dedicatyd to ye honor of St. John Baptiste, by ye worschypfull fader Araclius, Patriarke of ye resurrection of Christe; ye sam dey was dedycatyd ye high altre and ye altre of St. John Evangelist by ye sam Patriarke."†

The Norman or circular portion of the present Temple Church formed the building alluded to above, and there is no doubt that the masons engaged in sculpturing the arcade in the aisle of the circular portion of the Temple Church were also employed on the ornamental capitals, &c., of St. John's Priory Church. The erection of the first buildings of the Priory occupied some years. It has been stated that between the years 1274 and 1280, Joseph de Channey, prior, built a chapel, and that William de Henley, prior, erected a cloister between 1280 and 1284. In 1338 it appears that some repairs were effected. The original church, of which part of the crypt remains, was semi-Norman and Early English; some of the bases remain *in situ* beneath the present modern floor, and part of the south wall remains, in which can be traced narrow window openings and a doorway also beneath the floor, formerly facing Jerusalem-court. In one of the houses in the court built against this wall can been seen a Norman capital in the wall.

With the exception of the crypt, all the Priory (including St. John's Gate) was destroyed in 1381 by the rebels of Essex and Kent, who set fire to the buildings, causing them to burn seven days.

After this calamity, the Priory was rebuilt, Prior Docwra completing it in 1504. Docwra's church was in the Perpendicular style, and grafted upon the Early English crypt, and consisted of nave, aisles, a great bell tower, graven, gilt, and enamelled; a choir, with side chapels, &c., and the remains of the Early English crypt. The present church is a part only of the ancient choir, and beneath it is the crypt.

The crypt comprises a central avenue 16ft. 3in. in width and 12ft. in height, with an aisle on each side extending from east to west, and is, with the aisles, of the same extent and length as the present church above. The west end of the crypt is bricked up; it originally extended westward, which has been proved from time to time when excavating for drains, &c.

The most interesting remaining portions of the crypt comprise the central avenue and a small compartment on each side of it by the entrance at the east end. The compartment on the south side is bricked up and forms a private vault, in which are deposited the remains of Simon Michell. It is 13ft. by 10ft., and was enclosed in 1793.

This system of allotting portions of the crypt to other families as well as Michell's injured its fair proportions and lessened its original size.

The entrance to the crypt is at the east end by a flight of stone steps beneath a modern vestry. The crypt appears to have been originally above ground, and not subterraneous. An entrance to it may be seen in Hollar's view of the east end as it appeared in 1661, from St. John's-street, with the hospital gardens and boundary wall.

The central portion of the crypt consists of four severeys or bays; two are simple and plain, being semi-Norman, and two (towards the east) are Early English, and very perfect, the details and mouldings being worthy of a careful examination. The voussoirs of the arch ribs are wrought in a similar manner to the voussoirs of the former nave, chancel and aisles; these are often dug up in the vicinity of the Priory. The voussoirs are worked with great precision, about 5in. long, are not arched; their shortness enabled them to be set to the proper curvature with apparent exactness; while the frequent occurrence of the mortar joints between them has preserved them from fracture by settlement.

The ribs of the Early English bays spring from triple-clustered columns 3ft. 9½in. high in each angle of the bays, with moulded capitals and bases. An excavation was made in 1854, exposing the bases to view; the upper moulding is horizontally fluted, similar to some Grecian Ionic bases.

The central shafts of the clustered columns are pointed, and the diagonal ribs have three mouldings; the central one is pointed, and the outer one rolls. This pointed bowtell occurs frequently in Semi-Norman and Early English work, and is coeval with the introduction of the pointed arch. Suspended from the keystone of each arch is an iron ring.

On each side of the two western bays of the central aisle is a deeply recessed pointed window; the opening was long and narrow, 3ft. 9in. high, and 9in. wide, and the inner splay is 7ft. 7in. by 4ft. 2in. wide; the wall is 4ft. thick. The trefoil-headed doorway on the west side of the north compartment has the large iron eyes of the door hinges still remaining. The original pavement of the crypt is 1ft. 5½in. below the present level. Clay, introduced in modern times to prevent the damp from rising, lies over the original pavement, and conceals the bases and part of the shafts of the columns.

On January 23, 1860, an order in council was made relating to the coffins in the crypt, viz.:—"That the coffins contained in the public vaults be laid down on the floor and covered with powdered charcoal and fresh earth." Instead of the coffins being laid on the floor, in March, 1862, they were piled up from the floor to the ceiling or arch in the aisles of the crypt, and the doorways bricked up. In this manner the Early English trefoil-headed doorway was obliterated. The crypt has been thus shorn of its proportions, and almost reduced to a central avenue, which might have been avoided if the coffins had been laid on the floor as directed by the order in council.

This crypt in 1762 was rendered notorious by the detection of the imposture known as the Cock lane Ghost. This was discovered in the crypt upon removing the coffins; her remains were turned quite black, and have been placed in the north aisle, and bricked up with the rest of the coffins.

The vaults existing beneath the house No. 19, St. John's-square abutted the crypt (formerly under the nave) on the north side, next Jerusalem-passage. The walls are of considerable thickness, composed of brick and stone, and stand upon rubble work, and were, no doubt, appendages to the ancient Priory. In a division wall in these vaults was a doorway of the Perpendicular period, in a perfect state, in January, 1861; at that time the vaults were converted into Turkish baths, the floors paved with tiles, and the whole of the vaults rendered with cement, including the old doorway, and thus ignorantly destroyed. The baths were open only for a few months, and then abandoned.

A bird's-eye view of St. John's Priory, Clerkenwell, restored, with its boundary walls, St. John's Gate, and the church, having its nave, aisles, transepts, tower, chancel, and chapels complete, may be seen in W. Newton's "London in the Olden Time, with a Pictorial Map of London, *temp.* Henry VIII.," folio, 1855.

In the third of King Edward VI., in 1549, the church, for the most part, the body and side aisles, with the great bell tower, a most curious piece of workmanship, were undermined and destroyed with gunpowder, and the stone was employed for building the Lord Protector's (Somerset) house in the Strand and the porch of Allhallows Church, Gracechurch street. That part of the choir which remained, with some side chapels, was closed up at the west end (next St.

* Read at the Charterhouse, before the London and Middlesex Archæological Society. Concluded from page 561.

† Cotton MS.

John's square) and otherwise repaired by Cardinal Pole, in the reign of Queen Mary; and Sir Thomas Tresham, Knt., was made prior, with restitution of some lands; but it was again suppressed in the first year of Queen Elizabeth. Five years subsequently to the dissolution, Henry granted to John Dudley, Lord Viscount Lisle, and Lord High Admiral of England, as well in consideration of his service as for the sum of £1,000 sterling, the site, circuit, and precinct of this hospital or priory of St. John of Jerusalem; only the lead, bells, timber, stone, glass, iron, and other things of the church, were specially reserved to the King's Majesty.

James I. granted, by letters patent dated May, 1607, "the scite or house of the late Hospital of St. John of Jerusalem in England, in the County of Middlesex, and all the scite, circuit, and precinct of the same house, having thereon one great Mansion House and one great Chapel, and containing, by estimation, five acres, to Ralph Freeman and his heirs in free and common soccage."

The cheir passed by various deeds to as many persons. Tenth James I. to Sir William Cecil, Lord Burleigh, son and heir apparent to Thomas Earl of Exeter, by marriage with whose daughter Lady Diana, it became (fifth Charles I.) the property of Robert Bruce, afterwards Earl of Elgin, whose son was created Earl of Aylesbury. It was now used as the Earl's private chapel, and for many years was called Aylesbury Chapel. In his noble family the estate continued until 1706, when it was sold by them, and being finally bought by Simon Michell, 1721, the chapel was, by his instrumentality, converted into a church for the intended parish of St. John.

When Michell converted the remains of the ancient building into the present church, the north aisle was used for part of a dwelling-house, and the upper part of the south aisle as a library.

In a newspaper of March 26, 1716, the following advertisement appeared:—"The remains of the once famous Abbey of Clerkenwell, called of late Aylesbury Chapel, is to be sold or let; where besides the adjoining house, furnished with all conveniences for a Boarding School) is a Gallery as fit as any whatsoever for a School Room, that will hold above two hundred Scholars."

In 1721, Simon Michell purchased the ancient structure of the Aylesbury family, and converted the remains into the present church (St. John's Church), and in 1723, having enlarged and repaired it, built the present west front of brick, with stone quoins, which has since been compoed, and re-roofed the whole. he, and a Mr. Hutton, his trustee, disposed of the church, vault, vestry-room, and adjoining grounds, together with two messuages fronting St. John's-street, for £2,950, to the Commissioners for building fifty new churches. Friday, December 27, being St. John's Day, the consecration of the church took place, being performed by Edmund (Gibson) Lord Bishop of London, when the edifice was formally styled "The Church of St. John, Clerkenwell, in the County of Middlesex," and was the second of the churches usually called Queen Anne's, in order of the time of consecration.

The turret was added in 1813, and the clock originally belonged to St. James' old church. The head of the beadle's staff also belonged to that establishment, and was used in James the Second's time; it has the following inscription:—"Anno Dom. 1685. Anno of Regni Regis Jacobi." It is silver-headed, and was made at "ye charge of ye inhabitants of ye east liberty of St John of Jerusalem." A portable baptismal bowl formerly supplied the place of the font now in use; it has a scriptural quotation round its rim, with the name of the parish and "Deo et sacris."

The font is a white marble pedestal with basin not capacious enough for total immersion), its date being probably coeval with Michell's alterations and additions in 1723.

On April 29, 1724, Michell sold to Queen Anne's Commissioners a dwelling house in Red Lion-street now No. 59), 20ft. wide and 96ft. (including the garden) in length, for £650, as a rectory house for the incumbent.

This church thus altered was repaired in 1800, principally at the expense of Philip Booth, of Red Lion-street, who contributed about £145 towards the painting, &c; and in 1812-13 further repairs were effected, and again in 1825. The external porches to aisles, next St. John's-square, were added in 1825, and the central porch was built in 1845.

In 1838, the badly-constructed wall, erected about 130 years ago, partly enclosing the north side of the church, was rebuilt. Several fragments of the Priory were found in the wall used as rubble.

In 1845, this church was repaired under my direction, and I took care to note the following:—Upon removing the plaster from the inside of the east wall and central window, it was discovered that (Docwra's) masonry still existed from the ground to the middle of the said window arch, in altitude 27ft., all of the wall above that having been rebuilt in brickwork (by Michell). This window remains in the same state as shown in Hollar's view next St. John's-street. It has still its stone mullions, but the foils are gone. In the south aisle the pews against the south wall were removed, and it was found that Simon Michell, when he partly rebuilt the church, used portions of the former church to support the pews. These consisted of ribbed mouldings, parts of shafts, portions of the groining, capitals of clustered columns, coloured and gilt, and other remains of the former church. The pew front, No. 82, opposite window recess in south wall by west end, stands upon eight large clustered capitals. Upon these capitals was marked the geometrical system employed by the mediæval architects in designing their edifices, and which has been propounded by myself during the last thirty years. The bulk of the shafts, the capitals, the centres for producing the large and small columns, are all accurately defined. There is no guess work, the diameter of the pier being determined; the whole of the parts produced bear a proportion to each other and to the original unit.

The floor of the original church was 1ft. 2½in. below the present floor. The south wall I found to have been built by Docwra on the remains of the Early English wall, which latter now remains some few feet above the floor, and contains the narrow splayed openings of the original windows, and a doorway that opened into Jerusalem-court. These are not visible without removing the pews. Docwra's wall contains large perpendicular windows. The upper part of the south wall was rebuilt by Michell. The north wall has been partly rebuilt, but still contains some of Docwra's windows. Upon taking down this wall, built by Docwra on the wall of the crypt, an angular capital was discovered built in the wall.

This capital belonged to the original church, and by referring to the plates of ornamental capitals in Billing's Account of the Temple Church it will be observed that the resemblance is striking. As the Priory and Temple Church are of the same date, 1185, the same masons may have been employed on both buildings. A small gilt capital was also found in the wall.

In the central east window is a coat of arms (a chevron between three combs) in painted glass, stated to be the coat armour of Tunstall, of Tunstall, in Lancashire. They are, however, the arms of Prior Botyler. The east windows of north and south aisles have lost their stone mullions. In 1812, in enlarging the east window of the south wall, the skeleton of a child was found in the masonry; it was left undisturbed.

The church was considerably injured and interfered with by the erection of houses on the south side, next Jerusalem-court, between 1600 and 1700. These contain the oak wainscoting of the period. The south entrance and windows of the church were unfortunately blocked up by these buildings, and many of our cathedrals and churches were formerly wantonly disfigured in this manner.

In conclusion, any further comments upon St. John's Church, as spoliated by Simon Michell, will be misspent, as all real interest to the architect and antiquary ceased the moment Michell put his Classic extinguisher upon the Gothic edifice. The day may arrive when this Classic fungus will be removed, and Docwra's Perpendicular church reinstated upon the ancient crypt.

In 1677, the principal inhabitants of Clerkenwell were Sir James Edwards, Lady Percy, Sir William Bowles, Knt., Sir Richard Chiverton, Lady Wright, Sir John North, Sir William Palmer, the Earl of Aylesbury, and others. Bishop Burnet's residence is still to be seen on the west side of St. John's-square; it adjoins the late Dr. Adam Clarke's house. John Weever, the celebrated antiquary, also resided in Clerkenwell, and John Britton, the author of the "Cathedral Antiquities of Great Britain," &c.

The residence of James Carr, architect of St. James's Church, was on the north side of Albemarle-street (No. 12) set back from the houses contiguous. It was here that two noted architects, Samuel Ware, author of "Tracts on Vaults and Bridges," and Edmund Aikin, author of several works, passed their articled clerkships, during which, moreover, as regards Ware, he began, I have no doubt, to study "Arches and Abutment Piers," subsequently published.

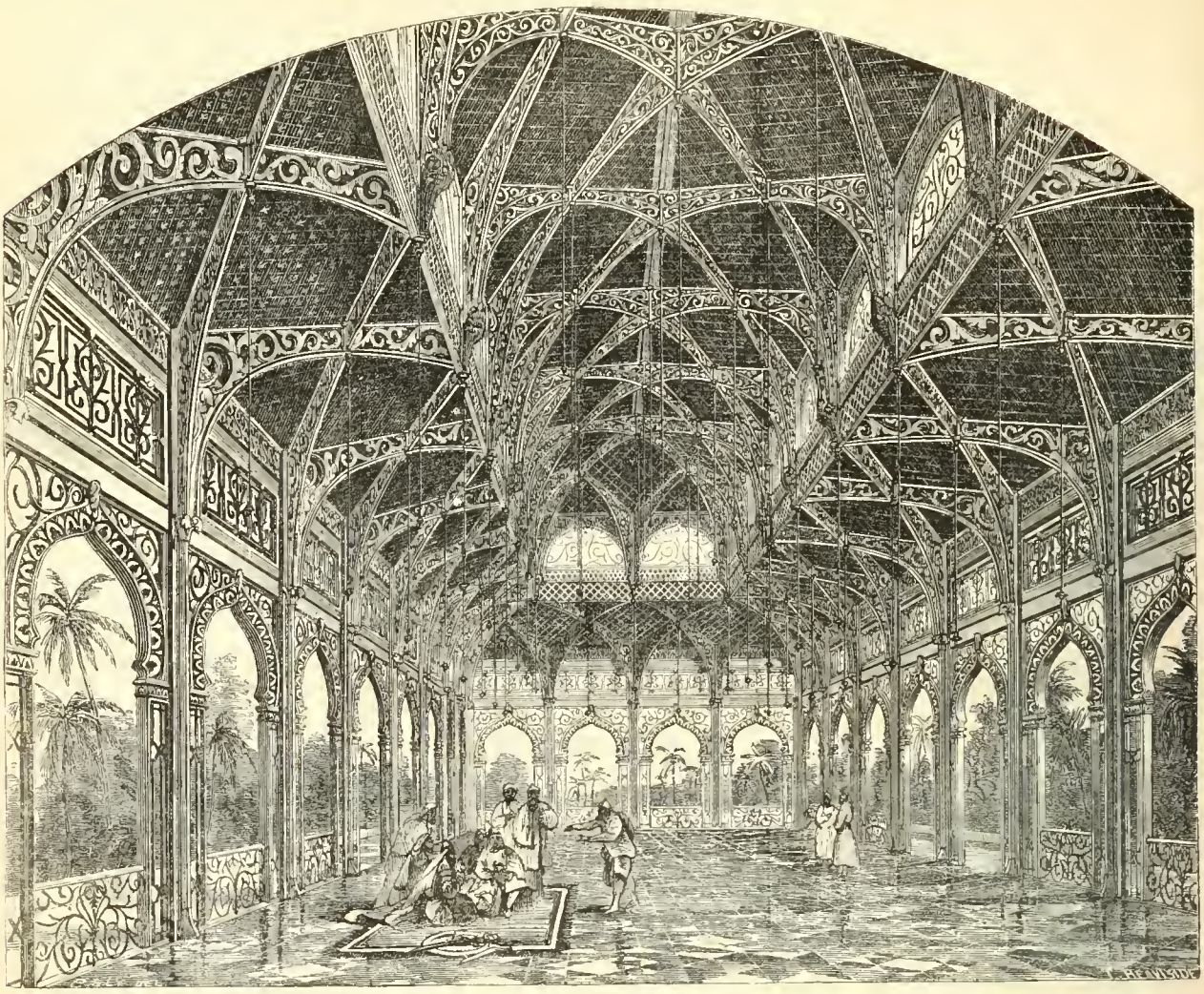
It was natural for the nobility to reside in Clerkenwell at an early period, when, according to Fitz Stephen, in A.D. 1190, the monk of Canterbury, but native of London, the fields and open meadows were very pleasant, and among which the river waters did flow, and the wheels of the mills were turned about "with a delightful noise." But Clerkenwell has been rendered more deeply interesting and remarkable by the numerous celebrated literary characters either resident in, or connected with, the locality—men not born great, but who have, by their own indefatigable industry, created their own greatness.

A CHAPTER OF ACCIDENTS.

(From a Correspondent.)

In March of last year, seven tenders, varying from £5,687 to £2,641, were sent in for building bacon curing works in the town of Cirencester. The lowest tender was accepted, and the works commenced under the superintendence of an architect. After expending a considerable sum, the contractor found he had made a mistake, and took advantage of some indefinite clause in the agreement to claim his right to give up the contract. The proprietors consented to take the job off his hands on condition that he made no claim for the work done. With the sum thus obtained the proprietors paid off their architect, and employed one of the other competitors whose tender was £4,150 (or about half way between the highest and lowest) to make modified plans and to execute the works The principal structure is the killing and curing house, which is about 60ft. wide outside, and divided internally by a wall into two rooms, respectively 25ft. and 29ft. wide. There are three floors—viz., cellars, ground floor, and store room, all of good heights. The cellars are arched in two spans, abutting on the division wall. The upper floor is supported on transverse beams resting on corbels, and the roof rests on the division wall. In January last the walls were up to the height of the store-room floor, and the beams fixed on the corbels, when the division wall fell, taking with it the whole of the arches and centering. The abutting ends of beams only fell, leaving the outer ends up, which acted as shores to the outer walls, and prevented their falling also. The division wall was then rebuilt, and the upper floor and roof put on. New centering was constructed, and arches turned with an additional half brick in thickness. The haunches were filled up with ballast. On easing the centering of the smaller arch, this again fell, seriously injuring a man who was laying the paving, and the carpenter who was underneath. The largest arch did not fall, because the centres were not touched. The ballast was, however, immediately removed from the haunches, masonry substituted, and the paving laid. This arch has now fallen, injuring another carpenter who was hanging a door in the building. The local paper reported the various accidents, and said there was evidently blame somewhere. This has called forth the following letter from the proprietors, which may prove instructive to those of our readers who may be called on to build arches. The letter is addressed to the editor of the *Wilts and Gloucester Standard*:—"Dear Sir,—We think it right to our builder that you should be correctly informed as to our last accident. The arch that has lately fallen is not the one last built, but one that was injured when the last accident occurred, and which was then partly condemned by the builder and ourselves. But the fact is, the arch is a wide span—20ft.—and, there being a floor over it, he has not been enabled to get sufficient weight on the haunches to keep it down; thus they have risen and the centres have dropped, but the foundations are good. Now, as he could not get weight he must substitute pressure, and he therefore removed the concrete and put in masonry for the haunches to thrust against, hoping it might stand, but after doing so he found the arch was too much injured for the masonry to answer the purpose, as it appears to do in the other. The first fall, we have no hesitation in saying, was caused by the very severe weather, but in each report the damage has been very much over-estimated.—Yours truly, Cole and Lewis."

IRON KIOSK FOR INDIA.—OWEN JONES, ARCHITECT.



IRON KIOSK FOR INDIA.

ONE of the most elaborate examples of ornamental iron work we have ever seen is the kiosk or smoking lounge which we have illustrated in the above engraving. It is intended for India, and has been temporarily erected on a piece of land adjoining the Horticultural Gardens, South Kensington, where it should be visited by all interested in constructive ironwork. The kiosk is 80ft. in length and 40ft. in width, and is composed entirely of cast iron, of which material the structure contains about 180 tons. The bed plates upon which the columns are bolted are extended 10ft. under the flooring of the building, by which arrangement sufficient resistance is presented to the strain transmitted from the roof through the columns. The columns in construction are divided into two parts vertically, and from them the roof ribs spring diagonally, and by their intersections divide the whole of the roof into equal square panels. This plan of roof arrangement, it will be seen, is similar to that of St. James's Hall in appearance and effect. The similarity, however, ceases here, as in the St. James's Hall roof the effect is produced by external or surface ornamentation, whilst in the kiosk it is really a structural ornamentation. By the arrangement of the ribs the hipped ends of the buildings have the same appearance as the ordinary portions of the roof, whilst in most cases they are of irregular construction. The roof is of arched form in section, and is quite independent of the aid of ties, &c. The application of cast iron in the ribs is novel and ingenious, the intersecting ribs being dovetailed together, the constructive details in this respect being very perfect.

In this structure it is easy to understand that the tendency of the load on the roof, acting as though concentrated at the springing of the upper ribs, would be to bend this point inwards. At the same time the crown would be raised under the influence of the transverse strain and the column necessarily turned round on its base. To resist this tendency, and to prevent these inevitable results, either the connections at the crown or at the springing of the upper ribs would have to be much stronger than they really have been made. Another alternative, however, remained, and that was to strengthen the connection of the column with its foundation. This alternative was chosen as being perfectly suitable, and as not interfering with the light appearance of the superstructure. Therefore, the base of each column, beneath the floor level, is secured by a number of 1¼in. bolts to a girder 10ft. in length, which is immovable, and unaffected by any strain, and at the same time makes a good foundation plate. Thus the building cannot give way, either at the springing of the upper ribs, or at the crown connections, whilst we may regard the ribs as being perfectly rigid near the eaves. As the roof girders take the transverse strain, the only strain acting on any part of the roof itself will be a shearing strain, which of course is amply provided for. Most of our readers are familiar with Mr. Owen Jones's works, so that they may already have traced his hand in the design. The engineering details were worked out by Messrs. Ordish and Le Feuvre, whilst the iron work was made by Messrs. Handyside and Co., of Derby, who certainly deserve credit for the way in which so elaborate a piece of work has been turned out. The contract price, we believe, was £18 per ton.

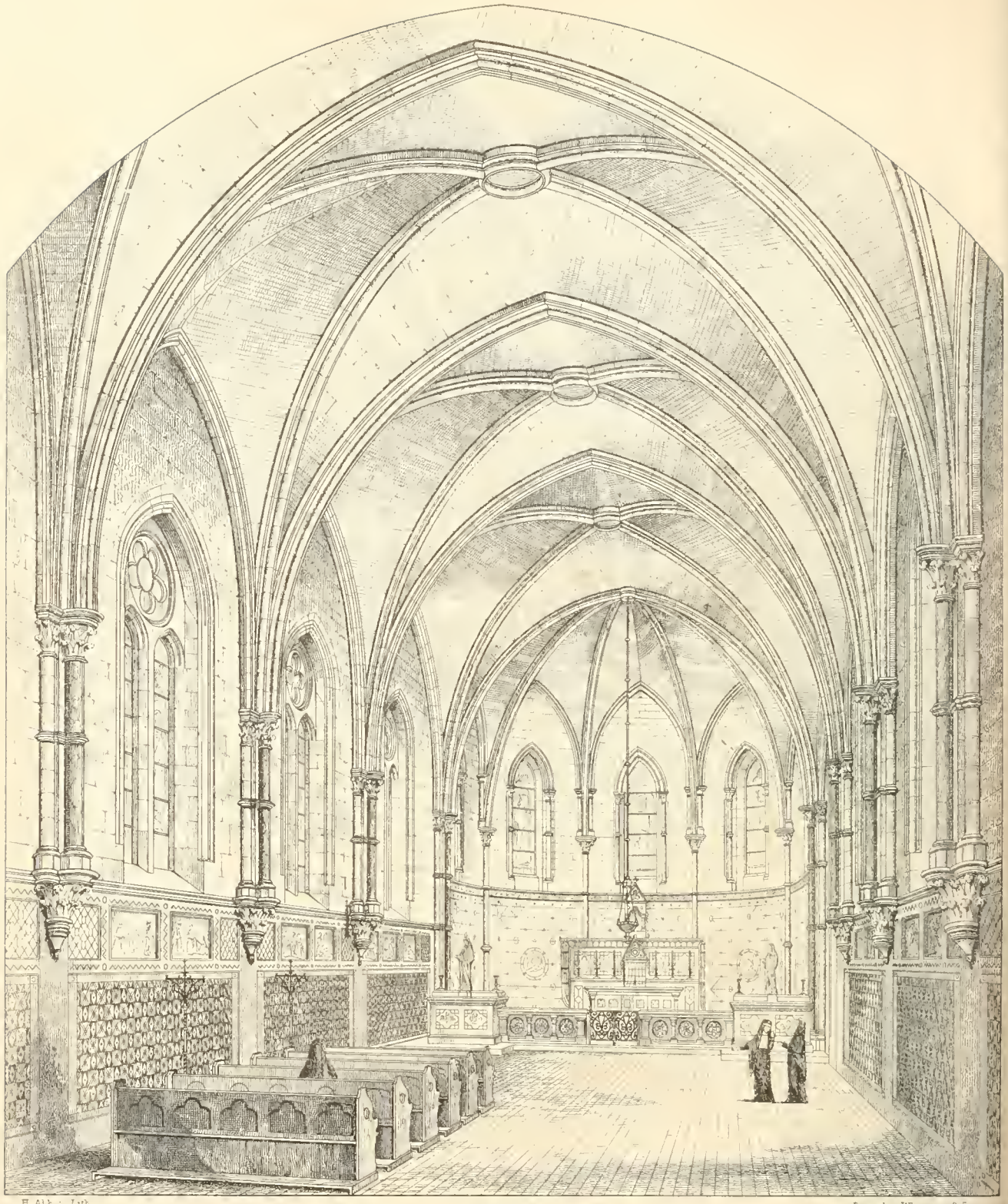
CONVENT OF NOTRE DAME, MOUNT PLEASANT, LIVERPOOL.

ON Tuesday, February 5, of this year, the new chapel, an interior view of which we this week lay before our readers, with its important additions to the present convent of the Sisters of Notre Dame, was opened by the Lord Bishop of Liverpool, a numerous body of clergy and laity taking part in the ceremony.

The new pile of buildings which front Mount Pleasant, and form a striking addition to the ecclesiastical architecture of Liverpool, comprises various apartments for the use of the schools, a spacious open staircase, and new entrance. The staircase is, by the way, worked in the "pierre bleu," from Namur, which far surpasses any material of the kind at our disposal in this country, and can be supplied at very moderate cost. It affords access to the principal or upper floor, where a corridor upwards of 100ft. in length passes through the new wing to the old buildings on either side. The chapel is approached from the centre of this corridor through a richly-moulded doorway. It is 85ft. long, 30ft. wide, and 40ft. to the crown of the vaulting. It is treated purely as a conventual chapel in the severe First Pointed style. The vaulting is executed in stone and brick, the springers resting on stone corbels with shaftlets of green Cornish serpentine. The apsis is semicircular, lighted by five large single lancets, which are filled with of some of Messrs. Hardman and Co.'s best glass, and are solemn and effective. The sanctuary has polished steps of the "pierre bleu" and a mosaic pavement by Messrs. Maw.

The exterior is well seen from Maryland-street, where its sweeping lines and great height tell out very effectively. The material is the local red stock brick, but stone is used abundantly where required. A figure of the archangel Gabriel in beaten lead work crowns the point of the apse, and midway rises from the ridge to a height of 50ft. a flèche of lead and slate work. It is hexangular in form, and holds a fine toned bell by Murphy, of Dublin. A carved image of Our Lord as the king and priest is placed over the chaplain's doorway, and at the eastern end is a group of sculpture representing Our Blessed Ladye, with the sisters of the order kneeling around her; these are executed by Mr. Phyffers, of Pimlico. The rest of the carving is by Mr. Earp, of Lambeth. The architects are Messrs. M. E. Hadfield and Son, of Sheffield; Mr. Farrel, of Manchester, the builder; and Mr. J. Pearson, clerk of works. The buildings were two years in course of erection.

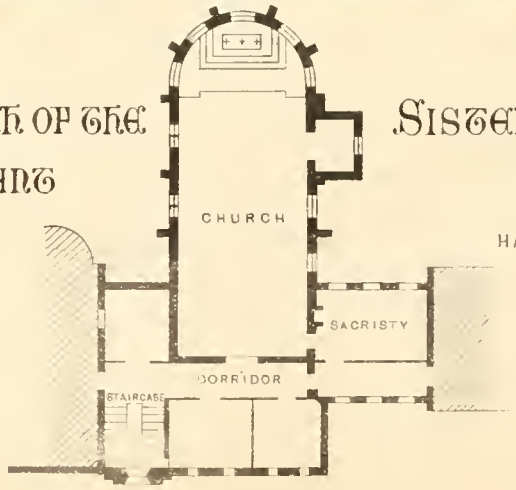
The Building News Aug 23rd 1867



H. Abbey, Lith.

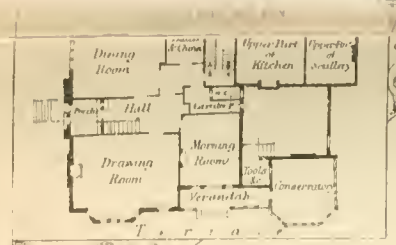
Printed by Whiteman & Bass

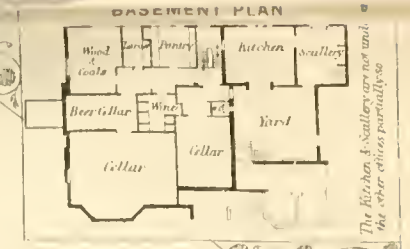
Conventual Church of the Mount Pleasant Sisters of Notre Dame Liverpool.



HADFIELD & SON, ARCHTS SHEFFIELD.

RESIDENCE NORHAM MANOR OXFORD W. WILKINSON ARCHT.





ON THE APPLICATION OF PHOTOGRAPHY IN ARCHITECTURE AND ARCHÆOLOGY.

If photography be chiefly familiar as a record of personal representations, it has its wider applications. The portrait painter may affect to undervalue it, but he cannot complain of its competition; he ought, indeed, to feel grateful to it, for while there are just as many portraits painted as of yore, photography has extirpated the Lacreevys, and the machinists, and scissor cutters of black profiles. Poor Miss Lacreevy! hers was a wonderful exhibition, and Dickens has not caricatured what could be seen exposed on many a private door of the Strand shops. One did not know which most to admire—the audacity of the artist, or the ignorance of the public. It was no uncommon thing in a miniature of high finish, whether of a lady or of a scarlet militia officer, hung out as a public challenge, to see the two eyes out of line. Other proofs of bad drawing might have escaped detection, but here was one palpable proof that the artist could not draw. It is no small service to art to have exterminated this brood, and the photographer, if he produces ugly features, imperfect proportions, and distorted attitudes, still preserves a resemblance to nature, starch though it be in its constituent parts, aggravating the outer objects, and presenting gigantic fists for delicate damsels. Photographs have proved of use to the painter and the sculptor in giving him further materials for study and reference, particularly in the intervals of sittings. Photography can, however, only afford the painter outline and not colour, and this greatly limits the value of photographic representations of the chief works of the galleries with which we are now so freely supplied. It is true, photography extends the range of engravings. Where outline is of greater importance, there photography is of the more service. This is particularly the case in architecture, where it suits the sharp well-cut forms, and the minuteness of detail. Such records become invaluable for reference; they are compact, and they will bear enlargement with the magnifying glass; but we get little benefit from enlarging a drawing or an engraving, because it is executed for a certain focus, and is incapable of expansion. It is curious to note how much more magnifying glasses have come into use with the extension of photography. Those which were reserved for certain pictures are now to be found generally distributed, and besides these there are stereoscopes and many instruments of enlargement of solid representations. Thus where we had only the flat surface of the engraving, we now get solidity of form, light and shade, perspective and sky, which powerfully contribute to a better appreciation of monumental edifices.

This can scarcely fail not to produce æsthetic effects. In the last generation, as in that preceding, study, so far as it was not made from the actual buildings, and that was limited by the place of residence, was made from the flat, not only in architecture, but in other arts. Study from the flat and drawing from the flat produced a most unfavourable influence on all artists, and on the public mind. Without assuming a natural connection, at all events there was a communion of effect in the flatness of buildings and of ornamentations. The dissociation from nature, resulting from the dissolution of the mediæval schools of art, had gone on until it reached the lowest stage of bathos in the long reign of George the Third. External carving and decoration had disappeared, nor was the substitution of brick for stone the sole cause, because old brick buildings and old wooden buildings present good examples of ornamentation. Brick, too, had nothing to do with interior decadence, and yet we find the richly moulded ceilings and carved panellings losing their relief. It is true that the use of moulded brick was limited by the brick duties, but though this has been often referred to, it cannot be accepted as an efficient cause, because there were no brick duties or excise affecting plastering or wainscoting. There were excise duties on paper hangings, but all the excises then existing would not account for the prevailing barbarism. The moment a better era dawned, the brick duties ceased to be deterrent, and we had an outburst of external ornamentation, though in plaster. The chief cause of decline must not be sought in fiscal obstacles, but must be traced up from the results of a long continued abandonment of natural principles, by which all art had become perverted. Drawing from the flat to the flat deteriorated the eyes of all artists, and destroyed the public appreciation. The only art that can be said to have survived was portrait, but then portrait is a study from nature, a study from the life. So, too, in the process of revival, another school of nature arose, that of landscape, which has most likely exercised a great influence on the growth of a truer feeling. If we look back to the architect's office, with its academy prize drawings, and its dearer or cheaper books and engravings, they were of course restricted to the flat, with which his own artistic education began, for few were the artists who entered the precincts of the life school. Scattered over the country was an army of drawing-masters, holding possession for the demon of dulness, and keeping boys and girls in boarding schools to the copying of drawings. From this vicious practice the schools of design and the national drawing classes are not yet sufficiently emancipated. Contrasted with such a state of affairs, the influences now at work must produce a different artistic atmosphere. Photographs, and, above all, stereoscopes, must educate the eyes of the public after a different fashion. The practice of drawing from models—if not from nature—must train many students; and free carving, and other exercises of art, must afford models. At all events, we are brought to a healthier state, far from satisfactory, far from what we ought to strive to attain, but one which, in providing for architecture, better attendant circumstances ought to promote better results.

It would be a great mistake to look to the shilling or half-a-crown tariff of photographs, or to regard chiefly their manufacturing characteristics, and wholly to neglect their artistic bearings, particularly their educational influence for good or evil. Thomas or Sarah may be chiefly affected with the portraiture of each other, the pledge of an undying affection enduring till the *avatar* of the next lover, but unwittingly they are made instruments of training themselves and others. As everything is education, so is the wide dissemination of other forms of art. A life spent in Baker-street or Harley-street in the daytime, with back or front parlours to resort to in the evening, was a Siberian doom which might have been fatal to all artistic inspirations. It is a relief to get anything better, and if any art is to be affected it will be architecture; for architecture, to be a living art, must not be the simple emanation of one mind, it must not be an effort of selfishness, but it must appeal to the public mind, and must get its response from the public. It is in this education and appreciation of the public that we have to seek the advance of each art, more than in any special cultivation of an individual. There were sufficient means of study in the last century, and as much of an academy as in this, and as much of zeal and devotion, which should have been all-sufficient to have produced architects, and yet which gave us Soane and Robert Smirke, and many much smaller men. There was no public to select the good from the bad; no public to encourage the good with more or less discrimination; and the consequence was there was less emulation. The name of an architect then but seldom occupied the public attention; very different from these days when a competition for the Law Courts will elicit partisanship, and a young man will find advocates in the press and followers in Parliament. Profound knowledge we cannot expect from the public, or from any great portion of it, nor anything approaching to profound knowledge—such never existed at Athens or at Florence; but what we must seek is to create an interest in the public for art, the same interest that is felt for the drama—an interest without critical appreciation, but which will, in the long run, support what is genuine and beautiful.

The instruction of the public is a duty of the architect as much as the instruction of himself, for the good artist may find himself lost for want of appreciation, and may fruitlessly exert himself labouring in a desert. It is thus that each effort for popular instruction becomes of interest, and of such a character is photography, carried out to a great extent as a manufacture, but propagating some elements of art more valuable than those prevalent in the past. The additions to the architect's repertory from photographs are very valuable, because they greatly extend the application of notes. While the notebook is a memorandum, often rough and incomplete, of use only to the owner, the photograph is a record which may be easily multiplied in every part of the world, exceeding the applications of more laborious architectural works. The circulation of the architectural publications of each country is greatly restricted by expense and other considerations, but the multiplication of photographs is a cheap process. There is, too, this advantage, that besides the circulation among architects of the views of monuments there is a large circulation among the public, effecting a double end—the readier provision of subjects for architects by the wider sale, and the communication to the public of an interest in the same objects of study.

Many of these sketches are made by architects, and have the advantage of being taken from suitable points of views, and of being properly selected. Where an architect or competent observer becomes the photographer we get an efficient delineation. There is many a local monument or country church which would never pay for a separate engraved publication, all the interesting details of which, many or few, can be preserved in photograph, and even the largest buildings can be treated with a profusion of illustration beyond the most copious architectural work.

RESIDENCE AT NORHAM MANOR, OXFORD.

We give this week a view of a house, with plans, which has just been built, with many others of a like character, on the above estate, the property of the President and Fellows of St. John's College. Until within a few years past, Oxford, although possessing attractions of an unusual kind as a place of residence, unlike other places of less importance, remained without any apparent increase in its house accommodation, chiefly owing to the want of suitable land for building purposes, most of it around the city belonging to the colleges, who only had power of granting short leases, and the conservative feeling of the "Dons" being averse to change. Certain alterations, however, having been made in the University statutes, which required the professors and some others to reside in Oxford, the desire of families to live in the place, having sons to educate, and of others who wished to profit by the many advantages offered by the museums, galleries of sculpture and painting, and the valuable libraries, &c., further accommodation became actually necessary, and the demand for houses so great, that additional powers were obtained by the colleges for dealing with their land, by which it is now let on building leases for 99 years, and a considerable portion of it is being covered with private dwellings of a superior class. Norham Manor, one of the estates so dealt with, contains about 30 acres of land, which is laid out for detached and semi-detached private residences; it lies to the north and most elevated part of Oxford, has a thick subsoil of clean gravel, and is contiguous to the New Park recently laid out by the University as recreation and pleasure grounds, and is within ten minutes' walk of any of the

colleges and halls; there are also two churches in the immediate neighbourhood, St. Giles, and the newly erected Saints Philip and James. The terms under which the land is let are liberal, and ensure buildings being erected of a substantial character, and prevent the erection of any likely to deteriorate those on the adjoining lots. There is one condition which we do not remember to have seen on any other building estate, but which deserves to be adopted, viz., the houses of all classes are required to be built of sound brick or stone, or a combination of the two materials, and no plaster covering is allowed on the face (the ordinary material used on most building estates, and which is made to cover a multitude of defects); the consequence is, that the buildings are much sounder and better in construction, and are substantial in appearance. Several of the houses which have been erected possess considerable merit; the one selected for illustration is designed by Mr. W. Wilkinson, the architect having charge of the estate, and is for George Mallan, Esq., of the well-known firm of solicitors of that name; it has all the conveniences requisite for a gentleman's residence: it is built chiefly of brick with stone for heads, sills, and mullions to the windows and doors. The natural fall of the ground enabled the kitchen and offices to be placed upon rather a lower level than the rest of the house, at the same time giving to the kitchen the advantage of an open roof. All the windows are fitted with sashes opening from the top and bottom, and the internal wood work and fittings are carried out in accordance with the style of the building.

ARCHITECTURAL CONGRESS AT PARIS.

THE Imperial Central Society of Architects of France have initiated a series of conferences, the first of which, says the *Journal of the Society of Arts*, took place a few days since. M. Baltard, Member of the Institute of France, and President of the Central Society, opened the proceedings with a complimentary reference to the attendance of foreign architects, and invited discussion on all points raised. The first question brought before the meeting was, "What, in an æsthetic and philosophical point of view, is the actual condition of architecture amongst modern nations, and what are its tendencies?" M. A. Hermant opened the question, arguing that the tendencies of the age were eminently scientific and industrial, and that such tendencies had produced an almost universal eclecticism, which had become the dominant characteristic of the architecture of the nineteenth century; and that industry inevitably tended to raise the useful above the beautiful, which was an unfavourable condition for the manifestation of art. At a second meeting, held some days later, the question was discussed, the conference generally adopting M. Hermant's view. The second question, opened by the president, M. Baltard, was, "What are the methods of education at present in use?" M. Baltard showed that in old times young architects were trained by masters with whom they were in close and intimate relation, and that afterwards such training was completed by special courses of study and competitions in public schools. The president strongly advocated the development of artistic study. M. Boeckmann, of Berlin, explained in outline the system adopted in his country, and mentioned the special fact that no distinction was made there between architecture and civil engineering. The third subject of discussion was, "The position of the architect in society, taken from a professional point of view;" and the fourth, "The influence of architecture on the productions of industry." The conferences were altogether four in number, and there was a generally-expressed hope that the architects of various nations should come into more frequent communication. Several Prussians, a Russian, and a Portuguese architect present, took part in the proceedings, but no English name appears.

CAMBRIAN ARCHÆOLOGICAL ASSOCIATION.

ON Tuesday week Sir Stephen R. Glynne, Bart., M.A., F.S.A., presided at the evening meeting at the Shirehall, Hereford, when

Mr. E. A. Freeman, M.A., gave an account of the excursion of the day. Clehonger Church was first visited, and here more time was spent than the church was worth, leaving so much the less for the more interesting places subsequently visited. There was nothing of remarkable interest at Clehonger, but at Madely, the next place they came to, there was a church with an apse, such as they found in most continental churches. There was another apsidal church (Mardin) in the county. Madely Church was also remarkable for its clerestory. The clerestory was not generally in use until the fourteenth century, but here it had been introduced much earlier. There had also been a large aisle subsequently added, making what was originally external internal. The chancel stood on the crypt, which was vaulted from one central pillar. The chancel was a good specimen of the fourteenth century Decorated work. It was wider than the nave, and a sort of squint had to be adapted to the wall of the nave. The English architect, however, could not get rid of his English ideas, and made the east window larger than the other windows in the apse, which was not done in the continental churches. From Madely they went to Kingstone, and thence to Abbey Dore, which was no doubt a Cistercian Abbey. The church was of the transitional period. They also inspected the church of Thruxton, and here a large barrow, recently excavated, was inspected. He did not care for barrows unless they proved something, and this Thruxton barrow did not prove much. Some bits of iron and remains of fire had been found. It would appear that in raising the tumulus the workmen took advantage of a natural elevation in the ground, and increased it artificially.

The Rev. E. S. Barnwell thought Mr. Freeman had hardly done justice to the Thruxton barrow. There had been a stone chamber inside.

Mr. Freeman was not aware that such a discovery had been made.

The Rev. Mr. Barnwell added that two pieces of iron had been found, which he took to be portions of a horse shoe. He thought this pointed to a later period than most of the tumuli found in the district.

A Member subsequently said he had picked up a piece of glass, which some persons thought was part of a large bottle, but he had taken it home and cleaned it, and believed it to be very old. It had been enamelled.

Mr. E. A. Freeman, M.A., then read a paper "On the House of Godwin," and stated that in the remarks he had to offer he had selected certain detached passages from his forthcoming history in connection with the subject under hand—*i.e.*, the history of the border district in the reign of Edward the Confessor. Herefordshire, he said, consisted of two parts, one of which he might speak of as purely Welsh, and which was in the diocese of St. David's, and, until the time of Henry VIII., was considered part of Wales. The other was purely English, and became part of England about the time of Offa in the eighth century. Although that was 1,100 years ago that was a comparatively recent conquest compared with the greater part of England, which was conquered at a time when the English were heathen. The first English conquest in the Severn Valley in the sixth century carried the English frontier to the River Severn, but not beyond. Herefordshire was a conquest made by Christian Englishmen, and therefore was a conquest in which the Welsh would not be so much disturbed. Hereford must at one time have been a great border town, and therefore it was a most important town for the English to keep and for the Welsh to take. It held, in fact, the same relative position to Wales as at one time Exeter did to Cornwall, as a border fortress. Mr. Freeman then sketched the history of Griffith, King of North Wales, from 1039 down to 1063, when Harold completed the conquest of Wales, and quoted copiously from his forthcoming work. He explained that when they read of North Wales in the early times it meant what was now called Wales as opposed to Wales in Cornwall. Griffith ruled with great rigour, and fought a battle near Upton-on-Severn, at a place which still retains its ancient name of Rhydd. Rhydd is now the seat of Sir E. A. Lechmere, M.P. In 1046 a reconciliation was effected by the Bishop of Worcester between Godwin and his son Sweyn, who had carried off the Abbess of Leominster and wanted to marry her after living with her some time. At that time the church of Leominster was flourishing, but after that it fell into decay. The evening meeting shortly after ended.

On Wednesday morning the archæologists met in Hereford Cathedral at eleven o'clock, to inspect that venerable pile. The cathedral has for a number of years been undergoing restoration, and these restorations are only completed within the last two or three years. The restorations have all been recently described, and the famous Hereford screen (now placed between the nave and the choir) formed a conspicuous object in the Exhibition of 1861. The visitors found the workmen busy in erecting an orchestra of timber at the west end of the nave for the Festival of the Three Choirs, which took place this week. After some time spent at the Cathedral the party inspected the fine old timber houses in the centre of the town. One venerable pile, used as a market house, was removed from the High Town only two or three years ago, greatly to the annoyance of archæologists, but as greatly to the improvement of the town; and the objects visited in the course of the afternoon were All Saints' Church, Aubrey Almshouses, the remains of Black Friars Monastery, Conyngsby Almshouses, St. Peter's Church, St. Ethelbert's Well, &c. The Venerable Lord Saye and Sele, the president for the year, entertained the archæologists to luncheon at his residence at three o'clock.

The objects of interest to be visited on Thursday were Bishop's Charlton or White Cross, Burghill Church and Earthwork, Credenhill Church and Camp, Brinsop Church and Moated House, Mansel Lacey Church, Yazor Church, Offa's Dyke at Marhampton, Bishopstone Church, Kinchester Church, and Roman station of Magna Castra. Of these objects the great feature was, of course, Magna Castra, previous to visiting which Mr. Davis had delivered a very interesting discourse upon this Roman station. He said that when the district around Hereford became a portion of Britannia Secunda, the sites of three Roman stations had been discovered in the county, all united by Roman roads. These were Magna Castra, Hariconium, and Circutio. Bravinium had also been contended for as another Roman station within the county of Hereford. The site of Bravinium was put at a spot near Leintwardine, but he (Mr. Davis) was not prepared to say that this was a fourth Roman station. His object in that address was to present such information as existed respecting the Roman station at Magna Castra, which went to show beyond reasonable doubt that this was at Kinchester. Leland spoke of it in his Itinerary. Kinchester was described as some three miles from Hereford, and about a mile from the right of the Wye. It was more ancient than Hereford, and coins of the time of the Cæsars had been found there in ploughing the fields. These coins the people of the country called dwarf's money. It had now been generally settled that the Magna Castra of the Romans was at Kinchester. Old Radnor (which is some three or four miles beyond Kington) had been spoken of as the Magna Castra, but he (Mr. Davies) thought the distances were all in favour of Kinchester being the site. Camden put the site of Aricorium at Kinchester, but Aricorium was now placed at Bollingtree, near Ross. He (Mr. Davies) was satisfied that there had never been a Roman station at Old Radnor. An examination of the Roman roads would throw some light on the subject and leave no doubt of the supposition that the Roman station of Magna Castra was at Kinchester. Mr. Davies proceeded to describe the routes of the different Roman roads through the Principality. Most of these ways were continuations of roads connecting portions of roads in Prima Britannia, or what they now called England. According to a plan of Magna Castra given by the antiquary Stukely, who erroneously called it Aricorium, the shape of the city was an irregular hexagon, and enclosed twenty one acres. The date of the plan was 1722, and the remains of Roman walls were noted on it. These were not now standing. The shape indicated on the Ordnance map was similar to that given by the antiquary Stukeley. In the year 1840, the late Dean Merewether directed his attention to the subject of Magna Castra, and some excavations were commenced. These excavations resulted in the securing of a good specimen of tesselated pavement and some other remains. On an adjoining eminence were relics and remains of entrenchments. In fact, the hill was skirted round by a vallum or fosse. Its construction on a conical hill would lead them to ascribe it to British origin, or it might have surrounded a place of Roman retreat. But whether it was of British or Roman workmanship the purpose of it was identical, and the remains continued as silent records of the history of past ages.

The evening's meeting was confined to members,

ɔeing simply a meeting for the dispatch of actual ɔusiness connected with the association.

In connection with the congress of the asso- iation a very valuable collection of objects of rchæological interest has been got together, and orms a capital museum at the Shire Hall.

PUBLIC GARDENS OF PARIS.

THERE are in Paris, besides the parks, twelve gardens thrown open to the public, and the ɔllowing are the particulars of their size and the ost of their formation:—The Garden (or Square, o adopt the Paris name) of the Tower of Saint acques measures 5,785 metres, and cost 141,700f. 'he Square des Innocents, which contains the ɔuntain decorated with the nymphs of Jean ɔujon, measures 1,957 metres, and cost 201,580f., 'hich includes evidently the restoration of the ɔuntain. The Square of the Temple measures .524 metres, and the cost was 148,580f. The quare Vintrinille, the first formed in Paris, was rchased by the authorities several years since, nd was transformed at a cost of 13,500f.; this quare is only 778 metres in extent. The Square ainte Clotilde, in front of the church of that ame, measures 1,733 metres, and its construction ɔst 32,229f. The Square Louvois, in the Rue ichelieu, covers 1,776 metres, and the expense of s transformation was 56,000f. The square re- ntly formed about the expiatory chapel of ɔuis XVI. and Marie Antoinette is 6,165 metres extent, and cost 183,000f. The Square of elleville measures 12,100 metres, and the ex- use of its transformation was 20,000f. The quare Montholon measures 4,300 metres, and st 185,000f. That of Montrouge, 7,100 metres, st 101,500f. That of the Arts-et-Mètiers, in the e St. Martin, 4,112 metres, cost 320,000f. The rgest of the new squares or gardens is that of atignolles; it measures 15,000 metres, and the ying out cost 155,000f. The whole of these rdens form, together, open spaces in the centre the city measuring about seventeen acres, and e whole expense of their establishment or con- rsion amounts to about £63,000.

HE PROGRESS OF ORGAN BUILDING.

WITH the exception of the controversy on the comparative merits of certain large gans and eminent organ builders, in 1864 and 65, hardly anything has appeared in our pages the subject of organs since 1859. We, there- re, propose in this paper to review generally e progress which the art of organ building has ade in England up to the present time. Our ief source of information consists in the speci- cations of new and enlarged organs, which appear almost every number of our worthy musical ntemporary, *The Choir and Musical Record*.

We are glad to be able to say that the grosser ults which disfigured organ building during the st half of the present century, have, to a great tent, disappeared. Organs are now no longer timated by the number of pipes they contain, thout regard to the size of the pipes; and, con- quently, modern organs do not offend our ears an excessive prevalence of shrill stops. The dal department, which affords the only means doubling the bass in the octave below, without rificing the good effect of dispersed harmony, w receives something like due attention; and, nsequently, the extra keys on the manuals, low CC, which formed a most imperfect sub- tute for the pedal organ, are now universally itted. It is now usual to have a stop of 16ft. ne, on one manual at least, in all but the allest organs. With the same exception, it is w by far the most common plan to make the cond manual of full compass. As to the system tuning most in use, our information is very nited; but equal temperament, the only one at suited to the wants of the present day, seems be gaining ground.

What, then, are the faults that remain to be red? for it can hardly be supposed that our gan builders have already attained perfection. the first place, we fear that many organs are ll built too cheaply; though it is not now the e of the pipes, but rather their quality, that is nted, either by not putting a sufficiently large portion of tin into the metal pipes, or by mak- g them too thin, or some other unwise device. funds run short, it is far better to defer any p that can be spared, than to put in flimsy rk; for in the former way we do something that will not have to be altered, while in the latter case all will need to be altered after a few years.

Secondly, we observe that some organ builders still hold to the tradition of tenor C swells. It should be considered, that although swells of short compass might be justified when the swell was a mere echo of the great manual, the case is widely different now that the swell is nearly equal in power to the great, and often contains a reed stop, when the great has none. The disadvantages of short swells are well known to every organist who has had to do with them; while there is nothing to be said in their favour, except that they cost less, and take less room. But a choir organ of full compass will neither cost more, nor take up more room, than a short swell, and is, on the whole, far preferable.

A third objectionable practice, which has not yet disappeared, is to put the stop of 16ft. tone, when there is only one, on the swell manual, not on the great. In reviewing "Hopkins and Rimbault on the Organ," early in 1856, we alleged some arguments in defence of this practice. We are not ashamed to confess having changed some opinions in the course of eleven years, while the world around us has been making great progress, for if we had not changed at all, this would not argue much for our infallibility. The reasons for putting the 16ft. stop on the great manual, are, that this is required in order to balance the fifteenth and mixtures, when the manual is played full; and if the 16ft. tone must be borrowed by coupling, there cannot be such a contrast between the two manuals as is often demanded. In short, since every manual ought to be complete and well-proportioned in itself, and the great ought to be more powerful in its upper work than the swell, a stop of 16ft. tone is necessary for the great, in all organs large enough to admit a stop of that kind. The only other general defect in new organs, that we are aware of, is that the pedal department, though making progress very hopefully, is not yet fully developed. There should be an open 8ft. stop, besides one of 16ft. tone in every organ of five stops or more on the manual, in order to make the pedal sufficiently independent of the manual; and every organ of ten stops, or more, on the manuals, should have a twelfth and fifteenth (6⅔ft. and 4ft.) on the pedal.

We conclude with a few words to architects on the subject of organ chambers, for it not unfrequently happens that in a new church an organ of sufficient power can hardly be erected for want of room. Of course the same thing happens occasionally in old churches also, but our forefathers are not to be blamed for it, as they could not have foreseen what sized organs would be required in these times, whereas modern architects have not the same excuse. It may be considered as settled that a chancel aisle is the best place for the organ, and there only remain the questions whether it should be north or south, and of its dimensions. The south side seems preferable on the whole, because the organ can be easily screened from the excessive heat of the sun, whereas on the north side it is more exposed to damp, and this can only be got rid of by heating the church every day in damp weather. But on whichever side an organ chamber is, care should be taken that it is large enough, for to have to build a new organ chamber is a very unwelcome addition to the cost of the instrument itself. The roof should always be gabled, not a lean-to, because the pedal pipes are always the largest, and they must be placed at the back of the organ. The height to the collar beam should be not less than 20ft. The length of the chancel aisle should be at least a quarter of the length of the nave, and its width about equal to that of the nave aisle. It should open both towards the nave and chancel by wide and lofty arches. In churches calculated for less than 300 worshippers, the height of the organ chamber, if there is one, need not be more than 15ft. to the collar beam; but we do not particularly recommend organs for such small churches, as a good harmonium will be quite sufficient, and we may add, that the manufacture of this humbler instrument, also, has considerably improved of late years.—*The Ecclesiologist*.

We beg to remind our readers that the First Annual General Meeting of the Builders Clerks' Benevolent Institution will take place at 14, Bedford-row, on Monday next. The chair will be taken by Mr. William Henshaw, at 8 o'clock.

Building Intelligence.

CHURCHES AND CHAPELS.

The foundation stone of a new Wesleyan Chapel was laid in Sunderland on Monday. The chapel will be built of stone, and will seat about 1,000. The schools adjoining are to be of brick, and will accommodate 300 children. Total cost about £3,000. Mr. Tillman is the architect, and J. C. Tone the contractor.

The memorial stone of a new chapel at Ossett, Particular Baptist) was laid last week. It will cost £1,000, and will accommodate 300 persons. The architect is Mr. Horsfield, of Halifax.

Hunsingore.—The foundation stone of a new church has been laid at Hunsingore. The church will be in the Geometrical Decorated style, and will consist of a nave, aisle, and chancel, with apsidal termination, and a tower and spire. The exterior will be of St. Helens and Lincolnshire stone, the interior being lined with Wetherby stone. Mr. Charles Kirk, of Sleaford, is the architect.

Llandaff Cathedral Towers.—We are glad to learn that the great and important undertaking of the completion of the western towers of this cathedral has been actually commenced, as it is the crowning work of the restoration of the entire structure, and second to none that has been projected in our time. It is, we think, also, a cause of congratulation that the work still remains under the conduct of so able, earnest, and conscientious a restorer as the architect from whose designs these towers are now about to spring, and we feel confident that at the hands of Mr. John Prichard we shall obtain a work worthy of the occasion and of the age. The following tenders were received, and Mr. Williams's accepted. A considerable portion of the previous works to the cathedral, and numerous other churches in the diocese, have been satisfactorily executed by Mr. Williams. Messrs. Barnsley and Sons, £8,100; Messrs. James and Price, £7,789; Thomas Williams (of Canton, near Cardiff), £7,694 10s.

Lanteglos-by-Cameleord (Cornwall).—This parish church, which during the last year has been under restoration, has just been reopened. The church is dedicated to St. Julietta, a noble lady martyred at Cæsarea in the year 303. The fabric consists of chancel, nave, south aisle, north transept, and tower, of which the nave and south aisle have been completely restored, and the remainder is in progress. The plans were drawn by Mr. J. P. St. Aubyn, and the work has been carried out by the contractors, Messrs. Westlake and Cann. The tower and north aisle are of the Second Period of English architecture, while the remainder of the church appears to have been rebuilt at the great restoration time of many of our Cornish churches—early in the fifteenth century.

Sligo New Catholic Cathedral.—Preparations have begun for the erection of a large and important structure in the town of Sligo, as the cathedral of the ancient Catholic See of Elphin. The building is, by special desire, to be of Lombard or Norman character, and consists of nave, aisles, transepts, semicircular apse, with an aisle passing round it, and apsidal chapel beyond, and two chapels of the same form in the transepts. A massive and lofty tower and spire will rise at the western end of the nave. The dimensions are as follows:—Total external length, 219ft. 6in.; ditto internal, 211ft.; total external width across transepts, 121ft. 6in.; ditto internal, 115ft. 6in.; width of nave and aisles, 66ft.; height of nave under vault, 61ft.; height of tower and spire, 176ft. The materials are to be externally the local blue limestone, and internally the yellow sandstone of the country, with a partial use of the limestone in columns and shafts, and polished Irish marbles about the apse and choir. The contracts have been let to Mr. Killgallin, of Sligo, for the mass of the work, and Mr. Clarence, of Balisodare, for the cut stonework. The designs and working drawings, &c., have been provided by Mr. George Goldie, of London. The total cost will be about £20,000.

Wombourne.—Wombourne Church has recently been undergoing a process of restoration and enlargement, and £3,500 has been expended in the work. The building, which possesses a handsome spire, is supposed to date back to before the fifteenth century. The object of the work just completed has been to restore the traces of

antiquity in the building, as well as to increase the accommodation of the worshippers. Mr. George Edmund Street, A.R.A., was chosen the architect, and his designs have been carried out by Messrs. Higham, builders, of Wolverhampton. The tower and spire have been strengthened and repaired, and here and there restored. A nave, with columns and arches, a south aisle, an organ chamber and vestry, the open roofs, and a chancel, are all new.

BUILDINGS.

Bacup.—A new market hall at Bacup was opened on Saturday last. The building is a substantial erection of stone with iron and glass roof supported by cast-iron columns and girders. The internal dimensions of the market hall are 137ft. by 71ft. The central part is laid out for stalls, and is divided into three spacious aisles or passages; around the interior there are twenty-three enclosed or lock up shops, and in the basement there are also eight other shops for the sale of fish, &c. The total cost is £6,000. The works have been executed for the local board of Bacup, from the designs and under the superintendence of Mr. Brierley, C.E., of Blackburn, who is engineer to the Board.

Leicester.—The Corporation of Leicester have commenced the erection of the new Borough Lunatic Asylum at Humberstone. The contract for the building, the plans of which were designed by Mr E. L. Stephens, the borough surveyor, has been entrusted to Messrs. Osborne Brothers, of this town. The stone selected by the Estate Committee to be used in the erection of the building is the Ketton stone, one of the finest kinds of oolite in the kingdom, from the quarries of Mr. Swingler. Mr. Pebbles, late clerk of the works at the new Wigston's Hospital, has been entrusted with similar duties in connection with the new asylum.

Sandringham.—The Prince of Wales last week paid a flying visit to his West Norfolk estate prior to his departure for Germany. New wings are now being added to Sandringham Hall, and commodious farm premises are also being erected for the royal home farm. The terrace running parallel to the west front of the hall is being enlarged and improved, and various matters of detail are also being attended to with a view to the general improvement of the royal estate.

Whitley.—The foundation stone of Christ Church Schools here was laid the other day by the Bishop of Oxford. The building is to accommodate 300 children, and there will be two separate houses for the master and mistress. Mr. Joseph Morris, of Friar-street, is the architect. The building will be red brick and of a very simple character, depending for effect upon the boldness of its outlines rather than upon elaboration of detail. The cost of the building will be about £1,800. There will be three school rooms—one for infants, 38ft. 6in. by 25ft.; one for girls, 40ft. by 20ft.; and one for boys, 33ft. by 20ft. The two latter may be thrown together by withdrawing the sliding doors, so that a large room upwards of 70ft. long is thus gained for lectures, meetings, &c. There will be class rooms attached to the boys' and girls' schools, and large playgrounds provided. The roof of the building will be open, and every attention has been paid to the proper ventilation of the rooms. The contract has been taken by Mr. H. Higgs, builder, of Reading, at £1,675.

TO CORRESPONDENTS.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the Editor, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

Received—J. C.—A. G. H.—H. and K.—T. C.—W. F. P.—A. P. W.—R. M. B.—F. G. N.—C. N. B.—A. P.—R. P.—H. S. T.—E. W. G.—J. H.—H. B.—C. and Co.—E. L. G.—W. J.—A. B.—S. T.—A. D.—J. P. S.—G. G.—J. B.—W. T.—J. S. S.—E. B.

A Pupil with Nothing to Do.—You have no redress, nor are you entitled to any. It is not your master's fault that his business has fallen off, and according to your own statement you had plenty to do for three years.

J. Connor.—We should say about £13 per rod for a large estimate.

Quarryman.—If you will let us know what kind of stone it is you wish to know the crushing weight of we will tell you how much it will bear.

Correspondence.

POPLAR NEW OFFICES COMPETITION.

To the Editor of the Building News.

Sir,—In the last number of your publication you have unsparingly alluded to my name with reference to the competition for the New Offices for Board of Works, Poplar. I think I shall show you that you are misinformed, and under a wrong impression, and had you made more calm inquiry, and been better acquainted with the facts, I think I should have been spared your severe and offensive personal remarks. If you were right in connecting my name with any act of "gross injustice and jobbery," I should neither expect or ask for your forbearance, for I should justly deserve your censure. These are the circumstances of the case as far as I am concerned, and I trust to your fairness to publish this letter. The Poplar Board of Works received, I believe, forty-four designs in competition for their new offices in response to instructions issued by the Board as to the accommodation required, with the sizes of the rooms, &c., given. Out of these forty-four the Board selected ten designs which they considered best, and they came to a resolution to submit these to me for examination, and to report whether they had been sent in in accordance with the instructions issued, and more especially as to cost and accommodation. I endeavoured to confine myself to my directions, and did not conceive they authorized me to award the premiums, or even to recommend the designs to be premiated, though I pointed out what appeared to me their merits and defects, and all the instances of departure or compliance with the instructions. You ask, what has Mr. Wood done for his fee. In reply, I beg to say that I, for nearly the whole of a week, often early and late in the day, gave to the subject both "hard work" and "earnest study," in the hope of doing justice to the Board and to all the designs submitted to me, with a serious regard for the responsible duties entrusted to me. You reproachfully ask how I could have overlooked the designs "Incognito" and the two concentric circles, and also state your surprise that a "respectable architect, whose name has stood upon the Royal Institute's books for more than a quarter of a century, should be found to be so ignorant of his art as to be incapable of judging between 'Incognito' and 'Circinus,' or two concentric circles and 'Octagon,' or 'Alpha' and 'Cives,' is a very painful discovery."

In reply, I beg to say that whereas "Incognito," two concentric circles, and "Alpha" were not submitted to me, and as I have never seen them, I certainly do feel that though my art knowledge is not at fault, it is true I am "incapable of judging" between them and the others named, which have been premiated, and that if "spiteful people" may assign other causes for my judgment, I hope on reflection that you at least will alter your opinion that I was actuated by the "sheerest ignorance or neglect of the work" I had to do.

In justice to the Board and to myself I can state that no member or officer of the Board ever hinted to me a preference for any motto, and I had no interest in the result, and did not know the motto or name of any one competing, and none of the successful competitors are in any way personally known to me.—I am, &c., Sancton Wood.

10, Craig's-court, August 21.

[We regret that Mr. Wood should have had occasion to write the above letter. We see nothing whatever to lead us to alter the expressions we used in the leading article of last week's Building News. That Mr. Wood should accept the office of a professional judge in a competition, and permit himself to ignore, through the act of the committee, no less than thirty-three out of forty-three competitors, only makes matters worse. Architects should not lend their names to such trifling. If a committee wants a professional judge, so much the better; but unless the judge judge of the whole merits of the competition, and the committee agrees to abide by his judgment, the whole affair resolves itself into a professional farce, which may amuse the comic members of the profession, but which only saddens those who take a serious view of art.—Ed. B. N.]

Sir,—I quite agree with your remarks on the Poplar New Offices competition, but think you are rather too hard upon Mr. Sancton Wood for the share he has had in this disgraceful matter. When the committee selected ten designs they recommended the Board to submit them to the examination of a disinterested professional gentleman to report on them in the order of their merit. A Mr. E. R. Cook moved an amendment "That the final selection of a plan should be left to the Board, and the examiner should only see which of the plans were fitted for the purpose of the Board, and not report on the order of their merit." By the adoption of this amendment the Board were, of course, free to do any amount of jobbery in the selection. Mr. Sancton Wood sent in a general report, and I believe had nothing whatever to do with the award. Perhaps Mr. Sancton Wood would have no objection to publish his report, so that the unsuccessful competitors may see that he has acted impartially. I have seen the designs, and must say, with the exception of about seven or eight, a greater amount of rubbish could not have been sent in. Of the premiated designs, "Cives" is the best, although the ground storey is completely crushed in appearance by the excessive height of the upper one, and the inferior offices reminds one very much of a suburban publichouse. "Octagon" looks more like a number of private dwellings than a public office, and some of the details are positively hideous. "Circinus" is so bad exteriorly that it is beneath criticism, and the interior perspective only helps to show Mr. Fletcher's utter ignorance of architecture. As a further proof of unfairness I believe that the envelopes containing the names of the successful competitors have not yet been opened, so that if this competition had been conducted fairly their names, instead of being notorious, would not have been known. Why the unsuccessful competitors do not write to the Board protesting against the decision I cannot understand. I should have thought that architects had suffered enough from committees, and that they would not meekly let any further insults be heaped upon them without some resistance.—I am, &c,

Delta.

MR. CARLYLE'S ATTACK ON OUR ARCHITECTURE.

Sir,—Really architects or builders are called on to undertake the confutation of Mr. Carlyle's last pamphlet, "Shooting Niagara; and After," in "Macmillan's Magazine." They are singled out therein as the very head and hands of that "fool of a world" which incurs the philosopher's ninth vial, more wrathful than all the previous "Latter Day" eight. Though "servantship on the nomadic principle, at the rate of so many shillings a day" be declared now "the poisonous taproot of all mischief," it is the architectural results and efflorescence of this upas root that draw forth the most prophetic language. It is only when contemplating his countrymen in their brick and mortar portrait of themselves that the censor loses both all heart and all moderation of invective, and joins the wailing and thunder of Jeremiah and Isaiah thus:—"Truly the state of London houses and London housebuilding at this time, who shall express how detestable it is, how frightful! For there lies in it not the physical mischief only, but the moral too, which is far more. I have often sadly thought of this. That a fresh human soul should be born in such a place, born in the midst of a concrete mendacity, taught at every moment not to abhor a lie, but to think a lie all proper, the fixed custom and general law of man; and to twine its young affections round that sort of thing!

"England needs to be *rebuilt* once in every seventy years. Build it once *rightly* and the expense will be, say 50 per cent. more; but it will stand till the day of judgment. Every seventy years we shall save the expense of building all England over again! Say nine tenths of the expense, say three fourths of it, (allowing for the changes necessary or permissible in the change of things), and in rigorous arithmetic, such is the saving possible to you; lying under your nose there soliciting you to pick it up,—by the mere act of behaving like sons of Adam, not like scandalous esurient Phantasms, and sons of Bel and the Dragon.

"There is a thrift of money, if you want money. The money saving would (you can compute in what short space of time) pay your national debt for you, bridge the ocean for you, wipe away your smoky nuisances, your muddy ditto, and make the face of Eng and clean again; and all this reckon as mere zero in comparison with the accompanying improvement to your poor souls,—no 'dead in trespasses and sins,' drowned in beer butts, in gluttonies, slaveries, quackeries, but r

alled then to blessed life, and the sight of Heaven and Earth, instead of Pay-day and Meux and Co.'s Entire. O my bewildered brothers, what foul infernal Circe has come over you, and changed you from men, once really rather noble of their kind, into beavers, into hogs and asses, and beasts of the field or the slum! I declare I had rather die! . . . . ."

Now, of course any of us builders, scandalous esurient Phantasms, and sons of Bel and the Dragon that we are, will utterly fail in computing by any extant arithmetic this "saving," or in what short space of time it would pay our national debt, bridge the ocean for us, &c., &c. Let us try. Call the expense of one septuagenary building of all England in the present esurient phantasmal and Bel-and-the-Dragonish manner 100 x. Then the expense of a right or Adamite building of it, we will take Mr. Carlyle's word, would be 150 x; and this additional 50 x is to save us something like 90 x, or at least 75 x, out of the 100 x otherwise needed every 70 years till the day of judgment. Well, are we to reckon 5 per cent. interest, or 3 per cent., or 2, or how little? At 5 per cent., the 50 x, improved yearly, would (as arithmeticians say) have "produced" in every 70 years, about 1,470 x, or more than the rebuilding fund, not of one England, but of fourteen! Similarly, at 3 per cent., we are taught that the proposed present expenditure of 50 is equivalent to one of 345 at the end of this and every 70 years. At 2 per cent., our 50 still counts as very near 150, instead of our esurient phantasmal grandsons' 100, at the next and every future rebuilding. And, descending to imaginary rates of an imaginary money-market, at ½ per cent., Mr. Carlyle's 50 would still cost more than the provision of 90 at each period of rebuilding; and at 1 per cent., still more than a periodical 75. In rigorous arithmetic such is the saving possible; and so, if we are to compute in that short space of time it would bridge us the ocean, &c., &c., we shall have to prefix the algebraic negative sign, for in any space more than nothing the saving will be negative, and more the wrong way, the longer the space.

Now, of course all this is too obvious by Mocker to be generally thought worth citing against an amusing satirist. Every schoolboy can thus triumphantly show that behaving like "sons of Bel and the Dragon" is the right political economy, and the exploded dark-age practice of "sons of Adam" totally wrong; can have his laugh at the Chelsea philosopher, and thank our stars we have no sage, but "him they call Dizzy," to manage the national debt. The world—Christian World (by her newspaper so entitled)—is especially merry over the blunder. Its great scandal is, of course, at his hypothesis that in a limited time, say 50 years hence, Anglo-Christianity shall have deliquesced into "aqueous residues of a vapid badly-scented character, and shall, like water spilt upon the ground, trouble nobody considerably henceforth, but evaporate at its leisure." Absurd prophecy! Is not Christianity divine? (and—understood—can anything divine evaporate out of England?) *Christian World* finds this hardly exceeded in absurdity by even the idea that we should bake everlasting bricks, build things once for all, and thus pay the national debt, &c. "And this kind of thing we have from Thomas Carlyle. Alas! alas! how are the mighty fallen!"

Verily, *Christian World* hath her reward. Preposterous philosopher! Why, he must have pored amongst musty records till he actually comes to argue as if the nature of things were unique; as if the modern world were under such a Deity as the Creator of the ancients—a creator who (according to Aristotle and the Fathers) had not given to metals, but only to plants and animals, the faculty of growth and unlimited self-reproduction; so that, though all thieves who made use of tools, or capital, called their gettings the Τοκος *Foenus*, Begetting or Produce of that capital, the term was a mere brigand's misnomer; no money, or dead capital, having ever begotten or produced a single obolus worth of anything; however much of other men's labour it might enable its owner to steal and call Τοκος. Our philosopher has actually ignored in the above scheme of "thrift" the whole change that has made what was thieving "improving capital," and what was crime virtue. He has forgotten that he was in a Christian world, not a Jewish, nor Mohammedan, nor even mediæval Christian; but a world of such Christians as would, to a man, in any of the times or places of dark Christendom—any of the fifteen centuries between Christ and Calvin—have been liable to either banishment, confiscation, or bodily mutilation, as criminals. In short, Mr. Carlyle here appears (doubtless through inadvertence) as if rejecting—nay, trampling upon—the most sacred dogma of his nation's religion—namely, the Immaculate Conception of her Messiah the Son of her god. For, as he himself insisted near a quarter of a century ago, a man's real religion consists not in those numerous things that he is uncertain of, and tries to believe, however honestly or conscientiously, but in those very few that he does certainly believe, with an assurance to stake life and death, yea, Heaven or Hell, upon. And by this rule it is plain that the chief things of our generation's, or Christian world's, religion, are by no means such as we hear on Sundays, or any biblical dogmas, but quite other. The very sacredest doctrine, I say, of our national faith, is this which Mr. Carlyle has thus appeared to impugn; the sonship and Immaculate Conception of Τοκος or *Foenus*, the nineteenth century's Messiah, how that this is (in direct contradiction to all the ancients and mediævals), the very begotten Son of Capital, begotten of the Capital before all duties, Mammon of Mammon, Wealth of Wealth, very Cash of very Cash, begotten not made, being of one substance with the Principal, whereby (and by no human labourers) all gains are made. Unless, therefore, the venerable sage retract and explain away the apparent heresy of this part of his last essay, I think he can expect no years to shield him from the treatment a nation gives to those attacking the very most cherished sanctities of their faith. E. L. G.

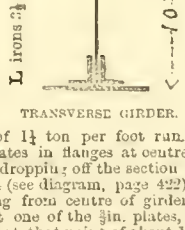
Intercommunication.

QUESTIONS.

[542.]—DRAWING ON WOOD.—Being desirous of making an attempt at drawing upon wood, I should feel very greatly obliged by any of your correspondents informing me as to the process, the pencils to be used, and the preparation of the block, &c.—A. L.

[543.]—PLATE GIRDERS.—Would you be kind enough to explain the following:—In your article No. 4 on Plate Girders, June 21, you say, "Load per foot run, 1¼ tons on each girder. This load will include the weight of locomotive and the structure itself" First, how many girders were employed in carrying the bridge? Or is it 1¼ tons per foot run for each line of rail, and, therefore, a girder under each rail? A section of the bridge would have been very useful in this case. Second, would a ⅜in. plate not do for the flanges as well as two ⅜in. plates, which would save labour and loss of metal? Considering that iron is now so much used, these calculations ought to be well understood.—Yak.

[In the example given at page 422, article No. 4 on Plate Girders, the bridge consists of two main longitudinal girders with a clear span or opening of 27ft. The total length of these girders would be about 31ft., which allows 2ft. at each end for resting on or building into the piers of masonry. The line of rails is carried on transverse girders, which rest on the bottom flanges of the main girders, and are riveted thereto. The transverse girders are placed 3ft. apart, centre to centre, being 10in. deep, measuring over the flange plates. The main girders are each calcu-



TRANSVERSE GIRDER.

lated for a load of 1¼ ton per foot run. The reason for using two ⅜in. plates in flanges at centre of main girders, is on account of dropping off the section at about the division marked ·34 (see diagram, page 422), where, at that length, measuring from centre of girder, it will be found we can leave out one of the ⅜in. plates, which then gives a sectional area at that point of about 10½in., whereas in the centre of girder the sectional area is 12½in.]

[544.]—COPAL VARNISH.—How is one (not a painter) to judge good copal varnish? Should not all walls or woodwork be payed over previous to varnishing with two coats of size?—Lampblack.

[545.]—GELATINE.—Will some reader inform me where to purchase and how to manipulate gelatine in taking casts from wood carving?—W. H. I.

[546.]—JERUSALEM.—About eighteen months since it was reported in the Building News that the dome over the Holy Sepulchre was to be restored. I shall feel obliged if any subscriber can inform me what progress has been made, and who the architect employed is?—Jordan.

[547.]—TIMBER PRESERVING. — Your interesting article, and also Mr. Deas', M.I.C.E., letter on the subject, has been shown to me. Being engaged in the timber trade, will you please inform me why German and French railways are beginning to creosote railway sleepers at a time when English engineers are leaving it off? According to Mr. Deas, whose railway amongst others, has suffered financially, it must be partly on account of the present depression.—I am, &c., Sleeper.

[548.]—ARCHITECTS' PUPILS.—Would any of your readers kindly inform me on the following point. I am an architect and surveyor's pupil (not land surveyor, &c.) and was articled, and paid a good premium. Can you tell me if I am bound (if my master so chooses) to do anything in the business of an house agent? There is no mention of it in the indentures; neither was it verbally agreed to between us. I am told, though, that it is a part of a surveyor's business, but I fail to see it.—Hopeful.

[549.]—BRICKWORK.—I shall be obliged if any of your readers will inform me if it is practicable, in taking out the quantities of brickwork, such as windows and doors, to take the entire length and width of the opening, or is there any allowance made for the reveals where the work is stuccoed.—Farnham.

[550.]—CONTINENTAL JOINERY.—Will you, through the "Intercommunication" of your valuable paper, inform me of whom I can obtain particulars and wholesale prices of the continental joinery, about which a great deal has lately been written in your paper?—A Constant Subscriber.

[551.]—CLEANING NEW CARVED OAK WORK.—A young carver has used some oxalic acid and spirits of salts in cleaning new carved oak work, which in nine or ten days has turned black. I should be glad to know the best wash or method of getting the black out.—A Mistake.

[552.]—COATING OF BOILERS.—Can any of your correspondents inform me where to obtain the new apparatus (I think electric) for preventing the coating of boilers, or destroying the coat where formed? I believe it was exhibited at the late Bury St. Edmunds Agricultural Show Any information respecting it will oblige.—J. G.

[553.]—LIGHT.—I propose building a house between two other houses, one of which, on the north-east side, has a small window looking on to the piece of ground I purpose building upon. Could any of your readers kindly inform me how far I should to have to build from the window so as not to intercept the light? Height of window from the ground 13ft., proposed height of my building (including roof), 30ft.—I am, &c., G. G. P.

REPLIES.

[537.]—PERIODS OF GOTHIC ARCHITECTURE—"Early English" cannot be extended beyond three reigns, Richard, John, and Henry III., and the first of these was rather semi-Norman. "Middle English," or Edwardian, follows, under the three Edwards alone—that is enough to remember Mr. Fergusson says the transitions fall curiously "on the three Richards' reigns." Now it is true that Richard I. saw the founding of "Early English," and Richard II. of "Perpendicular" (as his Hall of Westminster testifies), but what of the intermediate change? Richard III. comes a full century after the last real change, and when the poor old art was running to seed. It would be safer to begin a style with the last quarter of each century, at 1175, 1275, 1375. But truly, from the former date to the latter there was uniform growth. Those 200 years include the whole career of logical and true art, from stagnant Norman savagery to stagnant "Perpendicular trade-unionism." As for the final break up, the priests were the Italianizers everywhere, and all ours were so, from 1500, with the sole exception of Wolsey. He alone kept the native art alive under Henry VIII., when otherwise the churches, if not all buildings, would have become pure Italian. Thanks to him, the effect of the Reformation and stopping of church building was to arrest the change, and prolong our imitation of ancestral art another century. It would have come too late even to do this but for Wolsey's previous power and Anglo purist crotchet, or had he fallen only a few years earlier.—E. L. G.

[537.]—The general hypothesis is that the various styles of Gothic architecture sprang from or grew out of one another, commencing with the rudest and most primary forms, and may be divided into two sections—the circular and the pointed. The first style is the Saxon. The exact dates of existing examples are scarcely to be ascertained, but it is supposed to have prevailed from the mission of St. Augustine, at the close of the sixth, down to the middle of the eleventh century. Then came the Norman, commencing with the Conquest (1066), and lasted a little over 100 years—*i. e.*, to the latter end of the twelfth century. From the Norman sprang the "Transition," a combination of Norman and "Early English," of which we have examples of the dates 1170, 1180, and even 1200. The Saxon and Norman may be considered the first section of Gothic. Then comes the pointed section, or Gothic proper, in the following orders:—First, "Early English," which took its rise in the reign of King John, about the beginning of the thirteenth century, and continued for a period of about 100 years, *i.e.*, from 1200 to 1300, A.D. Second, "Decorated," a more elaborate and finished style than its predecessor, commencing in the reign of Edward I., and flourished for a period of 160 years, *i.e.*, from 1300 to 1460 A.D. The first period of this style, known as the "Edwardian," which lasted about sixty years, appears to be the type from which our Law Courts are to be erected, provided Mr. Street, as has been hinted, becomes the architect. Third, "Perpendicular," rising with the House of York, and continuing for a period of about eighty years, dying out in the reign of Henry VIII. (1460 to 1540 A.D.). It is a remarkable coincidence that when England was allied to the spiritual power of the Pope the best architecture prevailed, and when that spiritual power was severed it decayed and became like an old man in his second childhood, when all sorts of fantastic gambols were heaped upon it in the vain hope of keeping it alive, and that now, when Romish ideas are insinuating in our land, Gothic architecture is reviving with it. Fourth, the style following the "Perpendicular" is known as the "Debased" Elizabethan or Tudor Gothic, and after that all semblance of style appears to have vanished from the land. I am afraid of trespassing too far on your kindness to give the peculiarities of each style.—Provincial.

[540.]—MOUNTING TRACINGS.—I can recommend to "Ignoramus" a plan which, by experience, I have found very efficacious. I will first describe the method of mounting tracings on linen. Cut a piece of linen to the size required, and after having soaked it in water squeeze out the superfluous moisture and stretch it very tightly on an

old drawing-board or the like, securing it with tacks or drawing pins. When thoroughly well stretched, and while still damp, apply a very thin and even coating of paste; on this, without delay, lay carefully the tracing to be mounted, holding it so that the centre part adheres first, and then press it gently with the hand, having previously laid a clean sheet of paper over it to prevent injury to the tracing. When evenly laid, allow it to dry without removing it from the board, and it will be found to be as tightly strained as possible. When mounting on drawing paper the latter should be strained on a board in the usual manner and allowed to dry thoroughly, then the tracing, previously pasted on the back side, should be laid down as before and quickly pressed. I can recommend no better paste for the purpose than that used by paperhangers, which should be thinned before using. If this is difficult to procure a good lasting paste can be made in the usual manner, a little alum being added at the time of making. —R. L. B.

WAGES MOVEMENT.

The masons in the employ of Mr. Wm. Thornton, of Liverpool, have struck work in consequence of some dislike to the foreman. Pickets have been placed near the work they left, and the matter is at present under the consideration of both the employers' and the masons' club.

Glasgow.—As regards the strike at the University buildings, no change has taken place in the relative position of the parties concerned. The original cause of the dispute, it may be remembered, was the employment by Mr. Thomson, the contractor, of certain non-union men, and his refusal to dismiss these men when requested by the unionists to do so. The immediate result of the misunderstanding was that nearly all the builders and hewers then engaged on the works, numbering 180, threw down their tools, leaving on the ground only labourers, quarrymen, smiths, and joiners. Notwithstanding the unpleasantness of the position in which he was thus placed, Mr. Thomson adhered to his determination to employ non-unionists if he saw fit. In the absence of masons employment was given to the labourers and quarrymen in obtaining stone, and thus at least one important branch of the work was vigorously pushed on. Meanwhile, masons continued to come in on Mr. Thomson's terms, but only 78 masons have yet come in, the number required in the present position of the works being about 250. Some of those who have accepted employment are unionists, but unionists who have made up their mind to break with the society. In all, including quarrymen, labourers, &c., there are at present about 350 men engaged on the buildings. In spite of the formidable obstacle created by the strike, the works have made satisfactory progress.

Washington.—A few weeks since (says a correspondent, writing on the 6th inst.) the bricklayers engaged in the Treasury building struck for the concession of eight hours as a day's labour on Saturdays. The striking workmen were dismissed and their places filled by importations from Philadelphia. During the past few days the newly-employed workmen have been subjected to almost incessant assaults by the persons whose places they have taken. Two or three battles have occurred. By order of the city authorities, the bricklayers at the Treasury buildings have been instructed to arm themselves, and a special police force accompanies the workmen to and from their lodgings.

STATUES, MEMORIALS, ETC.

A Royal Monument.—The memorial executed by desire of her Majesty, for St. George's Chapel, Windsor, to mark the estimation in which she held her uncle, the late King of the Belgians, is now fixed in the place assigned to it, near the fine group which records the death of his late Majesty's first wife (the Princess Charlotte). The monument was executed at Miss Durant's studio in Radnor-place, Hyde Park, at a cost of £1,600.

A Colossal Group.—Robert E. Launitz, the American sculptor, is at present engaged on a colossal group, intended to adorn the new Park Bank in New York. The central figure, which will occupy a position above the main entrance, is emblematic of Justice, and will be 10ft. in height. The figure is in a sitting posture, holding the balance in the left hand, and the sword of justice in the right. Owing to its colossal size, the statue is being executed in two pieces, one of which weighs, in the rough, about fifteen tons. On either side of the grand central figure, resting on the arched pediment, will be placed supporting statues, one of which represents Abundance. The companion figure, on the opposite side of the central statue, is emblematic of the Genius of Finance. The corner, or flanking figures, are two in number, respresenting respectively Commerce, and Bank Trade, and Industry. These pieces will be each 9ft. 6in. in height. The entire work will be composed of the finest white marble. The same artist has been selected by the Commissioners of the Legislature of Kentucky to execute monuments for the late governors of that State, J. J. Crittenden and R. P. Letcher.

General Items.

The Metropolitan Board of Works has ordered the following alterations to be made in the names of public thoroughfares in the metropolis:—The names Norfolk-street and Upper Cleveland-street to be abolished, and the whole line of thoroughfare extending from the north end of Newman-street (Oxford-street) to the Euston-road, to be called Cleveland-street. In Islington—Queen's Head-lane to be Queen's Head-street; Upper John-street and Lower John-street to be called John-street; and the subsidiary names in Richmond-road, Mildmay road, and Thornhill-road to be abolished. New Millman-street, Guilford-street, to be incorporated with Millman-street; Victoria-terrace, Camden-town, to be incorporated with Rochester-square; Pugh's-row, Spitalfields, to be called Heneage-street; Cambridge-terrace, Camberwell, to be incorporated with Peckham-grove. In Mile End Old Town—Cloudesley-place to be incorporated with Jubilee street; the names of Queen-street, Wellington-place, and Lower Oxford street to be abolished, and the whole line of thoroughfare to be called Oxford-street. In Chelsea—Robert-terrace to be called Robert-street; Upper Church-street and Lower Church-street to be called Church-street; and the subsidiary names in Beaufort-street to be abolished. The subsidiary names in the following thoroughfares to be abolished:—Glasshouse-street, Whitechapel; Hyde-road, Shoreditch; Cranmer-road, Lambeth; and St. Leonard's-road, Bromley. In all cases the houses and premises are ordered to be renumbered.

A competition has been opened to all architects for plans for the great cathedral which is to be built in Berlin, and partly on the site of the present one. The estimate is not to exceed £600,000, for which sum one may expect to have a very magnificent edifice, especially if we consider that the relative cost of labour in Prussia and England makes it equivalent to at least a million pounds in this country.

The Inns of Court Hotel has passed into the hands of a new company by a decree of the Court of Chancery, and speculation is rife as to what will be done with it.

A memorial window has been placed in the parish church, Rastrick, near Brighouse, Yorkshire, in memory of the son of Thomas Bradbury, Esq., Longroyde, Brighouse. The window is composed of two lights covered by a transom, and contains in the lower division two subjects, the "Nativity" and the "Presentation in the Temple," framed by canopies and rich mosaic borders. The upper parts of the window is filled by medallions containing angels, with suitable inscriptions, and the base is formed by rich mosaic work under which is placed the inscription. The window is from the works of Messrs. R. B. Edmundson and Son, Manchester.

Patents are now being issued at Washington, U.S., at the rate of 300 a week. Records of the Patent Office indicate that the number of patents issued during the present year will not fall short of 20,000.

Titian's painting of Peter Martyr, and a number of other masterpieces of art, have been lost through a great fire which occurred in the church of St. John and St. Paul, at Venice, last week.

The excavation of the ancient Roman city of Uriconium, near Shrewsbury, has been carried on at the north angle of what is known to archæologists as "the enameller's workshop;" and the opinion formed some time ago that this portion of the buildings was used by the Romans for the purpose indicated by the name bestowed upon it is strongly confirmed by the exploration of the last few weeks. A large number of miscellaneous articles have been turned up by the workmen, among which were fragments of Samian ware which, when put together, formed a pair of bowls of handsome appearance. About a dozen coins of various value and different dates were also found, together with hair pins, rings made of amber and of iron, fragments of engraved glass, &c. These have been added to the store of Wroxeter antiquities in the museum at Shrewsbury.

The old Elizabethan red brick building in Doctors' Commons, known as Heralds' College, or the College of Arms, following the fate of the ecclesiastical courts, is now in course of demolition to make way for the new street between the Mansion House and Blackfriars. Here was the Earl Marshal's office, once an important court, but latterly of little consequence. It was some time called the Court of Honour, and took cognizance of words supposed to reflect on the nobility.

A length of 2,570ft. of the dam, and 2,870ft. of the staging of the Thames Southern Embankment is complete, and in the construction of which about 237,000 cubic feet of timber, 13,000 cubic yards of clay puddle, and 185 tons of iron have been used. Within the dam, about 240ft. in length of the river wall have been brought to a level of 1ft. below, and 2,060ft of the wall to levels varying from 1ft. to 7½ft. above Trinity high-water mark. For the construction of this wall about 87,000 cubic yards of earth have been excavated, 30,000 yards filled in, 22,000 yards of concrete deposited, 580 yards of brickwork laid, and 123,000 cubic feet of stone bedded. The total approximate value of the work done is £107,000.

The New Haven Building Block Company are manufacturing patent bricks, having a long narrow slit, or air chamber, which they claim will keep buildings constructed therewith cooler in summer and warmer in winter than when built with ordinary bricks. The bricks are of a mixture of cement and shell lime.

In parts of Germany, railways are now constructed without wood. According to *Chambers' Journal*, the rail is made about 9in. high, with a broad flat base, which rests on a well prepared bed of ballast, and, when properly fixed, is further supported by a layer of gravel. Thus constructed, the jerky motion of a train, occasioned by numerous cross sleepers, is done away with; the hammering sound becomes a steady continuous roar, the longitudinal bearing is distributed over a greater distance, and the need for repairs occurs but rarely.

Just before going to press last week, the news reached us of the fate of Frankfort Cathedral. We have now the particulars of the conflagration. It first broke out in a brewery opposite the cathedral, and the flames spread so rapidly that the inmates could not escape. Two women, who jumped from the second storey, were so severely injured that they died soon after. A mass of sparks rose from the burning edifice, and some of them, falling on the roof of the cathedral, set fire to it. The celebrated Pfarr thurm (parish tower), one of the greatest ornaments of Frankfort, has been destroyed. The woodwork was rapidly consumed, and the peal of bells entirely melted; in fact, nothing remains except the masonry. Several houses adjoining caught fire, but, fortunately, the flames were soon extinguished. No such conflagration has taken place in Frankfort for half a century. The Emperor of Austria has remitted 100,000 florins to the burgomaster for the restoration of the cathedral.

The quantity of gas made by the several metropolitan gas companies is about 10,440,000,000 cubic feet per annum; the gas sold may be taken at 9,000,000,000 cubic feet per annum. The difference between these quantities is the amount of the loss incident to the distribution; in fact, so much worse than pure waste, as it is injurious to health on being absorbed into the earth and expended in the air. The manufacture consumes nearly a million and a quarter tons of coal a year: the loss represents, according to the statement of the opponents of the gas companies, 1,440,000,000 cubic feet, which, at the mean cost of 4s. 8d. per thousand, is worth £336,000 per annum.

The Theatre Royal, Newcastle, has undergone very extensive alterations and improvements. The improvements, which have been under the superintendence of Mr. Fritz, of London, include the entire re-decoration of the house, by Messrs King and Green, of London, and the introduction of a magnificent sun-light, erected by Messrs. Jones and Co., of Covent Garden.

"A. A." writes to us as follows:—It has often occurred to me that a vast amount of needless suffering might be removed from the travelling public if the railway companies were to adopt something to prevent the sharp and unpleasant concussion caused by the slamming of the carriage doors. I cannot see why strips of gutta-percha or some similar substance, could not be fixed to the rebates of the door frames to prevent the unpleasant sound. If this is practicable, and I do not doubt it, the railway companies ought certainly to avail themselves of a remedy, at once so simple and inexpensive, for the benefit of the public. The evil is more generally felt on those railways where, like the North London and other metropolitan lines, the stoppages are necessarily frequent. The consideration of the fact, that to nervous and indisposed persons the continual jarring is almost unbearable, should be, of itself a sufficient reason for inducing the railway companies to do their duty.

Mr. Betts, the celebrated contractor, was buried on Wednesday in Southampton Cemetry. He was a native of Ashford, in Kent. He was of humble origin, and when he left his native place fifty years ago, he said he would never return to it until he could enter it in his carriage. Many years afterwards, when he kept his carriage, he visited Ashford. At one time he owned large property in Southampton. He purchased Bevois Mount, the seat of the great Earl of Peterborough. Mr. Bett, was a Wesleyan, and a munificent supporter of the sect. He was father of Mr. Betts, the partner of Sir Morton Peto. He died at the age of seventy-three years.

On the north side of Temple Bar, writes "Observer," a considerable crack is visible, extending from the soffits or voussoirs of the arch to the pedestal upon which the statue stands. It is possible that this may be an old settlement, and escaped my notice; but if of recent date it would appear to threaten danger, and the coincidence of its occurring simultaneously with the removal of so many houses near would be singular.

Our American brethren are great in bridges. The very character of their country has taught them. Workmen are at present busily engaged in preparing for an abutment on the United States side of the Niagara River, for a new suspension bridge which is to connect the Canadian and American shores at Niagara Falls. It is intended for the accommodation of foot passengers only, and it will afford one of the grandest and most imposing views of the Fall. The bridge will be situated but a short distance from the International Hotel on the American side, and the Clifton House on the Canadian side. It will require a span 1,260ft. The width will be 10ft. and the height above the water 100ft. The structure will be on the usual wire cables, resting upon wooden towers.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

3450. L. G. SPEYSER. IMPROVEMENTS IN MIXING APPARATUS FOR MIXING MORTAR AND SIMILAR MATERIALS. Dated December 31, 1866.

The mixing apparatus is constructed in the form of a rake, in which around an axis which traverses it are arranged five cross frames, of which two are fixed and three movable; each cross frame has four branches, in each of which are emplanted teeth like those of a rake; there are four teeth in each branch of the moving frames, and three teeth in each branch of the fixed frames. The axis at its lower end is stepped into a suitable bearing, and near its upper end it turns on a collar formed by two flat bars bent round it, and bolted together and also bolted to the sides of the cask or vessel. The axis rises some distance above the top of the cask or vessel, and receives a bent cross head to which manual power is directly applied. The cask or vessel is somewhat longer in diameter at the top than at the bottom; it is made in oak and bound with iron hoops. At the bottom of the cask or vessel is a square opening closed by a sliding sheet or iron door, which is moved by means of a lever. The mortar when it is sufficiently mixed is drawn out of the vessel by this door. Other doors are provided to facilitate the cleaning of the apparatus. *Patent abandoned.*

3. A. D. CAMPBELL. AN IMPROVED BENCH PLANING MACHINE. (A communication.) Dated January 1, 1867.

This invention is designed to effect a ready means for forming and smoothing the sides, ends, or angles of wood or other material by means of a certain arrangement of parts adapted for the purpose. The improvements consists in the use of a plane having one or two cutters projecting or acting at the side of the plane block (instead of at the bottom), the plane block is mounted on parallel rails or bars on which it may be moved to and fro by hand, the bed or platform which supports the wood whilst under operation is rendered adjustable vertically by slotted links and screws, or other equivalent, and at the end thereof a stop piece is provided which is also adjustable literally so as to suit any angle to which the wood under operation is to be formed or planed. When the wood is placed upon the bed, and the other stop piece adjusted (and the bed if necessary) if the plane be moved backward and forwards the wood will be reduced to the desired angle, and the surface smoothed, which is particularly useful in the formation of mitre or other angular joints. *Patent abandoned.*

81. J. HOADLY. AN IMPROVED APPARATUS FOR PREVENTING WIND, DRAUGHTS, AND WATER FROM PASSING UNDER DOORS, CASEMENTS, AND SIMILAR PLACES. Dated January 12, 1867.

This invention consists in the following apparatus:—In the under edge of the door or casement the inventor forms a groove in which is a metal rod of the length required. It is caused to project a little from the under edge of the door, so that, when the door frame pushes the rod forwards in the groove, he prefers that the rod should project and press against a screw in the door frame or sill, so that by withdrawing the screw, or screwing it in further, compensation may be made for a sinking of the door, or in summer time, when the apparatus may not be required. By means of a bent lever attached to the aforesaid metal rod, motion is given to a lath or board in such a way that, when the rod is pushed forward when the door is shut, the board or lath is pressed down upon the floor or carpet, and prevents wind, dust, or water from coming underneath. In the same manner when the door is opened, and the end of the rod released from pressure, it is pushed out by a spring on the under side of the lever, which causes the lath to rise so as to pass over the inequalities of the floor or other obstacle. It is preferable to insert two or more levers so as to raise the lath or board at different points, but if the door be narrow, one only need be used. *Patent abandoned.*

Trade News.

TENDERS.

ALSAGER.—For the erection of a house for Mr. J. Dudson. Messrs. Scrivener and Son, Hanley, architects:—Farlow, £600; Booth (accepted), £515.

BIRMINGHAM.—For Congregational chapel, Small Heath, Birmingham. Mr. W. F. Poulton, Reading, architect:—Barnsley, £2,629; Hardwick, £2,595; Briggs, £2,530; Webb, £2,519; Partridge, £2,500; Smith, £2,498; Mathews, £2,445; Bennett, £2,395; Horsley, £2,316; Jones (accepted), £2,249.

DOVER.—For Holy Trinity Schools. Mr. Clarke, architect. Quantities supplied by Pain and Clarke:—Pepper, £2,259; Mackenzie, £2,070 10s.; Fagg, £2,023; Adcock (accepted), £1,868.

EAST DEAN (GLOUCESTERSHIRE).—For townhall and market house, Cinderford, for the Townhall and Market Company (Limited). Mr. Edwin J. Reynolds, architect:—Coleman, £3,000; Clutterbuck, £2,400; Durke (accepted), £2,220.

HANLEY.—For alterations in three houses in Hope-street. Messrs. Palmer, architect:—Matthews, £205; Woolridge, £195; Steele (accepted), £193.

LONDON.—For additions and alterations at No. 12, Wilton-crescent, S.W., for Mr. Henry W. Bull. Messrs. E. Habershon, Brock, and Webb, architects:—Manley and Rogers, £533; Bowman, £493; Eborall, £490.

PARK GATE (YORK.)—For building Christ Church. Mr. William White, architect. Quantities by Mr. Samuel Field:—Askew, £2,951; Ainsworth, £2,824; Ripley, £2,822; Chadwick (accepted), £2,627.

PORTSMOUTH.—For building new lock ward, and other additions, to the Royal Portsmouth, Portsea, and Gosport Hospital. Messrs. Rake and Ranwell, architects. Quantities supplied:—Absalom, £2,919; Simms and Marten, £2,911 14s. 9d.; Lawrence, £2,180 19s. 6d.; Light Brothers, £2,725; Backhurst (accepted), £2,715. For incidental works, &c.—Lawrence (accepted), £685.

WEST CROYDON.—For a villa residence on the Norbury Park estate, West Croydon. Mr. J. H. Rowley, architect. The quantities supplied by Mr. T. T. Green:—Piper and Wheeler, £1,969; Browne and Robinson, £1,942; Killby, £1,895; Brass, £1,858; Bayes, £1,817; Killby Brothers, £1,811; Perry and Co., £1,800; Webb and Sons, £1,741; Hill and Keddell, £1,706; Tully, £1,695; Carter and Sons, £1,674; Henshaw, £1,560; Crabb and Vaughan (accepted), £1,482.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

PROPERTY SALES.

AUGUST 15.

AT THE MART.—By Mr. Robins.—Copyhold premises, being No. 104, St. George-street, East—sold for £235.

Freehold house and shop, No. 29, Upper-street, Islington, let on lease at £42 per annum—£1,300.

By Mr. Stuart Barker.—Leasehold residence, No. 2, Glenvillas, Cobden-road, Denmark Park, South Norwood, annual value £35, term 90 years unexpired at £5 5s. per annum—£275.

By Mr. Newbon.—Leasehold house, No. 2, Princes-terrace, Pulteney-street, Barnsbury-road, let at £26 per annum, term 81 years from 1838, at £4 per annum—£245.

Leasehold house and shop, No. 22, Henry-street, Pentonville, let at £55 per annum, term 98 years from 1785, at £2 10s. per annum—£370.

Leasehold house, No. 5½, Warren-street, Chapel-street, Pentonville, let on lease at £8 per annum, term 78½ years from 1802, at £1 per annum—£56.

Leasehold house, No. 6, Cloudesley-road, Pentonville, let at £24 per annum, term 60 years from 1811, at £4 per annum—£42.

Leasehold houses, Nos. 18 and 29, Richard-street, Liverpool-road, Islington, producing £48 per annum, term 4½ years unexpired, at £10 per annum—£84.

Copyhold two cottages, meadow and garden ground, situate at Pound-gate, Buxted, Sussex, producing £15 per annum—£190.

Leasehold house, No. 9, Penton-street, Walworth, let on lease at £17 per annum, term 94 years from 1790, at £2 5s. per annum—£115.

Leasehold house and shop, No. 13, Elizabeth-street, Hans-place, Chelsea, let on lease at £68 5s. per annum, term three years unexpired, at £6 per annum—£110.

Leasehold residence, No. 15, Lonsdale-square, Islington, let at £50 per annum, term 70 years from 1839, at £10 per annum—£425.

Leasehold four houses, Nos. 3 to 6, Benyon-cottages, Hertford-road, De Beauvoir square, producing £120 per annum, term about 33 years unexpired, at £15 10s. per annum—£915.

Leasehold two residences, Nos. 5 and 6, Northampton-terrace, Islington, producing £95 per annum, term 39½ years from 1828, at £11 per annum—£1,175.

Leasehold five houses, situate in Northampton-street, Essex-road, Islington, and ground and buildings in the rear, producing £100 per annum, term 89 years from 1828, at £30 12s. 6d. per annum—£1,725.

By Mr. J. G. Prevost.—Freehold house, known as Waterloo Cottage, Wellington-road South, Bow-road, annual value £24—£235.

Leasehold two houses and shops, Nos. 78 and 79, Turner's-place, Rhodeswell-road, Stepney, term 99 years from 1862, at £10 per annum—£460.

Leasehold house and shop, No. 43, Jubilee-street Mile End-road, let at £40 per annum, term 42 years unexpired, at £4 per annum—£315.

Leasehold six houses, Nos. 1 and 2, Henry-street, and Nos. 1, 2, 5, and 6, James-street, White Horse-lane, Stepney, term 99 years from 1807, at £9 10s. per annum—£285.

Leasehold three houses, Nos. 4 and 12, Henry-street, and 13, Alfred-street, aforesaid, term 50¼ years from 1824, at £3 per annum—£295.

Leasehold five houses, Nos. 13 to 17, John's place, Bedford-square, Mile End, term 34½ years from 1864, free from ground rent—£305.

AT THE GUILDHALL COFFEE-HOUSE.—By Messrs. Stanley, Robinson, and Palmer.—Freehold residence, with stabling, grounds, and paddock of about 3 acres, known as "The Elms," Woburn Sands, Bucks.—£3,000.

AUGUST 16.

AT THE MART.—By Messrs. Norton, Trist, Watney, and Co.—Freehold residential property, known as Northaw Place, Northaw, Herts, comprising a residence, with stabling, buildings, farmyard, cottages, and 55a. 2r. 6p. of meadow, pasture, and woodland—£11,000.

Freehold 19a. 0r. 5p. of meadow land, situate adjoining above—£3,000.

Freehold house and shop, situate adjoining above, let at £18 per annum—£400.

Freehold 0a. 1r. 16p. of woodland, situate as above—£100.

Freehold 0a. 1r. 16p. of meadow land, in the parish of Lingfield, Surrey—£55.

Freehold estate, known as Drivers' Farm, Lingfield, Surrey, comprising farmhouse, yards, sheds, and 68a. 3r. 11p. of arable and meadow land—£3,840.

Copyhold plot of land containing about three-quarters of an acre, situate in Brentford, Middlesex—£1,100.

By Messrs. Cobb.—Freehold estate, known as Bredgar House, Bredgar, Kent, comprising residence, with stabling, farmyard, homestead, cottage, and 25a. 1r. 16p. of land—£4,500.

Freehold 1a. 1r. 27p. of fruit plantation, situate as above—£250.

Corn rents in lieu of tithes amounting to £182 18s. per annum, charged on lands in the parishes of Frampton-upon-Severn and Slimbridge, Gloucester—£3,350.

By Messrs. Wilkinson and Horne.—Absolute reversionary interest in £4,100 Reduced Three Per Cent. Annuities, expectant on the death of a lady aged 78 years—£1,950.

By Mr. Eiloart.—Freehold and copyhold estate known as Blake's Farm, Much Wymondley, Herts, comprising residence, homestead, buildings, and 170 acres of land, producing £1,177 per annum—£6,650.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Henry George Cope, Bedfordbury, carpenter, September 3, at 11—Joseph Chandler, Portland-street, sawyer, September 3, at 12—William Richard Dix, Clewer Green, mason, August 27, at 11—John Thomas Douglass, Francis-terrace, Hackney Wick, builder, August 27, at 1—John Gordon, Romford, builder, August 27, at 1—John Simmons, St. Paul's Brickfields, Bow Common, brickmaker, August 27, at 1—Henry M'Calla, Westbourne-place, Eaton-square, civil engineer, September 3, at 11.

TO SURRENDER IN THE COUNTRY.

William Broughton, Leicester, bricklayer, September 21, at 10—George Bartle, Ruswarp, near Whitby, brickmaker, August 29, at 11—William Cooper, Leicester, joiner, September 21, at 10—William Horrox, Leeds, builder, August 29, at 11—George Jackson, Penmaenmawr, joiner, August 19, at 12—John Lawson, Wavertree, near Liverpool, engineer, August 30, at 12—Edward Beattie, jun., St. Helen's, architect, September 2, at 11—Evan Davies, Portmadoc, joiner, September 2, at 11—Robert Gregson, Barrow-in-Furness, builder, August 27, at 10—Samuel Hallett, Plymouth, builder, September 4, at 10—Charles John Keefe, Devonport, builder, September 4, at 10—Thomas Morgan, Taff's Well, Glamorganshire, blacksmith, September 3, at 11—Samuel Marsland, Sale, joiner, September 11, at 12—John Pearson, Bepton, Sussex, brickmaker, September 2, at 2.30—Reubens Ross, Sunderland, painter, September 6, at 12—William Sheep, Plymouth, ironmonger, September 4, at 10—Joseph Taylor, Penn, locksmith, August 31, at 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

October 2, L. Shiel, Liverpool, ironmonger—September 25, J. Bartlett, Birmingham, builder—September 25, J. Everard, Birmingham, ironmonger—September 18, T. Bailey, Sunderland, ironfounder—September 5, T. Fidler, Barnsley, Yorkshire, paperhanger—September 10, W. Earl, Newby Cross, Carlisle, joiner—September 30, H. G. Hilditch, Wolverhampton, carpenter—September 17, H. Dancy, Woolston, Hants, carpenter.

PARTNERSHIPS DISSOLVED.

Delany and Okes, Greenwich, engineers—Dixon and Co., Chester, timber merchants—H. and P. Stringer, Hull, painters—Hine and Evans, Nottingham, architects—Dennis and Hayes, West Derby, builders.

DIVIDENDS.

October 2, R. Walker, Ampthill, railway sub-contractor—August 29, J. Serjeant, Appledore, painter—August 23, S. Holroyd, Cleckheaton, joiner—August 30, T. Bartlett, Yateley, builder—September 3, C. Grist, Chiswell-street, glass merchant—September, 2, T. Vickerman, Almondbury, stonemason.

SCOTCH SEQUESTRATION.

Thomas Knox, Glasgow, builder, August 23, at 12.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9	0	£10	10	Archangel, yellow ..	£11	10	£12	10
Quebec, red pine	3	0	4	10	St. Petersburg, yel...	10	10	11	0
" yellow pine..	2	15	4	0	Finland	8	0	9	0
St. John N.B. yellow	0	0	0	0	Memel.....	0	0	0	0
Quebec Oak, white..	5	5	6	0	Gothenburg, yellow	8	10	10	10
" birch.....	3	10	4	10	" white	8	0	9	0
" elm	3	10	5	0	Oefle, yellow.....	9	0	11	0
Dantzic oak	3	10	6	0	Soderham	9	0	10	10
" fir	2	0	3	0	Christiania, per C.,				
Memel fir	3	0	3	10	12 ft. by 3 by 9 in.				
Riga.....	3	0	3	5	yellow	16	0	22	0
Swedish	1	15	2	2	Deck Plank, Dantzic,				
Masts, Quebec red pine	6	0	7	0	per 40 ft. 3 in.	0	15	1	4
" yellow pine..	5	0	6	0	PUMICE STONE per ton	5	0	8	0
Lathwood, Dantzic, fm	4	10	5	0	OILS, &c.				
" St. Petersburg	6	10	7	10	Seal, pale....per tun	40	0	41	0
Deals, pr C., 12 ft. by 3					Sperm body .....tun	103	0	105	0
by 9 in., duty 2s per					Cod	38	10	39	0
load, drawback 2s.					Whale, Sth. Sea, pale	39	0	40	0
Quebec, white spruce	14	10	21	10	Olive, Gallipoli.....	66	0	0	0
St. John, white spruce	13	10	15	10	Cocoanut, Cochin, ton	56	0	57	0
Yellow pine, per reduced C.					Palm, fine	40	0	0	0
					Linseed	38	5	88	10
Canada, 1st quality.	17	0	19	10	Rapeseed, Eng. pale..	40	0	0	0
2nd do.....	12	0	13	0	Cottonseed.....	33	0	39	0

METALS.

IRON:—

Welsh Bars in London	per ton	6 7 6		6 10 0		3	
Nail Rod	do	7 10 0		7 15 0		2½	
Hoops	do	8 10 0		9 0 0			
Sheets, Single	do	9 15 0		10 0 0			
Staffordshire Bars	do	7 10 0		7 15 0			
Bars, in Wales	do	5 15 0		6 0 0		3	
Rails	do	6 5 0		0 0 0		nett	
Foundry Pigs, at Glasg. No 1 ..	do	2 14 0		3 5 6		2½	
Swedish Bars	do	10 5 0		10 10 0		nett	

STEEL:—

Swedish Keg, hammered	per ton	15 0 0		15 10 0		2½	
Swedish Faggot	do	10 10 0		12 10 0		2½	

COPPER:—

Sheet & Sheathing, & Bolts	per ton	79 0 0		83 0 0			
Hammered Bottoms	do	89 0 0		92 0 0			
Flat Bottoms, not Hammered ..	do	84 0 0		87 0 0			
Cake and Tough Ingot	do	70 0 0		71 0 0		3	
Best Selected	do	77 0 0		79 0 0			
Australian	do	82 0 0		86 0 0			
Y 1, Metal Sheathing & Rods	per lb	0 0 7		0 0 0			

TIN:—

English Block	per ton	91 0 0		0 0 0			
do Bar	do	92 0 0		0 0 0		2½	
do Refined	do	94 0 0		0 0 0			
Banca	do	92 0 0		0 0 0			
Straits	do	87 0 0		0 0 0		nett	

LEAD:—

Pig, English	per ton	21 15 0		0 0 0			
,, Spanish Soft	do	19 5 0		0 0 0			
Shot, Patent	do	23 0 0		0 0 0		2½	
Sheet	do	20 15 0		0 0 0			
White	do	30 0 0		31 10 0		5	

SPELTER:—

On the Spot	per ton	21 0 0		21 2 6		net	

ZINC:—

English Sheet	per ton	26 10 0		27 0 0		2½	
Devaux's V. M. Roofing Zinc	do	26 10 0		0 0 0			
* And 5 per cent. discount if laid upon the new system.							3
QUICKSILVER	per btl	6 17 0		0 0 0			

BEGULUS OF ANTIMONY

French	per ton	28 0 0		0 0 0		2½	

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August 8, 1867.

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'HE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 30, 1867.

'HE CONGREGATIONAL YEAR BOOK FOR 1867.

WHETHER the rest of the world advances or recedes, one "Congregional Year Book" turns out, as to its archiecture, pretty much like another. If the resent one has anything to distinguish it, it s the tendency of good and bad alike to reach a general level, nowhere in excess." Exceptional badness is perhaps growing slightly less btrusive than formerly, but exceptional ower meets with as little encouragement as ver. Whether this state of things deserve ie name of improvement or not may be a natter of opinion; but, to continue the quotaon:—

> "'Tis a poor climax, to our weaker thought,
> This future middlingness."

There is no design in the present volume of qual interest with that by Mr. Waterhouse i the last one. Battersea Congregational hurch, by Mr. Fuller, is novel and picaresque in its general grouping, and quiet id unpretentious in its style. The wide oof, however—that perpetual curse of chapel chitecture—though less prominent than sual, is kept out of sight by a not very satisctory expedient. There is no clerestory, and hat might otherwise have been termed the sles, return against the side walls of a kind f nave, which projects many feet before them. he principal end of the chapel is, in fact, arrowed, on the common system, to improve ie proportions of the front elevation. Both ie ridge and the eaves run through on an niform level, the roof being lowered in pitch the wide part of the building enough to ake it cover both nave and aisles in the same eight which in the narrow part covered the ave alone. The front and back gables, therere, are totally different in their angles, and his fact alone will make it obvious that the esult in certain views cannot be pleasing. All he ingenuity which from time to time has een wasted on disguising huge roofs and unted walls only points to one conclusion—hat sooner or later we must abandon either ie wide span or the steep gable. The latter the alternative chosen in the new chapel at arden-street, Sheffield, which, seating 1,020 ersons, at a cost of about £1,700, must surely uch the utmost limits of cheapness. The hort-sighted economy which demands results ke this is, in truth, only folly and extraagance in disguise; but the design here prouced may show that it is not lack of money lone which makes the chapel architecture enerally so repulsive to persons of taste and eling. There is a transparent simplicity and onesty about the exterior which is not withit a charm of its own; and though obviously arved to death, its wan lineaments have chaeter enough to command respect. The archiects are Messrs. Innocent and Brown.

In the Stratford New Congregational Church, uilt at a cost of £11,500, the shopkeeping ind has surely reached its ideal. This must ideed be that glorified pattern of "Taberacle" which committees have been dumbly riving after for half a century, and have ever attained till now. There is hardly a ard of plain wall about it. It is all columns id pediments, panelling, fluting, and carng; less like a building, in short, than an chitectural twelfthcake. The architect, howver—Mr. Rowland Plumbe—displays quite bility enough to prove that he could have one much better; and in a smaller work at orth Bow gives us a pleasing, if not very ovel design, with simple Gothic details. ettenhall Proprietary School, by Mr. Bidlake, possesses fair ordinary character in those parts of it which do not aim at being specially artistic; and Wycliffe Chapel, Hull, is slightly above the average of the gablet and tracery style to which it belongs.

The highest compliment which could be paid to most of the other designs engraved would be to overlook them altogether. Some of them, however, are too astonishing to be passed without remark. The chapel at Brantford, Canada West, may be pardoned on the plea that the colony is fifty years behind the mother country in matters of art; but such an excuse can hardly serve for the frightful erection at Liskeard, Cornwall. Let us hope that it stands sufficiently near the fields to save neighbouring farmers any further expense for protecting their corn, and its wild-looking gables will not have been built in vain. The peculiar form of spire—apparently strangled just at its junction with the tower—in which chapel architects so much delight, appears at Penrith, Stoke-sub-Hamdon, Bollington, and Edgeworth. The Decorated style, rejected by almost every leading Gothic architect as feeble and unsuited to modern wants, still finds high favour among the Congregationalists. The very name sheds a lustre over the work it pertains to. How can anything in the Decorated style be mean or poor? It is as absurd as to think that a Pleasant-row might not be pleasant, or that a Paradise-street might prove a purgatory.

Seriously, however, it is no matter for rejoicing to see a large and influential body patronizing what is vulgar and commonplace, when they might do so much to promote culture and honest improvement. The appearance of Mr. Waterhouse's name in the "Year Book"—almost the only one of acknowledged eminence which has ever been seen there—was a hopeful sign for the future. It is to be trusted that some advance may yet result from the contrast of real art, however plain, with the masquerading finery now in fashion. Let the promoters of chapel building open their eyes and look into the world beyond their own immediate connections. Others have left the childish prettinesses with which the Gothic revival began, and have produced work with something of nobleness, freshness, and strength about it. Here and there a church or a town hall may be seen which really looks as if it was meant to last, and be a permanent source of pleasure and interest. Why do we almost never see a chapel of equal merit? Why should the same dreary idea be repeated over and over, not tens but hundreds of times? Why should every other chapel have an overgrown pinnacle by way of spire, and have it always in the same place, at the side of the front gable? Why should they all have the same sort of wiry, starved tracery windows, and the same mean, narrow doors? Why should they be covered with cheap decoration, and yet never have a particle of detail which would be worth crossing the road to look at? Lastly, and most important of all, why should their form so rarely be governed by those internal requirements which ought to be the very basis and framework of the whole design?

The rage for excessive cheapness is, of course, one cause of failure. The idea that a religious building should be beautified only as a sort of bait to get people within its walls is another. The natural party feeling which contents itself with the smallest architectural talents, if it be but connected with the denomination, is undoubtedly a third. But the main one, probably, is the want of knowledge in the mass to distinguish good from bad; and the want of power, on the part of those who do know, to enforce their opinions. Still, much might be done even by these few, if they would speak out, boldly condemning the bad and upholding the good. Their friendly criticisms would perhaps have more weight with the parties concerned than anything that may be said by others whose interest in the matter is far from being equally great.

PUGIN *VERSUS* BARRY.

UNTIL a few months ago we were all under the belief that the late Sir Charles Barry was as really and truly the architect of Westminster Palace as was Sir Christopher Wren the architect of St Paul's, or Sir William Chambers the architect of Somerset House. Some of us entertain the same belief still, and, indeed, Sir Charles Barry's claim to be regarded as the author of this great work has never been disproved. Surprising as it may seem, it is now disputed, however; and, what is still more surprising, not only is the claim disputed, but a very serious charge is brought against the memory and professional reputation of the distinguished architect in question. It may be remembered that, about two months ago, Mr. E. Welby Pugin made a statement in the Building News to the effect that his father, the late Mr. A. Welby Pugin, and not Sir Charles Barry, "was the actual architect of the Houses of Parliament, that his was the master mind which conceived, and his the hand which portrayed, their manifold glories, but that *tulit alter honores*." In answer to this statement, Mr. E. M. Barry, in a note addressed to the editor of the *Pall Mall Gazette*, reprints a letter, dated September 3 1845, written by the elder Pugin, and giving a positive denial to a rumour, even then current, that he was the *bonâ fide* architect of the original design for the Houses of Parliament. His occupation, as he himself says, was to assist in carrying out Sir Charles Barry's designs. This letter, which originally appeared in the *Builder*, was intended, it is alleged, to put an end, once for all, to such claims as are now advanced. This does not satisfy Mr. E. W. Pugin, who, in a second communication, enters into an explanation of his father's letter, which, he asserts, was "written at Sir C. Barry's solicitation, and for his own peculiar advantage." (Mr. J. L. Wolfe, a witness on the other side, admits that the letter was written in concert with Sir C. Barry, and "after consultation with me.") "It refers," continues Mr. Pugin, "to one particular arrangement made with Sir C. Barry, 'with the approval of the Government,' for certain works connected with the internal fittings and decorations of the Houses. It has no reference to anything my father had done ten years previously. It was in 1835 that he made for Sir C. Barry the designs which obtained the competition." This, then, is the charge against Sir Charles Barry, that he got Mr. Pugin to do a set of designs, which he (Sir Charles) appropriated as his own, and which gained the competition; that, being unable to carry out the designs himself, he employed Mr. Pugin, who did so, and received 400 guineas for his labours. Mr. E. W. Pugin says his father "had previously been engaged in preparing designs for the same competition for Mr. Gillespie Graham, for which he received 300 guineas; and he did not accede to Sir Charles's application until he had obtained Mr. Graham's consent. In order that my father's touch should not be detected in two separate sets of drawings, many of the designs were redrawn in pencil by Sir Charles, as Mr. Talbot Bury can testify." The question will naturally be asked, why did not so eminent an architect as the late Mr. Pugin compete in his own name? The reason, says his son, was "that, being a Catholic, he was under the idea that he had no chance of success. He all along abandoned himself to this impression, which, rightly or wrongly, I have heard him say, was fostered by Sir Charles Barry." Mr. E. M. Barry, as it seems to us, satisfactorily disposes of this point by stating that the competition was "an open and anonymous one, the essence of which was the concealment of the names of the competitors." Mr. Barry, feeling that he is necessarily dependent on the evidence of others (the competition drawings having been made when he was five years old) brings forward two witnesses intimately acquainted with the whole circumstances of the case, who, while frankly admitting that Sir C. Barry

derived valuable assistance in carrying out the details of his design from Mr. Pugin, positively declare that "it was not till after Sir Charles had originated, and with his own hand drawn out, the general design, both in plan and elevation, that Mr. Pugin's assistance was obtained." Such is the testimony of Mr. J. L. Wolfe, and Mr. R. R. Banks, chief assistants to the late Sir Charles Barry. Mr. Talbot Bury and Mr. B. Ferrey (the biographer of Mr. A. Welby Pugin) give similar testimony. The former gentleman says, "It was not until Sir Charles Barry had completed his design in pencil, including elevations and sections, that Mr. Pugin *had anything to do with the work* . . . . The drawings enumerated in Mr. Pugin's diary were details prepared for the purpose of obtaining tenders, not made till after Sir Charles's original design had been selected." Mr. Ferrey says, "On more than one occasion, when mentioning to the late Mr. A. Welby Pugin the common rumour that in reality he was the architect of the New Houses of Parliament, I remember well how energetically he denied the truth of the report, bidding me give it the most positive contradiction whenever I heard it repeated." These testimonies have called forth another long letter from Mr. E. W. Pugin, which appears in the *Pall Mall Gazette* of Wednesday. After reviewing the evidence brought to rebut his original statement, he repeats that statement in the following words :—

> The facts of the case in the beginning were simply these :—My father intended to be himself a competitor ; and he had prepared a complete set of designs for the purpose, which were finished and mounted before he put pencil to paper for either Mr. G. Graham or Sir Charles Barry. From the day they were mounted they appear to have been lost sight of ; but there is little doubt that these were the designs for which Sir Charles paid 400 guineas, and which, as far as possible, were engrafted on Sir Charles's ground plan. The designs thus prepared were eventually successful, and my father was called in to complete the work which he had commenced.

Mr. Pugin concludes by stating that his evidence will be contained at length in a pamphlet which he hopes shortly to publish. And here the matter rests for the present. It is with considerable regret Mr. Pugin tells us that "he finds himself compelled to enter into a statement of facts which would have been better told when the present generation had ceased to exist." We cannot see it altogether in that light. If his father was the architect of the Houses of Parliament, another ought not to reap the reward, and enjoy the honour. Honour to whom honour is due. Mr. E. W. Pugin has accepted a delicate, and, to some extent, a painful position, but, having accepted it, he is bound to make it good. The fair fame of Sir Charles Barry, as well as that of his own father, demand that this matter should be settled once for all, beyond the possibility of dispute. The general public, not less than the architectural profession, will wait anxiously for Mr. Pugin's promised pamphlet, in order to see how he accomplishes his task. As yet no one will say that he has proved his case.

QUANTITIES AND MEASUREMENTS.*

It is a common mistake, especially with beginners, to imagine that because they are capable of cubing, or, in other words, of ascertaining the solid contents of a design, that they are therefore fully competent to take out quantities and measurements upon which a contractor's estimate may be made. Those who have had the opportunity of examining bills of quantities must have frequently observed how general this error is, and traced its presence by items being valued at the super or running foot instead of by the cubic foot, and *vice versâ*. It is true that in some few instances it is optional with the surveyor to use one of two units of measurement, but this small degree of latitude is often stretched far beyond its proper limits. Brickwork, for instance, is frequently—not in houses, however, but in engineering structures—estimated like masonry, by the cube yard, and there is no question but that it would be a great improvement if it were always so estimated, and the absurd measurement of the rod altogether abolished. The little volume under notice, which is one of Weale's rudimentary series, is well calculated to instruct beginners in the proper method of estimating different descriptions of work, but it is not altogether free from what might be termed "old saws," and which ought never to appear in a volume of 1867. We notice one with respect to concrete, where note is to be made of the "height it is thrown from." This is a mischievous old idea, which we hoped was thoroughly exploded. No one ever thinks of throwing concrete from a height except where unavoidable, or unless they wish to separate the ingredients, which always occurs in a greater or less degree when the operation is so performed. The concrete should be simply wheeled in barrows to the site, and, when laid, thoroughly well punned and beaten with good-sized rammers. Instead of specifying, as was, and is still, the custom, that the concrete should be pitched from a certain height, the words should run "that it be well punned after laying." The evil will thus be avoided, and greater good ensured. Clear instructions are given in the chapter upon brickwork especially regarding chimney breasts, cornices, splays, and other projections which constantly puzzle the beginner. There is, however, no necessity for going through the tedious process alluded to for converting cubic feet into standard rods. The calculation is simply to divide the number of cubic feet by 306 and the answer is in rods and decimals. Putting R to represent the number of rods, and 480 for the number of cubic feet, we have, quoting from our author, $R = \frac{480 \times 8}{9 \times 272}$. Reducing this fraction, we obtain $R = \frac{480}{306}$ at once without first multiplying by 8, then dividing by 9, and completing the operation by a further division by 272.

In alluding to the measurement of king and queen posts and principal rafters, it is stated that they ought to be calculated by their mean lengths. This statement must be received with caution, as in many instances it is absolutely necessary to take them out to their extreme dimensions, according to the manner in which the ends have been cut and fashioned. As a general rule, we would advise every one engaged in taking out quantities, to do so in a fair and liberal spirit, and always in the case of any doubt to give it in favour of the contractor. We are well aware that many parties pride themselves upon the close manner in which they can take out an estimate, and shave down the measurements to the exact thing, but they forget that true accuracy is as far removed from niggardliness, upon the one hand, as from waste upon the other. In the chapter upon joinery, which is one of the best in the book, particular stress is laid upon the fact that a drawing should always be furnished of all mouldings and descriptions of work not among the ordinary run. This is a valuable suggestion, as we have known much unpleasantness arise from the imperfect manner in which a particular part has been specified, when there was no accompanying sketch to point out what was really intended by the designer. Latterly, especially since they have been made by machinery, it is not an uncommon thing to class doors, window sashes, and other similar items simply by their number. Price lists can be had from many first-rate makers, giving all particulars, with illustrations, from a common barn door to the most highly moulded specimens in Belgravia. The last two chapters of this little work are very inferior, and bear no comparison with those which are somewhat similar in character, in another of Weales' series, "Rudiments of the Art of Building." Omitting these two, the remainder of the volume will be very serviceable, as a text book for estimating quantities and measurements.

* Quantities and Measurements. How to calculate and take them in bricklayers', masons', plasterers', plumbers', painters', paperhangers', gilders', smiths', carpenters', and joiners' work. With rules for abstracting and hints for preparing a bill of quantities. By Alfred Charles Beaton, architect and surveyor. London: Virtue and Co., 26, Ivy-lane, Paternoster-row. 1867.

THE ALLUVIAL DISTRICT OF HORNSEA, YORKSHIRE.

In the great bay of Bridlington, on the romantic coast of Yorkshire, with Flamborough Head in the hazy distance, and busy Bridlington some dozen miles to the north, stands the quiet town of Hornsea, a place almost unknown until recent times. We will pass by the ordinary attractions of the modern bathing town, and dwell for a while on the town and neighbourhood as far as regards its buildings and constructional appliances. It possesses many peculiarities worthy of notice, occupying a position in the alluvial district of South Yorkshire at a point which marks an ancient estuary or horn of the sea, now an inland lake. Hornsea, as may be inferred, has little to boast of in its variety of building materials. Near the terminus of the Hull and Hornsea Railway the sands of the coast spread out before us. To the north and south, as the eye follows the white fringe of the restless waters, the land rises in pleasing undulations to the height of 50ft. or 70ft., presenting a broken line of cliffs to the action of the sea. Upon examination we find them to be composed of alluvial drift, closely allied to the boulder clay formation, a weak and feeble bulwark to the inroads of the sea, which, upon our coasts composed of this and other sedimentary deposits, is marching with such rapid strides year by year, and season by season. The action of rain and frosts disturbs the masses of material composing these rugged cliffs, and the high tides and lashing waves undermine their base, causing periodical land slips of vast extent. Hundreds of tons are thus during one season torn from the parent earth and spread out upon the coast, to be dissolved or carried in minute particles to distant points of rest in the bosom of the sea. Such is the rapid encroachment of the sea in this neighbourhood that towns known in modern history—as Auburn, Hartburn, and Hyde—have been totally destroyed, their sites now forming a portion of the German Ocean. At Owthorpe, the parish church is half-way in the sea ; and many is the melancholy tale, how, in tempestuous nights, the angry sea has carried off the dead. Along these perishable cliffs, boulders of all sizes, claiming kindred to almost every strata of the earth, present themselves to the passer-by, either as pebbles on the strand, or high up on the face of the cliffs, firmly embedded in the marl. The sea does not, in removing these marly cliffs, so readily dispose of the boulders, which are left upon the beach in countless numbers, varying from blocks of many tons to those which have been worn down to the ordinary pebbles. In their lithological character they commence with the granites and syenites and work upwards in geological time to serpentine, quartz and micaceous slates. With the sedimentary or fossiliferous rocks, limestones are the best represented, a fact which may be partly explained by the enduring qualities of the older crystalline limestones, and partly by the close proximity of the chalk formation. Geology has not taught the builders in this district to distinguish the various rocks ; but practice and the experience of generations have taught the workmen to distinguish the limestone boulders from those of other rocks, and even to separate them again in point of quality. A trade is done in this class of material, for here lies the stock of limestone by which the building operations of the district are carried

on Men of quaint aspect are to be seen upon th shore followed by asses whose measured tr d and solitary men bespeak some lowly oc pation; these are the stone gatherers, who ek out a miserable existence by collecting li stone boulders on the shore, and conveyin them on the old pack-horse principle to th lime kilns in the neighbourhood. Gravel fo railway and engineering purposes is also co cted in this humble way. Other groups m be seen collecting pebbles for road materi and as they deposit them one by one in th peculiar wooden scuttles with which the p iers are filled, we are led to attach a very lo estimate of their value of time. Turning o attention to the lime burners, we are st ck with the peculiar form of their kilns, w ch are constructed somewhat after the fa ion of an ordinary brewing copper with a ir hole on either side from which the lime is ked out as it falls. Connected with these ki s are inclined or elevated roads by which the pa -asses carry up their burdens. The collec d stones are here broken into fragments, an the geologist will readily detect the older fo stones of the carboniferous age rich with th peculiar fossils. This quality, along w the blue lias limestone, is justly esteemed th est for making the strongest lime. Oolitic an septaria stones may also be found here, bu the greatest proportion are chalk, which o poses 60 per cent. or 70 per cent. of all th limestone collected in the district.

s in other parts of the world where one n ral feature reigns supreme, we find al m everything required near at hand. At H nsea, the boulder clay not only supplies th lime, but it furnishes the stone for b ling. The ancient church, the boundary w s of the various properties, and the sub-st ys of the houses, are constructed with bo ders from the beach, mostly laid in the ol Roman herring-bone fashion, ornamented he and there with portions of brick being sq ezed into the soft mortar, thus filling n e wider interstices of the work. Sand is ob ined from the same source lying in erratic bo in the natural ground or representing fi particles of foreign matter washed from th boulder clay and spread along the beach; an, last, but not least, the same place sup s the material for brickmaking. It would be presumptuous to fix the date at which b ks were first used as a building material in th district; certain it is they were in use n ards of 300 years ago, and we have only to examine the churches in this portion of Y kshire for proof. As a thing of beauty, th have never ranked high; but as one of nt ty, where squared and workable stone was unown, they seem to have naturally pre-se ed themselves, when building on a dur-it form became a settled custom. As may be pposed, brickmaking is now somewhat a st le trade, but until recent times it was ca ied out in a very primitive form. The na ral material is rude to commence with, bo g highly argillaceous and strongly im-pr nated with oxide of iron. To the pre-se e of this metal the sombre red colour of th bricks is due, as also the easy manner in w ch they fuse while burning. In addition, pe bles of every kind are freely intermixed w the material, and they are a source of co tant trouble to the workmen, and one of gr t cost to the makers, as the breakage, ca sed by the explosion of the limestone pe bles during burning, is a serious item in th production of the bricks. The best beds of lay are selected for making land drains, fl ring, and facing bricks, &c., none of which po ess a high degree of finish, owing to the ro seness of the clay. We were scarcely pr pared to find these local clays applied to th purpose of making eaves' spouts, but one ho se at least we noticed which possesses th e peculiar earthenware gutters, moulded in about 3ft. lengths of half round and be led sections. New energy has lately been in sed in the brick trade of this district by J. t. Wade, Esq., of the firm of Richard W te, Son, and Co., timber merchants, of Hull. His works are situate close to the line of railway, on some good beds of clay, where very superior bricks of both red and yellow colour are now being produced. We understand it is Mr. Wade's intention to use machinery in their manufacture, which cannot fail to improve the quality of the bricks, and reduce the cost of production. W. S.

SCULPTURE AT THE PARIS EXHIBITION.

SCULPTURE is the art which most frequently in our day reminds us of the saying of Horace with regard to poems—that it is not enough for them to be beautiful; they must also be interesting. What an enormous amount of talent do we not see wasted in sculpture! And what an enormous number of statues fail to excite in us any emotion save that of impatience! The sculptor is an artist who goes to work somewhat after the fashion of Lightfoot in the story—he ties his hands as Lightfoot tied his feet, and yet he declares to win the race. He deliberately foregoes many of the most potent means of exciting human interest. Thus he rejects all the charm of colour, and engages to please us without it. Again, he insists on generalising the nature he presents to us; the figures he produces are more typical and less individual than those we find in a picture, and if they assume clothing at all it is seldom the precise costume of any particular date. Yet he undertakes to delight us, while he pays little or no attention to that tendency of human kind to fix its affections on individuals and not on types. Once more, if a statue is not always in repose, the range of movement which is allowed to it is limited; and for the most part in sculpture we are invited to consider a character rather than an action—a situation rather than an event. And yet, thus discarding that principle in human nature which leads us to take most interest in seeing something done, even if it be but a dog fight, the sculptor proposes to hold us spell-bound. As a matter of fact, however, it is very rarely he succeeds. The number of sculptures we admire without liking is prodigious. It is difficult not to note this by comparison in the French Exhibition. It is full of sculpture, some very good, some bad, but almost every piece of it infinitely better, as works of thought and of art, than some other objects which I shall presently refer to. But people pass the sculptures without notice—scarcely even seem to see them; and they flock round those other objects so that often one cannot get near them. The objects I refer to are lay figures of men and women dressed in the costume of different countries, and of different districts in the same country. It is one of the aims of the Exhibition to make a comparison of natural costumes, and of the people who wear them. Thus, we have the lay figures here of a Japanese, and there of a Turk, here of Swedes, Danes, and Norwegians, there of French peasants—Breton, Gascon, Alsatian, Norman—and so of nearly every nation under the sun except the English. These figures are not only correctly dressed, but their features are represented with tolerable accuracy, so as to give a fair idea of their ethnological characteristics. Sometimes the figures are single and doing nothing Sometimes they are arranged in groups, and there is a little attempt made to represent them as engaged in the business of some scene. Now, there are few things in the Exhibition more popular than these lay figures. The art in them is of the lowest kind, but they never fail to interest the crowds, because they are life-like, and they have the charm of individuality. The sculptor says virtually to the delighted crowd who gather round one of the figures:—"I will strip this figure of its clothing, and show it to you either naked or in ideal drapery; I will take away all colour from its flesh, and show it to you either pure white or all bronzed; I will take away from the individuality of the face and make it more typical; I will moderate the liveliness of its action; in a word, I will remove from it nearly all the attributes by which it commands your interest; and still I will retain and enhance your interest in it." To do this the sculptor must be a man of extraordinary power, and we need not wonder that even in the exercise of extraordinary power he should often fail to rouse the interest of the public, especially since nowadays he has no such sentiment as that of image worship to help him in his difficult task.

France and Italy are the only countries that make a considerable show of sculpture in the Champ de Mars. England is almost wholly unrepresented. Our chief sculptors refused to lend any of their works, deeming that under the conditions imposed upon them they could not exhibit with any advantage. A fine but somewhat wasted figure of a sad-hearted girl, which is called "The Song of the Shirt," and which is the work of Mr. Marshall Wood, is the most important piece of sculpture we have to show. Mr. Woolner sends a terra cotta bust of Captain Fowke, Mr. Munro sends a few sketches in plaster; Mr. Durham is represented only in the ceramic court, where some of his most graceful conceptions are exhibited on a very reduced scale in Parian. America has given evidence of great skill in sculpture, and several works of considerable merit by Miss Hosmer, Messrs. Thompson and Ward, make their appearance in the Exhibition; but the collection, as a whole, is unimportant. Denmark is another country which has achieved no mean renown in sculpture, and some specimens of the work of M. Jerichau (which, however, came too late for mention in any catalogue), as, for example, the group in which Adam appears awakened from his sleep and astonished at the sight of Eve newly created by his side, show that the art is still alive there. There could not be a finer theme for a sculptor than this which M. Jerichau has selected for his principal contribution; the group in which he has handled it will be found outside the building, under the verandah that goes round the central garden; and Englishmen who survey it will be pleased to think that, being a wedding gift to the Prince of Wales, it will find its way to England. The Germans, also, have shown ambition in sculpture; but they do not justify, scarcely even attempt to justify, their reputation. The ablest work they show is a bronze equestrian statue of the King of Prussia, which has obtained for M. Drake a Grand Prix. It is not without vigour, and especially there are some good points about the horse; but in all equestrian statues there is a tendency to make such an overwhelming display of animal power that, instead of the man riding the horse, we seem to see the horse overriding the man. The very means which the sculptor takes to exalt the man lowers him; for he is forgotten in the horse. And this is precisely what happens to us when we look at M. Drake's statue of the King of Prussia; we are interested in the horse, not in the man. The King of Prussia is simply a mass of clothes on horseback. Nearly opposite to this Prussian statue, in the roadway leading to the military school, are some specimens of Belgian handiwork, chiefly of the kind which seeks for the source of influence in colossal proportions. The most interesting examples of statuary, however, which Belgium exhibits are in miniature—little terra cotta groups by Leopold Harzé, which I described at some length when writing about ceramic art. And we may say of Belgian art generally that it raises one of the smallest kingdoms in Europe to a position of the first rank. But still even Belgium leaves the statement untouched that France and Italy are the only countries which make a considerable show of sculpture in the Champ de Mars.

Now, the best sculpture in the Exhibition is French. But, lest this remark should seem to be too sweeping, I hasten to explain that it is but another way of saying that the best sculpture in the Exhibition takes the form of portraiture. In imaginative sculpture the French must cede the palm to the Italians, who, on the other hand, are very poor in portraiture. The French portraits are uncommonly good, and one series of them rises even to greatness. There is a series of six portraits of the First Napoleon, by M. Guillaume, for which he has obtained one of the large gold medals. In the first of these he appears as a youth at Brienne; in the next, he has that attenuated face which belongs to the period when he commanded the French army in Italy; in the third, he is First Consul; next, he appears as Emperor; once more he appears as Emperor in the year 1812; finally, we have a portrait of him in his last days at St. Helena. The series is wonderfully interesting. Napoleon had a beautiful face, which a sculptor may well delight in; and each one of M. Guillaume's portraits of him is by itself worth looking at. But all together are a study. No one who can take an intelligent interest in a fine head but must like to follow this one of the great soldier in its course from boyhood to manhood, from manhood to the height of power, and then from power to adversity; and M. Guillaume deserves great praise for conceiving this idea, and for the way in which he has worked it out. He has, besides, a full-length

statue of Napoleon in classical drapery, which should be viewed in connection with the six above-mentioned busts. Napoleon is one of the few modern men whom we are not shocked to see in classical drapery. We prefer to see him in modern costume, but when the artists of his day, following the ideas of art which were then in vogue—the ideas of David and his school—insisted on showing him in classical drapery, we do not feel that the picture is wholly incongruous. With these achievements of M. Guillaume should be compared some other representations of the mighty conqueror which are to be found throughout the Exhibition. Thus, in the gallery which we share with the United States, there is a bronze statue of Napoleon by an American artist, Mr. Thompson. It is, perhaps, a little hard in style, but it is full of vigour, with so much of intensity in its stillness that few persons can pass it by without observation. Then, in the Italian Gallery, there is a statuette of Napoleon as a child, by M. Romanelli. But the representation which most of all demands notice is one by M. Vela, called "The Last Days of Napoleon." Crowds of people collect round this, and sometimes one sees at the feet of the statue offerings of flowers and wreaths of evergreens like the *immortelles* that rest on the railings of the column in the Place Vendôme. Napoleon, in his *robe de chambre*, is seated in an easy chair, that noble countenance of his worn with sickness and sorrow; a map is spread on his knees, and he meditates intently on all that has been, on all that might have been. There is something very good about the head, but it is not better than M. Guillaume's bust of Napoleon at the same period of his life; and the statue, as a whole, is rather overrated. The measure of M. Vela's power as an artist may be seen in two other works of his which are not far from the Napoleon statue. A female figure, which is supposed to represent Spring, is quite close to it; and a colossal group of Columbus and an American Indian every one must have stopped for a moment to look at, though probably few, after looking at it, have felt very eager to know the meaning of it. The art which is displayed in these three works is all of a piece. In the Napoleon statue the artist could not go far wrong; it would be difficult to fail altogether with such a subject. He also deserves credit for the skill with which he has managed the dress, so that, despite its homeliness, it is not wanting in dignity.

Besides M. Guillaume, there are a number of French sculptors who succeed in portraiture. Thus M. Carpeaux has a good deal of reputation here, and is clever in his way. A statue which he has done of the Prince Imperial, with a dog at his side, is very popular. A still better and surer portrait sculptor, however, is M. Carrier Belleuse. When this artist attempts to imagine he is not to be trusted—witness his statue of Angelica chained to the rock. But trust him for portraiture. M. Crauk is less certain in his work. His portraits are so good that we do not like to say a word against them, and yet so doubtful, that it is difficult to bestow on them that last word of praise which means everything. This half-and-half sort of success we must acknowledge in the portraits of Mdlle. Favart, of the Comédie Francaise, and of Mdlle. Pélissier, the little daughter of the Duke of Malakoff. Of much the same character are the portraits exhibited by M. Etex. M. Iselin is much more firm in his seizure of character. M. Millet seems to be commonplace in dealing with figures the size of life, but to attain great power if he is allowed to represent them of colossal grandeur. M. Oliva is not only able in his work, but fine also; but his bust of the late Mr. Cobden is neither like nor fine. M. Oudiné is very prolific of busts and medallions, and his portraits, if not great, are at least sufficiently striking. The same praise may be given to M. Ponscarme, who has a very able bust of Marshal Forey, and many cleverly wrought medals. The cameo portraits of M. Reverchon are more than clever, they are beautiful; and last of all in the way of portraiture, we come to M. Thomas, who has a large statue of Mdlle. Mars, which belongs to the Théâtre Francais. The ability of this statue is marked; but there is little more to be said of it, except this, that the texture of the dress is rendered with a minuteness which scarcely befits good sculpture.

The Italians, I have observed, are feeble in portraiture, and it is in imaginative sculpture that they excel. And yet, even in imaginative sculpture, they have not many works of importance to show. I have already mentioned Vela's statue of Napoleon in his last days, which is the most popular of all their works. But a greater artist than M. Vela is M. Dupré, who has obtained a Grand Prix. The works which are supposed best to set forth his genius are a great bas-relief placed above the doorway of the Italian picture gallery outside, and called the Triumph of the Cross, together with a group of the sort commonly known as a Pieta. These works are well enough; but one fails to see in them any exhibition of original thinking. One gets a much higher idea of his power from a bronze figure placed rather out of the path of visitors, in the covered way that goes round the central garden. It is a figure of Cain, very powerful, a good deal of action in his frame, and a wonderfully vivid expression of remorse in his countenance. His hand is held up to his forehead, but this is not the commonplace action of holding the palm of the hand to the brow. The action is quite different; it is the back of the wrist that is held to the brow. Another sculptor who has done well is M. Luccardi, whose group of figures, which he calls an episode of the Deluge, contains much admirable modelling and some good feeling. One of the most considerable exhibitors of sculpture is M. Magni, but he has nothing to show which is so good as the well-known "Reading Girl." I suppose it is scarcely necessary to say that these Italian sculptures abound, like the French, in nymphs, Bacchantes, Cupids, nude slaves, and personifications of Innocence and Modesty, and Spring and Sleep. The Italians, however, are more graceful and moderate in their rendering of these ideals than the French; but perhaps this is because they had far to send, and their collection of sculpture was weeded of its monstrosities far more thoroughly than the French. Some of the work which has been allowed to pass is bad enough. Witness the contributions of M. Marcello, who is the most abundantly represented of all the Italian sculptors. Some of his portraits are too bad.—*Correspondent of Times.*

CARPENTERS AND JOINERS.

THE RELATIONS OF MASTERS AND MEN.

THE masters and men engaged in the business of carpenters and joiners in Liverpool held a meeting last week to take into consideration a new code of rules for the regulations of trade matters. Mr. Grant occupied the chair. The first rule, which provides that the hours of work shall be 55 per week, was all but unanimously adopted, on the motion of Mr. G. Leeves, seconded by Mr. Biggins. On the second rule, providing that the average rate of wages shall be £1 11s. per week in summer, and £1 9s. in the four winter months, being moved by Mr. J. Boughey, and seconded by Mr. E. Boughey, an amendment was moved by Mr. Reid, seconded by Mr. Gilchrist, and almost unanimously carried, to the effect that the existing rule of the operatives which provides that the rate of wages shall be the same all the year round shall be retained. It was unanimously agreed to adopt the third rule which fixes the commencement of quarter time at 9 o'clock all the year round. The rule in the operatives' code regarding overtime was substituted for the fourth rule proposed by the masters, relating to the same matter, the object in introducing the amendment being to prevent the system of working by the hour. On the fifth rule, proposed by the masters, which provides that the boundary should be taken at a radius of one mile and a-half from each shop as a centre, beyond which walking time shall be allowed, considerable discussion arose, but ultimately it was carried by a considerable majority. The sixth rule proposed, which related to country jobs, was rejected, and the clause in the operatives' code adopted in its place, with an amendment providing that 2s. 6d. per week shall be paid by the masters as lodging money to men working in the country. The seventh rule, proposed by the masters, providing that men shall be allowed to leave jobs out of the shop in time to be at the pay table at 1 o'clock on Saturdays, was rejected in favour of a rule providing that if the paying of wages did not commence at 1 o'clock, the men should be paid overtime for the period they were detained. The eighth rule, proposed by the masters, was as follows:—Each employer shall conduct his business in any way he may think advantageous in the matter of letting piecework, employment of society or non-society men, taking apprentices, using machinery and implements, and in all details of management not infringing the individual liberty of the workmen. The adoption of this rule was strongly opposed by Mr. F. Bromley, who condemned the system of piecework as being highly injurious to the workmen. Mr. W. Walker seconded the rejection of the clause. Mr. Pritchard said some of the masters informed th deputation that they would not press the piec work. They were sometimes asked for it by th men, and all the society had to do was to bring little influence to bear on those who took piec work. But in his (Mr. Pritchard's) opinion the s ciety would have to put such men in the grav before they abolished the piecework. The ru was rejected. The ninth rule proposed, which pr vides that before any alteration of the rules l made, sixth months' notice shall be given on eith side; and the tenth rule, providing a court of a bitration, consisting of an equal number of er ployers and workmen to settle trade disputes, we then agreed to. A vote of thanks to the chai man brought the proceedings to a close.

THE CATHEDRAL OF MENTZ.

NOWHERE are the various styles of Christi architecture, from the Romanesque basili to the Gothic cathedral, more amply represent or more closely packed together than on the ban of the Rhine. The restorations that are bei carried on there, as in France, while they pro the interest felt in the architectural monumer of the country, yet leave room for the desire th existing things might be more respected, a deficiencies supplied with better understandir and with more feeling for the general effect. the three great vaulted basilicas of Spire, Worn and Mentz, the first has been long restored, t second threatens ruin, while the third is now the very midst of a repair and decorative proc that offers many remarkable points. Germa was strong, and Mentz was its most flourishi city when, in 978, the foundation of the cathed was laid by Archbishop Willigis, Chancellor of t Empire, and, after the death of Otto II., guardi of his son Otto III. In those days the churcl were generally of wood; but Willigis determin that his basilica should correspond to the mag ficence of the city, and built it of hewn stone *pulchro tabulato lapide pretiosissime*, as Trit mius says. After thirty years of labour it v ready for consecration in 1009. The candles w lighted for the ceremony, when the buildi caught fire, and the flat ceiling and all the wo work were destroyed. Of this original build portions remain in the eastern choir and transe Willigis spent the rest of his life in repairing building. The work was continued by his s cessors, and was sufficiently advanced for Con to be crowned there in 1024, though it was consecrated till November 4, 1037. The mass arcades, with their aqueduct-like arches, and th piers, with the half pillars to carry the gird of the roof attached to every alternate colur together with the eastern staircase turr originally erected to facilitate the hoisting of materials, all belong to this period.

Many historical recollections of the next are connected with the cathedral. Rudolph Swabia was crowned there on August 7, 1077 opposition to Henry IV. There, also, in 1 Henry IV. caused the anti-Pope Wigbert to he up against Gregory VII. The next year greater part of the town was devastated by a f which destroyed the roof of the cathedral, w out further damage to the fabric; but anot fire, in 1191, destroyed the vaults, the upper p of the eastern choir, and the greater part of walls of the nave. Archbishop Sigfried im diately set about its restoration. To this pe belongs the greater part of the present build Its style is the fully developed Romanesque, w occasional use of the Early Gothic. The va of the nave and aisles are Pointed, and the b and capitals of the half columns show twe century details. To this period the great po opening on the market place belongs. Soon af wards, in 1200, the western choir was commen It is a semi-hexagonal apse, with a half do backed by a transept. To this age belong also e lower part of the great tower and the two west towers. Whilst the doors, windows, and galle are all round arched, the great octagonal cup dating from 1237, has the pointed arch, and e pediments of the transepts have large and l wheel windows. In 1260 the side walls of e nave were first broken through for the purpos erecting one of the lateral chapels. By deg sixteen of them were built, all in pure Gothic, e latest having been finished in 1506. The up part of the great tower, and the pyramid crown of the clock tower, date from the sec half of the fifteenth century. At this time, the great pillar dividing the triumphal arch of e eastern choir was put up to support the incre d

weight. This pillar is now the great stumbling-block in the way of the restorers. After the fire in 1191 the cathedral remained uninjured for six centuries. Gustavus Adolphus was prevented from demolishing it by the Marquis de Brige, the ambassador of Louis XIII. It also escaped unscathed during the bombardment of 1689. But in a storm on May 22, 1765, a flash of lightning struck the great tower, and reduced the roof of the church and adjoining buildings to ashes. The great tower and the two western towers were restored by Neumann, of Wurzburg, who, however, consulted the fashion of the day by crowning his work in the bulbous style. Once more the bombardment of 1793 burnt the roof of the eastern choir and clerestory, and the church was subsequently used as a magazine and stable. Jean Bon St. André, the French Prefect, soon afterwards, at the instigation of the anti-ecclesiastical party, found that the building was dangerous, and decreed its demolition. But Bishop Colmar appealed to Portalis, the Minister of Worship to the First Consul; and the cathedral was spared, to be restored to public worship in 1804. But it was again used as quarters for 6,000 fugitive Frenchmen in 1813, and had to be reconsecrated on November 12, 1814. At this time Moller of Darmstadt was allowed to crown the bell tower with a cupola of iron and zinc, which proves his incapacity to understand the spirit of an ancient work of art; and even the present age, which boasts of its profound study of ecclesiastical art, in its completion of the northern staircase turret, undertaken recently by order of the *Dombauverein*, offers only a fresh instance of inability to solve the problem. The new structure is too heavy, the profile of the windows too flat, and the pointed stone roof too high and inanimate. But in spite of eight hundred years of alterations and degradations, the cathedral is still, in every respect, a grand building. With its one great and four smaller towers and its cupola it overshadows the old Rhenish town, which crowds round it, leaving only one of its ends and part of one side open to a bustling market place. Even the bizarre dome of the clock tower has its own beauty and harmony, and now that the staircase towers have been raised so high, could not be replaced by a lower construction.

In the interior, the solemnity of the Romanesque style, often made gloomy by the small windows, is relieved by the light which shines through the high pointed windows of the chapels and penetrates the arcades of the nave. The pillars and walls are freed from all adventitious colouring, and display some fifty life-sized figures of archbishops, and monuments of royal and historical persons, in sandstone or marble, many of them of the fourteenth, fifteenth, and sixteenth centuries, and harmonizing admirably with the architecture; and while the decoration of the lower portion of the walls has been entrusted to the sculptor, the painter has undertaken to fill the higher spaces with sacred imagery. The task has been fulfilled by the master hand of Philip Veit, who, with his two friends Overbeck and Peter Cornelius, was the youth who undertook to restore to art, corrupted by frivolity, and disfigured by the frigid scholastism of academies, the vigour which alone can command respect, and the simplicity which made the great masters unrivalled in their representation of sacred subjects. The four mural compartments of the western apse above the altar represent the sacrifices of the lamb by Abel, of Isaac by Abraham, of the bread and wine by Melchizedek, and of Himself, under the symbol of a lamb, by our Lord. The spandrels of the vaulting ribs contain angels bearing the lily, the palm, and sacrificial symbols. An angel with censer stands on each side the Lamb, and over the four sacrifices, palm trees bend their heads in token of victory and peace. The majesty of the compositions, the finished execution of the pictures, the ingenuity and intelligence with which each bit of wall is covered with its appropriate figure, as if the building had been erected for the pictures, and the richness of the gold and colours used for the tasteful architectural decorations, render this apse one of the most magnificent in the world. The decorations of the aisle vaults are almost as remarkable, but those of the nave and transepts, though good in design, are too large in their proportions, too strong in colour, and decidedly injured by the dark blue ground. They were painted without Veit being consulted. Over the arches of the nave, the mural compartments, which are 17ft. high, are filled with great pictures representing the principal scenes of the Life of Christ, very beautifully conceived. Veit furnished the cartoons; the paintings were executed in colours upon a gold ground by his friends Joseph Settegast, Gustav Lasinsky, and Hermann. The execution exhibits great intelligence and ingenuity in realizing the spirit which animates Veit's sketches. There are eighteen of these great pictures, beginning with the Annunciation, and ending with the Crucifixion.

The two remaining mural spaces, one on each side of the eastern arch of the nave, were to have been occupied by pictures of the Burial and the Ascension, while the triumphal arch, thanks to the great pillar inserted in the fifteenth century, offers a vast space for the principal picture, that of the Resurrection; the apse behind it was destined for the Last Judgment. Such was Veit's conception, approved by the committee, and suggested by the whole architectural arrangement. The entire cycle of pictures had been designed to follow in this order. The work had advanced thus far in 1866, and seemed near its completion, when the committee seems for the first time to have become aware that the great pillar inserted in the fifteenth century in the Arch of Triumph was an addition to the original building, and to have begun wondering whether it might not be better to remove it. But those who have carefully examined the venerable building tremble lest the imprudent eagerness for embellishment may prove more disastrous to its existence than the corrosion of time and the destructiveness of war.—*The Chronicle.*

BUILDERS CLERKS' BENEVOLENT INSTITUTION.

A MEETING of this society was held at 14, Bedford-row, on Monday last. As several who were expected did not attend, it was deemed advisable to adjourn the meeting until September 23, when it is expected there will be a much larger attendance. The balance-sheet shows a gross income of £638, and the expenditure about £160. The support received exceeds what was anticipated, and considering that the Institution was started at a very bad time financially, gives promise of its ultimately attaining a proud position amongst our useful institutions. There are still many employers and others who doubtless only require asking to become supporters, and taking into consideration the very limited means the committee have of personally canvassing their own class, the support received from the clerks is as much as could be reasonably expected. Many of them allow one-sided views and petty jealousies to keep them away, but time and personal appeal will doubtless remove these obstacles. It is surprising, considering the advantages such a society as this holds out, that more do not flock to its assistance or, rather, to their own assistance. They not only receive as much and more than they give, but membership in such a matter inspires to some extent a sense of security, and promotes the best interests of society.

NEW METROPOLITAN TRAFFIC ACT.

THE Act for regulating the traffic in the metropolis, and for making provision for the greater security of persons passing through the streets, was issued on Saturday. There are 29 sections in the Act, which is divided into two parts. The metropolis is defined to mean the city of London and all places within the jurisdiction of the Board of Works. The "general limits" of the Act mean such parts of the metropolis as are enclosed in a circle of which the centre is Charing Cross, and the radii are four miles in length, as measured in a straight line from Charing Cross. The expression "the special limits" of the Act is to mean such streets as may be declared to be special limits. As to scavengers, it is enacted that after the 1st of January next, between the hours of 10 in the morning and 7 in the evening, in such streets as may be named by the Commissioner of Police, no ashes, &c., are to be removed from a house, and no goods deposited or unloaded, under certain penalties, between the hours mentioned. Cattle are not to be driven through the streets in the hours stated without the permission of the Commissioner of Police, and the fines not to exceed 10s. each head of cattle. Within the general limits of this Act the driver of a metropolitan stage carriage shall not stop such carriage for the purpose of taking up and setting down passengers at any part of the street except as near as may be to the left or near side of the roadway. For acting in contravention, the fine is not to exceed 40s. Advertisements on carriages, &c., are prohibited, except those approved by the Commissioner, but the section is not to apply to the sale of newspapers. The Commissioner of Police may make "special limits" with the approval of the Secretary of State, and regulations may be made after notice as to the route of vehicles, &c., and for disobedience penalties are to be enforced, and within special limits no driver of a metropolitan carriage is to take up or set down. Certain rules are to be enforced as to the delivery of coals and timber, and as to hackney carriages. With respect to dogs, the police may take possession of any dog not under control, and detain the same until claimed and expenses paid. The Commissioner may order dogs to be muzzled, the police to send a letter to the owner of any dog with a collar on and address. The Commissioner after three days may order a dog to be destroyed, and upon complaint that a dog has bitten or attempted to bite any person a magistrate may order such dog to be destroyed. There are to be regulations as to shoeblacks and messengers. Three or more persons assembling for betting in a street are to be deemed an obstruction, and each liable to a penalty of £5. No fare for a hackney carriage to be less than one shilling. The Act is to take effect on the 1st of November next.

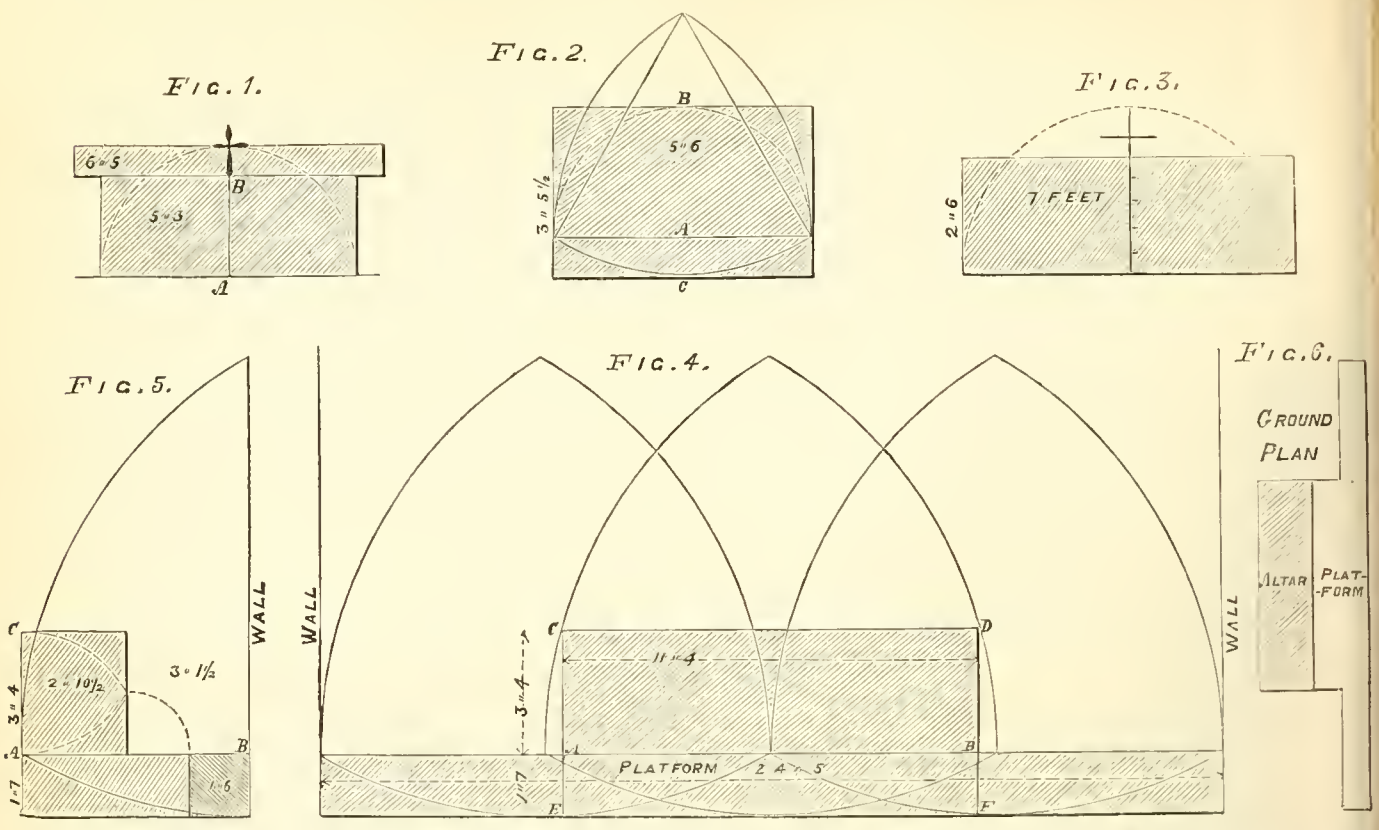
ENGINEERS' AND DRAUGHTSMEN'S BENEVOLENT SOCIETY.

MR. R. M. BANCROFT has issued a circular on the projected Assistant Engineers', Surveyors', and Draughtsmen's Benevolent Society. He says:—"The time seems now to have arrived when something of a more decided character than newspaper correspondence or editorial encouragement is required, in order to set the matter fairly afloat, and it has been suggested that a meeting of the persons interested in the movement, and particularly of delegates from as many as possible of the large engineering offices, should be convened on an early day, such meeting to be presided over by some well known and universally respected member of the profession. The subject could then be fully discussed, and, if desired, a committee be appointed for carrying out the wishes of the meeting, and for promoting the general success of the movement. I therefore beg to inform you that as soon as the necessary steps have been taken, and the time and place of such meeting have been determined on, the invitations will be issued. In the meantime, may I venture to commend to your earnest consideration the various advantages aimed at in this movement. A plan is proposed for providing a fund for sickness, old age, and superannuation; also a provision for the widows and orphans of deceased members; and a scheme by which the children of assistant engineers, surveyors, and draughtsmen would be enabled to obtain a good sound education at a very reasonable rate. Of the many details involved in these matters, you will easily understand it is at present premature to speak. What is first wanted is to arouse general attention to the question. We may then safely reckon on securing a good and influential meeting of those who are interested, and if this be followed by a hearty co-operation of all concerned, I feel convinced the objects can and will be speedily obtained. Before, however, we can, with any propriety, ask any of our leading engineers for their counsel and support, we ought to have some idea as to how far the desire for such a society is shared in by assistant engineers, surveyors, and draughtsmen generally, not only in London, but throughout the kingdom. May I, therefore, further request you will lay this letter before your associates, and that you will kindly oblige me with a line as early as possible, stating what are the views you entertain on the question, and whether I may hope for the pleasure of your attendance and co-operation at the meeting proposed."

Any letters on the subject may, for the present, be addressed to the honorary secretary (pro. tem.) of the proposed Assistant Engineers', Surveyors', and Draughtsmen's Benevolent Society, office of the Building News, 166, Fleet-street, London.

A small town called Johanngeargerstad, in Saxony, has been totally destroyed by fire. 350 houses are one mass of ruins, only stone walls to indicate the place where they once stood. The town contained 5,000 inhabitants (many of whom have gone to other towns), and this is the first fire which has occurred since theplace was built 200 years ago.

THE PROPORTIONS OF OLD STONE ALTARS.



THE PROPORTIONS OF OLD STONE ALTARS.

OUR old churches teem with living specimens of thought, which speak in unmistakable language of the piety of the devoted men who reared them; and with their love of symbolism it is probable that the details of their works were influenced by this means to a greater extent than we are apt to notice. And I suggest that their stone altar, to them the most sacred part of their holy church, was not built at random, but the proportions were thoughtfully made out by symbolic figures, as 3, 5, 7, &c., bearing on the Trinity, the five wounds, &c., which I have attempted to illustrate by diagrams of what altars I have been able to obtain.

Fig. 1. Shows the dimensions of front elevation of old Altar at Peterchurch, Hertfordshire.—The proportions of this altar bear on No. 3. Having the length of altar slab given to find the height, lay this length down as a base line, which divide into three equal parts; erect one part perpendicular, AB, this gives the height of body of altar that is, without the slab. Divide this height into three equal parts, erect one part upon the altar BC, which form into a dedicatory cross by placing a cross arm at one-third of its whole height from the top, the distance from the top of the altar to the cross arm gives the thickness of altar slab. The distance from base of altar at A to cross arm gives the total height of altar; this length also gives the half of base of altar, as shown by the dotted semicircle.

Fig. 2. Altar at Ballintubber Abbey, County Mayo, Ireland.—Set off 5ft. 6in. on base line as length of altar, upon this erect an equilateral triangle, and from the same points draw a curvilinear triangle, with half the length of one side of the triangle as a radius; from A describe a semicircle; the distance between the crown of this arc at B and the curve of triangle at C gives the height of altar.

Fig. 3. Altar at Urishay Church, Hertfordshire.—Given the length of altar, 7ft.; erect half this length as a perpendicular as at AB, divide this into seven parts, taking five for the height of altar.

Fig. 4. Altar at Ballintubber Abbey, County Mayo, Ireland.—On 24ft. 5in. as a base line, which is the distance between the chancel walls, erect three triangles, as shown at fig. 4, on the base line, and in the centre set 11ft. 4in., the length of altar as at AB; erect these points, and their intersection with the sides of the triangle gives the height of altar as at CD. The distance between the base line and the arc of triangle gives the height for platform AE and BF.

Fig. 5. End elevation of fig. 4 from the wall line as a centre, set off half of one of the triangles of fig. 4; this determines the distance of front of altar from the wall as at AB. From A carry up the perpendicular to the height already found in fig. 4, as at AC; take this as a base line, on which erect a triangle, and the apex D gives the width of altar from back to front. T. Prince.

Bradford.

PATENTS.

THE Chancellor, the Master of the Rolls, and the late and the present Attorney-General, as commissioners of patents, report that 2,124 patents were passed in the year 1866. The amount received in the year for stamp duties, the fees now being paid by means of stamps, was £114,461. The receipts included £31,400 for continuing old patents beyond the first three years of their term of 14 years, and £21,900 for continuing old patents beyond the first seven years of their term. The fee of £50 for continuing a patent beyond its third year is paid on about 30 per cent. of the patents issued, and the other 70 per cent. become void at the end of three years. The further sum of £100 payable at the end of the seventh year is paid on about 10 per cent. of the patents issued, so that 90 per cent. are allowed to become void at the end of the seventh year. The commissioners continue publishing abstracts or abridgments of all specifications from the earliest enrolled to the present time. The new classes in course of preparation relate to fuel, steam-engines, railways, railway signals, hydraulics, ventilation, rolling stock, raising, &c., heavy bodies, acids and alkalies, agriculture, optical, &c., instruments, roads, stone and cement, writing instruments and materials, saddlery, and bridges. After the present year all patentees will be required to deliver with the specification an abridgment of it, and these abridgments will be published in quarterly volumes after the expiration of the six months' protection. The large amount of surplus of fees received over expenditure provides a fund from which the cost of a proper building might be defrayed.

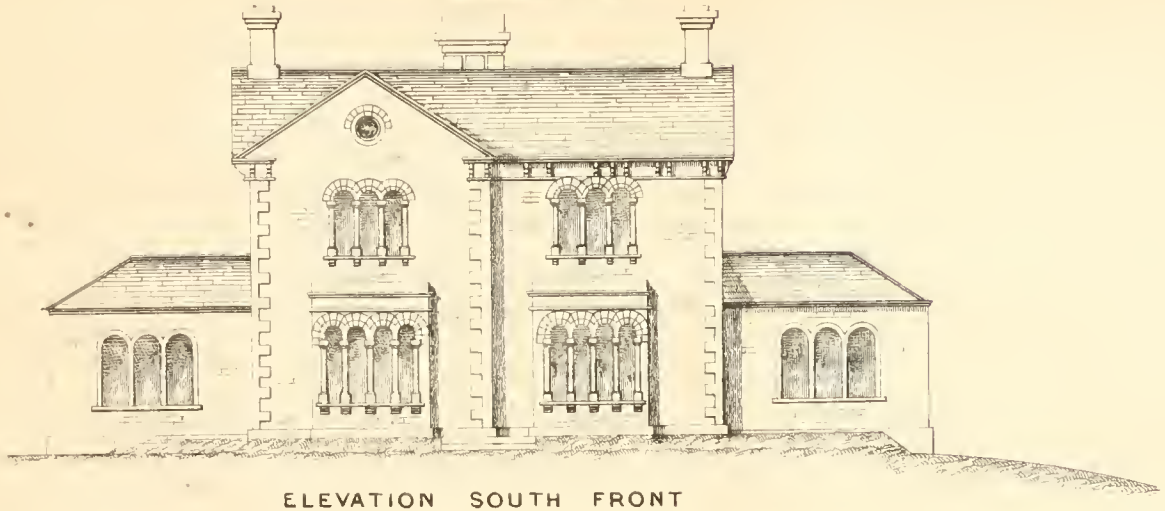
OBITUARY.

The death is announced of M. Paccard, architect of the palaces of Fontainebleau and Rambouillet, at Aix-les-Bains, in his fifty-fourth year.

We regret to learn of the death of Mr. Thomas Cundy, the architect, which took place suddenly at his residence in Chester-square. Mr. Cundy's principal works were:—Hewell Park, for the Earl of Plymouth; Tottenham Park, for the Earl of Ailesbury; Moor Park and Grosvenor House, for Earl Grosvenor, besides many others. He was more especially known as surveyor to the extensive estates of the Marquis of Westminster, an appointment which he held for upwards of forty years. Mr. Cundy was born in London in 1790, and was brought up in the office of his father, who was extensively engaged as an architect and builder.

Michael Faraday, the distinguished chemist, died on Sunday, at the age of seventy-six. He was born in the parish of Newington, Surrey, and, like many others who have illustrated the pages of British history, was entirely a self-made man. Although the late professor chiefly confined himself to experimental researches, there are theoretical views thrown out with regard to static induction, atmospheric electricity, the lines of force, both representative and physical, which are well worthy of consideration. His papers on the conservation of force, and on the division of gold and other metals, are amongst his latest productions. His lectures, adapted for young minds, delivered at the Royal Institution during Christmas time, will not easily be forgotten. The ease with which he descended from the heights of science, and conveyed in the minds of his youthful listeners the scientific principles of "common things," was not the least of the many gifts possessed by Dr. Faraday. But it is in connection with electricity, and its relations with almost all physical, chemical, and physiological phenomena, that his fame will principally depend. His investigations on this subject led him to the presumption that electricity, magnetism, and light are but one and the same force, varying in effect according to circumstances, but obedient to laws which will one day be discovered.

The extensive tract of land, heretofore occupied as market gardens, extending from the Spa-road, Bermondsey, to the Hamlet of Hatcham, Old Kent-road, and intended for the site of the park for Southwark, is being cleared, levelled, and enclosed. The clearing of the ground previous to planting trees and flowering shrubs will be a work of time. There will be four entrances to the park; the principal one from Drummond-road is nearly completed. The pillars are of stone, with a handsome lodge; the others are to be of a similar design, and will be erected at the cardinal points of the park. The approaches from the Lower-road, from the Blue Anchor-road, Bermondsey, and from Hatcham and the Old Kent-road, have been commenced, and will be finished simultaneously with the park.



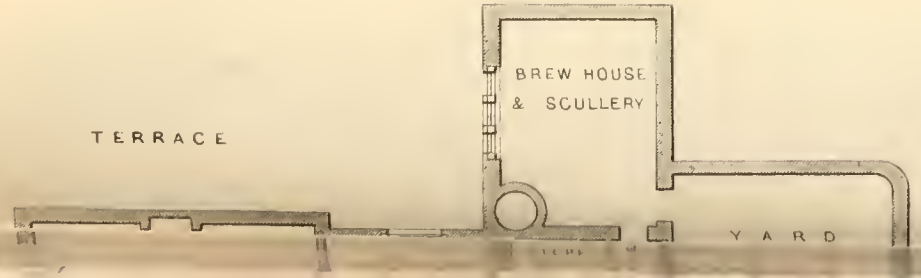
ELEVATION SOUTH FRONT

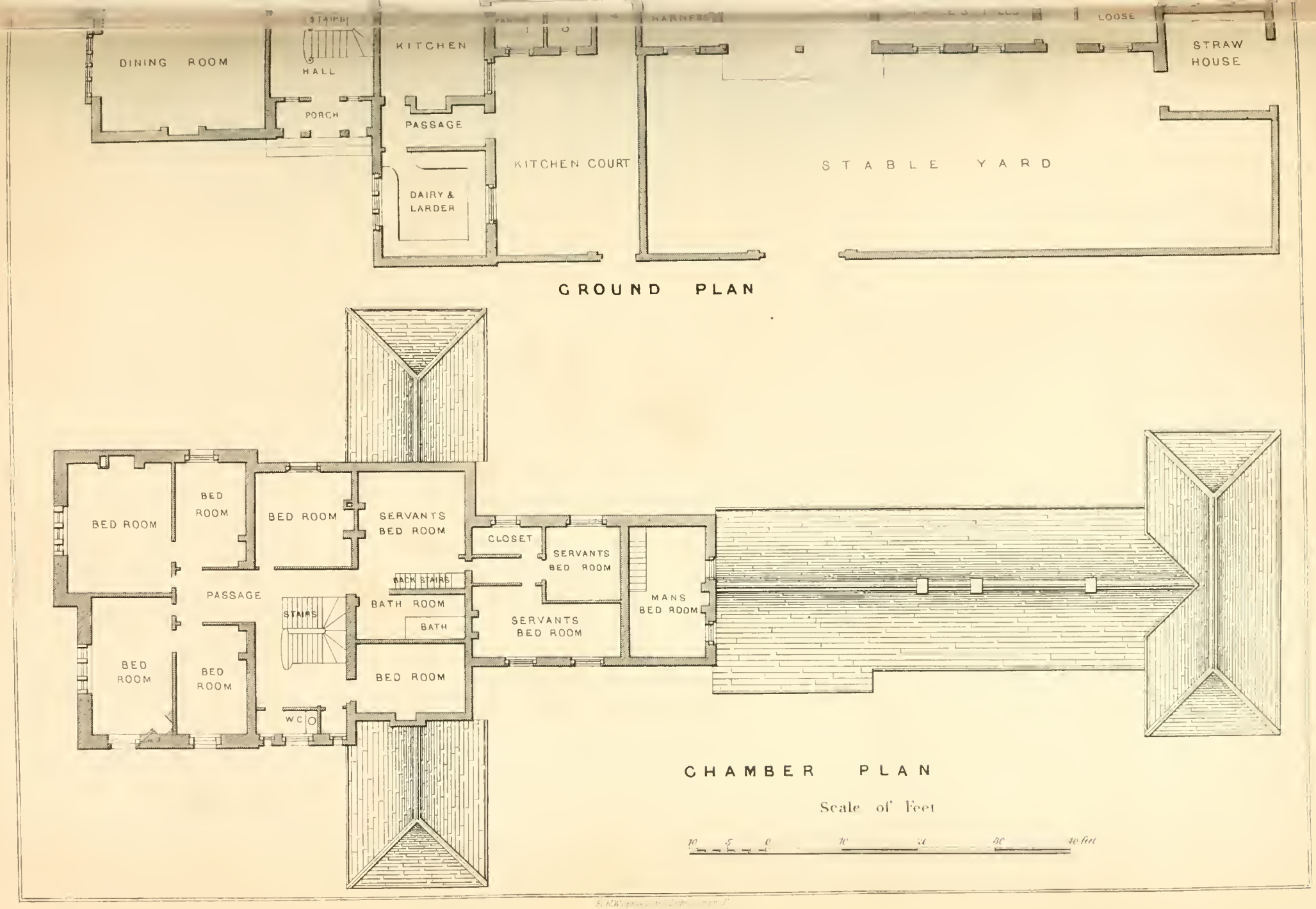
RESIDENCE
NEAR
LAVENHAM
SUFFOLK

C. A. DEAN, ARCHT

ELEVATION EAST FRONT

STABLES




DINING ROOM
STAIRS
HALL
PORCH
KITCHEN
PASSAGE
DAIRY & LARDER
KITCHEN COURT
HARNESS
LOOSE
STRAW HOUSE
STABLE YARD
GROUND PLAN
BED ROOM
BED ROOM
BED ROOM
SERVANTS BED ROOM
CLOSET
SERVANTS BED ROOM
PASSAGE
BACK STAIRS
STAIRS
BATH ROOM
BATH
SERVANTS BED ROOM
MANS BED ROOM
BED ROOM
BED ROOM
BED ROOM
W C
CHAMBER PLAN
Scale of Feet
10 5 0 10 20 30 40 feet

DESIGNS FOR RESIDENCES, LODGES, COTTAGES, &c.*

MORE air, more light, and more space, are the three requisites to be complied with, in all attempts at rendering all modern-built dwellings superior to the older examples, with respect to the esssential points of health and comfort. While, in all probability, we shall never witness the reappearance of the thatched roof and the diamond-shaped pane, yet we continually meet with rooms in newly-built houses where it is impossible to stand erect, and with gardens and yards where one could not swing a cat. These remarks undoubtedly apply more to the dwellings in cities and towns than to those of the description illustrated in the volume before us, but still it will be universally admitted that the latter afford ample room for improvement equally with their neighbours. It would, moreover, be difficult to fix upon a spot for a rural residence in the neighbourhood of a town without the remote contingency of it becoming in some years a part of the town itself. But a few years ago a residence at Clapham or Brixton was considered to be perfectly in the country, and now those suburbs, with others lying in opposite directions, have become insensibly, as it were, incorporated with our great metropolis. In the designs he has selected, the author very judiciously makes no pretence to high art. He does not aim at anything beyond a plain and simple style, alike suitable to the purposes for which the buildings are intended, and to the requirements of economy. There is no greater mistake committed, than in wasting money upon the exterior of a small and unpretending cottage, which the nature of the interior but too plainly demonstrates should have been expended elsewhere. The text of the book commences with some good hints relative to the selection of the site, the laying out of the approaches, and the preservation of any plantations in the vicinity. We concur with all the author mentions respecting the water supply, drainage, ventilation, and warming of the apartments, although no rules are laid down for effecting the last result. There is no question but that our whole system of heating only certain portions of our houses during winter time, is totally destructive to proper ventilation, and to the comfort of the inmates. Without discussing whether a uniformity of temperature is the most suitable for a dwelling, although the converse might be maintained arguing from the analogy of nature, yet it is quite manifest that even in our climate, or, rather, in our weather, for climate we have none, there is not during the same day the same difference in temperature as is to be found in the dining-room and in the bedroom.

In the arrangement of farm buildings and out-offices there is one important consideration to be kept in view, and that is, that steam and agricultural machinery, and implements of every conceivable description, are fast overcoming the prejudices that have so long attended them, and at present form an indispensable adjunct to every farm of moderate size. To enable the farmer to set in action, by steam power, his chaff cutters, grinding and bruising mills, root pulpers, slicers, and other small machinery, provision must be made either by strong side walls, or by the erection of cast-iron pillars, to receive the shafting necessary for transmitting the motive force. The fact that a farmer has no place to put up machinery in, is frequently the cause of his being compelled to go without it, and carry on his operations in the same manner as his forefathers, from sheer inability to do otherwise. The subject of foundations is treated briefly, but to the point; but we would suggest that where it is necessary to employ concrete, the depth should not be less than 1ft., and that a wise plan would be always to lay a course of slate in cement, or in tar and mortar, above the footing course. Where stone can be had in the locality, and if the houses are to be built either of rubble work or of work requiring nothing but rough dressing of the stones, the latter will be found quite as cheap, and preferable to brick upon the whole, as the walls will be both stronger and thicker. The construction of the roofs of dwellings, although noticed in the volume, belongs to a particular branch of carpentry, and requires special study, the more so since the introduction of cast and wrought-iron trusses has become very general. A notice of the various timbers and stones used in ordinary construction concludes the text; and in our opinion the concluding paragraph might as well have been omitted. We cannot say we altogether agree with the arrangements of many of the designs illustrated. For instance, in plate 2, it is by no means an agreeable prospect for those driving up to the house by the "carriage sweep" to pass the kitchen, which is placed curiously enough in the front of the house upon one side of the entrance. The introduction of a staircase into the scullery, for the purpose of leading to one bedroom, appears sacrificing a great deal to obtain very little, and it moreover encumbers valuable space in the regions of the sink and copper. In plate 6 the difficulty is got over by making the ascent from the harness room, a much better plan. It appears rather singular in plate 7 that there should be a door of communication between the drawing-room and a bedroom, both upon the ground floor. Possibly the word is a misprint for breakfast-room. The front elevation of the house in plate 8 is the most pleasing of all the illustrations, but the ground plan is marred by the scanty dimensions given to the library, 10′ 6″ × 7′ 0″, and by the introduction of a fireplace stuck crosswise in the corner of the room. Plate 12 represents a compact and well-arranged little dwelling, although we should have reversed the names of the living-room and parlour, unless the former is to be regarded solely as a kitchen, and the latter as a general sitting-room for the family. Similarly, in plate 14, which is a neat little design in the main, we should have preferred putting the kitchen where the dining-room is. An error has been introduced here in calling a room 5′ 6″ square a servants' bedroom, since a full-sized bed could not be got into it. The arrangement in plate 15—where the bedroom upon the ground floor has no independent entrance of its own, but can only be gained access to by passing through the sitting-room—is a very inconvenient one, and would be intolerable to many people. The drawings are carefully got up, and the lithographs well executed. Although there are scales attached to every plate, still, had the principal dimensions which are given in a few of them been written upon them all, it would have been a valuable addition to the information contained in the plans.

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As a specimen of the general character of the book, we give as our lithographic illustrations this week plans and elevations of a residence erected near Lavenham, in Suffolk. The book, barring the few deficiencies we have pointed out, will be found a valuable companion to architects and builders who may be engaged, or who may be expected to be engaged, in the erection of country residences.

* "A Series of Selected Designs for Country Residences, Entrance Lodges, Farm Offices, Cottages, &c." By G. A. Dean, architect, land agent, and surveyor. London: Longmans, Green, Reader, and Dyer. 1867.

ON THE APPLICATION OF PHOTOGRAPHY IN ARCHITECTURE AND ARCHÆOLOGY.*

THE library of a wealthy architect, with its costly folios of large engravings, appears a valuable apparatus for the study of the art, and yet if we could but gauge these professing records of the antique or of monuments in far countries, how seldom should we find them decently accurate. There are many views of old abbeys and cathedrals of the last century discarded because they are evident distortions of the mediæval styles, but the misfortune is, that the majority of our works, old and new, are chargeable with the like defects.

Here we have a laborious and well-finished plate of a ruined temple and monument in Ionia. It is deserving of admiration, and cannot fail to be correct. The process of production, if we knew it, might make us more sceptical. First, as to the sketcher. Though trained to the rule and compass, he has never had such practice in drawing from nature or the round as would give him smartness of eye and strength of hand. He does his best, and believes he draws well, but no decent professor in a school would pass him. Such is the man, in most cases, who supplies the drawings for our great works. He is an architect, a painter, or an amateur, equally defective in that very low department of art, drawing, but perhaps he can put in some picturesque touches. Now we have him on the ground. He has slept in a dangerous and feverish place with the attendant properties of the scantiest population, and a band of brigands, his res broken by buzzing and stinging mosquitos, in a coffee-house or tent. He gets his breakfast either according to his own fancy or that of his dragoman, rough and ready, or frowzy and nasty, with little comfort and enjoyment, and he goes forth to work, perhaps on foot, perhaps on his horse. After a saunter among the varied remains, he makes up his mind what to begin upon. By this time the sun is glowing hot, not uncomfortable when on horseback, particularly if the indraught of the daily wind has already blown its first gusts, but rather disturbing when the traveller has sat down to his task, which seat is chosen, perhaps, not because it is the best point of view, but as the one owning the best shade. You think this rather wrong, reader, but the warning is not forgotten by the most careless traveller. Alongside of him, it may be, stands the poor countryman holding his books, who asks for quinine, and has his fit on him.

Now, wherever everything external limits action, even in the ablest and most conscientious, it must as much do it with one who is unknowing he has a bad eye and is a loose draughtsman. He toils away; the field of labour is large; he dares not for his life-sake stop many days, and he makes the most of his time, moiling and broiling away, grudging the noonday rest, and by sundown fairly worn out. To get through his task he makes a sufficient sketch—he does not make a finished sketch, of course, for few people do or can. Those who can are men thoroughly well trained, and they are few, and their sharp smart drawings show in our architectural exhibitions like photographs. Now it is a temple in Nubia, now one in Greece, now a bit of Mooresque, now a touch of Spanish Gothic. Our traveller makes a sketch, with notes which he fully understands, and will enable him to reproduce the scene. He has nothing of this kind, but the reader thinks that in the tent or mud hut at night the sketch will be finished or marked out. The first care is, however, a good supper in Turkish style, sitting on the ground, no chairs, and after supper the tired wayfarer, leaning back, begins smoking the cigarette, the short pipe, the chibouk or narghileh, and the man who smokes is done for. To touch up a drawing by a dismal lamp is not an easy task, with mosquitos buzzing about one's ears and snapping at one's fingers, disabling them perhaps for to-morrow's work, and with gloves on the pencil cannot be used deftly, so sleep is the only shelter against the noisome fiends.

The traveller gets away rejoicing from the famous classic site. He has done his fourth church, and has only three more to make up seven, and has only a slight touch of fever, for which he takes preventive quinine—drowsing his head—and he has not been winged with a brigand's bullet. In time, the un-

* Continued from page 583.

finished sketches reach the seaport, where there will be a halt, and where it is fully settled to overhaul them, and to give some time to them. After vagabondizing for many days inland, some rest is wanted, some cleansing, some doctoring, some setting to rights; but there will be several days of work—mornings, however, which are embargoed by the Levantine twaddler, with his cigarette and evenings by flirtations with pretty and empty-headed half-castes.

The sketches come to Europe. They are much admired. They are from rare subjects, and very many. Now, will our architect work at them, and finish drawing after drawing. Not so, he is busy in his letter-press, he is hunting up authorities, but perhaps he makes some kind of a larger sketch for the engraver. Unluckily, his impressions, never very straightly defined, have become hazy: so have his notes. He is called upon to pronounce a judicial decision as to whether this column was imperfect or defaced, and what is the meaning of the scrawl; he decides scrupulously and conscientiously, but decides wrong. He has got back into practice and the cares of life; but he labours much in his work—so does the draughtsman—so does the engraver. Some muddle—more doubts—do the best you can—do it as you like—and a noble plate is produced, which all must admire, and nobody dares to criticize, for nobody can tell how a temple at Laodicæa ought to look, as next to nobody has been there, and nobody has a sketch to pit against a plate in which the engraver has been most accurate and exact.

The very next traveller who goes to the place finds that the engraving is not like it, but it is ten to one whether he cares about publishing his opinion; and by that time, may be, he is in fear of the saying *De mortuis nil nisi bonum*, for the author has passed away from the world. Such is the explanation of the process by which very good men and great authorities produce highly-finished engravings, which are very unlike the originals; and hence the cause of that disappointment and dissatisfaction which is felt by travellers. It is no exaggeration to say, apart from any ordinary misconceptions and slips, that monuments are engraved which may be said to have no existence; limbs where none have ever been; eyes, nose, and mouth where lineaments are wanting. This does not shadow forth all the harm, and it will strike any one who reads this, that if the details are so often wrong, how seldom can that whole be given which is of most worth and most wanted—the artistic spirit of the composition, the true impress of style, the relationship between the building and its surrounding.

Except so far as architectural details are concerned which have been measured and drawn, the suspicion of inaccuracy attaches to most of our standard books of architecture, archæology, and travels in various European languages, however precise they may profess to be. The exponent of this is photography, and the corrective is photography. Colour, as has already been said, cannot be given, but light and shade are given, and outline and detail. One point we cannot reach by photography, and that is the artistic relation designed between the monument and its landscape, nor can a painting now affect this. What we have now is either portions of a building or its bleached sketches of white marble pillars, but we can never accurately reproduce the polychromic effects or the result of ornamentation. The temple standing on its knoll, when painted and gilt, we know not how, must have had a very different effect—perhaps in the neighbourhood of a sacred grove long since stricken down or grubbed out—to what we can figure from a white stone block cut out in outline against the sky. Then the theatre placed on the mountain or hillside. True, as we sit on its well-worn seats or, more commonly, on the bank once covered by marble slabs now burnt to lime, we still see that landscape which greeted the Hellenic eye. There is the far-off temple or mountain, no less a shrine of some great God; there the widespread bright blue sea giving its own colour to the back ground, glittering under the gleaming light, and at eve canopied with the kaleidoscopic hues of the ever beauteous sunset. The theatre, however, was made not only to see from, to see the landscape, and to see the stage, but no less to be seen. It had its colossal architectural frontispiece for daily display; but then at gala times there must have been streamers, the velum and many transient decorations giving colour, but what is no less life to the scene by their movements, when the performance was refreshed by the rise of the grateful breeze, fanning the scores of thousands of pleasure seekers.

Much of the artistic life we cannot reproduce, for we must never forget that these scenes are of the dead, and what we have are their remains. All we can have is that fancy portrait which the genius and local inspiration of a Cockerell or a Faulkener can give to Athens or to Ephesus, setting forth a scene as glorious as that of yore, but an estimate of the treasury and its belongings, rather than an inventory, something which we know must be most untrue, but a dream which best pictures incidents we have never seen performed, but judge most plausible.

Where the effect of a work is greatly dependent upon carving, tracery, or ornamentation, photography comes in thoroughly. Such are the monuments of Assyria and Egypt, reproduced for the archæologist and architect. Such are the fruits of lifelong labour bestowed on the Saracenic mosques and palaces of the east and west, wherein the exclusion of animal form has led to a fairylike revelling in tracery, and such the like labours of piety and love on the Gothic buildings of the north and south. These we have given to us in masses or piecemeal, in their whole or in such broken bits as yet remain, with a sharpness and accuracy which permit of their microscopic examination.

In the like case of India, photography may be said to have endowed us with that school of art. In a climate so unfavourable to European exertion, where native help can be so little trusted, and in a land so wide that the work of many hands cannot overcome it, we had but imperfect and costly representations of its great monuments and rock-cut temples. Now, by photography we can study calmly what we dare not visit, and places so difficult and so troublesome of access as the cave temples of Ellera and the neighbourhood are now laid before us in all their wealth of wondrous carving. The labours of government, of societies, and munificent individuals are year by year yielding us large collections of these records, and it is from these materials that the researches of Fergusson and of those who study Indian architecture, will give us a knowledge of its powers and its resources. Many of the temples and monuments of India are to be found in the jungle, overgrown, like Cohan and the cities of Yucatan, by the forest, overthrown in the wilderness by the trunks and roots of the kings of the woods, or dragged down by ivy and creepers, and buried under the mounds made by the mouldering decay of many ages.

Hyde Clarke.

THE LIONS AT THE THAMES EMBANKMENT.

ONCE more have we to receive, if not to welcome, a specimen of leonine physiognomy. Honest Æsop, in one of his fables, makes a lion hint to a somewhat vainglorious fellow that lions had their own ideas of sculpture which differed from those of men. What the ideas of lions were on the subject we have no means of knowing, which is perhaps a pity; but the ideas of men have been fully ascertained of late, and have been most recently exhibited at the Thames Embankment, near Westminster-bridge. As no human work can be said to be perfect, it will not be invidious to class the lions' heads on the Embankment among works that are not perfect, but they differ from many, inasmuch as they admit of great improvement at small charge. In a similar emergency, female ingenuity proved equal to the occasion, and a lesson may with propriety be taken even from so humble an individual as Dolly Drumbelly. This honest woman, a resident of Pudsey, Yorkshire, and a laundress by occupation and courtesy, desired to decorate her house for a little Christmas party, being mainly incited thereto by a laudable ambition to emulate, if not utterly eclipse, her neighbour, Mrs. Inkletape. Store of holly was provided, twigs of laurel placed in advantageous situations, nor was the misletoe forgotten. Everything, in short, presaged success, and lent itself to decoration, except one object which appeared to defy the utmost resources of art. To be brief, the object was a copper warming pan. Now, although the handle could be made to assume a festive appearance by being swathed with bands of greenery, the pan rejected such treatment as utterly unsuitable, and, for a time, nearly drove the artist in greens crazy. But what may not be accomplished by female quickness, stimulated by the thoughts of an Inkletape. Drapery to the rescue! No sooner said than done, and the company who began to arrive almost before the finishing touches were given, unanimously pronounced the warming pan, adorned with the hostess's best nightcap, to be the crowning glory of the decorations. Thus do great minds triumph over difficulties which appal the irresolute. Now, in the case of the Embankment lions, something in the frill line is absolutely required, and considering all the circumstances of the case, it may be doubted if any trimming would be more appropriate than a delicately frilled nightcap, in bronze, of course with strings pendant or volant, as may be preferred. As they stand, these lions' heads are inappropriate. The wall is granite; they should also have been of granite. Used as a street gutter spout, the head of the noble beast is degraded; it will not be improved when turned of the sooty black which all bronze assumes in the trying atmosphere of London.

SOMERSETSHIRE ARCHÆOLOGICAL SOCIETY.

THE nineteenth annual meeting of this society opened on Tuesday morning, at the Fine Arts Academy, Queen's-road, Clifton, under the presidency of Sir Edward Strachey, Bart., of Sutton Court. There was a large attendance of members and friends, among whom were many ladies. The president having delivered a brief address of welcome, the formal business of the society was transacted. Major Thomas Austin, F.G.S., then read to the society a letter and other documents of ancient dates relative to transactions connected with the county of Somerset. Mr. Badcock read two short papers written by the Rev. J. M. King, of Cutcombe, near Taunton. The subject of the first was the origin of the name of Devonshire Junket, and the other related to a superstitious belief, prevalent in West Somerset and the eastern border of Devonshire, that turnip seed sown on Thomas à Becket's Day (believed to be July 4), is sure to produce an abundant crop.

On leaving the Fine Arts Academy, most of the company proceeded to the Cathedral, over which they were conducted by Mr. E. A. Freeman, in the absence of Mr. E. W. Godwin, who had undertaken the duty, but was prevented from discharging it. Mr. Freeman commenced his description from the yard adjoining the cloisters, and, after briefly alluding to the mutilations and alterations which the building has undergone from time to time, said it was not to be compared with any of the great churches or with any other cathedral church in England. The fact was, it was only the fragment of a church, and that not the church of an Episcopal see, but of a monastery founded by Robert Fitzhardinge, in the twelfth century. Mr. Freeman pointed out evidences of the existence in former years of a nave, and explained some of the differences between this cathedral and those of

Hereford and Wells, giving reasons for these differences. With regard to the destruction of the nave, some people, and he among them, thought it occurred at the period of the dissolution of the monasteries, while others were of opinion that it took place as late as the civil wars. Mr. Godwin, however, was of opinion that it was pulled down by Abbot Elliot, with a view to its being rebuilt. That was an entirely new argument, but it was clear that a nave was begun if not finished. After some further explanations, the party proceeded to the Chapter House, which Mr. Freeman described as one of the most beautiful and perfect specimens of Norman architecture. The Rev. Canon Norris, who accompanied the party, gave some interesting particulars in reference to the building. Referring to the Austin canons who formerly occupied it, he mentioned incidentally an investigation which was made about four hundred years ago by the then Bishop of Worcester into their conduct. It was reported to the Bishop that they kept their hunters and hounds, and he sent down some one to inquire into the matter. The doors of that part of the building in which the animals were kept were all made fast, and the messenger returned and reported that he could see nothing of the kind. The suspicions of the Bishop, however, were not removed, and he determined to investigate the matter for himself. Keeping his determination in secret, he put on his scarlet coat, if huntsmen did wear scarlet in those days, and joined in the hunt. Subsequently, he assembled the canons, and challenged them with the fact, and on their denying it he pointed to one, saying, "I saw you go over such and such a fence," and to another, "You came to grief in that ditch." The canons were thus caught, and there was a document in existence in which they made a promise to keep no more hunters and hounds. With regard to the nave, he rejoiced to say that by the next meeting of the society it would be rising from the sod, and that, thanks to the noble spirit of the citizens of Bristol, the disgrace which had attached to them for three centuries was about to be wiped out. He gave some extremely interesting evidence, including that of William of Worcester, in 1488, to show that a nave was in existence at that time, and then gave some particulars of the steps which had been taken to secure its rebuilding. The company partook of sherry and sandwiches in the Chapter House, and afterwards the other parts of the building were described by Mr. Freeman.

A brief visit was next paid to the Mayor's Chapel, and from thence the company proceeded to Redcliffe Church, the artistic character of which was described by Mr. Freeman, who said it was the finest of the Somersetshire churches, and stood alone as the only parish church in England which possessed the features of a minster without having ever been one. He recommended the erection of a high reredos and the speedy removal of the old organ screen from the western gallery. The vicar (the Rev. H. G. Randall) said it was intended to build a high reredos, and the organ screen would be removed as soon as Hardman had finished the new western window. At the invitation of the vicar, the party adjourned to Colston's Room, where they partook of an elegant collation. Mr. R. Neville Grenville, M.P., proposed the health of the "Vicar and Churchwardens, and prosperity to to the parish of St. Mary Redcliffe," which was cordially drunk.

An evening meeting was held at the Fine Arts Academy, Sir Edward Strachey presiding. The Rev. Prebendary Scarth, of Bath, read a short paper, by Mr. E. W. Godwin, on the Mayor's Chapel. Mr. E. Green, of Holcombe, read a long paper, compiled from letters and scarce documents, on the Somersetshire rebellion. There was no discussion, but Mr. C. Moore, of Bath, suggested that Mr. Green should consent to the publication of his paper in the society's volume of proceedings, and the chairman supported the suggestion. Votes of thanks were passed to Mr. Godwin and Mr. Green.

The second day of the society's visit to Bristol was devoted to the acquisition of information respecting the remains of mediæval architecture to be found in different parts of the city. The party met at the Council House at eleven o'clock in the morning, and were there received by the right worshipful the mayor (Mr. E. S. Robinson), who conducted the party to the Council Chamber, where the civic plate and muniments were laid out for inspection. At twelve o'clock, Sir E. Strachey (president of the society) took the mayor's chair in the Council Chamber. The Rev. Prebendary Scarth was then called upon to read a paper on "Ancient Bristol." He said it was, in the first place, arranged that Mr. E. W. Godwin should read such a paper, and should afterwards conduct the party over the city, but that gentleman had been ill, and had since been called away to Ireland. That gentleman had furnished him with a vast amount of information respecting the ancient history of the city, and from that he had compiled a paper. The paper gave an exceedingly clear and succinct sketch of the history of the city in the Saxon and Norman periods, pointing out the several remains now in existence of mediæval architecture. The paper was illustrated by two maps, one of which is the property of the corporation, and gives a representation of the city as it stood in the period from 1673 to 1710. The mayor proposed a vote of thanks to Mr. Scarth. Mr. Neville Grenville, M.P., in seconding the motion, expressed a hope that there would soon be a handsome nave to Bristol Cathedral. The Rev. Prebendary Scarth, in returning thanks, said all Mr. Godwin's details in reference to ancient Bristol had been so carefully prepared that they were thoroughly reliable. Great service had been thereby rendered, not only to the city, but to the country generally, and he hoped that Mr. Godwin would publish his researches in a volume. The company were afterwards hospitably entertained in the mayor's parlour.

On leaving the Council House the party made a perambulation of the city in illustration of the paper which had been read by Mr. Scarth, the plan adopted being first the Saxon, next the Norman, and lastly the mediæval city. The absence of Mr. Godwin, with his great local knowledge, was of course a great loss, but the route laid down by that gentleman was adopted by his substitute, the Rev. Prebendary F. Scarth. Proceeding to Bridge-street, they walked up Bridge street, and half-way down Union-street, turning down the steps into the Pithay. From thence they made their way to St. John's Church, at the bottom of Broad-street, where a brief examination of the interior and exterior of that building was made. More time was spent in the inspection of the crypt under the church, which Mr. Freeman pronounced to be of the late fifteenth or the early sixteenth century. At St. Nicholas's Church everyone was anxious to examine the large crypt, in which service is occasionally held. Mr. Freeman said he had been told this was a Norman crypt, and he was surprised to find that it was of the fifteenth century, it being a good characteristic specimen of the local style of that period. He pointed out some of the characteristics of the style, and remarked that the crypt being divided into two suggested the idea that the original church was also of two bodies, with two equal naves side by side. The route the archæologists followed was Lower Castle-street, the Weir, Merchant-street, Fairfax-street, and the Pithay a second time to the Bridewell. At the last-mentioned place the Norman tower was described by Mr. Freeman. Greyfriars, St. James's, and Colston's House, Small-street, were visited, and the party then spent some time in St. Stephen's Church, which Mr. Freeman said in some of its features carried out the characteristics of the Somersetshire Perpendicular to perfection. The pillars and arches especially were some of the best that could be seen anywhere, and the clerestory windows were high and fine, and belonged to the same type as those of Bruton Martock and St. Mary's, Taunton. The chambers of St. Werburgh and All Saints' were also examined, and the perambulation was brought to a close by a visit to Canynge's house in Redcliff-street, now in the occupation of Messrs. Jefferies and Son.

At the evening meeting, Mr. E. A. Freeman presided. Mr. W. Stoddart, of the Bristol Natural History Society, read a paper on the "Geology of the Clifton Rocks." The paper was an able one, and was divided into the following sections:—The physical features of the rocks, the old red or Devonian junction, the lower limestone shale, the massive mountain limestone, the upper limestone shale, and, lastly, the millstone grit. He mentioned that he had collected 255 specimens of fossils from the Clifton rocks. The paper was illustrated with diagrams. Mr. C. Moore said he had followed the paper with great interest, and could appreciate the labour of mapping and measuring which Mr. Stoddart had undergone, which must have occupied him a considerable time. Mr. Moore mentioned one or two points upon which he did not agree with Mr. Stoddart, after which a vote of thanks was passed to the latter. The Rev. W. Hunt then read a paper on the rise of the trade of Bristol He pointed out the importance of liberty and trade in conferring happiness upon a community, and referring to the early trade of the port of Bristol spoke of the large share the citizens had in the slave traffic at that time, they having great facility for it by their direct communication with Ireland. He traced the connection between Bristol and Ireland for a century and a half, until the time when King John granted a charter to the city, giving it the right to Dublin, and then alluded to the increasing wealth of Bristol since that period. He showed how the trade was protected by the guild of merchants, in whom all corporate authority was vested, and to whom we were much indebted for our clearly-defined municipal rights and liberties. He explained the spirit of exclusion and monopoly by which the guilds were animated, and the illegal tolls on merchandise that were levied by both abbot and lord. These latter, however, were eventually successfully resisted, and from the time of John the foreign trade of the port grew rapidly, a proof of which was to be found in the making of the New Cut by the burghers. Mr. Hunt noticed some of the trades carried on in this port in ancient times, a principal one being the trade in wine.

In the course of the excavations at the West Dock works, opposite Messrs. Earle's cement works at Hull, the navvies have come upon a stratum of dark soil, in which a number of trees in horizontal position were met with. They are oak, in excellent condition, and remarkably hard. Besides these interesting remains of a long past age a large number of acorns and hazel nuts were found, and some oyster and mussel shells. The discovery is the more interesting to geologists seeing that trees were found at a depth of about 19ft. below the water line of the river. The wood was of a similar nature to that found when the Victoria Dock Extension was in progress, and goes far to prove the correctness of the supposition that Holderness and this part of the river were once covered by a dense forest. The trees at the Victoria Dock were found at about the same depth. Several eminent geologists have visited the West Dock, and examined the wood and the ground. Many gentlemen have secured pieces of the oak and had fancy articles made out of it. The oyster shells are characterized as very much larger than those ordinarily seen, but no remains of other fish were found.

NOTICES OF PUBLICATIONS.

The Epitaphs and Monumental Inscriptions in Greyfriars Churchyard, Edinburgh. Collected by John Brown. Edinburgh: J. Moodie Miller, 1867.

Greyfriars Churchyard has been called the Westminster Abbey of Scotland, and not inappropriately. To no other sacred resting place in that country, and to very few kindred places elsewhere, does the same amount of interest attach as to Greyfriars, of Edinburgh. During the seventeenth and eighteenth centuries by far the largest proportion of the most distinguished inhabitants of the northern capital, including many of the most eminent Scotsmen, beginning with George Buchanan, were interred in its grounds. Many of the monuments erected to the memories of these "Scottish worthies" have very great interest as architectural and sculptural relics, particularly those that date from the first half of the seventeenth century. But "time corrodes our epitaphs, and buries our very tombstones," and it is with the view of rescuing from oblivion these memorials of a bye-gone age, that this work has been compiled. It is a beautifully printed and handsomely got-up volume of upwards of three hundred pages, prefaced by an introduction from the pen of Mr. David Laing, the learned Scottish antiquarian. This able and curiously interesting preface is a valuable addition to the work, which, moreover, is illustrated by a number of well-executed engravings of the principal monuments in the churchyard, including the famous Martyrs' Monument, which forms a frontispiece to the book. The inscription on this monument states that "From May 27, 1661, that the most noble the Marquis of Argyle suffered to the 17th February, 1688, that Mr. James Renwick suffered, were executed at Edinburgh about one hundred noblemen, gentlemen, ministers, and other noble martyrs, for Jesus Christ; the most part of them lie here." Greyfriars is now very little used, its narrow homes being well-nigh fully tenanted. Dean, Rosebank, Grange, and Warriston, are now the favourite places of sepulture in Edinburgh. They are all

pleasantly situated, and beautifully laid out, and are models of suburban cemeteries.

Handbook for Travellers in Scotland. With Travelling Maps and Plans. John Murray, 1867. Price 9s.

To his well-known handbook series Mr. Murray has just added a tourist's guide to Scotland. It will be sufficient, by way of general description, to say that the new volume is identical in plan and principle with the rest of the series. There exist already several admirable guide books to Scotland, Black's being certainly one of the very best, and we cannot say that the present work possesses any superiority above its predecessors. It is arranged on the itinerary or route plan, and the facilities of reference, in the shape of maps, plans, and index, are abundant and complete. The information, however, so far as we have tested it, is hardly so accurate as it ought to be in a work of such pretensions and price as this. We note a few of the inaccuracies and omissions we have come across. The University of Edinburgh is said to be in South Bridge-street, and immediately after we read, "Further up North Bridge-street is the Royal College of Surgeons. Beyond that is the Asylum for Blind Men, and at No. 38 is that for blind women." Now, in the first place, the thoroughfares referred to are simply called North Bridge and South Bridge; in the second place the College of Surgeons is not in either of these streets, but in Nicholson-street, which is a continuation of South Bridge. The Asylum for the Blind is, of course, also in Nicholson-street. "A dark, heavy building" is a vague and meagre way enough of describing so important an edifice as the University. Again, we have Douglas Hotel and Slaney's Hotel (in St. Andrew's-square). They are one and the same, Slaney being the proprietor. There is no hotel called the Royal British in Princes-street; the Royal is there, the British must be somewhere else. The notice of Burn's monument is very carelessly broken off in the middle (p. 116.). *Apropos* of monuments, in a work published in the present year, mention ought to have been made of the statues of Professor Wilson and Allan Ramsay in Princes-street-gardens. Turning to Aberdeen, we note that the population is given as 73,794. According to the census of 1851 the population was 72,000 or thereby, and it is now estimated to be between 80,000 and 90,000. It will be rather a surprise to his townsmen (as to everybody else) to see the great painter, the late John Philip, mentioned as "Philip, a native artist." On the other hand, strangers will naturally inquire who was Bishop Cheyne, or at least when he flourished, The statement that the Brig O'Balgownie is supposed to have been built by Bishop Cheyne can hardly be regarded by itself as a piece of useful information. The Market Cross of Aberdeen was removed to its present position not in 1812 but in 1842. At page 289 we read that Aberdeen "owes much of its beauty" to the abundance of its granite. At p. 291 it is said the city "is justly celebrated for the neatness and regularity of its streets, but beyond these qualities it has no particular beauty." And at page 292 "the lover of street architecture" is informed that he "will find much to interest him in Aberdeen"—a somewhat loose and contradictory way of putting the matter, to say the least. The New Market here, admittedly one of the most remarkable buildings of its kind in the kingdom, is described merely as "a very convenient and well built edifice of two storeys, 300ft. long by 100ft. broad." However, this being the first edition of the handbook, which must have entailed a very great amount of labour, considerable allowance ought to be made, and we look for greater perfection in future editions of the work. It strikes us as rather odd and out of place that Mr. Murray should give us some sixty pages of advertisements of foreign hotels in a handbook of Scotland. This species of information is very useful and even desirable in a work of this kind, only we fail to see the appropriateness of the thing in the present instance. The introduction, which treats of the physical geography, geology, industrial resources, antiquities, &c., of Scotland, is ably compiled.

Where Shall We Go? A Guide to the Watering Places of England, Scotland, and Ireland. Edinburgh: A. and C. Black.

In noticing the fourth edition of this popular guide book it will only be necessary to remark that every sea and inland watering place of any importance is briefly described in alphabetical order. The points chiefly dwelt upon are climate, bathing, mineral waters, scenery, and recreations, and the usual miscellaneous information in which tourists are supposed to stand in need is not wanting. A map of each of the three countries, with engravings of Scarborough, "the queen of watering places," Hastings, Clifton, and of the Bridge of Allan, in Scotland, illustrate the work. The hints on climate, addressed chiefly to invalids, and the tables of analysis of mineral springs, are really useful features of the work, which altogether is well written, and appears to be very carefully and accurately compiled as regards facts. The book is decidedly cheap at half-a-crown, though we might suggest to the publishers that, suppose one wants to visit "the watering places of Scotland" he might prefer not to be obliged to carry "the watering places of England and Ireland" along with him. Why not publish the work in three separate volumes? The less bulk and weight it is necessary for the tourist—more particularly the pedestrian tourist—to carry by way of luggage the better, as everybody knows.

Building Intelligence.

CHURCHES AND CHAPELS.

The church of Kirkheaton, near Hexham, having undergone restoration at the hands of Mr. Bodeley, architect, London, was re-opened last week.

Among the new works in contemplation in the Staffordshire Potteries is a new Roman Catholic church, designed by Mr. E. W. Pugin, and estimated to cost £8,000. It will be erected at Longton.

A new Roman Catholic church (St. Hilda's) was opened at Egton-bridge, Yorkshire, on Tuesday. It is built of stone from designs by Mr. Sadfield, architect, Sheffield, at a cost of £2,500. The new church will accommodate between 600 and 700 persons.

The memorial stone of a new English Calvinistic chapel has been laid at Cardiff. It will be in the Doric style, and beneath will be two school-rooms, capable of accommodating 600 children. The chapel itself will have three aisles, and three galleries running round the upper part of the building, and accommodation will thus be provided for 700 persons. The building is not, as is usually the case, let out by contract, but Mr. David Jones is appointed for its erection. The architects are Messrs. James and Price.

The first and second contracts, which include the repairs of all the lower portions of St. Mary's Church, Aylesbury, are now nearly completed. The churchwardens and the committee have received, or had promises sufficient, amounting to about £700 to warrant them in going on with the restoration of the tower and spire, and a contract is being entered into. The tower, like the other parts, will be faced with stone, the spire and clock tower will be leaded, and the battlements of the main and clock tower will assume a more architectural character, according to the plans of Mr. Gilbert Scott.

Bristol.—The tender of Mr. James P. Stephens, of York-street, St. Paul's, has been accepted for the erection of the large school-room and class-rooms, for the use of the Congregationalist body now worshipping in the temporary chapel, Pennywell-road. The cost of the school-room and class-room is to be £1,200 (including fittings). The architect is Mr. Hans Price, of Weston-super-Mare.

Cowley Bridge.—The foundation stone of the new chapel-of-ease was laid here on Wednesday. The style of the chapel will be Decorated Gothic, with nave, chancel, and vestry. The walls will be of Westleigh stone, with Ham Hill and Bath stone dressings. There will be accommodation for 150 persons, and the total cost will be £1,200. Mr. Hawkins, of London, is the architect, and Mr. E. P. White, of Pimlico, the builder.

Llanbadam Fawr, close to Aberystwith.—This noble old church, formerly a cathedral, is about to be restored. The work has been, we are glad to learn, placed in the hands of Mr. Seddon, as architect, at the proposal of Col. Pryse, M.P. The names of six architects were discussed by the committee, when Mr. Seddon obtained the greatest number of votes. The Aberystwith University College is also in progress under the same architect, and the great tower of the building will soon be finished to the cornice line. Estimates for the entire completion of the exterior of the north wing are in course of preparation.

Sunderland.—The foundation stone of a new chapel for the United Methodist Free Church denomination was laid in Lister-street, Sunderland, this week. The style is Gothic, and the chapel will be of coloured brick, with stone facings. Accommodation will be provided for 350 persons, and the total cost is estimated at about £600. Messrs. Potts and Sons are the architects, and Mr. Walter Scott is the contractor.

The Albert Memorial Chapel. — Of the monuments which have been erected in memory of his late Royal Highness the Prince Consort, few will possess so great an interest to the public as that now in course of completion above the burial-place of the principal monarchs of Great Britain at Windsor Castle. Most visitors to the Palace are familiar with Cardinal Wolsey's Chapel, a building at the east end of St. George's Chapel, from which it is separated by a covered way leading to the cloisters. It was originally erected by Henry VII. as a burial-place for himself and his successors, but not used, and Cardinal Wolsey obtained a grant of it from Henry VIII., and he began to prepare it as a receptacle for his remains; but upon his disgrace it again reverted to the Crown. Charles I. intended to fit it up as a mausoleum, but troubles interposed, and after James II. had converted it into a chapel the windows and decorations were destroyed in a popular commotion caused by the King entertaining the Pope's Nuncio. Eventually the present Royal cemetery was constructed beneath it, leaving the chapel itself empty and unoccupied. It is now being converted into a most interesting memorial of the late Prince Consort, and the decorations are being contributed by and at the expense of the Princes and Princesses of the Royal family. The gracefully-formed roof, with its beautiful arched work, has been covered with a magnificent mosaic ceiling, said to be the finest in Europe for its size. Around the sides of the chapel the plain glass windows have been re-filled with stained glass depicting events in the life of the Prince. On the west wall the panels are being filled with mosaic pictures of the Sovereigns and celebrated persons whose history is intertwined with that of Windsor. When finished (thirteen are already up), the scenes will comprise portraits of Henry III., Edward III., Edward IV., Henry VII., Jane Seymour, Earl of Lincoln, Duke of Suffolk, Henry VI., Henry VIII., Charles I., George III., James II., Lord Hastings, Marquis of Worcester, Archbishop Bembridge, M. A. de Dominis, Matthew Wren, Bruno Ryves, Beauchamp, Wykeham, Wolsey, Dean Unswick, Bishop Turner, Bishop Robinson, Bishop Douglas, Archbishop Sutton, and others. Baron Triquiti is to cover the walls beneath the windows with marble inlaid work, the subjects being of a scriptural character. Four of these large panels are at the present moment being exhibited, by permission of her Majesty the Queen, in the Paris Exhibition. The panel contributed by his Royal Highness Prince Leopold has for its subject David and Saul; that by Princess Louise, a scene from the life of Moses; on the panel given by Prince Arthur, David is shown with his harp, while Princess Beatrice has presented a picture of Nathaniel. Above each panel is a medallion portrait of the contributing Prince or Princess, sculptured in white marble. There are appropriate inscriptions attached to each panel. These works of art, upon the closing of the Exhibition, will be placed upon the walls of the chapel.

BUILDINGS.

New National Schools are about to be erected at Smallthorne, Staffordshire.

Mr. Alfred Barlow has obtained the contract for alterations and improvements at Brampton Tree House, Newcastle, Staffordshire, the residence of Mr. H. Coghill. The cost of the work will be £2,000.

The premium offered by the West End Park Company, Harrogate, for a plan of their estate laid out in building sites for villas and terraces, brought together, we hear, some very excellent designs. The company had considerable difficulty in deciding, but eventually awarded the premium to Mr. J. H. Hirst, F.R.I.B.A., architect, Bristol.

The new Millwall Docks have now so nearly approached completion that it is expected they will be ready for the admission of water by the end of the present week, and shortly after for the reception of vessels. The total area of the land purchased by the Millwall Dock Company is 204 acres; 42 acres will be the area of the water in the docks, so that 152 will be available for wharves and warehouses. The portions of the work already constructed have a water area of something more

than 33 acres, and present about 2,600 yards of wharf frontage. The magnificent graving dock, which is also included in the work completed, is 413ft. long, and has an entrance 65ft. in width. The docks are situated to the south of the West India system, and will, when completed, be of a T form in plan. The lock gates are each 43ft. wide by 31ft. high, and differ in the details of their construction from any that have hitherto been erected in England. They are "box" gates, but instead of its being attempted to make the "box" formed by each leaf water-tight, as is usually done, the river side of each gate is perforated, so that the water flows freely into or out of the "box." On each side of the river entrance is being erected a capstan to be worked by hydraulic power, and capable of exerting on a hawser a pull of five tons at the rate of 80ft. per second. Two smaller hydraulic capstans, each capable of exerting a pull of three tons at the rate of 80ft. per minute, are also being erected near the end of the inner entrance lock. The water by which it will be worked will be supplied at a pressure of 700lb. per square inch by a pair of horizontal engines placed in an engine-house near the graving dock.

New schools are being erected at Tyne Dock, Newcastle, at a cost of £2,500. The plans have been prepared by Mr. Prosser, architect to the North-Eastern Railway Company.

New York.—American papers tells us that "the building mania is on the full run" there. Union-square is nearly transformed. The Maison Doree is disembowelled. Above the square, blocks of handsome stores rise from the *debris* of mean-looking places. Tammany Hall is being changed into a newspaper-office. Narrow Church-street is almost converted into wholesale stores. Away up the Third Avenue high and massive blocks rise like elephants from green pastures. Stewart's big house looms on the soft, still atmosphere of Fifth Avenue like a giant of selfish vanity, glistening with the tears of unremunerated humanity.

Totley.—On Wednesday week the corner stone of the Cherrytree Orphanage at Brook Hall, Totley, near Sheffield, was laid by the mayor. The building is entirely of blue stone from the Twenty-well-sick quarries, the walling being rock-faced courses, and the dressings tooled. The architectural arrangements are adapted to the purposes of the building, there being a spacious school-room, a dining-room, nursery, kitchens, dormitories, store rooms, teachers' sitting and bedrooms, &c. Messrs. C. J. Innocent and Brown, of Sheffield, are the architects, and the contract, which is for £1,630, has been taken by Messrs. T. and W. Nelson, of Wadsley Bridge.

TO CORRESPONDENTS.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the Editor, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

Received.—Messrs. F.—R. D. and Co.—J. A. H.—B. J. F.—F. C.—H. H. V.—J. E.—J. G.—G. H. H.—J. N.—J. H.—W. W.—Rev. J. S.—A. H. H.—A. P.—A. W. H. A. D., Coventry.—We can give no information on the subject. Consult some local connoisseur.

J. B., Alton.—Your question on photographic apparatus is scarcely in our way.

Correspondence.

POPLAR NEW OFFICES COMPETITION.

To the Editor of the Building News.

Sir,—"'Octagon' looks more like a number of private dwellings than a public office, and some of the details are absolutely hideous." I must strongly protest against the above remarks of "Delta"; and, as for nearly twenty-five years I have been actively employed in the practice of my profession, and on some of the largest works of modern times, I may perhaps not be thought unworthy of a voice in the matter. Seeing so much commotion in the professional papers with reference to this competition, I felt some curiosity to see the "exhibition," and, having done so, I can conscientiously assert that the only *real* design in the room is that against which the remarks of "Delta" were levelled, and I am at a loss to understand how he could have fallen into such an error, for, during a lengthened and careful examination, I was quite unable to discover a single feature which would support his views; on the contrary, I was agreeably surprised to find in "Octagon" a most excellent and well-proportioned work, a highly effective skyline, capital play of light and shade, enrichment sparing but well placed and good, and the details most effective, original, and piquant, the whole evidently the production of a man of ability and experience. I beg to add that I am quite unacquainted not only with "Octagon" but with any of the competitors or members of the Board, even by name, and that my sole object in this communication is to endeavour to prevent so gross an act of injustice being perpetrated as confounding a real and excellent work with the mass of rubbish by which it is surrounded. I shall feel obliged by an early insertion of this letter.

I beg to inclose my card, not, however, for publication.—I am, &c., V.

Spring-gardens, W., August 26.

THE INSTITUTION OF CIVIL ENGINEERS.

Sir,—Some weeks back you published an extract from the rules of the Institution of Civil Engineers respecting the admission of a new class of students to the Institute. This is, no doubt, a step in the right direction, but there remains still much to be done if they are anxious to make the Institute a national affair, and prevent other engineering societies springing up and being incorporated. The Institute has been very exclusive hitherto, and the consequence is they have not a twentieth part of the profession as members. For instance, one of their rules that every applicant for admission must have passed through a regular course of pupilage with an engineer, keeps out a very large portion of the profession, because however talented a man may be, and although he may have for years held the position of engineer to some public board, committee, or corporation, yet the only way he could join would be as an "associate," a class composed of mathematicians, chemists, and tradesmen of various classes connected with engineering. Of course this is not a position that a man with talents perhaps superior to many of the "members" would like to be placed in. I think to these circumstances may be attributed the rise and progress of the new Society of Engineers, which has lately applied to Government for a charter of incorporation, and which application the Institute of Civil Engineers has been opposing with all its strength. This seems a good deal like the old fable of the dog in the manger. If the Institute wishes to prevent new societies springing up, why do not they frame their rules to meet the wants of the profession? If you were to draw attention to this in your valuable paper it might lead to some rules being formed to prevent the profession being split up into small societies, as I have no doubt that most of the members of the Society of Engineers would join the Institute if they were permitted to do so.—I am, &c.,

Engineer.

TO FIND THE CIRCUMFERENCE OF A CIRCLE GEOMETRICALLY.

Sir,—One of the first results derived from the model of my "trigonometer" for taking heights and distances in English and foreign measures, is the accidental discovery of a geometrical figure by which the circumference of a circle may be readily obtained, and may be briefly described either with or without a diagram:—

Construct an internal square to the circle, to three of the sides of which add the length of one diagonal. The result, *plus* one-sixteenth of an inch to the foot, equals the circumference of the circle. As this subject may be interesting to some of your readers, the insertion in the columns of your journal will oblige.—I am, &c.,

Southampton. Geo. Guillaume.

PROPORTION OF ROOMS AND RESONANCE.

Sir,—A query in the "Intercommunication," "Can anyone explain the phenomenon of 'reciprocated vibration,'" really suggests the only practical reason, but one given by no architects, for their traditional proportions of rooms. All resonance is, certainly, "reciprocated vibration," nor do I see how a more clear or explanatory term for it can be needed. It is well known that feeble impulses will, if rightly timed and repeated times enough, set great masses in full oscillation, and increase it *a l'outrance*. A suspension bridge over which some companies of soldiers, not marching in order, had just passed, was broken down by a lighter company following with a band playing, whose master unconsciously regulated his time, and hence the step of the whole company, by the bridge's natural vibrations. The late Professor Cowper, after making Hammersmith Bridge oscillate with his arm, expressed a belief, that by continuing his efforts, he alone might have brought that structure down. We need not, surely, wonder, if two watches whose rates when apart differ, say, by one second per hour, are placed on one table, as described by the querist, and the fast one's pulsations, communicated through the wood, have power to hasten each beat of the slower watch by a 7,200th part, while its own beats are each retarded to a like amount. This requires very slight force, but this effect I should not class under either "resonance or reciprocated vibration." For a case of this latter, if a large balance clock and a small pendulum one be regulated very accurately alike, and the small one wound up, but not set going, it is well known the large powerful clock will, at a considerable distance through woodwork, if not a wall, gradually swing its pendulum and set it going.

If the vibrations are more numerous and quick, the air is a sufficient communicator. Proceeding from these cases of 1, 2, or 4 beats per second, to 20 or 50, most of us have heard a loose pane in a church window respond to that particular organ pipe that is in unison with it, or, rather, that makes 2, 3, or 4 vibrations to its one; for the glass is only noticed by its rattling, that is, making certainly fewer than the 16 per second that the very deepest organ-pipe (peculiar to a few of the largest instruments) makes. Ascending, now, from tens of vibrations per second to hundreds, Mr. Tomlinson, of King's College, describes the best mode of finding a set of harmonica or "musical glasses," to be this:—You go into a glass warehouse with a flute, and some 50 little little semicircles of wire or card, the size of the top of this letter ∩, which you place astride on the rims of as many goblets. Then sound any note strongly on the flute, and the glass in unison declares its presence by throwing off its little hook. Those glasses that give the harmonics to the flute note—especially the octaves above and below it (that is, which makes 2 vibrations to its 1, and 1 to its 2)—also reciprocate audibly, but never palpably enough to unhorse their riders.

"Reciprocated vibration," however, is the very root of the latest progress in physics, the prism analysis, the facts of which (though the thing itself were easily foreseen at least thirty years ago), are so perfectly marvellous, extending this phenomenon, as they do, to the very limits at once of the inconceivably vast and minute, that the subject is brought from a sort of bye-way of science into its very foreground. There can now be no shadow of doubt that the very chemical molecules are all, as bells or musical instruments, attuned each to its note or pitch, or, more commonly, its dozen or hundred exact pitches or rates of pulsation, so as to be moved by the waves of those particular pitches, in the universal star-reaching fluid, and not by any of its other waves; the particles of sodium, for instance, by either 43,185 or 43,209 pulses in the time of light's travelling an inch, but not by intermediate numbers, say, 43,190 or 43,200, nor by any rate of vibration above or below these—that is, by none slower than, say, 509,000,000,000,000 (509 billions) per second, nor any faster than 509,250,000,000,000—(the two rates being separated by about a quarter billion, though we cannot define each to within even 10 or 20 billions in these time measures so surely as we can the above space measures to a single unit). And so again with the particles of hydrogen; of iron, which can vibrate to some hundred definite rates, but none between; of thallium, which appear to have but one rate, and so forth. Not that one can see, hear, or test by thermometers the atoms thus set vibrating (that is, heated), but that

nature yields, in every mere transparent wedge, an instrument that will explore the inventory of a sun ray—nay, a star ray—and detect it to have been robbed of just the vibrations of this or that pitch, by the atoms of this or that—of sodium or of vaporous iron—whether here in a lamp flame, or ninety million miles back, at the starting of the waves eight minutes ago from the sun, or unknown billions further back, at their starting unknown years ago from the star or nebula. And when that rarest sight of the centuries, a temporary star, is seen away in the unfathomable, distant by years of lightning-flight, as that whose waves reached us one week last year, Messrs. Huggins and Miller are thus able to see, not merely that it had been a conflagration that started the waves—not merely a world burnt—but a world of what? Of hydrogen, of just that gas chiefly!

All this by "reciprocated vibration." And before returning to resonance, it suggests another thing or two strangely overlooked. The octaves of our music range up from tens of vibrations per second to a thousand or two; but in passing thence to vibrations of light (*i.e.*, those *we* see by), the step is at once, as above said, to hundreds of billions, our whole scale of colours lying between the 400 billion and the 800 billion—that is, within one octave—and that one, as Sir J. Herschel has remarked, "about forty-two octaves above the middle notes of the piano." Now, as plenty of other light is produced, observe—but we "humans" are only capable of seeing by that of the said forty-second octave—how perfectly conceivable is it (not to say probable) that ever so near a neighbour, the dog or the cat, may see only by rays of the forty-first octave, or of the forty-third—those known to our men of science as "dark heat" or "dark actinism." Nay, why should not those of the thirtieth or fiftieth octave, which none can prove not to exist, be the only light some or most optic nerves are made to see by? In fact, it is pure assumption to suppose of any non-human eyes, that they see by any of the rays which are light to us, or we see by any that are light to them.

Another point shown by these high numbers is that we need not marvel at the "instantaneousness" of any photography. For even in a hundredth of a second, if any effect on ponderable chemicals have been produced, which I doubt, in that short time, their particles will only have yielded to the accumulated shock of billions of accurately timed impulses—in fact, more waves than have broken on a sea cliff since Adam's time!

Having answered the querist about "reciprocated vibration," returning to its grosser variety, then, as the medium conveying the pulses need not be solid, so may the resonant body be only a mass of air somewhat enclosed, whose note depends on the time a sound wave takes to traverse its length, breadth, or depth; and, in fact, every organ pipe and every whistle is only made to enclose a column of air for this purpose. Again, the mass of air between two parallel walls will yield its proper note, however unmusical the exciting sound or noise may be; for it is merely a case of echoing to and fro, by the two walls, as many times in a second as their distance is contained in the 1,050ft. or 1,100ft. (the exact number depends on the state of the weather) that sound travels per second. Hence, when walls are parallel, and nearer than some 64ft. (which is twice the greatest organ-pipe length), the echoes, recurring more than sixteen times a second, form a musical resonance; and thus a room has commonly two notes depending on its length and breadth. Sometimes a flat ceiled one may have a third, dependent on the height, when empty, but either carpets or occupants will prevent resonance between ceiling and floor. If the length and breadth are in any harmonic ratio, especially that of 2 to 1, the two notes will reinforce each other, as also in a square room. But if they are in such ratios as 3 or 4 to 7, 4 or 5 to 9, &c., and especially any surd ratio, as $\sqrt{2}$ to 1 (which is among those recommended by Palladio), the resonance will either be a discord, or destroyed entirely. Whether this latter effect has been ever aimed at I know not. But, you see, the ancients, or Vitruvius, their reporter, have been needlessly ridiculed for connecting their rules about proportioning rooms with the lengths that strings had which gave harmonizing notes. If they wanted resonance, there was no other way of promoting it in rooms; and this was the sole practical reason I can see for preferring one proportion to another. Moreover, did not a "surd" ratio mean originally that of two strings deaf to each other, or which, in building, tended to make deaf, non-resonant rooms?—I am, &c., E. L. G.

P.S.—An inquiry was made shortly before this about "resonance," respecting the analogous phenomenon with light, namely, "iridescence" ("Intercommunication" [401], May 31.). When it is known that light, no less than sound, consists of vibration, it will be readily conceived that the relation of musical sounds to mere noises is the same as that of rainbow colours to those of clouds, earths, or common objects. The more equal-timed the pulses of the vibration, the more musical and "clear" is the note, or the more "clear" and rainbow-like the tint of light. Now, in resonance from walls, any noise gives rise to a musical echo, and similarly, in iridescence, ordinary colourless light is reflected coloured. In both cases the reflected pulsations or waves become equal-timed. This happens with sound when there are two reflecting walls as near together as the wave-breadth of some musical note. So it happens with light when there are two reflecting surfaces distant by only one or a very few wave-breadths of some kind of light. This is the case with the two surfaces of a very thin soap bubble, or those of the films formed on the glass of old stable windows (which I would recommend to the querist's notice in his decorative experiments). As a room whose smallest dimension exceeds 30ft. or 40ft. gives no musical note like smaller rooms, but only echoes, so you can get no iridescence (in ordinary light) from films of matter thicker than two or three wave-breadths of light, that is, about a twenty-thousandth of an inch. But the correspondent who answered "Grainer" (June 14) refers to another kind of iridescence, that of mother-of-pearl, arising, as Sir David Brewster discovered, from parallel grooves on its surface, some thousands in an inch. He should have added that casts of the surface in wax, having the same grooves, exhibit the colours. These grooves exist only on a ground or sawn surface of the shell, as they are the edges of the alternate hard and soft layers cut through; but the shell's natural face, being (like that of a pearl) all of one layer, usually reflects no colours. Now, in sound, we shall find a kind of resonance also when a noise is reflected from a great series of equidistant parallel bodies, as square piers, posts, or iron railings, and the note may be calculated from the number of them in 550ft., the distance a sound wave can go and return in a second. Such are the analogies arising from the marvellous mechanism of the universe, in which vibration plays so constant a part, though the air waves carrying sound and the ether waves constituting light are of widely different nature, the former being alternate compressions and dilatations of air, but the latter involving probably no motion of any ether particles out of their places, only a wagging of each on its own centre; and though the waves of light occupy each between a thirty-thousandth and a sixty-thousandth of an inch, but those of sound from 3in. to 30ft. each; and the former travel in a second three-quarters of the way to the moon, but the latter barely across the Thames at Blackfriars.—E. L. G.

ARBITRATIONS.

Sir,—Every year boards of health and railway companies take from individual owners an immense amount of property, the value of which is assessed by juries, or, more silently, in what may be called private courts of arbitration. The comparative absence of the last-named tribunals from public observation leads in some instances to strange inconsistencies in practice. For instance, on the 15th instant, an assesor and a jury of Liverpool awarded £18,500 for a property in Church-street, in that town, producing an aggregate rental of £608, and occupying an area of 380 square yards. Nearly at the same hour, Mr. Henry A. Hunt, who had been presiding as umpire in a court of arbitration in Nottingham, awarded £4,751 in payment for a property, the area of which is 940 square yards, with 214 square yards of roadway additional, and the nett rental of which, according to the evidence of the local board, was £233 19s. per annum. Thus whilst the Liverpool owner obtains from a jury 27½ years' purchase and the customary 10 per cent. for his property, I, as the owner of the last-named estate, only obtain 18¼ years' purchase and the conventional 10 per cent.,—that is, on a rental assumed by the corporation witnesses, whilst on a fair average of my past rental it is considerably under 18 years' purchase. The relative conditions of the two properties are very similar, in each case the buildings on the site being unworthy the value of the situation, and open by moderate outlay to prospective improvement. For my estate, which Mr. Hunt has given over to the local board of health for £4,751, I have never intended to take less than £8,000. To my great annoyance and surprise, I am debarred from appealing to another tribunal, save that of public opinion. Even taking rental as a criterion of value, we in Nottingham have never yet had an award equal to less than 22 years' rental—sometimes over 30 years.

This is a very important question, not only for owners but for arbitrators and surveyors generally. Let them look to it.—I am, Sir, &c.,

Richard Mercer.

Nottingham, Aug. 28.

PILLAR LETTER BOXES.

Sir,—Your number of February 2, 1866, contains a letter of mine, in which complaint is made of the unsafe state of pillar letter boxes, in consequence of letters adhering to the shoot in wet weather. It will be interesting to learn that since that time the pillar letter boxes erected in various parts of the metropolis have been made on a principle which entirely removes the former fault. The simple, and, at the same time, effectual plan by which this has been accomplished, is by fluting vertically the surface of the shoot. Hence it will be seen that the letters cannot adhere, because on their passage the sharp edges of the fluted surface are alone presented to them.—I am, &c. R. L. B.

August 21.

MANCHESTER TOWNHALL COMPETITION.

Sir,—In your last publication you comment very properly on the prospect of fair dealing in the above competition, in which remarks every competitor and the whole profession must heartily coincide. That the result will be most satisfactory, there is no reason to doubt. The corporation have already gained the complete confidence of competing architects. I am surprised, therefore, that you should have thought fit to give the names of any of the gentlemen who have sent in designs. In one breath you exhort the Manchester corporation to deal honourably; in another, you do violence to your own sensible expressions, in publishing information, which it is unjust they should have. I take the liberty of writing to say competitors are complaining about the unfairness of so doing. I could myself send a tolerable list of names and mottoes, but it would be manifestly wrong to print such information. Though you only supply names, it will be easy for the professional advisers of the corporation to spot the drawings of the architects whose names you give. Mr. Scott's name is likely to mislead. I have reason to believe it is not Mr. Geo. Gilbert Scott; many will think so.—I am, &c.,

A Non-Competitor.

Intercommunication.

QUESTIONS.

[554.]—POLISHING TORTOISE-SHELLS.—I have a very fine tortoise-shell, and wish to polish it. Could any of your readers inform me how to manage it? Also if the outside scales should be taken off.—G. W. F.

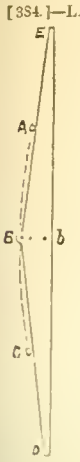
[555.]—ARCHED WOOD PRINCIPALS.—I should be glad if you could inform me whether the laminated arched wood principals, now in such general use, do or do not in practice exert a thrust upon the walls. For example, suppose a roof of 60ft. span, with arched principal 9in. × 6in., forming a segment of a circle, with a rise of about 10ft., the principals to be formed of six 1½in. planks, 6in. wide, bent round on templates to the proper curve, and kept from separating by marine glue and strong iron straps or bolts. The principals are supposed to be about 20ft. apart, with trussed purlins between. Would these exert any thrust upon the walls? If so, what are the best means of preventing this thrust? I have seen arched ribs forming about a semicircle; as, for example, the roof of King's Cross station, London, and no provision against thrust appears to have been considered necessary. I should be glad to know whether this is really so, and whether the same would hold good in such a case as I have mentioned?—A Puzzled Student.

[556.]—OVERTIME.—Will some of your readers kindly inform me if it is the practice in the architectural profession for salaried draughtsmen to be paid for overtime? and, if so, whether at the ordinary rate of salary or above it? As unpaid extra work is to me a common occurrence, I should like to know whether I can seek any remedy or not.—Draughtsman.

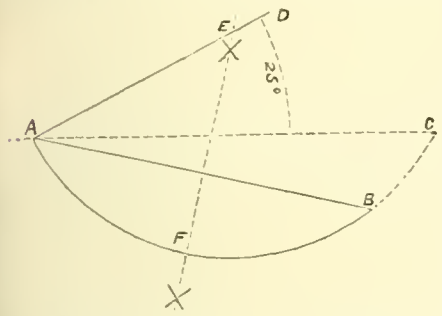
REPLIES.

[530.]—SEWERAGE.—Use best Portland cement with an equal quantity of sand, make good the inequalities of the bed of the invert, and fill in the interstices between the sides of the sewer and the excavated earth with Portland cement concrete. The sand should be sharp, gritty and perfectly free from loamy or soluble particles; washed it would make the soundest work.—A. H.

[384.]—LARGE RAILWAY CURVES.—No one appears to have corrected the wrong answer of "Engineer," who complacently tells the querist that "the carpenter can do the rest." He can generally do all, if "Engineer" would let him alone; but certainly not if he gives him all the points wrong. All those found as "Engineer" describes will lie in a parabola, not a circle! But nothing is easier than to strike any circular arc, however flat, with nothing longer than twice the portion of arc to be struck at once. Let its ends and middle point be ABC. Join them by straight lines BA, BC, continued each to double their length, and formed as edges on the board ED. This is to be kept pressed against two round pins fixed at AC, and as it is moved up and down the angular point B will describe the true circular arc. See Euclid III., 21. A pencil may be fixed as much in advance of that point as half the diameter of either of the pins AC; or if inserted through any hole in the line BD it will describe any other concentric arc. Every carpenter should know this.—E. L. G.

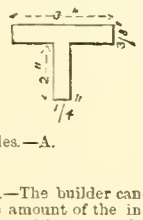


[400.]—CYCLOIDAL CURVE.—As "Simpson, jun.," thought the descent in a shorter time by the longer way needed "further proof," if it be true, the proof that should have been offered him was experiment. He must learn the differential calculus before he can have any other, and even then he would probably think experiment the most satisfactory. Let AB be any inclined way, straight, and not less than some feet long. Draw the horizontal line AC, and then AD elevated 25 deg. above it. Bisect AB by



a perpendicular continued to meet AD at E, and from E as a centre strike the circular arc AFB. This (which, if continued to C, would be 130 deg.) approximates the shape of a cycloid, and if a way or groove be made as smooth as possible, two balls being released at once from A, that which descends by F will arrive at B before that which rolls on the inclined plane. Seeing this, perhaps "Simpson, jun.," will take the word of scientific men, that the true cycloid would be described in a trifle less time still.—E. L. G.

[531.]—WEIGHT OF ANGLE IRON.—Take the ordinary tables for flat bar iron, and in calculating the weight take the whole width the iron would be if it were flat. T-iron the same, or if the parts are of different thicknesses, thus:—Weight per foot run 3in. × ⅜in. = 3·75lb.; 2in. × ¼in. = 1·68; total weight of the T-iron per foot run 5·43lb., or nearly 5½lb. From the nature of the question, I should say that it is necessary that "T. W." should study the use of decimal fractions before he can comprehend the tables.—A.



[534.]—INCORRECT QUANTITIES.—The builder cannot make the gentleman liable for the amount of the incorrectness, unless by agreement the quantities are made, equally with the plans and specification, a part of the contract; but if the contractor has paid the architect for the quantities, unless the architect has expressly stipulated that he does not guarantee their correctness, the architect is personally liable to the builder for the amount.—H.

[534.]—The established custom is that if a surveyor furnishes quantities to a contractor, and receives from him the usual amount of commission, the surveyor renders himself liable to the contractor for the accuracy of the quantities so furnished, and very properly so, otherwise contractors would have no guarantee that the quantities had not been furnished by incompetent or interested persons, which would often entail upon them great losses. Besides, no person ought to assume a position and receive the remuneration of that position without its responsibilities. If an architect furnishes quantities there can be no doubt but that he, acting as the agent of his client, renders his client liable to the contractor for the accuracy of the quantities, unless it can be shown by the client that his agent, the architect, was not employed by him to furnish quantities, and that he did so without his knowledge and consent. The business of quantity surveyors has grown up out of the system of estimating, and is quite distinct from the practice of the architect; but in this age of scrambling for money there are not a few architects who do a little "on the quiet" in quantities. Sometimes they have them taken off by qualified surveyors, but very frequently by themselves or an assistant, whose practical knowledge of construction (a knowledge, by the way, quite necessary to enable anyone to take off quantities) has been acquired in his employer's office. In the case of the architect taking off the quantities there is a bias in favour of "keeping down the estimate"; in the other, incompetency and uncertainty. It cannot be too strongly urged upon contractors, when receiving quantities from the architect's office, to ascertain by whom they were taken off, that before estimating from them they be quite satisfied that the quantities do fairly represent the work required to be done, and receive any as doubtful that do not bear the signature of the surveyor. If contractors would be particular in these respects much less would be heard of "incorrect quantities."—A CHIP.

[537.]—PERIODS OF GOTHIC ARCHITECTURE.—"Provincial" has been very unlucky in his authorities. Perhaps, like his Transition style, "a combination of" that which had been and that which was to be, he combines all the blunders current in 1800 on the matter with those to exist a century later. 1. There is no Saxon style, unless we can restore one from their missal drawings. The two or three bits of building demonstrably older than 1066, as Waltham Abbey, show that nothing new was introduced by that event, which, indeed, preceded all our refinement and art worth the name. 2. There is no need to father Early English on the ignoble reign of John. Every Londoner has the Temple Church rotunda at hand, dedicated by his predecessor, and already thorough refined English, all but the windows; and even under Henry II. the rebuilding of Canterbury Cathedral was begun with no unpointed arches, though rather Early French than leaning to our style, being by a Frenchman. But complete vaulting is what makes Gothicism. 3. The Middle English was neither generally more "Decorated" than its predecessor, as Rickman's absurd name implied, nor "a more elaborate and finished style," but the reverse. At least, from 1300 (when "Provincial" begins it) genuine elaboration and finish declined. The aims were more gloss, less stone, but especially less thought. 4. Instead of its "flourishing 160 years," till 1460, it ran its full course under the three Edwards, or by 1377—nay, even before that date—its flowing tracery, itself a debasement, had pretty generally been further debased to "Perpendicular." So this whole style, and not "its first period" is "known as Edwardian." 5. "Perpendicular, rising with the House of York and continuing eighty years," should be "rising with, or even before, the last Plantagenet (which family saw the whole four styles), and continuing through his reign and all the Lancaster, York, and Tudor reigns, for 200 years." The manor houses, even under Elizabeth, were but a last mimicry of it, no new style. And in what few churches were then built (as one or two that the fire of London has left, and one at Reading) no Italian details were admitted; when all Roman Catholics had got beyond St. Eustache, Paris, to pure Italian, and what the priests would have done here, may be seen by Gardiner's chantry, Winchester, the schools tower, Oxford—nay, Henry VII.'s tomb 50 years before! 6. It is a "coincidence" not at all remarkable, that England, having been Protestant only three centuries, and the golden age of all modern architectures known, in Europe or Asia, having been six centuries ago, England had her best architecture during one of the many ages she was Popish. 7. It is wholly false that "when that spiritual power was severed" her architecture decayed and became decrepit, for it had been decaying more than two centuries and quite decrepit for one (as also that of all countries where the said power remained in full sway). 8. Gothic architecture is no more "reviving with it" than Egyptian architecture is, or than the Saurians at Sydenham.—E. L. G.

[540.]—MOUNTING TRACINGS.—Tack the linen tightly on a drawing-board, so as to leave no crease or fold, and paste both the linen and back of the tracing; the tracing expands with the moisture of the paste, but contracts in drying so as to cause the disappearance of all the small bubbles, &c., which show when the tracing is first mounted. In laying the pasted tracing on the linen, care should be taken to dab it only with a clean soft cloth; if rubbed the lines will smear. Do not cut off until perfectly dry.—A. H.

[540.]—The method I adopt in mounting tracings, and which I find very successful, is first to procure a surface and roller, both of a somewhat yielding nature. Upon the surface lay gummed paper; and the tracing intended to be mounted damp at the back. Take the tracing and lay it upon the prepared paper, keeping it as tight as possible by holding it at the edges or corners; then roll it with the roller, commencing in the centre and work towards the outer edges, laying on pretty heavily, so as to take out the air bubbles. A sponge and needle-point pricker will be of great use; the first for washing the dirt off the tracing in mounting, and the second for occasionally pricking obstinate air bubbles.—T. L. P.

[540.]—Although the method of mounting tracings, described by your correspondent "R. L. B.," will answer if very great care be taken, I have found by a long experience that the following is much more simple and far better:—Take a perfectly clean drawing-board rather larger than the tracing to be mounted, and with a sponge wet the surface thoroughly, allowing so much water to remain on it that when the tracing is laid on it it may float, or, rather, that there may be a film of water between it and the board. Then, holding the tracing by the ends in both hands, lay it gently on the board with the inked side downwards, taking care that the centre be the first part to touch the board, and gradually lower the hands until the whole tracing lies flat; it will begin to expand at once, and probably some wrinkles will appear. These and any air that may be under the tracing must be gently rubbed out with a well wetted sponge, beginning in the centre and working to the sides and ends. In a few minutes it will be found that the tracing lies perfectly flat on the board without a wrinkle or air bubble. Then take the linen or paper on which it is desired to mount the tracing, and having cut it about an inch and a-half larger every way than the tracing, paste it thoroughly over the whole surface, and after seeing that there are no lumps of paste or hairs from the brush left upon it, lay it with the pasted side on the tracing, taking care that the centre be the first part to touch it. Again apply the wet sponge, and, rubbing lightly, get rid of any air bubbles that may be under the paper; then gradually rub harder with the sponge until no more water is taken up by it. The operation may now be considered complete, but I generally finish off with an old ivory scale or ruler, holding it as flat as possible with both hands, and by drawing it over the whole surface of the paper, squeeze out any paste and water the sponge may have left. If the tracing be wanted in a hurry the drawing board may be placed on its end in a draught, or in the sun, or during winter opposite (but not very near) a fire, and it will soon dry, but I would recommend that the mounting be done the last thing in the evening, and the tracing may be cut off the first thing next morning. By cutting just inside the edges of the tracing paper (which can be seen through the mount) the tracing can be removed without difficulty, as the paste holds only outside the tracing. If there are red lines drawn with carmine or lake on the tracing, they may run, if the tracing has been made quite recently, so when I want to mount a tracing immediately after it has been made I draw in light pencil the lines which are to be red, and put them in with red after the tracing has been mounted. I may add that all colouring should be done after the tracing has been mounted, as the colours then lie more evenly, and are softer and more mellow than under any other circumstances. I fear I have been rather verbose, but my excuse must be my desire to explain the method thoroughly to my younger brethren. If desired, I will in a future number describe the method of mounting drawing paper on linen.—I am, &c., C. E., Torquay, August 28.

[547.]—TIMBER PRESERVING.—I note "Sleeper's" remarks in your issue of the 23rd inst., and must say that it somewhat surprises me to learn that creosoted sleepers are only beginning to be used on German and French railways. I should have thought that their introduction there had been coincident, or nearly so, with their first use on British railways. It was in compliance with the request of the general committee of the International Exhibition of Agriculture and Timber at Cologne addressed to the directorate of the Edinburgh and Glasgow Railway Company, that I, as their engineer, sent the specimens referred to in my former letter, and which the jury awarded a medal for the same, they, in their report (a copy of which I sent you), disapproved of preserving timber by creosote. I am, therefore, the more surprised to learn that creosoted sleepers should continue to be used, in Germany especially.—I am, &c., JAMES DEAS, North British Railway Company, Engineer's Office, Glasgow, August 26.

[547.]—Having been recently in conversation with a large merchant upon the subject of creosoting, I am in a position to reply to "Sleeper's" question. Tramway sleepers are a serious item in the expenditure of every railway company. Decay in connection therewith is calculated upon every five or six years, to avoid which creosoting has been resorted to; and there is little doubt, where this principle has been fully carried out, that decay is resisted for double the length of time. As this latter measure doubles the cost, there is little or no advantage. On the one hand, there is the cost of replacing the unprepared sleepers (say) every five or six years, whereas, with the creosoted sleepers, replacing may not be required under ten or twelve years, but there is the loss of interest upon the original cost of the creosoted sleepers to bear against it. It is a financial fact, whatever it may be in any other light, that the benefit of creosoting is not felt until five or six years after the operation is performed, and the cost has to be paid at the time the sleepers are laid down. With the directors of our railways it is a question of spending (say) £10,000 this year and £10,000 in five or six years, or spending (say) £20,000 this year and no more for ten or twelve years. In these times of great panics and monetary depression, the former alternative is chosen. It is purely a financial question, and the discontinuance of the use of creosoted sleepers can be attributed to no other cause. Some persons may remark that creosoting does not double the cost, or that by creosoting they will last above double the time when compared with the ordinary sleepers. But the best answer that can be given is the course our English railway companies are taking after testing both methods.—W. S.

[549.]—BRICKWORK.—In deducting the quantities, let "Farnham" take out the opening measured from the brickwork or stonework, as the case may be.—C.

[549.]—In taking off quantities of brickwork no allowance is made for reveals of doors and windows. The nett width and height of the opening must be taken as the deduction. It is only in measuring facings that any allowance is made for reveals when the width of one reveal is taken.—A CHIP.

[550.]—CONTINENTAL JOINERY.—Your correspondent will obtain every information he requires respecting continental joinery, by addressing, W. S., care of Messrs. Stalhammar and Co., 58, Salthouse-lane, Hull.—T. A.

[553.]—LIGHT.—"G. G. P." must inform us how long the window has existed, whether it is fixed in a wall immediately abutting on the verge of the land he proposes to build on, and if so, and if it is a recent construction, whether it has been objected to at any time by the owner of the land.—L.

STATUES, MEMORIALS, ETC.

The statue to David Teniers, the painter, has just been inaugurated at Antwerp.

In the lecture room of Charing Cross Hospital, a plain but elegant tablet has been erected to the memory of Dr. H. Llewellyn, who went down in the "Alabama." The tablet is the work of Mr. Hall, sculptor.

THE STATUE OF LORD CLYDE.—This statue has just been erected on the grounds of the Senior United Service Club, Pall Mall, and occupies a space similar to that of Sir John Franklin, nearly opposite. The granite plinth is relieved with an oblong tablet, which supports a large bronze lion, which is lying in repose. Upon the animal is seated a female figure, crowned with a laurel wreath; the right arm gracefully reclines over the mane of the animal, and the left is extended, and presents a branch of laurel, which is held in the hand. The figure is draped in a scale armour bodice, from which flow ample robes, and a sheathed sword is suspended from the side. Behind this group is raised another granite plinth, which supports a circular pedestal of polished red granite enriched with bronze mouldings, and upon which is placed the statue of Lord Clyde, which stands in a familiar attitude, taken during the late Indian campaign. The whole forms a most imposing group, and is an object of public interest.

WAGES MOVEMENT.

The London gas stokers, 4,000 in number, are endeavouring to obtain a reduction of the hours of labour, from eighty-four to fifty-six per week. A meeting on Wednesday night week was attended by 1,500 of the day workers.

The strike of masons at Liverpool, which threatened at one time to lead to a lock-out, has been rendered easy of settlement by the foreman employed resigning his situation; and the strike of masons, employed at the work being done for the corporation at Wavertree, is being deprived of effect by the employment of non-unionists, of whom Mr. Duncan has between thirty and forty.

Barnsley.—The protracted strike in the building trade, which has been pending for the last six months, is in a fair way of settlement. A few days ago the men forwarded a letter to the secretary of the Masters' Association, desiring an interview, and a meeting of the masters and men took place last week. The points at issue were fairly discussed, at the conclusion of which the masters made the following proposition:—"That the masons should commence work at seven o'clock on Monday morning, other mornings at six, and cease work at one o'clock on Saturday, at the rate of 30s. for the summer months, and 28s. for the winter months; or, to commence work every morning at seven, and cease at four o'clock on Saturdays, and receive 29s. per week for the summer months, and 27s. for the winter months." The men then withdrew, and the proposition is to be submitted to a full meeting of the workmen on an early day.

General Items.

In accordance with the scheme of the Society of Arts, the Birmingham Chamber of Commerce has selected from sixty applicants twenty-five artizans to visit the Paris Exhibition, and report on the branches of manufacture in which they are severally skilled. The Chamber met on Saturday last, when the artizans were present, and were addressed by Mr. J. S. Wright, President of the Chamber of Commerce, Mr. Dixon, M.P., and Mr. W. C. Aitken. The latter gentlemen will go in charge of the artizans on their visit. They are to start on the 2nd of next month. Each will receive £10 to defray his expenses.

The act regulating the consecration of churchyards has been issued. Its object is declared to be to diminish the expense attendant on the consecration of portions of ground adjoining and added to existing churchyards. A bishop is now empowered to sign the instrument of consecration without the presence of the chancellor. "No officer of the bishop or of the diocess shall receive any fee for attendance at such consecration, or any allowance for travelling or for attendance." The fee to the registrar for the deposit of the instrument of consecration is limited to 5s. Conveyances may be made in accordance with the Act on School Sites. A deed of gift is to be exempted from stamp duty, and matters simplified. The exclusive right of burial in a portion of the land added to a churchyard may be secured to the giver of the land in a form set forth. There is a provision in the Act to remove doubts as to a church or chapel being reopened or enlarged, and it is enacted that where the communion table has been removed, or the walls of a church demolished, the marriages, &c., are to be valid although no reconsecration had taken place.

A new promenade pier, 705 yards long, constructed at Rhyl by a company at a cost of about £17,000, was opened last week.

Sweet oil, according to the *American Artizan*, is an antidote for poison. It says that "a poison of any conceivable description and degree of potency, which has been swallowed, intentionally or by accident, may be rendered instantly harmless by swallowing two gills of sweet oil. An individual with a very strong constitution should take twice the quantity. This oil will neutralize every form of vegetable or mineral poisons with which physicians and chemists are acquainted."

The arrangements for the forthcoming annual congress of the Social Science Association at Belfast on September 18 next, are now near completion. Lord Dufferin will preside over the association, and deliver his inaugural address on the evening of the opening day. The Jurisprudence Department will have the Hon. Mr. Justice O'Hagan at its head, with the Irish Master of the Rolls over the Repression of Crime Section. Dr. Andrews, F.R.S., vice-president of the Queen's College, will preside over the Education Department; Sir James Y. Simpson, M.D., of Edinburgh, over that of Health, and Sir Robert Kane, F.R.S., of Dublin, over that of Economy and Trade; Mr William Mulholland, of Belfast, will act as chairman of the Trade Section. Queen's College has been placed at the service of the association, and the departmental meetings will be held in the various rooms. Arrangements are being made for holding *soirees*; and excursions, in connection with the association, are being organized to places of interest in the neighbourhood.

The grand prize of £1,200 has been awarded by the Emperor of Russia to Sir Charles A. Hartley, C.E., engineer in chief to the European Commission of the Danube, for his plans for improvements of the harbour of Odessa. There were upwards of twenty competitors.

By a telegram received at the Board of Trade on Tuesday, we learn that the passage over Mont Cenis by railway is now an accomplished fact, the first engine and train having, on the preceding day, travelled over the line from Michel to Susa, a distance of 48 miles, and at an elevation of 6,700ft. above the sea level. Traffic operations are expected to be commenced some time in the month of October.

The Lords Commissioners of the Admiralty have issued a notice that the next examination of candidates in connection with the School of Naval Architecture will take place on Monday, September 23. The pupils will be selected by competitive examination, the subjects for which, and the number of marks assigned for each, are as follows:—Pure mathematics, including arithmetic, mensuration, geometry (plain and descriptive), plane trigonometry, and the elements of the differential and integral calculus, 2,500; applied mathematics, including mechanics and hydrostatics, 1,000; practical shipbuilding, including laying off (for shipwrights' candidates only), 2,500; practical marine engineering (for engineer candidates only), 2,500; French, 500; elements of physic and chemistry, 750; English grammar and composition, 750; geography and history, 750. No candidate will be admitted who does not obtain at least two-thirds of the full number of marks in the two first-named subjects, and three-fifths of the full number either for practical shipbuilding or marine engineering.

Dr. Robert Chambers intends to bring under the notice of the British Association at Dundee, a moraine at the foot of St. Fort approach, at that town, the supposed *debris* of a great iceberg that must have floated down the Tay many thousand years ago.

The last of the sixteen great girders for the new viaduct building on the Scarborough Railway, across the Derwent, at Hutton, was safely placed in position last week. In a few days it is expected this noble structure will be ready for full traffic.

A warm controversy has been waged in the Nottingham papers on a somewhat novel subject,—viz., that of stone carvers being brought into the town from London for the restoration of St. Mary's Church, under Mr. G. G. Scott. A local sculptor complains that where money is collected amongst a class of ratepayers for restoring our churches, employment ought to be found for such of the inhabitants who profess to be church restorers. A correspondent also remarks:—It is too much the custom of London architects to despise provincial talent, no matter whether it may have been previously trained in London or not; and even with our local architects, some there are who will not put a penny in the way of the local sculptors, but run to London for every petty job that may be required.

Mr. Delane, of the *Times*, has offered through Mr. Layard, M.P., the president of the Paris Excursion Committee, the sum of £5 to any working man who will send in a well written account of Paris and its Exhibition.

In speaking of church bells, a writer remarks that bells are generally reputed to weigh heavier than they really do, especially old ones, which it has been the fashion to overrate to an extravagant degree. It is true that many of them are superior to those cast fifty or sixty years ago, when bell-founding and all Gothic arts were at a very low ebb; but of late years the profession has much improved, and there are new bells as good as the most ancient. It is also worthy of observation, that although time and use will not make those good that are essentially bad, yet the tone comes out more freely and fully after a bell has been fairly used for a year or two.

While removing one of the Surrey piers, preparatory to the construction of the new Blackfriars Bridge, two foundation stones of black slate were discovered by the workmen. One of them is evidently a stone that was laid with all pomp and ceremonial, while the other and smaller one found near it was evidently stowed away on the same day, but prior to the ceremonial, by some master workman, who took this advantage of his opportunity to hand down his name to posterity. The clear cut inscription on the first says:—"On the 23rd day of June, 1761, in the first year of the reign of King George III., the first stone of this the first pier was laid by Sir Robert Ladbroke, Knt., and president of the honourable committee for carrying this bridge into execution. Robert Mylne, architect; Joseph Dixon, mason." The second stone says:—"On the 23rd day of June, 1761, in the first year of the reign of King George III., the first stone of this pier was laid by Joseph Dixon, master mason to this bridge."

The decision of the arbitrators on the designs for the New Law Courts has given much dissatisfaction. One by one the organs of public opinion are expressing themselves adversely to the decision. An impression gains ground that insufficient attention was given to the matter, that the spirit and intention of the original conditions have been infringed by two competitors being selected instead of one. The Manchester town hall is pointed at as an instance where two competitions will be resorted to, first an unlimited one, and then a limited number, selected from the whole; and journalists ask why should such an arrangement be carried out in Manchester in order to secure a good building, and not carried out in London in favour of a vast historical building, which will be regarded as the greatest architectural work of this generation.

Trade News.

TENDERS.

Dalston Lane.—For building four shops on North London Railway Company's land. Mr. E. H. Horne, architect:—Bishop, £2,979; Axford, £2,954; Eaton and Chapman, £2,882; Preedy and Son, £2,875; Crabb and Vaughan, £2,586; Turner (accepted), £2,447.

Derby.—For the erection of an hotel in the cattle market, Derby, exclusive of foundations, cellaring, and stabling. Mr. George Thompson, Boro', surveyor:—Lockett and Forrest, £1,990; J. W. Thompson, £1,744; J. Gadsby, £1,564; J. Fryer (accepted), £1,539.

Low Leyton.—For finishing ten houses at Low Leyton. Mr. Edmeston, architect:—Munday and Hutchinson, £2,700; Harris, £2,575; Mansfield, £2,536; Fisher, £2,456; Cubitt, £2,937; Warne, £1,930; Cogswell, £1,928.

London.—For the construction of brick and pipe sewers, for the Lambeth vestry. Mr. Hugh McIntosh, surveyor:—Girdler, £15,104; Munroe, £13,354; Pearson, £13,000; Crocket, £12,900; Blackmore, £12,250; Wainwright, £11,950; Burton, £11,900; Thackrah, £10,850; Hitchcock and Co., £10,850; Wigmore, £10,520; Mutton, £10,400; Mayo, £10,276.

Southwark. — For new warehouse, in Park-street. Messrs. Newman and Billing, architects. Quantities supplied by Mr. Edsall:—Axford and Whillier, £6,095; Simms and Marten, £5,985; Downs, £5,890; Ashby and Horner, £5,831; Little, £5,698; Perry, £5,695; Thompson, £5,640; Greenwood, £5,598; Rider, £5,589; Coleman, £5,340; Wells, £5,300; Brass, £5,247; Browne and Robinson (accepted), £5,192.

Tottenham.—For church and schools. Messrs. Smith and Son, architects. Quantities not supplied:—

	Schools	under church.
Adams	£4,180 0 0	£3,365 0 0
Barker	3,958 0 0	3,218 0 0
Nightingale	3,957 0 0	3,125 0 0
Blackmore and Morley	3,583 0 0	2,800 0 0
Crabb and Vaughan	3,400 0 0	2,550 0 0
Munday & Hutchinson	3,153 0 0	2,403 0 0
Palmer	2,820 0 0	2,179 0 0

BATH STONE OF BEST QUALITY.

Randell and Saunders, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[Advt.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

J. N. Bodley, Avenue-road, Camberwell, carpenter, September 4, at 1—J. E. Copper, Princes-road, Plumstead, builder, September 5, at 11—John Flint, Lewisham, builder, September 5, at 12—G. W. Jenkins, Torrington-place, Finchley, builder, September 5, at 11—George Rogers, sen., Queen's-row, Cambridge-road, Mile-end, builder, September 3, at 1—Charles John Smith, Essex-road, Islington, builder, September 3, at 1—John Wadson, Albion-road, Hammersmith, carpenter, Sept. 5, at 1—J. Anstee, Chipping Barnet, bricklayer, September 10, at 1—J. Frederick Curel, Cross-street, Walworth-road, gasfitter, September 12, at 1—Edmund Coombs, Gresse-street, Rathbone-place, builder, September 12, at 11—James Dallison, Westmoreland-place, builder, September 12, at 11—William John Elliott, Battersea, builder, September 10, at 11—Richard Ferris, Blenheim-passage, Abbey road, St. John's-wood, plumber, September 10, at 12—Julius Joyce, Murray-street, Hoxton, carpenter, September 12, at 11—Richard Seed, jun., Tottenham-street, Tottenham Court-road, builder, September 12, at 1—Stephen Howland Willard, St. Leonard's, ironmonger, September 12, at 1.

TO SURRENDER IN THE COUNTRY.

Samuel Lee, Fowey, ropemaker, September 6—William Hebditch Perry, Crewkerne, builder, September 3—John Shaw, jun., Manchester, house painter, September 3—Henry Shillinglaw, Birkenhead, painter, September 4—Thomas Standley, Northampton, gasfitter, September 7.

THE BUILDING NEWS.

LONDON, FRIDAY, SEPTEMBER 6, 1867.

IMPROVEMENTS IN WESTMINSTER.

WHEN a considerable portion of the most fashionable quarter of the town, a portion owned by a nobleman of vast wealth, is in course of reconstruction, public attention is naturally drawn to the fact. As a general rule, the public base their expectations on the importance of the work, the character of the proprietor, or the reputation of the architect; and, either of these things being ascertained, it would not seem a very difficult matter to foreshadow with some accuracy the nature of the works. This is not, however, always the case, and the buildings now being erected at Grosvenor-place and Grosvenor-gardens, the property of the Marquess of Westminster, are proof that in architectural affairs probabilities go for very little. In criticizing these buildings, it must be borne in mind that the employer was wealthy, the neighbourhood fashionable, that money was not spared, and that tenants were not wanting. That the conditions, in short, were favourable for the display of, at least, the proprieties of architecture, cannot be disputed any more than can the fact that the proprieties put in but a small appearance. To those who have not seen the buildings in question, the following description may be interesting, to those who have done so its correctness will be apparent. Commencing in Grosvenor-place, near St. George's Hospital, is a row of eleven houses in one block, having a projecting bay in the centre house, and one in each of the end houses. There are four storeys, without including basement or attics, which latter, as the roofs are what are known as Mansard, contain a great amount of accommodation. The material of the front is Portland stone, with a little mixture of red Mansfield, and a small amount of polished granite in little panels under the windows. The style is very difficult to describe. It is certainly not Gothic, it cannot be called Renaissance, it has no claims to be considered Grecian, and has no affinity to the Italian school. Certain peculiarities in the treatment of the roofs might lead a casual observer to imagine that the modern French style was imitated, but the want of projection in the mouldings, the coarseness of the carving, and the redundancy of zinc ornament on the roof precludes this idea. Were it distinguished as the Hotel Company style "limited," it would give a better idea of what it really is than could perhaps any other description. So much for the style.

All the windows are square-headed, with the exception of those of the first floor, and this is a merit. There is little to be gained by using segmental windows; they are either round-headed nor flat, and cannot accord with the general lines of the building, whether vertical or horizontal. A continuous balcony supported by trusses is in front of the first floor windows, and this balcony and these trusses are absolutely the only features of any prominence, boldness, or character, throughout the entire front. Flatness marks all the other details, the very rustication of the ground floor being fine to a ridiculous degree. Now, although we hope that the day is far distant when coarseness finds favour with us, and deprecating the rash and erratic flights of undisciplined aspiration, our love for the delicate has not hitherto over-mastered our sympathy for the bold, nor induced us to prefer feebleness of design and execution to firmness of character and individuality or both. If any reader thinks that the case is overstated, it is only necessary that he should take the same pains to inform himself as the writer of this notice has done. If he approves of the feeble details, without profile, of the first floor windows, of the nondescript main cornice, of the side lights in the bays, of the absence of sufficient stringcourse, of the general want of character pervading the whole buildings, we can only say that his views will be of exceeding difficult justification; and, to our thinking, neither warranted by analogy nor borne out by practice. Very little alteration and no increase in expense would, for instance, have made the string under the second floor windows assume the importance of a feature. The breaks are there, the trusses are there; the money has been laid out, but the characteristic stringcourse so necessary to divide the four-storeyed elevation into well-defined horizontal spaces is for all practical purposes absolutely wanting. No cost seems to have been spared; but a smaller expenditure would have produced a better display of architecture. This row of buildings is so far advanced as to be almost covered in. The work throughout is good, and the material excellent. Messrs. Holland and Hannen are the contractors. These are the only works at the northern extremity of the property. Lower down the road, at the corner of Lower Grosvenor-place, will be found a very large mansion, containing upwards of forty windows on the north front and twelve on the south, without including minor windows in the roof. The style is the same as that of the previously described buildings, but the faults are even more conspicuous. It has in some portions a decidedly French character, but this is contradicted in others. The carving is delicate here, and coarse there; indeed, the wing on the north front, which is quite plain, is the most satisfactory portion of the building. The openings are well-proportioned, and are not encumbered with ornament, but the bay in the centre is open to the serious objection of having a balustraded roof that the windows to which it should belong give no access; in fact, it is placing a balcony in front of a window without allowing the window to reach to the floor. The chimney tops are the most conspicuous that have ever come under our notice, having, in addition to other ornaments, a lion's head at each corner. Terra cotta has been freely employed in the decoration of the cornice, the parapet, chimneys, &c., and little panels of red Mansfield stone are to be seen in various situations. The columns supporting the porch roof are of polished red granite, a material altogether too fine for the purpose, and according ill with the very peculiar area balusters which flank them. The roofs require little remark. They are in the French style, but exaggerated as to pavilions and ornament generally. A pavilion is a good thing, no doubt, and very effective; but here there is so much of a good thing as to make its goodness very questionable. Look in what direction one may, we are struck with the eternal roof with a big pavilion in the middle of the row, and a smaller at each end. The profuse gilding of finials and cresting, and the enormous amount of zinc ornament in the roofs, must have cost much money, and is in bad taste.

Adjoining this mansion, and facing the west, are three finished houses of the same character, and at the end of the block at the corner of Ebury-street is the site of the Belgravia branch of the National Bank. On the north front of the block we have been describing, and which is triangular in shape, is a row of five houses, having shops on the ground floor. The dressings only are of stone, but the decoration is as excessive as in the other instances. For all these buildings Messrs. Trollope and Co. were the contractors. We now reach Belgrave Mansions and Grosvenor-gardens. The former consists of a block of ten houses, facing west, having shops on the ground floor. The materials are red brick with stone dressings. The roofs are, as usual, of a towering character, but the cornice is not bad. It is to be regretted, however, that it should contain so much carving, as, from its height, the work can scarcely be seen, while the same amount of work on either the first or second storey would have redeemed them from absolute poverty. Everything is of the most substantial character, and money does not seem to have been spared. Facing Belgrave Mansions, and fronting east, are two long blocks of very superior houses. The southernmost block consists of nine houses, which are only carried up to the first floor. The architecture will resemble the block to the north, consisting of nine finished and six unfinished lofty houses, both blocks bearing the name of Grosvenor-gardens. The style is the same pseudo-French in which the others are built, and the same faults are displayed. There is the same reliance on gigantic pavilions, the same thinness of detail, and the same overdoing of the chimneys. The materials are Portland and red Mansfield stone, and terra cotta. The bed mould, trusses, and ornamental frieze of main cornice is in terra cotta, with which material the chimneys are profusely decorated. The arrangement of the windows is, to say the least of it, unusual, the second floor windows having semicircular heads, while those of the first floor are square. As the former are considerably the lower, the effect is not good, but the windows themselves are not too large. The porches are decorated with small columns of serpentine marble. This is in as bad taste as an ormolu scraper would be. The polish will, however, soon yield to the atmosphere, and when the glitter is gone the effect will be less disagreeable. Architects are beginning to find out that few buildings will bear polished granites or marbles, the mirror-like effect being destructive to all repose. Polish is only endurable when mixed with a due amount of tooled work, as the mat or frost and burnish relieve each other in jeweller's work. The general impression which all these new houses convey is that they are bran new, and that the people who will inhabit them are bran new also. In our opinion a greater regard for plainness would have given them a more respectable look. There is an air of solid respectability about even the unfashionable squares in the Bloomsbury quarter that we look for in vain in many parts of Belgravia. These things are to a great extent matters of association, but that they influence the educated mind in all countries is no less true. The Faubourg St. Germain differs internally as much as it does externally from the Chausée d'Antin. The plain but excellent red brick and white marble of Philadelphia is, in reality, handsomer than the tinsel ornament amongst which Shoddy and Petrolia niche themselves in New York and Chicago. In the case of a single house here and there the matter would be of a little importance—an amount of picturesqueness would follow the display even of bad taste; but where buildings are erected in large blocks, every house of which is a counterpart of its neighbour, it is essential that a more than ordinary amount of care and skill should be exercised. The importance of the work, the conspicuous situation, the ostentation everywhere displayed, seem to invite rather than deprecate criticism. That the houses will be convenient and let well, we sincerely hope, but something more than mere habitableness might justly be expected under the very peculiar circumstances of the case. Few men are as wealthy as the landlord; not often do such opportunities for the display of architectural skill occur, and few cities can boast a population rich enough to become the tenants of buildings of such vast size and costly character.

PLATE GLASS AND ITS MANUFACTURE.

THE other day we visited one of the largest glass factories in the North of England—the oldest manufactory in a town renowned for its glass produce—South Shields,

and the only one in the district where plate glass is made. Our readers need hardly to be reminded of the fact that the banks of the Tyne afford the greatest facilities for the manufacture of this important material. The cheapness of coal and the facilities for shipping, have led to the settlement of this and other manufactures on the banks of the Tyne, and while the iron trade of the locality has latterly, through the late unfortunate strike and commercial depression, suffered considerably, the glass trade has largely increased. It is rather curious that glass for architectural purposes was first used near the scenes of the most extensive glass manufactories. At Jarrow, which is but two or three miles from Shields, the Venerable Bede flourished in the seventh century; and in his ecclesiastical history he records the fact of the Abbot Benedict bringing over from beyond the seas skilled artificers to glaze the monastery at Wearmouth. This was in the year 674; and we are informed that Bede's church at Jarrow, which we found had been beautifully restored by Mr. Gilbert Scott, was always famous for its windows; indeed, a local tradition informs us that a belief once existed that it was never dark in "old Jarrow church." Glass, however, was not in common use in this country until after the close of the twelfth century, although there is evidence that even then it had become a trade. The records in York Cathedral show that a contract was entered into with a glazier to glaze the west windows of that building in 1338, the contract being performed at the rate of 6d. per foot for white, and 1s. per foot for coloured glass. But window glass was very rare in the North up to 1616, when the first manufactory was erected in Newcastle-upon-Tyne, by Admiral Sir Robert Maunsell. Crown glass was subsequently largely made on the River Tyne; but no crown glass is now manufactured since plate glass has superseded the old processes. The glass bottle trade in this district affords employment for large numbers of men and boys; and we understand that the produce of forty-seven factories on the banks of the Tyne, the Wear, and the Tees, was, in 1862, nearly four and a-half million dozens. The extensive fluvial deposit at Jarrow Slake, which is dry at low water, was once used in the manufacture of glass bottles, but superior materials are now employed.

Horace Walpole, in his "Anecdotes of Painting," proved that the manufacture of window glass must have been introduced into this country long before 1557, the date popularly given for its introduction. This he shows by a document dated in 1439, by which the Countess of Warwick stipulated with a Westminster glazier that "no glass from England but glass beyond seas" was to be used for a monument which she was erecting to her husband's memory. This indicates that English glass was far inferior to that made in foreign countries. In 1557, a superior kind of window glass was manufactured at Crutched Friars, London; and in 1635 some Venetian workmen were employed to improve the character of English glass. The Savoy House, in the Strand, lays claim to the honour of being the birthplace of the first flint glass manufacture in this country. In 1610, James VI. granted to Lord George Hay the right of introducing the art of glass-making into Scotland, and a very primitive manufactory was then erected at Wemyss, in Fife.

Plate glass was first used for looking-glasses and coach-windows, and it is believed to have been first made in England by some workmen brought over from Venice by the Duke of Buckingham, in 1670. There are records in existence to show that plate glass of small dimensions was made in South Shields long before 1771, when the art of casting plate glass by throwing the molten materials on an iron or copper table, and rolling it into a sheet, was, it is said, first adopted. Mr. Swinburne, the head of the works we visited at Shields, says, that in the early part of the seventeenth century, an article called brown plate glass was made in the town, and that the manufacture was continued by the family who originally established it until about twenty-two years ago, when the process was superseded by cast plate. The returns of the excise duty show that up to 1845 more plate glass was made in South Shields than any other manufactory in the kingdom. It was in this year that the glass duty was abolished, and the business of the firm was in consequence quadrupled. Prior to that time the quantity blown and cast in the manufactory was 312,000ft. per annum; now, upwards of 1,240,000ft. per annum can be produced. The cost of production is infinitely less—less by 80 per cent. in coal—since the restrictive duties were abrogated. Thus it is that the cost of materials is less than in any other country; and Sir Robert Peel's prophetic words, in proposing the abolition of the duties, are almost realized, "If you leave the manufacture altogether disburdened, as in France and Belgium, then, with your peculiar advantages of material, the command of alkali and coal, my belief is you will supply almost the whole world." Mr. Swinburne, in a paper read before the British Association, in September, 1863, pointed out that a very great impediment arose from the prohibitory duties imposed by foreign governments. He remarked that "the English makers of plate and window glass have represented to our Government that their cost of labour is 60 per cent. more than that of their foreign rivals, who are allowed to import their produce to this country duty free, whereas the Continental duties are prohibitory. He asks no protection, but desires equal terms with others, and he will take his chance in the competition." The English manufacturers of glass, he adds, universally complain that our diplomatists negociated treaties and settled tariffs without preconsultation with those who understand the business, and "they think that better terms might have been had if more information had been previously obtained."

It has been estimated that the cost of plate glass is now reduced to about that of the common window glass of thirty years ago, and that the manufacture has increased from 7,000 superficial feet per week, sold at from 20s. to 25s. per foot to 140,000ft. sold at 2s. and upwards. Between 12,000 and 16,000 square feet of plate glass is imported, the finest qualities coming from France and Belgium. Some English manufacturers, stimulated by the success which has attended the efforts of foreigners in this department, have improved their plate glass, and reduced its price—very necessary steps in order to keep pace with foreign competition. In Section L of the Building Materials Department, South Kensington Museum, will be found some specimens of a new kind of plate glass, known as rolled plate, manufactured by Messrs. Hartley, in the Wear Glass Works, Sunderland. It was invented by Mr. James Hartley, and is only made in three places in the kingdom, the Sunderland works turning out nearly a million feet per annum, representing a value of £15,000. This glass resembles the ordinary plate descriptions in their unpolished state, but, like the foreign examples, is much lighter; it is used largely for roofing and other purposes where translucency is required.

The works at Shields are very extensive, and many of the buildings are very old. In the yard are the used pots, which are left out in the air to cool; these crucibles are made by the firm themselves. In the first building we entered were the furnaces, in each of which there were four pots, which were being filled by workmen, with masked faces, with the materials. The sand is of the whitest description—perfectly pure—it having been well washed and passed through a sieve before being mixed with the other ingredients. Great care is taken in the selection of these materials. The following proportions of ingredients are said to be the best:—Lynn sand, well washed and dried, 720 parts; alkaline salt, containing 40 per cent. of soda, 450 parts; lime, slaked and sifted, 80 parts; nitre, 25 parts; broken glass, 425 parts. These quantities will yield 1,200 pounds of glass. At the celebrated glass works at St. Gobain, in France, where the plate glass produced is of the finest description, the materials used are in the following proportion:—White sand, 100 parts; carbonate of lime, 12 parts; soda, 45 to 48 parts; fragments of glass of the same quality, 100 parts; oxide of manganese, ¼th part. The broken glass, we should add, is the waste taken from sheets, and the overflowings from the pots. There is a large amount of mere waste, which cannot be used in consequence of its contact with the ashes of the furnace. The ingredients having been "fritted," or partially combined in small furnaces, are placed in the pots. Originally they were heated twice; but one heating is now considered to be sufficient. When the red hot liquid lava is in a fit state to use, the crucible is taken out, and placed on a carriage, which runs on rails to the casting-table. Arrived here, three men examine the liquid glass, and by means of a copper ladle, having a long handle, all the impurities which have accumulated on the surface are removed. The scene at this point is very interesting and exciting. The reader may imagine a large, gloomy, lofty, substantial shed, lit up entirely by the reflection from the liquid glass. A group of fifteen or twenty men surround the casting table; the *cuvette*—which is the name of the vessel from which the glass is poured in the casting—is raised up by means of a crane, the red hot vessel is swung round so as to be in the centre of the table; and at a given signal from the foreman the vessel is tilted up, and the hot golden lava streams on the table. A very heavy iron roller, resembling a huge rolling-pin, is immediately passed over the melted mass, which assumes the thickness required. The passing of the iron roller over the glass causes a beautiful play of brilliant sparkling colours of every possible tint. The plate of glass is soon solidified, when it is dexterously thrust from the casting table into the oven. These ovens allow of four immense plates being put into them; and the plates remain here for fifteen days; the heat is thus allowed to decline gradually, so that by this slow process of cooling the glass may be properly annealed. The value of each of these plates varies of course with their quality and size: those we saw being cast were worth between £20 and £30 each, while some have been cast worth at least, £60. When the sheets are taken from the annealing oven they are sent to Newcastle to be ground and polished. These processes have been carried on by the firm in Newcastle for many years; and the heavy expense of removing the machinery from that city to Shields renders it impossible to carry on both establishments in one town.

The sheets of glass are, frequently, an inch and a-half in thickness upon leaving the oven; but they are ground to about one-half that thickness in Newcastle. The edges are cut smooth and square by means of a sharp diamond; and a gentle rap by a small hammer underneath the glass is sufficient to break the piece away. When in the grinding department the plates are imbedded upon a table made either of freestone or wood, the glass being securely cemented by plaster of Paris. The plate is reversed and suspended over the other, and ground flint is placed between the two plates. In this way the sheets are ground after which they are again ground with emery powder. Dr. Lardner thus describes the preparation and process ("Cabinet Cyclopædia," No. 26):—"A considerable quantity of emery is put into a vessel containing water, and is stirred about violently until the whole is mechanically mixed with the water. Emery is absolutely insoluble by such means

and if the mixture were left at rest during a sufficient time the whole would subside in layers; the coarsest and heaviest particles sinking first, and so on successively, until the very finest particles would range themselves as the upper stratum. Previously to this, however, and while these finest grains are still suspended in the water, it is poured off into a separate vessel, and the emery is there allowed to settle. A fresh supply of water is poured into the first vessel, the contents of which are again violently agitated and allowed partially to subside as before." The liquor is poured into a third vessel, and thus emery of the second degree of fineness is produced; this operation being repeated in order to obtain powders having five different degrees of fineness. "The deposits are then separately dried upon a stove to a consistence proper for making them up into small balls, in which form they are delivered to the workmen. In this further rubbing together, or, as it is called, 'smoothing,' of the glass plates, it must be understood that the coarsest emery is first used, and so on, substituting powders having increasing degrees of fineness as the work proceeds." When the glass is thoroughly even, it is delivered to the polisher. The polishing is done by means of an elastic cushion, which, being wetted, is covered with the red oxide of iron. In all these processes the utmost care is taken, and if flaws are discovered in the glass, it has to be cut up into small plates. The risk and skill involved in the manufacture of plate glass, of course, keep up the price of the article. Some of the plates made during the last few years are of extraordinary size. In Messrs. Robinson and Preston's vaults, at Hackin's-ley, Dale-street, Liverpool, there is a window, unmounted by a half circular frame, and to accommodate this a separate plate has been used for the upper portion. The plate below measures 145½in. by 82¼in.; that above, 25in. by 42¾in. The total superficies is 26ft. 8in., the thickness being three-eighths of an inch. Messrs. Whitby and Williams supplied these enormous plates.

We believe the social condition of the workmen engaged in the plate glass trade is much superior to what it was a few years ago. The old practice of compelling the masters to provide drink on the works has been abandoned in the manufactory we visited, and some of the men are teetotallers. This is somewhat surprising, considering that the nature of the work is such as to induce the men to drink hard. We are assured, however, that in the brown flint trade the master is powerless to prevent intoxication; and that if drink money were to be withheld the whole of the men would strike at once, and would be supported in their movement by the glassmakers' society. Indeed, it is notorious that the trades' unions are exercising a power over the master which the majority of intelligent working-men would not approve. We believe that the wages of the men in the plate glass manufacture vary from 25s. to 35s. per week, and the hours of labour are from three or four o'clock in the morning to twelve (noon). "No one dies here, Sir," remarked the foreman, a stout, dark fellow, whose muscular frame indicated extraordinary strength; and, notwithstanding the intolerable heat of the place, and the state of perspiration from which the men suffer for eight or more hours a day, the men remain here for years, and if they are not slaves to drink see old age. The majority of the men at work in the factory had been apprenticed there, and had never left their situations.

PRESERVATION OF TIMBER.

No. III.

ALTHOUGH some of our English engineers, taking a purely financial view of the question, are discontinuing the creosoting process, it is at this time being taken up by the principal French and German railway companies, and is officially adopted for all fir and beech sleepers in Belgium and Holland. It is certain that the solidity, hardness, and elasticity of timber are increased by the process of creosoting. Mr. Hemans stated, as far back as 1850, to the Institution of Civil Engineers:—"I have noticed particularly a great degree of toughness in the fibre of the wood, which was apparently derived from the creosote." Mr. Badge, of the Lancashire and Yorkshire Railway, in 1851, stated, in a published letter to Mr. John Bethell, that creosoted wood seemed to acquire "the hardness of brass." This gentleman now states, on relaying creosoted sleepers with new rails, only about one per cent. are broken. It is found in Holland, as Mr. Waldorp, a distinguished Dutch engineer, affirms, that beech wood, which generally has a tendency to split, does not do so when creosoted. Recent experiments made by Mr. Cudworth, of the North Eastern Railway, and by Mr. Crepin, of the Belgian State Railways, show in the most conclusive manner that creosoted wood is superior in elasticity and hardness to un-creosoted wood.

Perhaps we cannot do better, in treating a question of this kind, than appeal to the experience of men who are entitled to speak with authority. Mr. G. R. Burnell, in a paper read by him before the Society of Arts, on Wednesday, May 30, 1860, says:—

That creosote is able to protect wood against ordinary decay is proved by the state of the sleepers of some of our railways, laid down as far back as 1841, but, of course, this process, like all practical chemical ones, requires to be applied skilfully and conscientiously. Much prejudice against the use of creosote seems, for instance, to have been created by the decay of timber treated by the pyrolignite of iron, and still more by the shameful manner in which the creosote itself has been used, for sometimes no more of that oil is to be found in the wood than the latter would be able to take up by a very temporary immersion. In the best creosoting works, the oil is injected at a temperature of 120 deg., and under a pressure of 150lb. on the square inch, so that ordinary fir timber absorbs, on the average, from 8lb. to 10lb. weight of the creosote to the cubic foot. For all building or hydraulic engineering purposes, fir timber thus treated is far more durable than the best oak, teak, or other hard woods; and as the cost of the operation is very small, it certainly should be resorted to on all occasions where smell is not objectionable. It may be here remarked that it is essential to observe that all these methods of protecting timber depend for their success upon the skilful and conscientious manner in which they are applied. The purity of the salts, or of the creosote used, the strength of the solutions, the treatment of the wood before the injection of the preservative materials, and the manner in which these materials are injected, all require strict attention, and they certainly render it necessary for the engineer or architect either to resort to those establishments which have a good reputation to lose, or to exercise the most rigid personal supervision. The machinery required for preparing a long stick of timber, of considerable scantling, is in itself a serious matter, for it is necessary, in the first place, to make a vacuum, which should allow the sapwood to escape, and to do this in cylinders of 6ft. in diameter, and from 20ft. to 50ft. in length, is in itself both difficult and dangerous; then the injection of the creosote at a temperature of 120 deg., and under a pressure of 150lb. on the square inch is, as every practical man knows, a dangerous operation, requiring very skilful manipulation and very costly machinery.

Mr. E. Alby, C.E. to the committee instituted by the Sardinian Government, in 1860, to consider the relative merits of the different processes for preserving timber, says:—

Creosote is the only antiseptic which has the property of augmenting the density of wood, and thence its resistance to mechanical actions. A fir sleeper of ordinary size has a volume of 0·70 m.c., and weighs 40k. After its injection with creosote its weight is 65k., and it has acquired a density equal to that of oak. This property admits the use of white wood sleepers under the joint cushions, and along the inclined plane D' Giovi (the steepest incline in Europe), where sleepers injected with metallic salts were obliged to be taken up after a few days, on account of the cushion having become imbedded on the wood.

The following extract from a paper by Mr. H. W. Lewis, University of Michigan, will give the view taken of this subject by an American [See BUILDING NEWS for January 11, 1867.]:—

English engineers deride American wooden railway bridges. Eight years is their average duration. Creosote them, and they are good for double or treble that time. For ordinary railroad purposes they cost 40 dollars per linear foot. The use of Bethell's process would effect a great saving on such a line as the Grand Trunk Railway, whose wooden bridges measure 9,355ft. upon the Montreal and Portland division alone. Further illustrations of the importance of preserving timber from decay seem unnecessary.

Mr. J. C. Mellis, engineer to the Government of St. Helena, in a letter dated June 19, 1865, and addressed to Mr. John Bethell, says:—

You were kind enough to allow to be prepared under my personal inspection, during my visit to England in 1863, a specimen of creosoted pine timber to be tried here, where the white ant abounds, and is most terribly destructive of buildings, &c. I have great pleasure in telling you, after twelve months' trial of that specimen, that it is found to be sound; you will perceive the relative value of such a test when I say that no other artificially-prepared wood has yet been found to resist the attacks of the ant here.

Mr. Harrison, at a meeting of the Institution of Civil Engineers in March, 1866, stated as follows:—

In his own experience he found no sleeper was better for wear than the ordinary Scotch fir sleeper, creosoted. It was tougher than others, and would stand the resetting of the chairs, and pins might be driven into it two or three times without splitting. The great defect of the ordinary Baltic sleeper cut down the middle was the splitting from the pins; but, notwithstanding that, he thought it was a mere question of wear. There were creosoted sleepers still in use on the Stockton and Darlington line, which had been down for more than twenty years.

Mr. R. Badge, of the Lancashire and Yorkshire Railway, in a letter dated February 23, 1867, says:—

About eighteen months ago I visited that portion of our line which was laid with creosoted sleepers in 1846, and I am able to report that the whole are as fresh and sound as when first laid. During a period of twenty years I have creosoted above a million of sleepers, as well as large quantities of timber of various kinds, and from my experience gained during that time, I would recommend that all timber be creosoted which is intended to be placed in exposed situations.

The following is the copy of a letter addressed to Messrs. Armstrong and Foster, of Sunderland:—

Hope Town Foundry, Darlington,
March 15, 1867.

Gentlemen,—I forwarded per rail yesterday a piece of creosoted yellow pine timber, cut from the end of a railway sleeper which was laid down on the Stockton and Darlington Railway, August, 1841. The sleeper is in a state of excellent preservation, save being slightly indented by the chairs, and likely to last many more years. You will perceive that the piece forwarded is as sound and strong as the first day it was laid in the ground, nearly twenty-six years, a period which would have rendered it useless in one quarter the time if laid down in its natural state.

Now, seeing that the decay of timber is gradual, and goes on from year to year, and the creosoted timber is unchanged after twenty-six years, one cannot put any limit to its duration, save from mechanical action, such as small-based chairs, the careless and injudicious manner in which they are fastened to the sleeper in many cases, and suffered to work loose for long periods, thereby embedding themselves. These are causes which, I believe, have never received a sufficient amount of attention, but which can, in a great measure be remedied, but which, no doubt, have often given a bias against creosoting. I believe I may safely say that I have had now as large an experience in permanent way as most men (something like forty years), and have had to do with stone blocks, different kinds of timber laid down in its natural state, cast-iron sleepers, which, by the way, I have taken up, after being down some seven or eight years, half eaten away by the sulphur from the ballast, and I do think that properly creosoted transverse sleepers, of good substance and properly fastened, a double-headed rail, 75lb. or 80lb. per yard, seated on oak cushions, the best and most economical permanent way that has come within my experience.

I am, &c.,
THOMAS SUMMERSON.

Mr. Deas, the engineer of the Edinburgh and Glasgow Railway, has sent us the report of

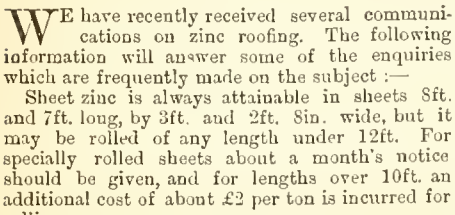
the Cologne International Agricultural Exhibition for 1865, which refers to this question of the preservation of timber. The report, which was drawn up by the Count of Westphalia, juror of Section IV., does not speak favourably of the creosoting process. The committee, however, had very slender evidence presented to it. According to the catalogue accompanying the report, it appears that the sleepers examined were impregnated with the creosote at a pressure of from 60lb. to 65lb. per square inch, and were consequently inefficiently done, whereas they should have been subjected to a pressure of 150lb. per square inch. We, however, have no prejudice for creosoting or any other method, and are only interested in the best ways to preserve timber. It is an important economical question, and we hope shortly to speak of other modes whereby timber is preserved.

ZINC ROOFING.

WE have recently received several communications on zinc roofing. The following information will answer some of the enquiries which are frequently made on the subject :—

Sheet zinc is always attainable in sheets 8ft. and 7ft. long, by 3ft. and 2ft. 8in. wide, but it may be rolled of any length under 12ft. For specially rolled sheets about a month's notice should be given, and for lengths over 10ft. an additional cost of about £2 per ton is incurred for rolling.

The sheets may be laid in three ways, viz., on boards; or corrugated with horizontal supports every 2ft., without boards (see sketch A), or in



what is called Italian-formed zinc, in which a corrugation occurs every 10in., 1ft., or 1ft. 3in., and the corrugation lies upon a light rafter or bearer running lengthwise (see sketch B); in the two latter instances no boards are required, and the Italian forms an excellent roof, and one that looks also exceedingly well. The strength allowed in large roofs for wind and snow will be always sufficient, without adding anything for the zinc covering. The thicknesses to be used should be on boards not less than No. 14 gauge, weighing 21oz. 13dr. to the superficial foot, and without boards not less than No. 15, weighing 24oz., or No. 16, weighing 26oz. 3dr. to the superficial foot. The zinc in common use till within the last seven years, and not by any means abandoned yet, is No. 9, weighing 10oz. 13dr. the superficial foot, which will not answer even if well laid, but laid in the ordinary way is sure to tear itself to pieces and to fail. The metal should be laid so that each sheet is quite free to expand and contract. If engineers and architects will specify the description of zinc, the gauge and weight per foot of the sheets they desire to use, and will add that it is all to be laid "quite free and unconfined, without soldering any joints," they will probably receive a proper material and workmanship. Short-sighted workmen will, of course, object, if they can, to do the work in a way that they are not fully used to, but it is quite certain a neglect of the precautions above-named will cause the work to fail. In flat roofs, if possible, a fall of 6in. on the ordinary length of a sheet should be obtained, and drips should be 2½in. deep, to allow the rolls to pass well under the projecting upper sheet, with its rounded edge. The carpenter will do well to give the zinc-worker notice before he forms his roof, so that these matters may be pointed out; it is too late to correct errors if the zinc worker is only called in when the carpentry is finished. No nail should ever pass through the outer surface of the sheets or roll caps; none is needed, for there are various secure modes of fastening the sheets from beneath. The price of sheet zinc varies with the price of spelter; it has ranged, during the last few years, from £24 to £28 a ton: £26 is an average price, and at this price zinc roofs, of a plain character, may be laid as follows at per superficial foot:—No. 14 at 7d., on boards; No. 15, on boards or Italian, at 7¾d.; No. 16 at 8½d.; but these prices are not measuring all the zinc used, but stretching a line from ridge to eaves, and from side to side, girting nothing, and adding nothing for rolls, caps, welts &c.; thus, any one, however inexperienced, may, by so easy a measurement as this, obtain an estimate of the finished roof he wishes to put up. Flashings and gutters are to be added to the above. If the roof has a fall of 12in. and upwards in the length of a sheet, no drip is required, only a fold at the junctions of the sheets. Lime destroys zinc; it will be well, therefore, that flashings should be pointed in cement. Small portable gauges to test thickness, models, and all detailed information are furnished at once, on application to either of the architects of the Vieille Montagne Zinc Mining Company, Mr. James Edmeston, 5, Crown-court, Old Broad-street, E.C., or to Mr. R. G. Fisher, Parliament-street, S.W., or to Mr. J. W. Tyler, 12, Abingdon-street, Westminster.

NEW HARBOURS, DOCKS, AND BRIDGES.

CONTRACTS are about to be taken for the removal of the present Hutchestown Bridge, Glasgow, and the construction of a new one. The architectural character of the new work will be entirely different from that of the other bridges which span the Clyde at Glasgow, as it will be chiefly constructed of iron. The bridge will measure 410ft. feet in length and 60ft. in breadth, and will comprise three spans—the centre one being 114ft. and the side ones being 108ft. wide. In order to guard against the dangerous effects of alteration in the river beds, which have been so fatal to the present structure, the piers and abutments will be founded on cast-iron cylinders, each 10ft. diameter, going right through the alluvial bed of the stream to the hard substratum of shale covering the coal measures, a depth of about 86ft. below low water. These cylinders will be filled with hydraulic concrete, forming columns of artificial stone, to about 15ft. from low-water mark, after which they will be filled in with solid masonry. Above the low-water level the piers and abutments will be built of white granite, with the exception of the shaft of the central piers, which will be of red polished granite, surmounted by enriched capitals. The abutment piers will be carried up 11ft. above the roadway, forming massive rectangular towers flanking each side of the entrances to the bridge. These towers and the pedestals of the piers will be surmounted by standards of a rich design, bearing each a cluster of three globular gas-lamps. The arches connecting the piers will be of wrought iron, of a slightly elliptical form, so as to give a light and graceful contour, and yet to preserve the important requisites of strength and rigidity. They will be relieved with ornamental cast-iron work. The bridge will be completed in two years. The engineers are Messrs. Bell and Miller.

The directors of the Furness Railway have invited the president of the Liverpool Chamber of Commerce to the celebration of the opening of the Barrow Docks, which will take place on the 19th inst. The two principal docks—the Devonshire and the Buccleuch—comprise 30 and 33 acres respectively, and the total water area of the docks and timber ponds is 105 acres. The wharves and sidings adjoining the docks measure 100 acres, and the sites for the ship yards and works 230 acres.

The British Fishery Society, who are proprietors of Pultney Town, on the south shore of Wick Bay, are engaged in the arduous and important work of constructing a new harbour on a large scale, from the designs of Messrs. Stevenson, of Edinburgh, in the Bay of Wick. This important and almost national work has now been going on for some years, but owing to the great depth of water in which the breakwater is founded (being about 30ft. at low water), and the interruption to the work in consequence of the heavy seas raised by easterly winds, the progress is slow, being only about 200ft. per annum. The contractors are Messrs. A. and K. Macdonald, of Glasgow. This great and difficult work which, when completed, will extend for a distance of 1,500ft. into the Bay of Wick, is proceeding satisfactorily, and, although as yet only about half finished, already shelters a considerable portion of the bay. The seas in the Bay of Wick, says the *Scotsman*, are heavier than those to be met with on any part of the east coast of Scotland, and it is doubtful whether any harbour work has hitherto been executed in a similar exposure; certain it is that the staging of pine timber which has been invariably used in the construction of breakwaters of this country has been found to be wholly insufficient to withstand the seas of Wick Bay, and staging of greenheart oak—a very strong timber—has been substituted. The damage done to the unfinished work during the three years since its commencement has not exceeded £300, which speaks well not only for the character of the work in course of erection, but for the stability of the structure when completed.

At a meeting of the Preston town council last week, a report on certain projected improvements of the navigation of the river, and the provision of more dock accommodation, was submitted. The estimate of cost is from £120,000 to £130,000. It was thought that Preston occupied a very favourable position for the development of a good trade. The consideration of the matter was adjourned for a fortnight.

PRICES OF ENGLISH PICTURES.

THE following "Jottings from the Note Book of an Undeveloped Collector" are taken from a very entertaining article in the current number of the *Cornhill Magazine*:—"Few pictures of modern times have brought larger prices than Turner's. Three of his works, the 'Guard Ship,' for which he got £25, 'Cologne,' and 'Dieppe' (he had £500 for each of these) were purchased in 1848 for £1,500; but at Mr. Wadman's sale in 1854 brought 1,530 guineas, 2,000 guineas, and 1,850 guineas. In 1860 his 'Grand Canal, Venice,' fetched 2,400 guineas, and 'Ostend' 1,650 guineas; Turner had got 400 guineas for the two. But the rage for Turners has, to some extent, gone by; for whilst Mr. Windus in 1850 had given 710 guineas for the 'Dawn of Christianity,' it realized in 1856 no more than 320, and the 'Glaucus and Scylla,' bought for 700 guineas, 280. The largest price, however, I believe ever given for a Turner was that obtained in the May of this year at Mr. Monroe's sale, when 'Modern Italy' brought 3,300 guineas.

"But some very startling prices have lately been paid for pictures by English artists. Holman Hunt received from Mr. Gambart for his well-known picture, the 'Finding the Saviour in the Temple,' £5,500. True, it was the result of six years' labour. The modern system of exhibiting single pictures—'admittance one shilling each'—makes even such a speculation as that of Mr. Gambart's pretty successful. Other pre Raffaellite paintings bring much more moderate sums. Hunt's 'Scapegoat,' for instance, which figured in Miss Florence Claxton's amusing 'Choice of Paris,' in the Portland Gallery, 1860 was sold at Mr. Windus's sale, 1862, for 497 guineas. The same sale disposed of Millais' 'Ophelia' for 760 guineas; and another sale the same year of his 'Black Brunswicker,' for which Mr. Flint had given £1,000, for 780 guineas. But perhaps the most fortunate of all our modern artists is Frith. Omitting his 'Derby Day,' may mention his 'Railway Station,' for which Mr. Flatou paid 8,750 guineas—the largest sum surely, up to that time in modern days an artist has received for a single picture. One of the items of the agreement was that Mr. Frith, though an R.A., was not to send his picture to the Academy He was engaged two years over it. Even here somebody seems to have made a good speculation for Mr. Graves, to whom the picture now belongs has just been assuring the authorities of Marlborough street that it cost him, copyright and the right of publishing included, £23,000. In 186 Mr. Gambart commissioned him to paint three pictures, 'Morning,' 'Noon,' and 'Night in London'—the sum to be paid being 10,00 guineas. Before, however, this commission was executed, her Majesty engaged him to paint picture of the 'Marriage of the Prince of Wales for £3,000. Mr. Flatou further purchased the copyright of the picture for 5,000 guineas.

"The difference between the prices at which such pictures are acquired, and those they fetch when brought to the hammer, is amusing. Raffaelle, declared in the auction-room to have cost its late owner 1,000 guineas, sells for £37 A Yorkshire gentleman bequeaths twelve of his pictures to the National Gallery; they are rejected every one. The whole collection is brought to the hammer; it had cost £3,000; it produced £150—about the value of the frames. Nor is it only in England that a man sells a horse for gross of green spectacles. A French collector insures his gallery for 3,339,500f. It is sold some years afterwards, numerous additions having meantime been made to it, for 535,435f. And one cannot imagine in these cases that there

any such possible explanation as in the case of the Earl of Suffolk's ten pictures—Guido's 'Ecce Homo' amongst them—that were stolen so mysteriously from Charlton Park in October, 1856, and not recovered till the early part of 1858, when some of them had been hanging in a small public-house and an old picture-shop, but failed to meet with purchasers, as they were considered such very inferior productions! Many of the pictures brought into England are most likely re-exported. One day I was in a well-known warehouse in the City, when, on turning a corner, I knocked down what in the imperfect light seemed to be a valuable landscape. Knowing the art propensities of some of the partners, I was really afraid I had committed some perhaps irreparable damage; but a young man who came to my rescue soon reassured me. 'Never mind, sir, we have plenty of these—we deal in pictures.' Wholesale of course, as it was a wholesale house. Accordingly I was soon introduced to a large collection. On my pointing to one, and saying if I bought any I should buy that, my friend said, 'We can do you that cheap; frame and all, thirty shillings.' Those pictures were exported principally to Australia. A story is told about the late W. Hope, the wealthy banker of Amsterdam, and one of his purchases. He had bought a picture as a Rembrandt and given 2,000 guineas for it. Finding that it did not quite fit the frame, he sent for a carpenter to ease it a little. Whilst watching the operation he remarked how wonderfully the picture was preserved, considering that it was nearly 200 years old. 'That is impossible,' said the carpenter. 'This wood is mahogany; and mahogany had not been introduced into Europe at that time.' Mr. Hope burnt the picture."

THE MONT CENIS RAILWAY.

SCIENCE, says a contemporary, has achieved a triumph in the passage of Mont Cenis. A railway train has crossed the mountain barrier, traversing the ridge from Saint Michel, in Savoy, to Susa, in Piedmont, and that transit is a lesson in engineering. If Mr. Fell's locomotive can climb and descend steep ascents like a fly, by virtue of a central wheel working on a middle rail, tunnels will become needless. There are few ranges which cannot be overcome, and the problem of Alpine railways is solved. We owe this result to the genius and perseverance of Mr. Fell; who, having perfected his engine by experimental trips in Derbyshire, has now made it available on the Alps. Napoleon the First said than wherever two men can pass a road is open to an army; and Mr. Fell may say that since he has conquered Mont Cenis every practicable pass in the Alpine ranges is at the service of the engineer. The great tunnel through the Western Alps is a monument of waste, for the summits can be crossed at far less expense. In consequence of Mr. Fell's success, the direct route from Calais to Brindisi will be open in a month, and Italy will have resumed her place as the road to the East.

The total length of line from St. Michel on the French, to Susa on the Italian side of the pass, is 48 English miles. Halfway in point of distance between St. Michel and Susa is Lanslebourg, the village of France nearest to the Italian frontiers. St. Michel is 2,493 English feet above the level of the sea, but as Lanslebourg is 2,099ft. higher, the rise between these two places are very gradual, and during the greatest part of the distance horses conveying carriages are never out of a trot. The summit of the pass is 6,332ft. above the level of the sea. It is distant from Lanslebourg 6 English miles; consequently, 2,240ft. in height must be ascended at an average gradient of 1 in 14. From the summit to Susa the distance is 17 English miles, and the difference in level is 5,140ft. The average gradient is, therefore, 1 in 17, but as a length of nearly three miles is comparatively level, the remaining portion has an uniform gradient of 1 in 12. To a person coming from Susa the rise and descent would, of course, be the reverse to those of a person going from Lanslebourg to Susa. This section—the section from Lanslebourg to Susa—will be ready for traffic shortly, and the opening of this portion, in the first instance, will be important in many respects, but especially as it will be at once put to the severest test the efficiency of the Fell system. The section from St Michel to Lanslebourg being that which suffered so severely from the inundations of last year, will not be ready for traffic until September, by which time it is expected that the line will be completed from end to end. When this is so, the distance, which is now accomplished by courier-diligences in never less than 9 hours, and is often 12, 13, or 14, will be travelled in 4½. The existing traffic across the Mont Cenis is, perhaps, the largest road traffic in the world. The average daily number of passengers that have crossed it in both directions since the commencement of April this year has been 220; tonnage of goods, 120 tons per diem. About two-thirds of this tonnage goes from France to Italy, but, on the opening of the railway throughout, it is expected that, even allowing for considerable expansion of business from France to Italy, goods that now cannot be sent from Italy on account of the high rate of transport, will be conveyed to an extent sufficient to nearly equalize the transit in both directions. The number of horses now engaged in the conveyance of passengers and goods across the Mont Cenis is about 1,200, and allowing ten miles a day for each horse, it gives a daily average across the mountain of 12,000 miles.

THE QUESTION OF QUANTITIES.

BUILDERS are unanimously agreed that there are few questions of similar importance to them, in a trade point of view, to the question as to architects' bills of quantities, and the agreements which builders have to sign for their contracts. They hold that this matter affects them much more than the consideration of an hour or two less work a day, or a few shillings more a week. And it is, perhaps, not too much to say that there is not a single builder who so looks upon the question of quantities and agreements as one of paramount importance, who is not also convinced that the present practice in regard to both matters is most unsatisfactory, as far as builders, at least, are concerned. The question has been mooted, and the practice strongly objected to, at meetings of the trade all over the country; and although numerous suggestions have been thrown out with a view to bring about a more satisfactory system, nothing beyond loud objections and protestations has been arrived at. At the half-yearly meeting of the Yorkshire branch of the General Builders' Association, held the other day, the subject was again discussed. It was introduced by Mr. Croft, of York, who asked whether any action had been taken by the Association in regard to it. It appeared not; the Association for some time past has had its hands too full of the trades' union business to be able to attend to much else. The subject, however, was not introduced in vain, since it afforded an opportunity to various speakers to state their experience with regard to contracts. Mr. Neile said the question appeared to him to be one of paramount importance, for there were many members of the trade who had obtained a little money and had been stripped of every farthing they had made through unsatisfactory contracts and bills of quantities. It was a practice that had been productive of great evil, and was fruitful of danger to builders, on whom it was incumbent to have the bills of quantities specific, and the contracts guaranteed. He suggested the appointment of a solicitor for every few towns; when an agreement of any importance was about to be signed, let it be sent to him, and if the quantities were not guaranteed, then let it be sent back to the architect. Mr. Croft instanced a case in which he had taken a contract, and found that the quantities were wrong. Mr. Woolley, of Leeds, remarked that under the present practice they had bills of quantities supplied by which they could not tell whether a particular item would cost them £50 or 50d. He had, the other day, sat down in an architect's office to read a form of agreement, to see that the quantities were guaranteed before he signed it. The architect said, "You are the first builder that ever sat down in my office to read a form of agreement. It is fair to you and fair to our clients that the quantities should be guaranteed, and I hope that the builders would bring their influence to bear upon the appointment of a surveyor to make bills of quantities." Mr. Beanland, of Bradford, also spoke on the question. He hoped that if contracts were sent to them, and the quantities were not specific, they would send them back, saying that they could not sign them on that account. He remembered the time (twenty years ago) when quantities were not supplied at all, and when nine or ten builders would all go to an architect's office and struggle for who should first see the plans and specifications. The fact that now they had quantities supplied, and the fact that they could get a seat in the office of the architect, showed that they had made an improvement. In bills of quantities that were supplied by the London surveyors, they always found them accurate, because the surveyors knew that their reputation was at stake. A suggestion was made by Mr. Latham, of Wakefield, who recommended that general forms of contract should be issued by the General Association, so that they could be carried out in small localities, where at present different forms were sometimes sent to those issued for the large towns. Mr. Mault said, as far as he was able, he would take care that the General Association did not lose sight of the question. He did not, however, see the practicability of the General Association using one unvarying form of contract, but he thought that they might issue a schedule of clauses that ought to be inserted in all agreements, and that each local association should appoint a solicitor to examine the contracts, as they had done in Birmingham. The clauses that should be inserted were a strike clause, an arbitration clause, and a clause making the quantities part of the contract, and the local solicitor should see that they were embodied in every contract.

WATER SUPPLY AND SANITARY MATTERS.

THE DRAINAGE OF SEA-SIDE PLACES.—An important sanitary reform has been effected at West St. Leonards, Sussex. Hitherto, like most sea-side places, St. Leonards got rid of its sewage by discharging it into the sea by nine long dirty tubes which greatly disfigured the shore. These tubes have now been removed, and all the sewage and drainage from the town is conveyed into a large reservoir formed on the beach westward of Bopeep railway station. This reservoir is so constructed as to contain within it all the sewage until the period when the tide turns westward, and by the strong sea current of the ebb tide it is then carried miles away to sea in the direction of Beacheyhead never to return; the reservoir is again closed before the tide turns towards St. Leonards and again twice during the 24 hours receives the sewage of the town, preventing its discharge into the sea, even at a distance from the town, excepting at that period when the receding tide sweeps it far away into the ocean. The works have been executed under the direction of Mr. J. W. Bazalgette, the engineer to the Metropolitan Board of Works, who designed the plans

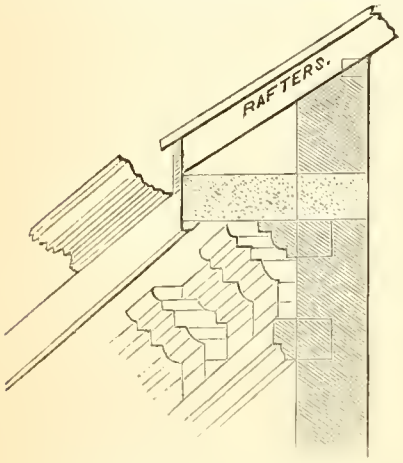
The monthly meeting of the Cheltenham Commissioners took place on Monday, when a report from Mr. Bateman, C.E., was read. It substantially confirmed the scheme of Mr. D. J. Humphries, the borough surveyor. The report had been under the consideration of the Sewage and Drainage Committee, who were unable to make any recommendation, the Board having rescinded a resolution adopting their recommendation for carrying out the irrigation plans of the surveyor; so the committee referred the report for the consideration of the Board. Mr. Harford thought that they were fast drifting into the same position as Leamington with a sequestration of the rates. Mr. Davies said that the cases were not analogous. Leamington had no power to discharge sewage into the stream, whereas such power was given to Cheltenham by the local act, and before any injunction could be obtained, that point of law would have to be settled. The consideration of the report was adjourned to the next meeting, and it was ordered to be printed and circulated.

By Dr. Frankland's analysis of the water supplied by the London companies it appears that both the New River and the East London waters contained in 100,000 tons 23 tons of extraneous matter, the other companies still more, while the West Middlesex water contained 29 tons, and the Kent 40 tons of stuff of various kinds. The previous sewage contamination of all the waters at the time of analysis had apparently been converted into innocuous compounds. By this test the East London waters were then the best, the Chelsea and the Kent waters the worst of the eight. The turbidity of the Southwark water implies some defect in the process of filtration.

The removal of the huge brick screen in front of Burlington House has been commenced. What is to become of the grand Doric colonnade "borrowed from a palace by Palladio at Vicenza?" it is asked.

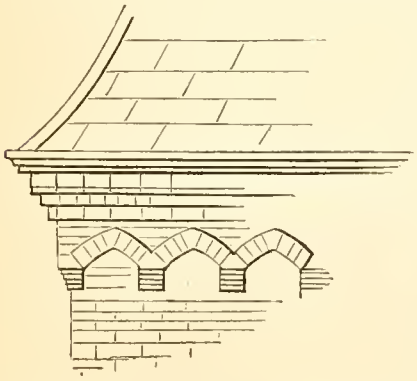
CONSTRUCTIVE AND ÆSTHETIC DESIGN.—No. III.

REVERTING to the subject of brick and stone design, it may be as well to remark the simplicity and homogeneity of material that have become leading characteristics of modern taste. We have briefly alluded to the eclective replacement of constructive for fictitious features—the displacement of counterfeits for realities—a change in our mode of building that has been accompanied by a growing preference for simple over complex constructive systems. Since our forefathers of the middle ages built, our experience and science have multiplied to an almost illimitable extent the materials and appliances of building at our command, and yet we cannot shut our eyes to the scientific use and assignment all these varied aids are beginning to take and occupy in the great economy of art. In one word, we give to each material and feature its full use and its unrestricted artistic value. We are not ashamed of showing unequivocally that our chimneys are chimneys, our roofs coverings, and our brick walls brick walls, and nothing else. Where a difference of construction or condition is necessary in the same structure, involving distinct materials, we openly exhibit the distinction, without endeavouring to merge them by disguises or to overrate one by sacrificing another. Hence the homogeneousness of our architecture is never obtained at the expense of truth, as formerly it was obtained, but by the unlimited employment of materials according to their natural qualities and intrinsic merits. We have already spoken of the almost entire substitution of brick and stone in lieu of cement for fea-



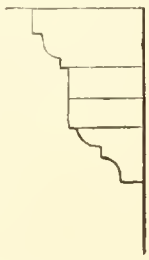
tures appertaining to our walls, and it is somewhat hard to say for how much of this change we are indebted to constructional abuses, and how much to improved manufactures, such as moulded bricks, cast iron, &c.

Taking the case of overhanging eaves cornices, ordinarily we have a wall to finish and cover, whereas on the abused parapet and con-



cealed gutter system the wall was distinct, carried up and coped with stone or rendered in cement. In the last case, if bricks were used, the cement finishing was absolutely necessary to prevent the natural gravitation of heavy rainfalls or soakage of wet into the upper rooms over the windows—a source of dampness not always discerned, and very often wrongly ascribed to the overlaying gutter. Even with our present knowledge, when we do resort to copings and parapets, this evil is not always considered. A slate or damp-proof course is as necessary in this situation under the dripping clouds as it is above the footings, for it must be remembered we have gravitation as well as capillary attraction to guard against. Chimney stacks and all absorbent masses of brickwork, &c., rising above the roof should be rendered impervious at a proper level.

It is alone in the eaves cornice, then, overlaid by the roof, that we can safely have recourse to bricks and porous kinds of stone as finishings to our walls. Effectually covered, bricks in all their moulded varieties can be so arranged as to produce a most pleasing effect, plain and square members being obtained by the intervention between the moulded ones of lain bricks. The interspersion of stone corbels under the corona in lieu of brick ones between the running members produces a charming variation, and with these substitutions the variety of brick mouldings may be very limited.



The intersertion of a continuous stone member as the corona would often serve to mark with more emphasis the eaves, particularly when red brick is the material, while its expense in most districts would not deter its use. To sum up the advantages the projecting eaves cornice possesses over its delusive rival as recommendations for its general adoption, we have—

1st. Its more adequate fulfilment in throwing off rain and snow falls.

2nd. The more effectual covering it gives to the walls.

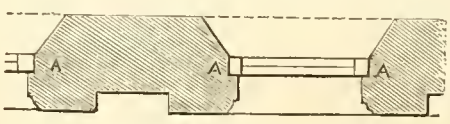
3rd. Its simplicity and cheapness.

4th. Its avoidance of a concealed gutter.

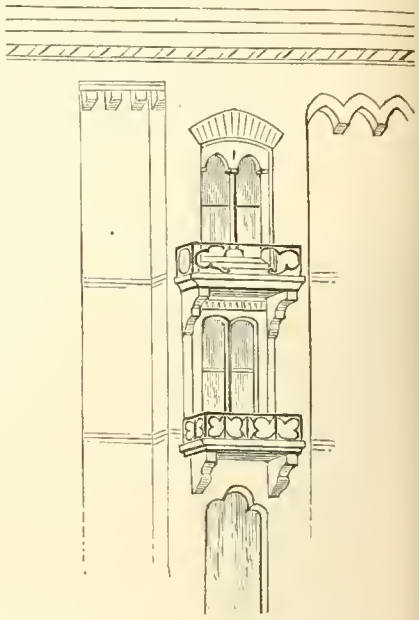
5th. Its truth and homogeneity compared with its counterfeit rival.

We are not, like the Orientals, addicted to use our house tops, for very obvious physical reasons; and it would be as well if the weathering and drip were a little oftener in our mind's eye.

Before leaving the subject of wall construction, I may here allude to a plan of thickening walls just where they require lateral strength and increased footing area, namely, the window or inter-pier spaces. As window openings are generally arranged one over the other, and often with very small interspaces of walling, the aggregate weight of roof, floors, and wall must be directly thrown upon points directly beneath the pier footings; and when this weight is not transmitted equally over the entire area of footing by inverted arches, an expedient not always deemed desirable, the uncertain nature of these intermittent pressures, combined with possible inequalities in the subjacent strata, render a plan of equalizing the weight and adding to the lateral stiffness of the fenestral spaces and jambs important. And the constructional necessity of such a plan is at once suggestive of, and leads to the adoption of, a very pleasing mode



of vertically connecting the window apertures seldom adopted in England but commonly seen among our French neighbours. Besides the increased footing area this thickening gives at points A A, which do not generally directly participate in the superincumbent weight, it also allows us to reduce our interfenestral walling and to deepen our jambs and reveals for effect. If red bricks be used for the wall intervening, these external window jambs or projections could be relieved in white brick, the recessed wall spaces being brought out under the cornice by moulded work or corbels; or the projections might pleasingly



break the line of curves by continuing up and forming gables.

It may be noticed here *en passant* that the spread of footings should be directly as the height of wall and weight it has to sustain and inversely to its thickness—a self-evident proposition, though I suspect often strangely overlooked in the complications of modern design, particularly among those addicted to the overbeaded irregularities of the Gothic style.

TWICKENHAM CHAPEL AND SCHOOLS.

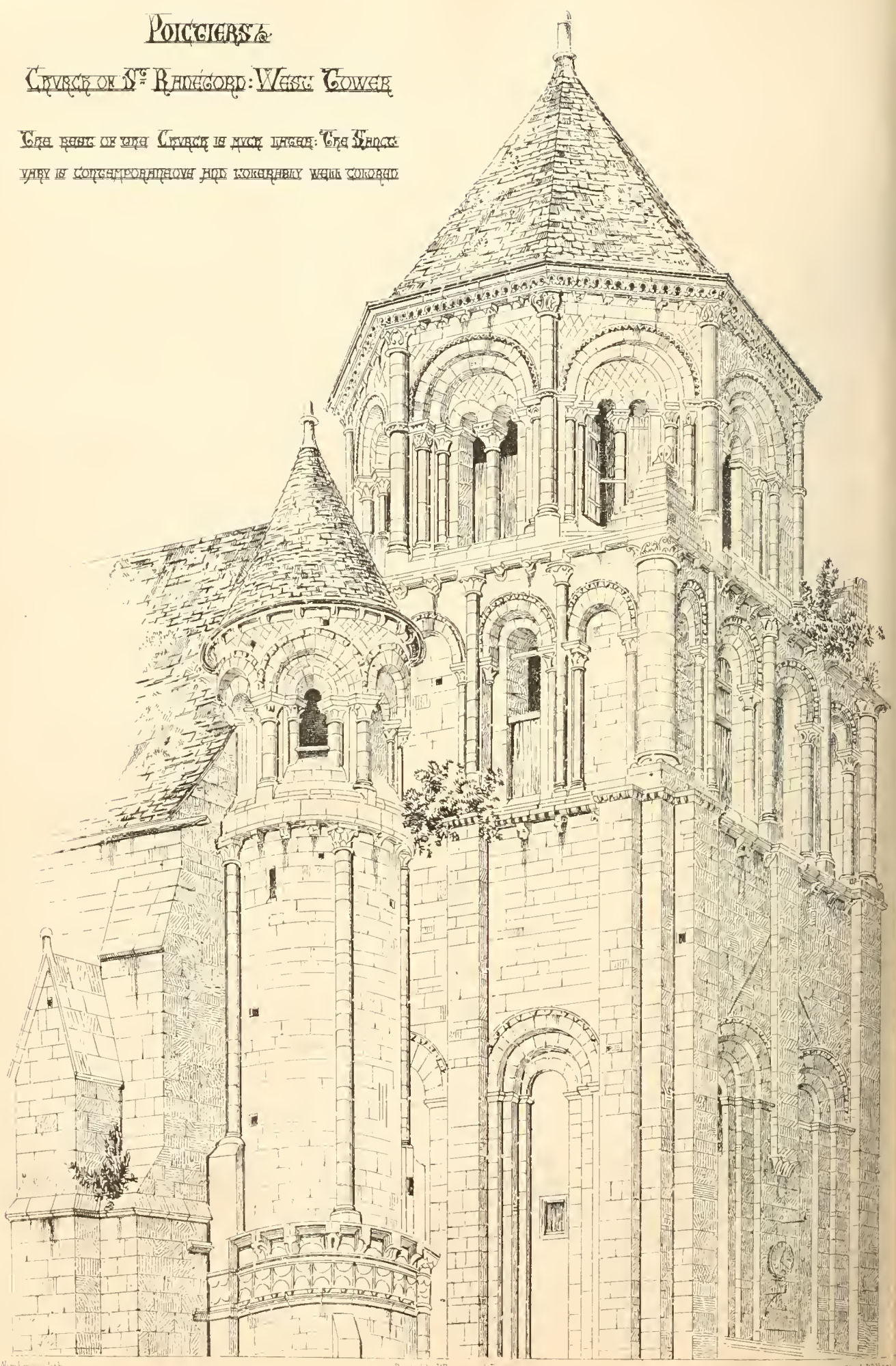
FACING the green in the pleasant hamlet of Twickenham stands the Congregational chapel and schools which have lately been remodelled and extended. One of our engravings this week illustrates these buildings in their new form, as well as that in which they appeared previous to the alterations. "These buildings present," says the *Congregational Year Book*, "an example of very successful planning and effective grouping and were designed with a view to making available, as far as possible, the old buildings and materials;" and this object the architect seems to have attained, at the same time succeeding in covering these old bunes with more fitting and seemly garments. The various parts of the buildings are so disposed as to range round three sides of the site, embracing a garden court opening out to the high road. The materials employed in the construction are yellow bricks, with dressings of stone and red brick. The roofs are open framed timber, ceiled between the rafters, low the seating the floors paved with tiles arranged in patterns, the windows glazed with cathedral tint quarries of various hues in geometrical designs. The warming is by means of hot water, and lighting by pendents from the roof, the latter executed by Messrs Peard and Jackson, the former by Mr. J. W. Smith. Mr. Nye, of Ealing, was the contractor for the building works, and the whole have been carried out under the superintendence of the architect, Mr. M. P. Manning, of Mitre-court Chambers, Temple, E.C.

The new Pier Company at Brighton have commenced the rather novel practice of hiring a band to play sacred music on the pier on Sunday evenings, and the result is that many thousands of persons flock there every Sunday evening, by paying twopence each. This, though regarded as an innovation by many, will be the means of making the erection of the pier a good speculation. The music, however, for want of a structure or sounding board of some sort to cover the band is lost to the mass of the listeners. The light from the lamps might also be economized.

Poictiers

Church of St Radegord: West Tower

The rest of the Church is much later: The Sanctuary is contemporaneous and tolerably well colored



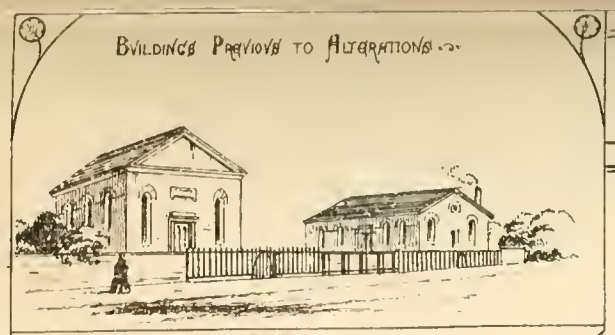
E. Winbridge lith

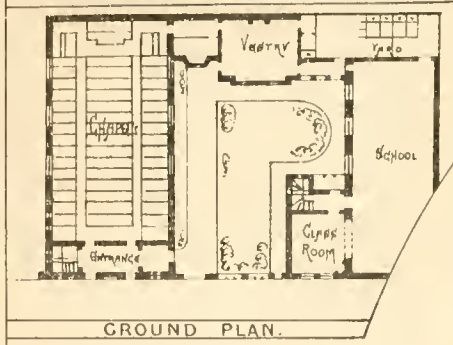
Printed by Whiteman & B...

W. J. Willcox

Twickenham Congregational Chapel and Schools.

M. P. MANNING, ARCHT





GROUND PLAN.

INTERIOR VIEW.

F. Wimbridge, lith.

ON THE APPLICATION OF PHOTOGRAPHY IN ARCHITECTURE AND ARCHÆOLOGY.*

IN reference to the delineation of monuments, better examples cannot be found than two of great note and importance which have come under my own notice, and which, having been difficult of access, have been seldom seen, namely, the Sesostris or pseudo-Sesostris, and the Niobe or Cybele, both in Asia Minor. As good an engraving as can be found of the pseudo-Sesostris is that of the distinguished archæologist, Charles Texier, who was so lately in this country to receive the gold medal of the Royal Institute of British Architects, which he has so well earned. There are few men who have seen so much of Asia Minor as M. Texier, and there are few men who have described so much. There are many places in the interior where he has been which, in all likelihood, will seldom be seen; and we are, therefore, greatly indebted to him for the works which he has given us on a large scale for the learned world, and in a cheaper shape for popular use. If, therefore, any remarks are made as to the monument now spoken of, it is not by way of lessening the merits of such a man; it is rather to show the results which so commonly happen under circumstances such as I have already portrayed. First of all, taking up an outside trifle, the rock around the relief is made to look like a hard stone. Next, the monument is made five-cornered, of a regular pyramidal shape, and having a pyramidal top. The figure is well set on a long raised base. The man stands upright, holding a smart spear in his left hand. The bow in his right hand is a smartly-marked triangle. Between the spear and the face are some fairly-wrought figures or hieroglyphs. The cap is a narrow cone; the man has a straight nose; the muscles of the arms are fairly drawn, with the fingers marked out. The man is clad in a short frock, the hem of which comes slanting across his thighs. The figure is a neat low relief, on a flat surface, presenting the appearance of good Egyptian work. It is only fair to M. Texier to say that something of this kind is to be found in every book of travels where the monument is drawn. It is possible that in most cases the draughtsman has thought himself called upon to settle the roughnesses, wants, losses, and ill-defined lines of the monument by reference to its original type of Egyptian, because there is no room to doubt that this is one of the two monuments, written of at some length by Herodotus, which, he states, illustrates the northern progress of Sesostris. Herodotus not only gives a description of the figure, and says the dress is half Ethiopian and half Egyptian, but he says that on the breast of the figure, and passing from one shoulder to another, is the inscription in hieroglyphics, which says, "With my own shoulders I conquered this land." Now it may be as well to say—and this is one thing among others, which leads me to doubt whether Herodotus saw the monument—that the breast of the figure can never have had any inscription upon it. Herodotus says that some who had seen this figure and the other in Ionia had held them to be that of Memnon, but this he holds out against stoutly. That they are Egyptian Herodotus and those of his day strongly believed, though we can see that even then there was no settled knowledge of the history of the monuments. Diodorus Siculus tells a like tale, and gives an inscription. These things being so, every one thought it was his bounden duty to bring the whole to an Egyptian standard. Lepsius, who has seen so much in Egypt and written so much, also wrote a memoir on this figure to the Royal Academy of Berlin, in which he lays it down that the monument is that of Rhamses Sesostris. All this is well worthy of attention, because it will show that the draughtsman must not lean on the writer, but stick closely to what he sees before him, whatever the greatest writers and all the best authorities may say. It seldom happens that an architect or artist, however learned he may be, can have such close knowledge of subjects, written in several languages, as to be able safely of himself to come to an independent judgment on the questions that arise. As, therefore, if he deals with them, he must be a blind follower of the blind, of the one-eyed, or of the seeing, it is far better instead to keep to his own calling, and to do what the writer cannot do—give a true and lively drawing of what he sees, leaving others to dream.

Having shown what the Egyptian school thought they saw at Ninfi, let us now look at another school. M. Kiepert, the learned geographer of Asia Minor, saw the monument in 1842, and he was led to doubt its being Egyptian. He made his own drawing, which may be seen from his own hand in Carl Ritter's Geography of Asia Minor, plate 3, with a few notes of description at p. 1024, referring to his memoir read before the Berlin Academy. First, again, as to the shape of the niche, Kiepert, unlike Texier, does not make it five-sided, but four-sided; the three upper sides are curved. The figure has quite a different cap. This cap is ornamented with four rows of dots, and in front is a large curved decoration, where Texier has only a projection. The arms are thickly and roughly made, unlike Texier's, but also with fingers. As to face, there are better eyes, nose, mouth, and chin than Texier's, and the nose is hooked, instead of straight. The difference as to the spear is this—Kiepert has only a plain shaft or pole without spearhead; Texier gives a spearhead. As to the bow, Kiepert makes the straight part the bow, and Texier the string. Kiepert's bow is hidden behind the right arm; Texier's string is shown as passing under the elbow. Each shows at the lefthand side a handle, which each makes otherwise, and which Texier calls a "sagaye." As to dress, instead of Texier's short frock, Kiepert clothes his man in breeches. Kiepert shows very nearly the same hieroglyphs or symbols as Texier, but he puts them in a frame, shield, or cartouche. We have now before us drawings of the same standard monument, by two men of great knowledge and learning, earnestly wishing to spread truth and enlighten the world, and they have been followed in several works. Readers may well ask how it can be that two truthful men with eyes in their heads can have seen things altogether different. How can it be that one can have seen five sides to the niche, and the other four. To say nothing of the details here spoken of, Kiepert's is more of a sketch, Texier's more of a finished drawing, but five sides and four sides cannot both be right. There is no need to think that either saw anything else that the other did not, or that either saw one whit otherwise, or that Texier or Kiepert went out of his way for the sake of falsehood. It is in the handling that the mischief has happened. First of all, the carving is on the steep side of a narrow dell, hard to get at when you are there; and the whole is at most times overgrown with bushes and scrub. Part of the time would be taken up, it seems from the drawing, in clearing away the bush. Now, as the figure is quite out of the way, as it is a long pull from the morning's start, and so again to the morning's rest, and as the hills have none but shepherds on them, who are looked upon as robbers; and as the Greeks and Jews, who are taken as dragomans or guides, are afraid, the traveller, who goes there, will very soon be started off by his leader without much time for drawing. Indeed there is so much dislike to go there that Ernest Rénan and other travellers who have wished to see the pseudo-Sesostris have been led past and missed it. It is most likely that Texier and Kiepert made very fair sketches, and perhaps the sketch of each was much alike; but it is the handling and working out which put the two so far apart, passing into the hands of draughtsman and engraver, and even through that of the traveller himself, and being at length trimmed according to pattern. In going through this, as M. Texier fully believed in the Egyptian, his engraving would become more and more Egyptian, his niche would be brought to its five-sided pyramidal shape from the ill-defined top-line, his pole would make a spear, and his cap would conform to his text in having an Egyptian character. The more M. Texier wrought up his authorities when he got home, the more was he strengthened in his Egyptian belief. He saw the *uræus* on the cap, and he was not even staggered by the turned-up points of the shoes. Any anomalies he settled by Herodotus, who had said the garb was half Egyptian, half Ethiopian. M. Kiepert dealt in the like way, for the more he thought about it at home, the more his mind was made up: the man was Assyrian and not Egyptian. His dress is brought near to the look of trousers so as to be Asiatic, and his cap is bedecked with four rows of spots and a hook or horn, which brought it nearer to that of the kings on the Yazili Kaya. As his drawing was put on the same plates with several other Assyrian drawings, it could hardly happen otherwise than that the engraver would deal with all much alike.

Such were the materials the learned world had before them when called upon to settle whether the monument was Egyptian or Assyrian. Those who followed Dr. Lepsius dwelt on the Egyptian feeling of the drawing of M. Texier; those who belonged to the rising Assyrian school looked upon the draw- of M. Kiepert as showing fully all they wished to lay down. Upon the settlement of this it turned whether the bounds of Egyptian were to be carried so far north as they had always been held to be since the time of Herodotus, or whether, with the new light we had got as to Assyrian art, we were to carry the bounds of Assyrian art forward and blot out so much of Egyptian. There was, however, in truth, no settlement which could be come to when the drawings were so unlike. Such is a fair picture of what happens—either what ought to be very clear remains unsettled, or some man of weight lays down the law on one side, and he is followed for years, and the more so if he is the writer of a book which has a great sale. There is no getting the world into a robber's den in Ionia, to sit down steadily before the rock, and say what it is. They will not go there.

As in the course of my investigations in Asia Minor I had the opportunity of getting this monument photographed by Mr. Svoboda, it may be as well to bring the photograph and the engravings alongside. The niche is, then, neither five-sided, nor as drawn by M. Kiepert. It is a very rough rhomboid leaning towards the right. The character of the niche is of some interest, because it is like that of the Niobe and of some inland at Pterium, &c. The man does not stand on a pedestal; there is nothing of the kind. The rock is not a hard stone, but a wormed-out gritty sandstone, never good in the beginning, and always wearing away. This the photograph shows to the glass as no engraving can so well give; and it is such a stone as the Egyptians would not shipwreck work and skill upon, when, instead of lasting for hundreds of years, it would be furrowed and waterworn by the next shower. It was no cunning school of workmen by which this figure was wrought, but by men careless of art. As to the cap, neither gives the shape right; and there cannot have been four rows of dots, as the stone will not bear such working. The dress of neither drawing is right, and there are on the figure marks of boots, but the figure may have been retouched. The symbols or hieroglyphics do not stand in any frame, and it is very uncertain what they are, if anything; nevertheless, theories have been raised upon the bird. The spear is much broken, and never seems to have been straight. The whole work is very rough, after allowing for hurt from weather,

* Continued from page 600.

mischief, and retouching; while M. Texier's text says it is rough, and his drawing shows it smooth. M. Kiepert's sketch, being slighter, sets it in a truer light. It is the photograph, however, which gives the most faithful record, even to every bit of the stone. We cannot blame M. Texier, or anyone else, for not giving a close copy of such outside things as this; but then it must be borne in mind that photography does give us the substance as well as the form, and in art material has great influence. We may look for a style of ornament in plaster which we cannot get in stone or in brick, and the question of material may sometimes settle that of style. In the pseudo-Sesostris we have a rock so vermiculated that the practised eye of Mr. C. Newton thought he saw tokens of Phœnician writing. In this photograph, Mr. Svoboda has gibbeted in notoriety a high Dutch schoolmaster and some others, who have scribbled there their worthless names. It may be enough shortly to say that although we cannot take M. Kiepert's witness any more than that of M. Texier. M. Kiepert is right, for the non-Egyptian character of the monument and the fact of its not being that of Sesostris must be allowed, and we can fairly put it in a class allied to the Assyrian, which I have named Lydo-Assyrian. The photograph is very unlike any of the engravings hitherto given to the world. So far so good; but we have another risk, and that is photographic reproduction, or, rather, photographic printing. The copy of the photograph communicated by me to the Revue Archéologique, printed by a peculiar process much patronized in France, is not satisfactory; but that which was printed at Calcutta at the Government Press, to accompany my paper to the Royal Asiatic Society of Bengal, is very indistinct, and may give wrong ideas. This may further be said, the man who brings a photograph to correct the drawings, sketches, and engravings of others is by no means welcome. It is not a pleasant thing for a woman's looking-glass to go bad and show her wrinkled and pimpled, and it is not a pleasant thing for the owner of a costly plate to have it stamped as a falsehood. Some people, however, are not so much put out by truth. A distinguished numismat of my acquaintance told me that he liked a pen and ink sketch of his fellow-traveller—which was quite wrong, by the bye—better than my photograph.

HYDE CLARKE.

MANCHESTER NEW TOWN-HALL COMPETITION.

THE first stage of this important competition has now been passed. According to the official report of the city surveyor, the exact number of competitors was 123, who sent in 137 sets of designs. At a meeting of the New Town-hall Sub-Committee, held on August 14, the mayor submitted for consideration a list of 21 sets of plans, together with a report made by the city surveyor as to the extent with which the conditions in the instructions had been complied with in respect of such plans, it being stated that any other numbers might be suggested by any member of the sub-committee for report by Mr. Lynde, and consideration at a subsequent meeting. It was resolved that the following numbers be provisionally selected for the second competition, viz.:—No. 14, 74, 98, 115, 120, 129, 67, 131, 143, 46, 90; and that the members of the sub-committee be requested to send in to the mayor, before the end of the week, the numbers of any other designs which they may desire to submit for report and consideration at a meeting to be summoned for Tuesday, the 20th ult. At this meeting accordingly the city surveyor submitted, as desired by different members of the sub committee, his report on the plans numbered 2, 8, 26, 42, 43, 51, 55, 89, 118, 136, 139. It was then resolved "that the plans sent in by architects, and numbered 26, 42, 55, and 89, be added to the provisional list for further consideration. That it is expedient to obtain the assistance of a competent professional gentleman in the selection of the designs of which authors shall be invited to send in plans for the final competition. And that the chairman be authorized and requested to invite Mr. George Godwin (the editor of the *Builder*), to visit Manchester on Monday or Tuesday next to inspect the designs, and give to the sub-committee his advice and assistance in the selection of the designs which shall be recommended for approval to the general committee."

From the record of a third meeting, which took place on August 27, we learn that Mr. Godwin attended, and reported that he had carefully examined the designs of the New Town-hall, and having, as far as practicable, made himself acquainted with the requirements of the corporation, for which it was desired to make provision in the proposed building. He submitted for the consideration of the sub-committee the following designs, sent in by nine authors, as possessing in his opinion the greatest merit, both as regards beauty of design and satisfactory and practicable internal arrangements, viz.:—Nos. 46, 55, 67, 74, 82, 89, 98, 99, 120, 119, 134. The meeting then resolved that it be recommended to the committee to approve of the selection suggested by Mr. Godwin, and to invite the authors of such designs to send in plans and finished drawings in final competition for the New Town-hall: and, that the best thanks of the sub-committee be presented to Mr. Godwin, for his prompt compliance with their request to come to Manchester to inspect the designs, and for the very satisfactory and valuable information he has afforded them.

The Mayor submitted a report from the City Surveyor, to the effect that the author of the design No 82 had not complied with the instructions in his arrangement for the accommodation of the treasurer's department, which he had placed on the main floor,, instead of, as required, on the ground floor. The committee then state that they have, therefore, adopted the recommendation of the sub-committee, except in so far as relates to the design No. 82, and they have, subject to the approval of the council, selected the eight authors of the designs numbered 46, 55, 67, 74, 89, 98-99, 119-120, and 134, to send in plans for the final competition. We believe we are correct in stating that the following are the names of the architects who have been selected for the final competition:—Mr. Alfred Waterhouse, London and Manchester; Mr. F. H. Wyatt, Great Russell-street, London (two designs); Mr. Cuthbert Brodrick, London and Leeds; Mr. Thomas Worthington, Manchester; Mr. Edward Salomons, Manchester; Mr. William Lee, Cornhill, London; Messrs. Speakman and Charlesworth, Manchester (two designs); and Mr. John O. Scott, Charing Cross, son of Mr. G. G. Scott, R.A. Each of these gentlemen will receive £300 on furnishing complete designs for the second and final competition. For the final competition no period has been fixed, but it is believed that it will not be less than three months. The designs will again be sent in under incognito mottoes to await adjudication.

The following are such particulars as are at present known of the selected designs.

No.	Motto.	Style.	Estimate. £
46.	St Michael	Gothic	170,000
55.	Ring out the old, ring in the new	Gothic	275,000
67.	A black ball within a white, and a black ring	Gothic	198,935
74.	Time tryeth truth	Gothic	206,175
89.	Polyanthus	Gothic	229,310
98.	Municipal	Gothic	246,850
99.		Italian	259,444
119.	Three Hebrew letters	Gothic	207,106
120.		Italian	236,403
134.	Au bon droit	Italian	199,888

In reference to this matter "A Competitor" writes to us as follows:—"Understanding that Mr. Godwin, of the *Builder*, has recommended certain of the plans submitted in this competition for the final competition, I venture to suggest that his report be published, in order that the other competitors may be enabled to judge wherein they have failed."

Another correspondent, "Not a Competitor," says:—"The result was known last Thursday. The three local architects, who everybody who knew anything of the composition of the committee was certain would be included in the number—let their designs be what they might—are on the list, and none others of the Manchester architects, viz., Salomons, Worthington, and Speakman and Charlesworth."

The bonded warehouses recently erected by Messrs. Dunville and Co., Belfast, will contain about 2,079,000 gallons of whiskey.

Building Intelligence.

CHURCHES AND CHAPELS.

The restoration of the beautiful apsidal chape in Gloucester Cathedral, known as St. Paul's Chapel, is about to be at once commenced, at the cost of the Earl of Ellenborough. Messrs. Hardman are to supply the glass.

Ekenhead Church, Belfast, has been opened for divine worship. The church and schools were erected at a cost of £2,700, of which amount £2,000 was contributed by Mrs. Dummet, in memory of her brother, the late Mr. Ekenhead.

The Bishop of Rochester has consecrated a new church (Holy Trinity) in Barking-road. The church contains provision for 1,029 sittings, which are to be free and unappropriated for ever. The architecture is what may be termed a mixed style, and the design is by Mr. Charles Barry.

BARNSTAPLE.—When it was decided some time ago to restore the church at Barnstaple, Mr. G. G. Scott, R.A., was appointed to superintend the work. The Restoration Committee now report that the first portion of the undertaking is now completed. Nearly £2,000 have already been expended on the alterations and improvements, and it is estimated that a further sum of £2,700 will be required to carry out the work of restoration. Barnstaple Church, by reason of its central position and its great antiquity, has always been considered a most important and interesting one. For more than five hundred years it has been the principal church in North Devon.

EARDISLEY, HEREFORD.—A new chapel for the Primitive Methodists has just been opened in this village. The edifice, which is in the Early English style, is built with brick and Bath stone dressings; open sittings. The roof, which is open, is framed and braced, with boarding under slate. The whole of the woodwork is stained and varnished. The building is from a design by Mr. J. H. Evins, of Hereford, architect, who also superintended the erection of the same.

MANCHESTER.—The Catholic Apostolic Church, Stretford New-road, which has been rebuilt and enlarged, was opened on Sunday last. It occupies the whole of the site, on a portion of which stood the former church, and has a frontage of 36ft. to the Stretford-road, and a depth of 100ft. The arches to clerestory of nave are supported on columns of red Mansfield stone, with Bath stone caps and bases. The roof of nave and chancel are continuous, giving length and height to the building, the chancel roof being distinguished from that of nave by trusses, supported on carved corbels, with columns of red Mansfield stone. There are also similar columns to the coupled windows of clerestory. The building will accommodate 380 persons, and has been erected in the Early Gothic style of architecture, from the designs of Mr. O. Ayliffe, architect, King-street, by Messrs. Ellis and Hinchliffe, who were the general contractors.

RICHMOND.—The laying of the foundation stone of the new Catholic Church of St. Joseph and St. Francis Xavier, Richmond, took place on Saturday week. The site selected is in close proximity to the old church. The plan consists of a nave entered from an extended porch, such as may be seen at Fountains, and as existed at Byland, in Yorkshire. The nave is flanked by two aisles, giving a total width of 50ft., and is terminated by a chancel of apsidal form, the total length being 101ft. There is a side porch and two confessionals, whilst a sacristy, with a picturesque turret and an upper chamber, terminates the eastern aisle. The aisles are separated from the nave by circular shafts of red stone and pointed arches, with a clerestory above of circular traceried windows. The roof is framed with arched principals springing from stone corbels. The plans have been prepared by Mr. George Goldie, of London, the architect of the magnificent new Catholic church at York; and the contractors are Mr. Smith, mason, and Mr. Naylor, of Richmond, builder. The cost of the whole will be under £3,000.

RIPON.—The committee appointed five years ago to carry out the restoration of Ripon Cathedral, in accordance with the recommendations of Mr. G. G. Scott, have issued a report, showing the present position of this important undertaking. Mr. Scott estimated that £52,000 would be required to complete the entire restoration necessary. Towards this sum £28,787 has been promised, and the committee earnestly appeal for aid to enable them to complete the proposed alterations.

THE CHAPTER HOUSE.—The restoration of the Chapter House of Westminster Abbey, to which public attention was called some time since, is now being pushed forward. What was some six months ago a crumbling pile has already been partially transformed by the removal of the old stone and brickwork and the substitution entirely of new stone, which is brought from the Chilmark quarries. Buttresses have been erected to give strength to the structure, and the brickwork with which many of the windows were blocked up when the ancient fabric fell into disuse is being removed and filled in with glass. The entire work of restoration, which is of a very extensive character, is being carried out under the direction of the Dean of Westminster and Mr. Digby Wyatt, the architect.

CHURCHES IN IRELAND.—A return has just been issued of all the new churches built by the Ecclesiastical Commissioners from 1834 to August 1, 1865, in the several dioceses in Ireland, specifying the cost of each church, and also of all the churches or licensed houses of worship rebuilt or repaired within the above period. The total amount expended was as follows:—Total new churches built, £28,362 8s. 7d; total churches rebuilt, £271,916 4s. 9d.; total churches built under engagements of late Board of First Fruits, and completed by the Ecclesiastical Commissioners, £35,873; total churches originally contracted for by the parishioners, but towards the completion of which the Commissioners made grants, £11,233 6s. 1d.; total churches built entirely from private funds, but contracted for by the Ecclesiastical Commissioners, £3,159 10s. 2d.; total churches repaired, £753,155 9s. 8d.; grand total expenditure on churches built and repaired, £1,103,699 19s. 3d.

BUILDINGS.

A meeting of the committee for building a vicarage and endowing the benefice of St. Helen's, Abingdon, was held in the Council Chamber on Saturday last. The plans of Mr. Dolby, architect, of that town, were finally decided upon, subject to the approval of the Ecclesiastical Commissioners, and the tender of Messrs. Selby, builders, of Oxford, for £2,453, was accepted.

A new fish market and wharves have been completed at Great Yarmouth. The market is 750ft. long by 40ft. wide, with a landing wharf of the same width between it and the quay. The market is covered with a roof resting on 148 iron pillars, the roof on the east side is lighted with 36 skylights, 10ft. by 6ft. each, the west front being open. The whole cost of the works has been about £12,000.

IPSWICH: NEW CONVENT.—A large convent has been commenced in the environs of Ipswich, planned with a view of affording accommodation as a place of education. The architects are Messrs. Goldie and Child, of 34, Gloucester-place Portman-square, London, W., and Mr. R. S. Smith of Ipswich, is the contractor. Red Suffolk brick, with a spare use of white and black bricks and Bath stone dressings, are the materials. The style is free treatment of Early Domestic Gothic, with long shafted windows opening in sashes, strings, and buttresses, and other features, simply to mark the points of thrust, floor lines, &c. The rooms will all be very spacious, light, and airy, and the whole design combines simplicity with architectural character.

A movement has been begun to provide funds in order to start the notorious Yorkshireman known as "Flint Jack" in a fair way of life on his release from gaol. Several memoirs of this strange individual, whose real name is Edward Simpson (of Sleights, Whitby), have already appeared, and in a recent account of him, Mr. Llewellyn Jewitt, F.S.A., the editor of the *Reliquary*, says:—"Flint Jack" has caused some noise in the world of antiquities and geology, as the very prince of fabricators of antiques, flints of every form, celts, stone hammers, ancient pottery, inscribed stones, fibulæ, querns, armour, and every conceivable and inconceivable thing—whose productions have taken in the most learned, and are to be found in the cabinets of the collector everywhere. He has made more dupes than any other man, but antiquaries owe him a debt of gratitude for opening their eyes to deception, and for showing them how a lost art may be restored. "Flint Jack" is now in Bedford Gaol for two small thefts committed while in a state of intoxication. His time will be up in March next, when it is desired to have a fund ready to assist this clever, remarkable, intelligent, and talented wanderer, in the hope that he will turn his talents into a better and more honourable channel.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the EDITOR, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty four Words.

RECEIVED.—H. C.—J. P.—D. R. W.—E. W. G.—W. B.—J. D. F.—T. T.—E. W. P.—J. and E. G.—W. O. C.—T. C. H. and Sons.—T. D.—O. A.—J. and E. G.—W. R. D.—M. O. T.—A. J.—W. H. D.—J. R. T.T.J. S.—E.D.

W. C. B.'s letter throws no new light on the "Pugin v. Barry" controversy.

J. B., Alton.—Write to some photographic paper.

J. C. E., Durham.—We cannot say without sending a sketch.

"Suns Rays."—From your statement the borough surveyor is at fault. Consult a well known and respectable lawyer.

"Hydraulic" wants some information as to the constitution of the Institution of Civil Engineers. Let him consult the letter from the Secretary of the Institution, which appeared in the BUILDING NEWS on July 26 last.

"Alpha."—We will give the information concerning schools of art in an early number. You can get what you want as to building materials, &c., at the South Kensington Museum.

Correspondence.

WHO WAS THE ARCHITECT FOR THE HOUSES OF PARLIAMENT?

To the Editor of the BUILDING NEWS.

SIR.—In your own words, "As yet no one will say that he has proved his case," allow me, at all events, to throw some light on the subject, by briefly analyzing in your columns the various letters which have appeared in the *Pall Mall Gazette*. The statements therein published are so antagonistic and so destructive of their own probability, that I am astonished at the conclusions to which one or two journals have rather hastily arrived. Setting aside the possibility of the different stories having been made up without regard to truth, which, of course, is quite out of the question, there are but two suppositions on which the letters can have been written:—

First. The memory of the witnesses has failed them (which I believe to be partially correct); or,

Second. They are ignorant of the real history of the case; and this I imagine to be the fact—they have got hold of odds and ends of the story, and nothing more.

Not one of the letters goes back to a period before their author's cognizance of the competition drawings. My father's drawings were made before he commenced the designs for Mr. Gillespie Graham, and therefore before he supplied Sir Charles Barry with his.

From the day my father's own original drawings were mounted by Mr. ———, they were lost sight of; and it was not until after this that my father was called in to apply his own elevations to Sir Charles Barry's ground plan.

Being called in, what did he execute?

Mr. Wolfe says that "under Barry's instructions, and from his designs, Pugin made some perspective views and drawings in pencil of the details of the building." "The general design, including elevations and sections" (says Mr. T. Bury), "having been previously completed in pencil by Barry himself;" and, further on, Mr. Bury implies that my father's assistance was so entirely confined to details, that we become impressed with an idea that his whole time was occupied in drawing dots and quatrefoils, and then making copies of them to enlarge afterwards.

I will grant this; but what do these details, to which my father's labours were confined, include? His diaries and Sir Charles Barry's letters are my witnesses. They include porch, hall, central lobby, stairs, witness-room, king's tower, entrance hall, court yard front, water front, upper part of front, turrets, sections of tower, commons' entrance, speaker's court entrance, interior of library, river front, land front, centre oriels, upper part of oriels, end towers, bell tower, lantern of bell tower, angle turrets, southl gables of Westminster Hall, &c., &c., &c. But "these were only drawings for tenders" (explains Mr. T. Bury). I will grant this also, simply remarking that this means all the working drawings necessary for carrying out the design. "But" (continues Mr. Wright, or rather those who write for him), "they were only drawings of parts of the buildings to enlarged scales." But what does all this amount to? The sum of it comes to this:—that Sir Charles having completed his general designs for the Houses engaged my father as an assistant, superior to his own clerks, to make a few perspective views and some drawings of details to an enlarged scale from his own designs; and then remunerated him with 400 guineas for work that any third-rate clerk could do as well. Now, these drawings were either the original productions of my father, or they were not. If they were Sir Charles Barry's, then he himself rejected his own designs, for Mr. Wolfe tells us, "most of these drawings were set aside." If they were my father's, what becomes of Mr. Wolfe's assertion that they didn't "exhibit a single feature designed by Mr. Pugin;" and Mr. Wright's prompted declaration that "the elevations and sections in no portion of the building accorded with any detail prepared" by my father. We may, therefore, assume that these drawings were original designs of my father, set aside, we are told, because they embodied "ideas" opposed to Sir Charles Barry's "ideas;" and thus it comes out, after all, without any doubt, that my father did make original designs. And it is equally evident that, if *most* of them were rejected, *some* of them were adopted. Out of his own mouth, then, I disprove Mr. Wolfe's positive declaration.

In another paragraph of his letter, Mr. Wolfe assures us that Mr. Barry "was the least likely person to adopt other people's ideas of art." Why, then, in the name of common sense, did he call in my father, whose "ideas" of art, we are told, in one line were "opposed" to Sir C. Barry's, and, in another, that he did not conceive "ideas" at all, but only made "suggestions" for the production of "new ideas" in Sir C. Barry? In other words, my father's "ideas" led to Sir C. Barry's "ideas." Can any one disentangle all this? Mr. Edward Barry would lead us to believe that the intimate and friendly relations "untroubled by the semblance of a quarrel" which existed between Sir Charles and my father, were "never uninterrupted;" but Mr. Wolfe more correctly allows that, at a certain period, they were "not in communication" with each other. This was the period between 1837 and 1844, when my father, disgusted at being thrown overboard, refused even to see Sir Charles.

It was at this time, Mr. Wolfe says, "all the more important changes were made by Sir Charles Barry alone."

Has Mr. Wolfe read the extract from my father's diary to so little purpose as not to see that his drawings extend to every portion of the building; that they were most numerous, and included "compositions" (*vide* leaf of diary in Mr. Ferrey's biography, which he seems to have forgotten), "compartments," and "drawings for tenders," *i.e.*, elevations, sections, and details as well. Sir Charles doubtless had all these drawings with him in the country; if not, what became of them? What were they made for? Why were they not used? If he had them in his possession, Mr. Wolfe, at all events, confesses never to have seen them, for all the drawings he saw "were made," he tells us, "by Sir Charles alone." What is the alternative, then? If my father's drawings were not used, they were all made for no earthly purpose; if they were, as Mr. Wolfe never saw them, they must have been privately copied before being made use of, as my father assured me; and Sir Charles, in acknowledging the receipt of some of them, says to my father, "You have given me a rich treat." Now, independently of the suggestion that people don't generally go into raptures at their own designs made bigger, I have pretty clearly shown that they were my father's original designs, and if they were used, as I have also clearly demonstrated, then, on Mr. Wolfe's own testimony, they constituted the "important changes" made in the building which "determined its character." So we inevitably arrive at this conclusion, that the original designs made by my father were so "important" as to "determine the character" of the architecture of the Houses of Parliament. And now a few words as to my father's Government appointment.

Mr. Wolfe's explanation is this—that Sir Charles, not having had any communication with my father for many years, and having, without my father's assistance, worked on the Houses entirely alone, suddenly became so anxious for his absent and useless "friend," that he was seized with a sudden desire to secure to him a position under Government; Sir Charles and he had

parted company; my father had ceased to make drawings for tenders, "or drawings of details," and to propagate "suggestions," which Sir Charles might conceive and bring forth as "ideas." The old drawings and ideas had all been worked out. New suggestions were wanted for the internal finishings; and therefore Sir Charles, unsolicited, recommends and secures a direct appointment from Government, and urgently entreats my father to come and extricate him from his "regular fix."

I had intended entering at length into the testimony given by Mr. T. Bury, but I must reserve this for fome future occasion. It will, however, be sufficiently evident to all, that the real truth being elicited from statements so contradictory and inconsistent, but little reliance can be placed upon the entire mass. Let it be distinctly understood that I have no wish to depreciate the undoubted powers which belonged to Sir C. Barry.

I cannot conclude this letter more appropriately than by quoting Sir Charles's own words to my father:—"I am much flattered by your hearty commendation of the plan, and shall know where to look for a champion if I should hereafter require one." These lines were written on October 22, 1836, and most aptly define the position of the two architects.—I am, &c.,

21, Savile-row. E. WELBY PUGIN

SIR,—Your columns having been opened to the Barry and Pugin question, it seems incumbent upon all who can afford so much as a tittle of evidence to put their information forward. Great names in architecture are so difficult to win, and Fortune so fully displays her attribute of caprice in this particular walk of art, that the honours attained in its pursuit may well be upheld and cherished by its followers in common. Pardon me for premising that when the tide of taste had strongly set in favour of the Gothic style, and had created a desire and interest concerning its examples and peculiarities, several artists of merit entered upon the work of illustration, and to that class belonged Augustus Pugin, a French Huguenot, employed by Nash, and afterwards known as a professor of architectural design in Great Russell-street. The profession are quite familiar with the admirable illustrations proceeding from his studio, but so far as my knowledge extends he was not called upon to design and superintend the execution of any building. Mackenzie, in the same way, though eminent as an illustrator, remained an illustrator to the last. Among the ablest Gothic delineators, however, was Mr. Edward Blore, whose exquisite renderings of many select specimens secured an early repute, and brought him into distinguished favour as a practical architect. To Mr. Blore I was indebted for an acquaintance with the style that enabled me to be useful to Mr. Raitson when he entered into the competition for the Houses of Parliament, and obtained one of the premiums of £500. After being assiduously occupied for months upon the drawings, there was a season of watchful anxiety about the result, but no intimation came, except that on a certain day the unsuccessful designs would be returned to their authors. It was then that, armed with Mr. Raitson's authority, I hastened to the portal of Westminster Hall, and had the intense gratification of hearing from Mr. Chaloner that the set denoted by "a winged orb,"—a device chosen in honour of my friend's recent travels in Egypt—was one of those selected and retained.

It may be fairly assumed, I think, that those who have gone patiently through the details of a design—have become familiar with each item of the instructions, and have studied the general embodiment and building up of the general scheme—must have acquired especial facilities for judging the comparative merits of other designs, and it has been my endeavour thus to show reasonable grounds for my conclusion before presuming to declare the conviction I have always felt that Barry achieved a great and unquestionable success. The whole of the plans, it may be recollected, were exhibited together at the Gallery of British Artists, in Suffolk-street, and (subduing a contrary opinion respecting mere arrangement) I was impressed, from the moment of looking at his river perspective, with an unhesitating consciousness that Barry had not only gained the front, but had thoroughly distanced all his competitors. The cause of victory was clear and indisputable—Barry's was the only conception that possessed unity of form, and presented a palace of Parliament as one unbroken whole! Success was not gained by any intensification of Gothic excellencies, but by infusing a classical or Italian element into English design—a circumstance that seems to stamp the authorship with the indelible impress of Barry's mind.

Architects, since the recent passion for writing has become so general, are apt to do much violence to truth and common sense in seeking to attach overmuch importance to the hand of the principal, but the work of an individual does not go very far in these gigantic competitions, nor is it necessary that any laborious drawing should be the positive production of the designer. It is the mind and not the hand that must permeate the whole production, and regulate and harmonize its every part. Allowing, therefore, due but subordinate honour to draughtsmanship, I think it would not be difficult to show that Barry's success was attributable to his own proper artistic sentiment, though this sentiment was itself antagonistic to the style proscribed. It was a tenet of the early revivalists that the spirit of Gothic could only be developed by sharp contrasts and boldly-opposed surfaces, while the tendency of Barry's feeling was in the opposite direction of breadth and evenness, as may be gathered from the pervading principle of his classic works. I noticed the germ of this application of a Continental rule to English art in the Grammar School at Birmingham, and saw at once that if that building had not been designed we might not have had its noble afterthought at Westminster. It was this masterstroke of the artist that gave superiority and won the prize. Nor are its consequences confined to the edifice in question, for its fruits are conspicuous in the current designs for the Law Courts, which one and all follow the example there originated, and instead of allowing, as heretofore, each portion to speak separately for itself, combines the multiplicity of parts in one involving generalization.

No architect could have commenced operations till the printed instructions were issued; and as the influence Mr. Barry enjoyed was regarded as one of the chief reasons for throwing the work open, it can hardly be supposed that he waited to bargain for an accidental or fugitive design. Nor could this design, any more than the rest, have been the work of a single hand, so that, were Barry to be displaced by Pugin, the line of claimants might not end with him. When the awards were known, the Commissioners entered freely into communication with the successful few, and made suggestions for the beneficial modification of their designs, of which, also, they desired some representation on a reduced scale. This was a task for which no artist could have been more suitable than my former office companion—the gifted pupil of Mr. Blore, who had lately accompanied Mr. Galley Knight in his tour to Italy and Sicily—Mr. George Moore, and upon my introduction he was employed by Mr. Raiton on these reduced drawings.

After the matter had been consigned to Mr. Barry's hands it is not wonderful that he should have felt considerable anxiety about the ultimate treatment of the parts, and a desire to secure the best available assistance. I had the opportunity of seeing some preliminary studies for the bays of the river front, that had been prepared by Mr. Moore, and the last I heard respecting them was that they had been handed to Mr. Barry, who proposed to work them out personally. Assuming this to have been a mere pretext for waiving further intercourse with an artist, when other arrangements were in view, it speaks with comparative force for his freedom of action up to that time, and it is perfectly reconcileable with Mr. A. Welby Pugin's appearance then first upon the scene.—I am, &c., T. M.

September 3.

HOW OUR CHURCHES ARE RESTORED.

SIR,—Lately I entered a well-known church in Norwich, and noticed a man scraping the base mouldings of a pier with an old jack-plane iron, in order to remove the paint from the stone; but instead of only getting the paint from it, his novel instrument took at least one-eighth of an inch off, and the manner in which he brought the moulding from its jagged state to a tolerably smooth surface was by filing. I remonstrated with one of the clergy, who promised me that it should not be repeated; but I am sorry to say that a good deal of the church had undergone this process. At Waddington, Lincolnshire, the restoration (?) is being carried on at the parish church by the builder's foreman, and not under the direction of any architect. The joints of the beautifully-scraped arch stones are pointed with a dark mortar, and present the same ludicrous appearance as the entrance porch groining of our Guildhall did at the Belgian reception. The Early English capitals are entirely spoilt by being scraped, and the restored carving is vile. I fear that many of our beautiful village churches are being restored in the same way, without professional advice, in order to save the fee.—I am, &c.,

September 4. TH. B.

THE NEW CIRCLE SQUARER.

SIR,—Examining Mr. Guillaume's diagram, and comparing its lines by the common arithmetical rule of square root, he would have found, calling his diameter 1,

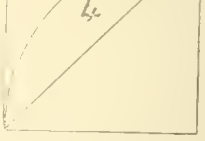
A side of his square = $\sqrt{\frac{1}{2}}$ = ...	0·70710678
Two sides = $\sqrt{2}$ = ...	1·41421356
A diagonal = ...	1·
To which sum add	192)3·12132034
A sixteenth of an inch per foot ...	·01625688
And we find his "circumference" =	3·13757722
Which is too little by	·00401543
The true circumference being... ...	3·14159265
But the common "three and a seventh" = ...	3·14285714
Exceeds the truth by only	·00126449

The new discovery, therefore, with Mr. Guillaume's correction, still errs more than *thrice* as much on the wrong side (the side of defect) as the old popular and easier rule errs on the right side by excess!

The correction required was very near a twelfth of an inch per foot, instead of a sixteenth; but this addition, he will find, brings him more in excess than the popular Archimedian rule. Strangely enough, his diagram actually afforded, by a still easier operation, a length approximating nearer than the common one. Thus—

Three times diagonal = ...	3·00000000
Add a fifth of one side = ...	·14142136
The sum = ...	3·14142136
Falls short by only	·00017129
	3·14159265

This is above seven times nearer than Archimedes, but it is on the wrong side. On the whole, then, I strongly doubt if we shall ever improve on the old rule, for practical use, even by such real discoveries as those of Metius and Mr. Drach. Every surveyor, I think, should impress and retain in his head by a mental diagram the



fact that the "spandrel" outside a quadrant is to the segment within the quadrant, practically as 3 to 4. From this very simple ratio would follow that the areas of internal and external squares are to the circle as 7 and 14 to 11; and thence the Archimedian rule, and all others needed for circular and spherical measurement, all exact to about a 2,400th part.—I am, &c., E. L. G.

A COMPETITION HOAX.

SIR,—I wish to draw your attention to another competition hoax. An advertisement was placed in your journal offering a premium of £25 for the best design for a proposed new church at Dorchester. In answer to this appeal, I prepared a very carefully studied set of drawings. A friend of mine, who is quite old in the study and practice of church architecture, also sent in an elaborately prepared set of drawings. After waiting about a fortnight, the drawings were returned, and I am informed that the committee decline to award any premium or to accept any of the drawings. I should scarcely have thought it possible that there could be found a committee of gentlemen having £6,000 at their disposal so utterly mean as to withhold a paltry premium of £25, after having caused a number of architects to

throw away at least six weeks' labour, as well as other expenses, such as frames, artistic colouring, &c. Surely the committee, even if they had determined not to carry out any of the designs, must have seen that the least they could do, consistently with honour, would have been to award this paltry premium of £25, as it would scarcely cover the expenses of the successful competitor. —I am, &c., A VICTIM.

Intercommunication.

QUESTIONS.

[557.]—A RARE BOOK.—Can you inform me where the second volume of "Oikidia, or Nutshells," may be procured? Part the first is dated—London: Printed for the author, and sold by Dilly, in the Poultry. MDCCLXXXV. —I am, &c., Io. BONOMI, the Soane Museum, No. 13, Lincoln's Inn-fields, August 29.

[558.]—SPECULATING BUILDERS.—Will you be so kind as to give me your advice as to the best place you know of for a speculating builder to pitch his tent for a living. By reading your paper I have thought of Yarmouth. Please inquire; I will pay all inquiry fees by return. I must change, for this town is overbuilt.—I am your humble servant, J. P., Birmingham, August 29.

[We give the above letter as a specimen of others we are in the habit of receiving. We beg to inform "J. P." who gives his full name and address) and all other similar enquirers that sending such letters is sheer waste of time, as we can give no advice in such matters.]

[559.]—SCHOOLS OF ART.—Will some of your readers be kind enough to inform me where the local schools of art, in connection with the Science and Art Department, are situated, and how I can become a student?—ALPHA.

[560.]—INDIAN INK.—I am unable to procure Indian ink, unless at a very high price, which does not run when the colouring is applied to the drawing or tracing. Can anyone inform me of a plan by which such inferior ink may be rendered serviceable and unaffected by the application of colour?—R. L. B.

[561.]—REMOVING PAINT FROM STONE.—I should feel obliged if any correspondent would favour me with a recipe for removing paint from stonework without injuring the surface of the stone. The paint I am anxious to remove has been on the stonework for many years, and probably has been applied many times.—R. L. B.

[562.]—POTASH IN GRANITE SAND.—I am just informed that potash is found in the granite sand in Cornwall, and that it ought not to be used for mortars. As I have always before considered that lime and granite sand made good mortar, I should feel obliged to any of your numerous readers if they would kindly inform me how, as a mason, I am to detect potash in the granite sand. Also what proportion of the potash, when found in the sand, would be considered injurious or detrimental to its being used for mixing with lime or cement for mortars.—A CORNISH MASON, Liskeard, September 3.

[563.]—PETERBOROUGH CATHEDRAL.—Will any one kindly inform me what kind of stone is used in the west front of Peterborough Cathedral, and also the kind of stone used in the construction of St. Margaret's Church, King's Lynn, and the style of architecture adopted in the latter?—IMPROVER.

[564.]—LOSEBY HALL AND BURLEIGH HOUSE.—Will some one better informed than myself kindly let me know, through your "Intercommunication" column, what is the style of architecture adopted in the construction of Loseby Hall, near Leicester, the residence of Sir F. Fawkes; also about the time of its erection; also the style adopted in Burleigh House, near Stamford.—ENQUIRER.

[565.]—ARCHITECTURE.—What are the predominant features, both decorative and in outline, of the Gothic, Tudor, Elizabethan, Tudor Gothic, Domestic Gothic, Modern Gothic, Italian, Grecian, and continental styles of architecture? No doubt others would be interested in the answer of this, and it would be esteemed a favour by—A COUNTRY BUILDER.

[566.]—CENTROLINEAD.—Will you or some of your readers inform me how to set, and use the centrolinead. I cannot understand the method as it is shown in "Nicholson." I wish for practical directions, and shall esteem it a great kindness, on the part of anyone who will, in the "Intercommunication," give me the desired information.—S. T.

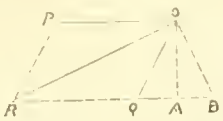
[567.]—ROYAL ACADEMY.—1. Can any of your artist readers inform me by what means pictures can be exhibited at the Royal Academy? 2. Can anyone exhibit, or is there a line drawn between artist and amateur? 3. What constitutes the degree of R.A., and how is he elected? 4. When are the sending-in days, and what notice would be required for sending in a picture?—A WOULD-BE ARTIST.

[1. By the usual means of sending them in. 2. Anyone cannot exhibit, because any one has not the chance, but it is open to anyone to try. 3. The title of R.A. is conferred on an associate (A.R.A.), at a general meeting of Royal Academicians, and is the highest honour they have it in their gift to bestow. 4. Apply to the Secretary of the Academy.

[568.]—WHAT IS CUSTOMARY?—A, wishing to build a house, employs an architect, who is also a surveyor, to prepare plans and specifications, and then to obtain estimates from builders for the work. Owing to the tenders far exceeding the architect's estimate, A determines not to build. The architect thereupon sends in his bill, in which he charges 2 per cent. for taking out quantities on the lowest tender. A never gave the architect instructions to take out quantities, or knew that it had been done until he received the bill. Is A liable for this charge?—A CHIP.

REPLIES.

[51.]—As the following query, proposed by myself in June of last year has as yet remained unanswered, allow me to show, for the benefit of non mathematical readers, how it may be solved without the use of trigonometry, by a method I acquired some time since? If two forces of 12lb. and 2lb. respectively act upon a point at an angle of 60 deg., what is the magnitude of their resultant? Let P O, Q O respectively represent in magnitude and direction the given forces acting at the point O. Complete the parallelogram PRQO and join OR. OR will represent in magnitude and direction the resultant required. From the point O draw OA at right angles to OP, produce RQ to B, making AB = AQ, and join OB. Then OQB is an equilateral triangle, each of its sides being = OQ = 9 ∴ QA = ½OQ = 4·5, and RQ = 12 ∴ RA = 16·5.



Since $OA^2 = OQ^2 - QA^2$ ∴ $OA = \sqrt{60\cdot75}$.

And $OR^2 = OA^2 + RA^2$ ∴ $OR = 18\cdot248$ Ans.

By trigonometry, of course, the solution can be readily effected.—R. L. B.

[528.]—MEDALS.—During the ancient days of Greece and Rome, medals were struck in commemoration not only of warlike events and the commencement of new reigns, but of the completion of temples and other public buildings. These latter were represented with more or less exactitude on the metal surfaces of medals, and their images have remained long after the original structures had perished. Here, then, is one use of the study of medals. A higher one consists, perhaps, in an examination of the fine personifications, symbols, and emblems which are to be found ornamenting old Roman and Greek coins and medals. To a man of poetical imagination these must be intensely interesting, whilst to the designer and the architect they are practically valuable and very suggestive.

If I were not fearful of trespassing too much upon your space, I might instance many examples of this latter class; as it is, one or two only shall be named. Hope is represented on a medal before me as a sprightly damsel, walking quickly and looking straight before her. With her left hand she holds up her garments that they may not interfere with the rapidity of her movements. In her right hand is seen the bud of a flower, an emblem, undoubtedly, more beautiful and expressive of the feeling sought to be depicted than the conventional anchor, which is a symbol of patience rather than of hope. Again, Abundance is imaged as a sedate matron, with a cornucopiæ in her hands, from which she scatters the fruit over the ground, and does not hold it up and keep its contents to herself, as some sculptors and architects have represented her. A cabinet of medals well selected is, in short, an invaluable adjunct to an architect's studio, as it is to that of the painter and the sculptor. I trust that enough has been said to convince "A. C." that numsimatics and architecture may well claim relationship. This fact will be more generally admitted one day.—KOBANG.

[528.]—The remarks made by "A. C." upon this subject have very much surprised me. I certainly had no idea that an architect was supposed to be a numismatist as well; but always imagined that branch of study to belong to gentlemen especially devoted to it. Thus, at all colleges, museums, and national collections of rare and valuable curiosities, a professed numismatist is attached to the establishment. As an architect, I should as soon think of troubling my head about old coins, unless I had a taste that way and nothing better to do, as of studying medicine or anything else equally foreign to my own business.—N.

[529.]—RESONANCE.—Resonance is undoubtedly reciprocated vibration. Galileo may be said to have first discovered the phenomenon. He observed that a heavy pendulum might be put in motion by the least breath from the mouth, provided the blasts were often repeated and made to keep time with the vibrations of the pendulum. From the same sympathetic communication of vibration will two pendulum clocks fixed to the same wall, or two watches lying upon the same table, take the same rate of going, though they would not agree with each other if placed in separate apartments. The undulations exerted by a vibratory body are themselves capable of putting in motion all bodies whose pulses are coincident with their own and consequently with the primary sounding body. Hence the vibrations of a string when another, tuned in unison with it, is made to vibrate. On the same principle, the resonance or reciprocated vibration of columns of air depends. Perhaps Mr. Wheatstone, in conducting a series of experiments with the tuning-fork and relating minutely the results, has contributed more than any other person to our knowledge of the peculiarities of reciprocated vibration. In Java, the natives long ago utilized their own observations on the matter by constructing a musical instrument in which the resonances of columns of air were employed to augment the sounds of vibrating metallic plates. Under each of these plates was placed an upright bamboo containing a column of air of the proper length to reciprocate the sound of such plate. In this contrivance, if the aperture of the bamboo be covered with pasteboard, and its corresponding plate be struck, a number of acute sounds only will be heard, but on removing the pasteboard an additional and deep rich tone is produced. This arises solely from the resonance of the column of air within the tube.—FLACTO MAGICO.

[530.]—SEWERAGE.—Roman cement is of little or no use, except in inside work, and it is quite a mistake to use it as you have done. Set the brickwork in Portland cement and it will last for ever.—CONCRETE.

[534.]—INCORRECT QUANTITIES.—In your issue of August 16, the above question was asked, and in your issue of August 30 two replies have been given. Will you kindly ask your correspondents if they have any legal authority for their answers to the question? If they have, and will quote them, they will much oblige.—A SUFFERER.

[536.]—LEAD PIPES.—Allow me to tell "Life," through the medium of your valuable "Intercommunication" column, that the nature of the water determines whether leaden pipes and cisterns may be used or not for holding water which is for drinking purposes. Water containing carbonic acid cannot be passed through leaden pipes without the formation of white lead, a notorious poison. Cast-iron pipes are nearly universally employed now for furnishing water supplies, and "Life" would do well to use them and abandon all ideas of leaden ones. It is a good plan to coat the interior of cast-iron pipes with a preparation of lime water, as it prevents any corrosion taking place and exercising a bad effect upon the quality and flavour of the water.—HYDRAULICIAN.

[537.]—PERIODS OF GOTHIC ARCHITECTURE.—It is quite amusing that in a few short sentences of mine "E. L. G." should have discovered all the blunders which are to exist in the year 1900. He says, "There is no Saxon style." Then what are the buildings which existed prior to the Norman? His statement would lead one to suppose there is no style but Gothic in the world, but there are scores of styles, and the Saxon (as I hinted) is a rather barbarous one.

King John came to the throne in the year 1199. We have examples of "Semi-Norman," or "Transition," of the date 1200, and I cannot see why "E. L. G." should cavil at "Early English" being set down in its general terms at the commencement of the thirteenth century, and of course in the reign of King John—*i.e.*, when speaking of it as the sole predominant style, and not intermingling it with lots of half-and-half Norman.

It is rightly enough that some of our best architects are choosing Early English as their directing posts, so to speak, because it is the purest style of all, but I cannot see that at the commencement of "Edwardian" there was "particularly less thought," while I admit there was greater lavish thrown away, and more glass and less stone, as "E. L. G." asserts, and there I hold with him.

Of course we all know that "Edwardian" has peculiarities of its own, and if we give it a distinct name so much the better, but it is because this and "Decorated" are generally classed together that I did the same. But then what becomes of the intervening period of about 100 years between Edward III. and the severe vertical lines of Henry VII. and Henry VIII.'s time? To put the question still plainer, what is the difference between "Edwardian" and "Decorated?" "E. L. G." says there is none, or that they are one and the same, lasting during the three Edwards alone, and followed by the Perpendicular, but let him take the designs for the New Law Courts—the "Edwardian" of Mr. Street, and the "Decorated" of Mr. Barry, and then say that there is no difference between them, or that they are types of one and the same period. In his former article, "E. L. G." quotes Mr. Fergusson as an authority, and then immediately contradicts him. But it so happens that Mr. Fergusson carries Decorated further down than even I did, for he says "the transitions fall curiously on the three Richards' reigns—which is to say, that the third transition (that between Decorated and Perpendicular), was from 1483 to 1485. "E. L. G." says 1375! Who is his authority?

If this is not the age of Gothic revivalism, what is it? And if High Churchism and the increase of Popery do not go to prove that "Romish ideas are insinuating in the land," what do they prove? If one is too sceptic to admit that they go "together," then they do at least go on at the same time. And this is not only an historical fact, but, Gothic having sprung from Romish worshippers, is, I think, "a remarkable coincidence."—PROVINCIAL.

[540.]—MOUNTING TRACINGS.—Allow me to bear testimony to the excellent plan of mounting tracings on linen described by your correspondent "C. E." I have tried the plan, and have found it to succeed much better, and also, I must admit, to require less care than the one advocated by myself in a former number; the only fault I have to find with the method is that the ink, unless of the best quality (which we all know is so difficult to procure), runs when in contact with the damped surface of the drawing board. Perhaps "C. E.," from his long experience, will be good enough to say how this fault is to be remedied. A tracing, recently finished, which I mounted on this plan, actually smeared on the reverse side when rubbed with the damp sponge, the ink having penetrated through the tracing paper. With the best Indian ink no doubt this smearing does not occur. I am inclined to think, from my present knowledge, that in every case a flat ruler should be used to remove all superfluous paste and water, in order to make a really good mounting. With the exception of the slight fault I have mentioned, "C. E.'s" plan is admirable, and well worthy of general adoption by architects, builders, and others.—R. L. B.

[541.]—ARCHITECTS' PUPILS.—From what "Articled Pupil" mentions, it is apparent he has made a bad choice of a master, and the best thing he can do is to endeavour to get his indentures cancelled. There is practically no redress in his case, and it is only one of hundreds. A pupil cannot dictate to his master, and compel him to teach him this and that. He must take his chance, and endeavour to pick up as much of the business as he can, which in reality is what everyone as to do.—ONE WHO TAUGHT HIMSELF.

[544.]—COPAL VARNISH.—Respecting copal varnish for walls or woodwork, I would advise in order to obtain a good face that two coats of parchment-shred size be used.—J. S.

[552.]—COATING BOILERS.—One effectual way to prevent boilers from corroding would be to galvanize them inside and outside. Joints, nuts, bolts, and screws should be treated in a similar manner.—J. S., Ramsgate.

[555.]—ARCHED WOOD PRINCIPALS.—"A Puzzled Student" may rest assured that no arch can be constructed of distinct pieces to exert much less thrust than a built one of the same radius, depth, specific gravity, and load, or be safe with any less provision. The "best" means of preventing that thrust will always be by ties following two or more straight lines from wall to wall, as little above the single straight line as taste will admit. Considering that the vaultings of Milan Cathedral, the costliest temple in existence, and of many hardly less renowned, have always been thus tied, with bars that our idealizing painters of them commonly omit, it is doubtful if architecture ever made sacrifices to æsthetic taste comparable in cost to those our engineers now get made thereto, in the tremendous buttressing substituted for a few such ties in their

present railway termini. The semicircular ribs at King's Cross, I believe, were actually adopted under the notion of having no thrust, and begun with no buttressing provisions (whence the extreme clumsiness of that found necessary over the east cab aisle), incredible and impossible as such crass ignorance might be in any other land. "A Puzzled Student's" roof ribs, having their radius 50ft., will thrust as much as semicircles of 100ft. span. Why not approximate their form by the ties to a pair of straight rafters, rising somewhat above twice as much, and throw off the water without costly metal covering?—E. L. G.

[556.]—OVERTIME.—Why does not "Draughtsman" bargain by the job, and break off wholly from what Mr. Carlyle calls "the poisonous taproot of all mischief?" Really, resolved supporters, at all risk, of "nomadic servantship at so many shillings a day," remind one of the tailoring fools that will throw way, in attempts to coerce their masters, ten times the cost of getting rid of their masters for ever.—E. L. G.

WAGES MOVEMENT.

A meeting of boiler makers and iron shipbuilders has been held in Glasgow to form a new national association for that trade. The new society deprecates strikes, will not grant any of its funds to support workmen who are out on strike, and intends to afford a healthy development of the friendly society principle.

Sheffield workmen seem to look upon outrages as a necessary concomitant of a strike. Some joiners employed by a Mr. Gomersall a master builder at Sheffield, have struck work through a misunderstanding respecting overtime. On Wednesday night, some persons, and suspicion points to these joiners, got into Mr. Gomersall's yard, and defaced a large quantity of dressed stone. Mr. Gomersall believes that the damage was done by the joiners on strike, and offers £20 reward for the discovery of the offenders.

STAINED GLASS.

The large eastern window of Llangollen Church has been filled with stained glass by Messrs. Dove and Davis, of that town. It illustrates the law and the Gospel. The window has been erected at the cost of Lieut.-Colonel Tottenham, of Plas Berwyn, as a memorial to his mother.

A stained glass window has just been placed in St. John's Church, Percy Main, Newcastle-on-Tyne. The principal subject is Our Lord Giving Sight to the Blind; above which is an angel bearing a scroll, with the text, "Thy faith hath saved thee," and in the lower part are the armorial bearings of the donor. The window is the gift of relatives of the Rev. Arthur T. Coates, M.A., and was designed and executed by Mr. Baguley, of Newcastle.

GLASGOW CATHEDRAL.—Government has commissioned Messrs. W. and J. J. Kier, glass painters, to repair the great west window, which was recently so much broken and otherwise injured by a malicious person named Marshall.

KENILWORTH.—The east window of the parish church has recently been filled with stained glass by Mr. John Harding, of Tattenhall Lodge, in memory of his last surviving son. The window is a specimen of the latest decorative or fourteenth century style, the artists being Messrs. Hardman and Company, of Birmingham. The subject is the Crucifixion, which has been treated in a thoroughly conventional manner.

QUERNMORE.—STORY OF A CHURCH WINDOW.—The east window of St. Peter's Church, Quernmore, Lancaster, has lately been filled with coloured glass under somewhat singular circumstances. Mr. Garnett, late M.P. for Lancaster, having been led to visit Cannes, in the South of France, for three successive seasons, assented to a proposal made to him in the spring of last year to join with the chaplain and another layman in providing a coloured window for the English church at Cannes, which was then about to be enlarged. An order was given in London, and the window was finished and sent out by the "Fairy Vision," for Marseilles, in October last. The ship foundered almost within sight of port on one of the dangerous sandbanks off the mouth of the Rhone. The window was insured, and an order was sent to London for another, which in due time arrived, and was fixed in the church. The unfortunate "Fairy Vision," at the bottom of the Mediterranean, was sold to a Greek, who set to work to recover the lost cargo, and while Mr. Garnett was at Hyères in the spring of this year the window was fished up and sold by auction at Marseilles. He bought it and sent it home, not much the worse for its five months' dip in the sea, and it is now in Quernmore Church. The window represents the leading events in the gospel history.

LEGAL INTELLIGENCE.

DISPUTED CONTRACT.—At the Leeds assizes, the other day, an action was brought to recover £46 19s. 6d., for work and labour. The plaintiffs (Illingworth) are builders in Bradford, and in May, 1865, they entered into a contract with the defendant to execute the woodwork about certain houses which he was then building. By the terms of this contract, the work was to be completed by the 1st of August then next, but it was not actually finished until some time afterwards. The contract contained a provision that if the work was not completed within the time specified the contractor who was in fault should pay £5 per week for every week during which the work remained unfinished after the specified time, and that this amount might be deducted by the employer on the settlement of accounts with the contractor. The defendant alleged that the plaintiffs had delayed the work for at least four weeks, and, therefore, claimed to deduct £20 from their account—the remaining £26 19s. 6d. to be paid into court. On the part of the plaintiffs it was contended that the first contract had been set aside by the defendant, and that another contract, much increasing the work to be done by the plaintiffs, had been entered into, and that in this second contract there was no limitation as to the time in which the work was to be finished. They also contended that, even if the terms of the second contract were to be taken as incorporated in the first, the delay had been caused, not by them, but by the alterations which the defendant had from time to time made in his plans. Verdict for the plaintiffs for the amount claimed.

"EXTRAS, SUBSTITUTIONS, AND OMISSIONS."—An action was brought recently by Messrs. Dudgeon, surveyors and measurers, Dublin, against Mr. Deane, a contractor and builder, in Cork. The latter had built the new Provincial Bank, in Cork, and the original design having been considerably departed from in the course of the erection of the building, a dispute arose as to the value of the "extras, substitutions, and omissions." The bank employed Mr. Doolin to measure the work, but Mr. Deane would not agree to his estimate, and called in plaintiff. Defendant was at one time during the course of negotiations afraid that law proceedings might be necessary in order to obtain his claim against the bank, but being anxious to avoid this if possible he requested plaintiff to use his good offices to effect an amicable settlement. Plaintiff complied, and was instrumental in bringing about the arrangement ultimately come to. One of the items in plaintiff's account was a sum of £105 for services in this respect. Plaintiff claimed £600, and defendant lodged £200 in court. Plaintiff and several builders were examined, to show that the usage of the trade was for the measurer to charge not only for measuring the work actually executed, but also for valuing work that formed part of the original plan, and was omitted, although of exactly the same kind as that executed. The chief matter in dispute was the right of plaintiff to calculate his fees on this principle, and to charge for his good offices in effecting an arrangement. Verdict for plaintiff for amount claimed, less £12.

General Items.

The *Manchester Examiner* states that among the discoveries made by the Cambrian Society during their recent meeting was an old gravestone, with the name "Cinderella," aged 20 years, in Wormbridge Churchyard.

A people's park of twenty-six acres in extent is being prepared for Chester by the Marquis of Westminster, and a statue of the donor is to be placed opposite the chief entrance.

The Council of the London Art Union offer a premium of 200 guineas for a series of not less than twenty partly-shaded drawings, illustrating some poetical or historical work of a British author, or some series of events in British history.

A terrible fire is said to have broken out in one of the Crown forests, near Ajaccio, Corsica. From the sea it presents the spectacle of a sort of mountain of fire. The flames are devouring a space of several leagues. Sailors and troops are hastening to the spot to afford help.

It will be a satisfaction to everybody to hear that the demolition of Middle-row, Holborn, has at last been commenced. In a few weeks we shall be able to announce that this great obstruction to the traffic between the City and West End has been wholly removed, and a long-needed metropolitan improvement effected in that neighbourhood.

Buckingham Palace will in a few days be invaded by an army of carpenters and painters. The eastern frontage, dull enough in itself, is so much blackened by London smoke that a little cleansing will be highly desirable, and if we are to credit rumour the interior is none the cleaner for the late Eastern visit.

Professor Tyndall, Dr. Percy, and Mr. Barry, a committee appointed to report on the best means for improving the acoustic qualities of the House of Lords, have recommended that they shall be permitted to postpone full consideration of the subject until the beginning of next session.

The principal thoroughfares of Hyde Park will be lighted with gas during the coming winter. The pillars are already erected, and the lamps will be lighted by an electric apparatus.

It is stated that Mr. Walker, the watchmaker, of Cornhill, whose premises were recently ransacked by the Caseley gang, has received a letter from the convict Caseley, dated from his *locus penitentiæ* in Fremantle, Western Australia, in which that worthy announces that he has completed the draft for a model of a safe which he considers to be thoroughly thiefproof, and which, with touching candour, he begs to place at the disposal of Mr. Walker, as some compensation for the injury he had formerly suffered at his hands.

A new cemetery has just been opened near Twickenham, on the road leading from thence to Hanworth, and at the junction of a road to Hounslow. The country around is very flat, so that the cemetery can be seen for miles round, and the effect it produces in the middle of the large field reminds the traveller of the celebrated painting representing the death of a camel on the desert. The designs were chosen from a limited competition, and the style may be called an adaptation of Early English, not overloaded with ornament nor strikingly original. The grouping is picturesque, taken from any point of view. The chapels and the lodge are built of rusticated stone (Kentish rag), with Bath stone dressings. The contract was £3,000, and was taken by Mr. T. Nye, of Ealing, the architect being Mr. C. Jones.

It has been proposed to throw foot bridges over the most crowded boulevards of Paris, and a plan for effecting this is now under the consideration of the authorities. The author of it proposes, by way of experiment, to erect a double foot bridge near the Boulevard Montmartre, where it is intersected by the Rue Montmartre and the Faubourg of the same name. The plan of the proposed bridge is nearly in the form of the letter X, that is to say, four flights of steps are to lead from the four corners of the footpaths to a central platform; each flight, however, is divided below into two branches, which being semi-circular, allow of a considerable elevation without overhanging the roadway. At the top of this compound staircase is a landing-place, which is connected with the main platform by means of another short flight of steps. The proposed height of the platform above the road is about twenty one feet. Executed in cast and wrought iron the estimate for this foot bridge is 50,000 francs (£2,000).

The weather-cock on the steeple of the Kenmare Roman Catholic Church, Ireland, having been broken by a storm, three brothers, by name Crimmin, undertook to replace it. The highest window of the spire being in the shape of a triangle on the top, and projecting from the main work, they got on this dangerous point, and erected a small scaffold of two or three treble deals. From this they placed two ladders, tied out of each other to the top of the mason work, and on this frail support ascended to the height of 150 feet. One of them, named John, but better known by the cognomen of Garibaldi, crept up the iron bar on which the weather-cock was fixed, and, holding on to the cross, took off the silent chanticleer, amidst the wondering gaze of an admiring multitude. Next day he again ascended, and, taking a pot of paint in his hand, repainted the cross, and put up a new weather-cock.

The new Master and Servant Act came into operation on the 27th ult. Under its provisions neither master nor man can, except in case of aggravated misconduct or premeditated injury, punish breach of contract by criminal process. The remedy is to be civil, but if the servant commits wilful or needless injury he may still be imprisoned for three months, at the discretion of the Bench. The new law is welcome, as abolishing one of the last relics of serfage, and will, moreover, put an end to cases of oppression, which, in remote parts of the country, have not been infrequent. Employers cannot imprison their men any more for not obeying an order to go to church.

We have to announce the death of Mr. John Louch, who for nearly fifty years had practised as an architect and civil engineer in Dublin. The works private and public on which he was engaged are very numerous; the survey and laying out of Mount Jerome Cemetery, where now his ashes repose, were entrusted to Mr. Louch some thirty years ago. The adjoining church was also designed by him. He was, moreover, the author of a valuable *brochure* on "Ventilation," published a few years ago. Mr. Louch had attained his seventieth year, and was much respected by his professional brethren in the Irish metropolis.

A correspondent who writes us on the Pugin v. Barry controversy under the signature "Truth," but who, by the bye, does not give us his name, says:—"Should any of your readers require evidence as to the capacity of the late Sir Charles Barry in Gothic work, they may see a specimen of his ability in the church in Cloudesley-square, Islington, which was, I think, built about the time the Westminster Palace was designed, and then say if they think it possible the two works could have been the production of the same author."

Attempts are being made to save the Paris Exhibition building from the threatened demolition in November. The press is almost unanimous in favour of preserving the structure and its annexes. It were the merest Vandalism, exclaims the *Siecle*, to destroy the marvellous products of so much labour, money, and successful care as are accumulated in the Champ de Mars. It is said that a practical plan for the utilization of the palace after the close of the exhibition is now the subject of consideration.

One of the most disastrous conflagrations ever known in Montreal took place in that city on the 18th ult. A coal oil store caught fire, and 600,000 gallons of oil were consumed by the flames, involving a loss of over 150,000 dollars.

The Naples correspondent of the *Times*, writing the other day, says, "Since I wrote, the cholera has maintained its very small proportions in Naples, so that hopes are entertained of our escaping a severe attack this year. With such influences, however, as surround us on every side, it would be rash to say that the city is yet safe. Disinfecting liquids are poured into the conduits daily, but poisonous exhalations continue to fill the air, and, as if in derision of the advice of the municipality to pay attention to personal cleanliness, water is so scarce that in some quarters it is almost fought for as bread would be by a famished population. There is some ground, however, of hope for the future, as the universal press of Naples has now taken up the subject and is now clamouring for water and a good system of sewerage.

As showing the opposition which is still manifested by some classes of workmen to the use of machinery in their trade, the *Darlington Telegraph* tells the story of what has happened to Mr. D. M'Dermid, an upholsterer of that town. This gentleman has invented a machine by which he proposes to save one-third of the usual amount of labour in paperhanging, and has taken out a patent for it. He tried to get it introduced in London, but although the masters were favourable to the design, the workmen were hostile, and either purposely spoilt the paper, or refused to use the apparatus. He had been recommended to the chief of one large paperhanging firm, but he found that in his repeated calls the gentleman could not be communicated with, as he was always out. He learned some time afterwards, although he had repeatedly left cards for the principal, that that gentleman had never been permitted to hear of his invention, and when ultimately he did so he stated that he could not adopt it because of the hostility of his men.

The cornice of a new building, now being erected by Messrs. Kippersly and White on the north side of Cowcross street, leading to the Metropolitan Railway station at Farringdon-road, fell with a tremendous crush into the street, breaking away the main supports of what appeared to be an excellent scaffolding, and knocking to the ground the scaffold, planking, bricks, mortar, pails, and workmen employed thereon. Just at that moment a Whitechapel omnibus, laden with passengers, was passing the hoard in front of the new erection, and one of the pails, filled with mortar, fell upon the driver and stunned him. The omnibus was partially shattered, and every pane of glass in the windows shivered to atoms. Several other persons were more or less injured, and one poor fellow, employed as a mason, has sustained very serious injuries.

Mr. G. E. Street, the architect, in a letter dated Venice, August 30, writes:—Owing to my absence from England, I have only just happened to see the *Times* of August 20, which contains several letters on the subject of the designs for the New Law Courts. I observe that "W.E.G." charges me with having agreed to some compact by which the successful architect in this competition "is to give £1,000 to each of his less fortunate brother architects." I beg you will allow me to give the most emphatic and unqualified denial to this statement. I have made no such bargain, and nothing would have induced me to do so.

The twelfth half-yearly meeting of the members of the London Labourers' Dwelling Society (Limited), was held on Thursday last, Mr. Richard Foster in the chair. The directors presented their report for the six months ending June 30th, which was received and adopted, and the usual dividend at the rate of 5 per cent. per annum, free of income-tax, was declared. The capital of the society now amounts to £30,500, the sinking fund (for the redemption of the leasehold property of the society) to £830, and the reserve fund (for the equalization of dividends or extraordinary expenses), to £3,962, of which sum £1,000 is deposited at interest, in order to provide the means of purchasing temporarily at par any shares that a member may from unforeseen circumstances wish to realize.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

82. J. WEBSTER, F. DEANE, AND W. RUMBLE. METALLIC ZINC PAINT. Dated January 12, 1867.

The inventors take spelter, and melt it in a suitable furnace, and raise it to about 800 deg. Fah. They then cover the molten metal with a flux of borax, mixed with caustic of soda, or chloride of ammonia, or other suitable flux, to prevent the action of the atmosphere upon the surface of the molten zinc. They then add thereto about seven or eight per cent. (or more or less) of finely divided iron wire or scrap, agitating the whole with an iron rod until the whole of the iron or scrap particles are taken up by the zinc. They then add sufficient antimony to cause the metal to run freely from the furnace. When the metal thus prepared has cooled down, it is next pulverized and ground, when it may be mixed with any oleaginous matter or varnish, and the metallic zinc paint results. When the paint is intended to be used for coating ships' bottoms, or for marine purposes, they add one and a half per cent., or thereabouts, of vermilion or oxide of mercury. *Patent abandoned.*

151. R. KUNSTMANN. IMPROVEMENTS IN THE MEANS FOR MANUFACTURING BRICKS, TILES, AND OTHER ARTICLES OF CLAY. Dated January 21, 1867.

This invention relates, first, to constructing the framing of the grinding machinery in such a manner that the rolls or cylinders can be adjusted or removed without taking down the said framing; to the employment of adjustable scrapers to keep the rolls clean while in operation; and, also, to the employment of a friction device by which they are stopped to prevent the passage between them of stones or other hard substances. Second, the invention relates to the arrangement in a box or cylinder of a series of spiral blades of varying diameter, by which the clay is more effectually mixed and pressed before being formed into bricks or other articles; and to the combination of these blades with a second series of blades, which may be caused to rotate in the opposite direction to the first series; also, to the arrangement of the bearings for the main axis or shaft (which carries the first series of spiral blades) outside the said box or cylinder; and so providing steel centres at the end of the said shaft to receive the "thrust" or longitudinal pressure on the same. Third, the invention relates to constructing the die which forms the clay "band" with adjustable zinc side pieces, by which the size and shape of the said "band" is varied as desired. Fourth, the invention relates to the arrangement in front of the said die of a wire, or series of wires, by which the clay "band" is divided longitudinally into a number of "bands" or layers. Fifth, the invention relates to constructing the wire frame (which is attached to an adjustable table carrying a series of rollers) so as to allow the number and distance apart of the wires in the said frame to be varied; and to the employment of side plates in combination with the said wire frame to hold the clay "band" against the wires while being cut; also, to the employment of an adjustable gauge, whose distance from the wire frame can be varied to form bricks or other articles of various sizes, and which stops the clay "band," while the same is being cut, but which is adjusted to allow the bricks or other articles when cut to pass, and also to allow the table to be moved back. Sixth, the invention relates to the employment of trucks consisting of an open framework mounted on wheels and provided with a number of shelves with slightly rounded edges, upon which the bricks or other articles are placed to be dried, the said shelves being readily taken out and replaced to facilitate the proper arrangement thereon of the said bricks or other articles. Seventh, the invention relates to the construction of a kiln consisting of a series of cells which are filled with a number of the bricks or other articles to be burnt, and with the fuel required for the same, one after the other of these cells being lighted, and each cell as it is burnt out being shut off from those that are still burning. Also, to the construction of a circular kiln with a fireplace on one side, and with a revolving floor, by which the bricks or other articles are all brought nearer to or further from the said fireplace as required. *Patent abandoned.*

183. D. S. CHATER. IMPROVEMENTS IN CHIMNEY TOPS FOR THE PREVENTION OF SMOKY CHIMNEYS. Dated January 24, 1867.

This invention relates to the application of a double coned surface, and a surrounding cylinder, to the tops of chimneys, whereby to prevent down draughts, and at all times maintaining a free escape for the smoke from the chimney top. The inventor applies this double-coned surface to revolving cowls, in which the smoke emerges in a horizontal direction, and also to fixed chimney tops, from which the smoke escapes in a vertical or horizontal direction. *Patent abandoned.*

215. F. LICHTENSTADT. IMPROVEMENTS IN PORTABLE OR OTHER WATERCLOSETS. (A communication.) Dated January 26, 1867.

This invention has for its object the application of a self-acting cover to close the opening to the pan or receptacle of a portable or other water closet when out of use, and thus prevent the escape of disagreeable odours into the interior of the room or chamber in which the portable or other water closet or night convenience is situated, the cover being removed from over the pan by the weight of the user acting upon suitable mechanism connected with the seat and cover. For this purpose the seat of the closet (having an ordinary opening therein) is hinged or jointed to the back of the frame above the pan, and when out of use the front edge of the seat rises at an angle, and when the user is seated thereon, the seat descends and acts as a lever to remove the cover from over the upper surface of the pan or receptacle below. *Patent abandoned.*

273. T. BULLIVANT. IMPROVEMENTS IN THE CONSTRUCTION OF WINDOW SASHES AND SASH FRAMES, AND IN THE ARRANGEMENT OF ROLLER BLINDS THERETO. Dated January 31, 1867.

This invention has reference to the construction and arrangement of sliding sashes and sash frames, and in the adaption of roller-blinds thereto with the view of rendering the sashes air-tight, and preventing any rattling or shaking of the same, as also readily removed for being cleaned or otherwise, and in fitting the roller blinds within the head of the said sash frames so as to protect the blinds from dust or dirt when not in use, and consists in forming the sash frames with vertical metallic grooves, or otherwise in pulley styles, in which metallic guides attached to the pulley cords and weights on each side of the said frames are caused to work in such manner as to admit of the sashes aforesaid being taken out and replaced when required through the medium of fixing screws, inserted within the sash style, flexible material being employed for covering the said metallic guides, so as to give a smoother sliding action to the window sashes, and also to shut out the draught. By these arrangements, the inner beading and parting bead, together with the projecting outside hinings of the sash frame, as at present, are dispensed with. A box or cavity in connection with the above is formed at the head of the said sash frames for receiving the roller blind and sash pulleys aforesaid, a space or opening between the movable head and front moulding being left for the blind to pass through when being drawn up or down. *Patent completed.*

Trade News.

TENDERS.

BRIGHTON.—For repairs to stables, Pavilion Estate, Brighton, for the town council acting as the local board:—Anscombe and Newnham, £643; Simms and Marten, £584; Hall, £558; Lockyer, £552; Sanders, £523: Farr, £508; Nightingale, £442; Cheeseman, £440.

CLAPHAM.—For the erection of additional vestry at the Congregational Church, Clapham. Mr. John Tarring, 26, Bucklersbury, E.C., architect:—Sykes, £290; Saunders (accepted), £265.

CITY-ROAD.—For repairs and additions to the Britannia public-house, City-road, for Mr. Thomas Kean. Mr. James Harrison, architect. Quantities supplied:—Turner and Sons, £1,387; Henshaw, £1,366; Browne and Robinson, £1,249; Bishop, £1,213; King, £1,178.

FENCHURCH-STREET.—For new offices, Fenchurch-street, for the East and West India Dock Company. Mr. E. J. Leonard, C.E., engineer. Quantities by Messrs. Parr and Strong:—Hill and Keddell (accepted).

GIPSY HILL.—For erecting a pair of houses at Gipsy Hill, for Mr. E. J. Gordon. Mr. Samuel H. Hope, of Penge, architect:—Cressell (accepted), £520.

ILFORD (ESSEX).—For chapel, Barking-lane, Ilford, Essex. Mr. A. Manning, architect:—Warner, £1,296; Hearle, £1,025; J. A. Withers, £830; Hill and Keddell (accepted), £874.

KINGSTON.—For an iron fence, 1,940ft. long, at the River Promenade, Kingston-on-Thames. Mr. Charles Slagg, Borough, surveyor:—*Matthews, £695; Bevington, £692; Deuce, £676; St. Pancras Iron Company, £664; Turner and Allen, £655; Windsor, £557; Cochrane, Grove, and Co., £552; Eddington, £536; Harris, £535; Yates, Haywood, and Co., £533; Guilford, £530; Bell, £525; Haywood, £524; Finney, £515; Butt, £515; Dixon, £514; Simpson, £485; Smyth, £485; Shaw, £458; Newton, Chambers, and Co., £454; Hill and Smith, £447; Morgan, £445; Russell, £442; Brooks and Shoobridge, £440; Norton, £438; Williams, £435; Hall, £429; Waddington, £315; Ingram, £310.

*Three tenders very much higher than this were received, but for the credit of the parties tendering, are withheld from publication.

NEW WANDSWORTH.—For works in building Reformatory, with master's and superintendent's residence, at New Wandsworth, for Mr. J. Leyland. Mr. H. M. Burton, architect:—Nightingale (accepted) £3,100.

NOTTING HILL.—For constructing brick sewers, and for other works on an estate adjoining Portobello-road, Notting Hill, for the Freehold Securities Company (Limited):—Tinsley, £1,409 8s. 4d.; Burgess, £1,400; Crockett, £1,350; Burton, £1,260; Whittick, £1,160; J. and S. Williams, £1,140; Shrimpton, £1,061; Kyan and Co., £1,035; Faulkner and Cowley, £990 7s.; Goodair, £967; Moxon and Mutton, £958; Carter, £885; J. Porter, £879; George, £830; Wigmore, £825; Hayden, £810; Brewer and Steggles £775; P. Porter, £708.

POPLAR.—For seed and jute warehouse, East India Import Docks, for the East and West India Dock Company. Mr. E. J. Leonard, C.E., engineer. Quantities by Messrs. Parr and Strong:—Hill and Keddell (accepted).

PUTNEY (SURRY).—For the construction of pipe sewers and other works for the Wandsworth Board of Works. Mr. James Niblett, surveyor:—Blackmore, £1,650; Brew and Co., £1,429; Trinsley, £1,387; Avis and Son, £1,355; Wainwright, £1,340; Goodyear, £1,260; Robinson, £1,240; Strickson, £1,175; Wigmore, £1,039 10s.; Thackerah, £950.

SOUTHAMPTON.—For proposed new main drainage works:—Wainwright and Co., £8,400; H. I. Sanders, £8,270; Mackenzie and Abell, £8,856 3s. 7d.; Thomas Furness, £8,750; George Nowell, £9,330; W. Sibsey, £10,033; and Joseph Bull and Sons, £6,968. The committee accepted the tender of Joseph Bull and Sons

SUTTON (SURREY).—For a detached villa, for Mr. M. Angelo. Messrs. Bacon and Bell, architects:—Chandler, £1,577; Crabb and Vaughan, £1,395; Gordon and Co., £1,360; Nightingale, £1,339; Hazell, £1,225; Mundy and Hutchinson (accepted), £1,200; Wilcox, £1,200.

TUFNELL PARK.—For the erection of a dwelling-house for W. C. Parkinson, Esq., at Tufnell Park, N. Mr. John Tarring, architect, 26, Bucklersbury, E.C.:—Saunders (accepted) £2,655.

TUNBRIDGE WELLS.—For a house, for Mr. John Guy. Mr. F. Johnstone, architect:—Axford, £6,170; Willicombe and Oakley, £6,100; Punnett and Son, £6,074; Simms and Marten, £5,876.

WAVENTREE.—For new front, staircases, and gallery to Independent Chapel, at Waventree. Messrs. W. and J. Hay, Liverpool, architects:—Isaac Denton, £1,390; Wm. Tyson, £1,320; Joseph Robinson, £1,298; R. Barker and Son, £1,285; Westmoreland, £1,098; Nicholson and Ayre, £1,083; Okills and Morrison (accepted), £1,067.

WESTBOURNE PARK.—For constructing brick sewers, and other works on an estate near Westbourne Park station, for the Land and House Investment Society (Limited). Mr. Josiah Houle, surveyor:—Burton, £1,080; Burgess, £1,064 10s.; Shrimpton, £1,022 12s. 10d.; Crockett, £930; Brewer and Steggles, £923; Carter, £883; Wigmore, £900 10s.; Faulkner and Cowley, £893 7s.; George, £890; Hayden, £880; Kyan and Co., £880; Whittick, £838 5s.; Tinsley, £821 18s. 2d.; Moxon and Mutton, £816; J. and L. Williams, £780; P. Porter, £745; Goodair, £736; J. Porter, £728.

WOOD GREEN (MIDDLESEX.)—For erecting shop and private house. Mr. J. Tanner, architect:—Eaton and Chapman, £2,289; Turner and Sons, £2,277; Hayworth, £2,000; Barker (accepted), £1,920.

WOLVERHAMPTON.—For the building of St. Jude's Church, Wolverhampton. George Bidlake, architect:—Thompson, £4,800; Lovatt, £4,647 6s. 4d.; Horsman, £4,349; Nelson, £4,250.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

PROPERTY SALES.

AUGUST 28.

AT THE AUCTION MART.—By Messrs. Edwin Fox and Bousfield.—Freehold messuage and shop, No. 88, Farringdon-street, City, let on lease at £80 18s. per annum—sold for £1,610.

Copyhold house and shop, situate in High-street, Mitcham, let at £22 per annum—£170.

Copyhold beerhouse, known as the Welch Harp, situate adjoining above, let at £24 per annum—£150.

Copyhold residence, with barn, malthouse, and other buildings, and 16 acres of land, situate in the parish of Chillington, Sussex, let at £55 per annum—£760.

Leasehold, two houses, one with shop, Nos. 1 and 64, Nelson-square, Blackfriars-road, producing £56 per annum, term 37½ years at £11 6s. per annum—£405.

Leasehold four houses, Nos. 103, 105, 107, and 109, Carlton-street, Kentish Town, let at £38 per annum each, term 99 years from 1862, at £6 per annum each—£315 each.

By Messrs. Chinnock, Galsworthy, and Chinnock.—Freehold ground rent of £2 1s. per annum, with reversion in 24 years, secured on Nos. 22 and 23, Harcourt-street, Marylebone-road—£200.

Freehold ground rent of £4 10s. per annum, with reversion in 8 years, secured on No. 28, Newnham-street, Edgware-road—£280.

AUGUST 29.

AT THE MART.—By Messrs. Edwin Fox and Bousfield.—The Wapping, New Cross, and Douglas-street estates, comprising freehold ground rents, amounting to about £400 per annum, arising from about 119 houses; also, building land, situate in the parish of St. Paul, Wapping.

AUGUST 30.

By Messrs. Farebrother, Lye, and Wheeler.—Freehold two cottages, Nos. 1 and 2, York-road, Limehouse—£270.

Freehold, two cottages, Nos. 3, York-place, and 1, Railway-place, Limehouse—£215.

AT THE GUILDHALL COFFEE-HOUSE.—By Mr. George Beckett.—Leasehold, two houses, Nos. 98 and 100, Wirtemberg-street, Clapham road, annual value, £50, term 26 years unexpired, at a peppercorn—£480.

Ten £10 shares in the Bedford Hotel Company, Brighton, fully paid up—sold for £10.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

John Lake, jun., Trafalgar-road, Camberwell, mason, September 11, at 1—John Newman, Reading, ironmonger, September 10, at 12—Samuel Hurst Seager, Hargrave Park-terrace, Holloway, carpenter and builder, September 11, at 11—Edward Ware, Nursling, builder, September 12, at 12—Ebenezer Woodard, Acton, builder, September 17, at 11.

TO SURRENDER IN THE COUNTRY.

Henry Blight, Plymouth, builder, September 18, at 12.30—Robert Davies, Kirkdale, Liverpool, painter, September 12, at 3—William Emmerson, Leeds, builder, September 12, at 11—William Gamble, Middlesborough, joiner, September 11, at 11—George Hailes, Birmingham, engineer, September 13, at 12—Joseph Pritchard, Arnold, Notts, brickmaker, October 9, at 11—Henry Penfold, Marden, bricklayer, September 11, at 12—William Rees, Merthyr Tydfil, builder, September 9, at 11—Edward Tucker Rudgley, Freshwater, Isle of Wight, painter, September 11, at 12—John Thomas, Penmaenmawr, joiner, October 1, at 12—Charles Benedict Wright, Leicester, carpenter, September 10, at 11—Robert Coates, Hinsworth-upon-Tees, brick and tile maker, September 16, at 10—James Samuel Hayward, Liverpool, metal broker, September 16, at 3—George Norman, Leeds, joiner, September 23, at 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

October 22, G. Shepherd, Saint Woollas, Monmouthshire, painter—October 21, R. and J. Whitehouse, West Bromwich, ironmasters—September 17, L. Thomas, Aberdare, carpenter—September 30, W. Fanton, Bilston, carpenter—September 30, B. Bolton, Wolverhampton, hinge maker—October 4, W. Seddon, Horwich, builder—September 13, G. Lewis, Enloe, Flint, brickmaker.

DECLARATIONS OF DIVIDENDS.

J. Wilkinson, Brymbo, Wrexham, ironmaster—S. R. Freeman, Manchester, engineer, div. 9s. 1d.

PARTNERSHIPS DISSOLVED.

Needham and Haswell, Ratby, Leicestershire, brickmakers—Cole, Marchent, and Co., Bradford, Yorkshire, ironfounders—H. and J. Shaw, Eccles, plumbers—Brook Furnaces Iron Company, Bilston; so far as regards R. Dodd Godfrey and Co., Elton, Lancashire, ironfounders—Lee and Co., Burnt Wood, and other places, Derbyshire, grindstone manufacturers.

DIVIDENDS.

September 12, J. W. Pollard, Liverpool, slater—September 13, H. J. Ledger, Hulme, builder.

SCOTCH SEQUESTRATIONS.

J. L. Cochrane, Glasgow, plumber, August 28, at 12—R. Martin, Glasgow, contractor, August 29, at 12.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9	0	£10	10	Archangel, yellow ..	£11	10 £12 10
Quebec, red pine	3	0	4	10	St. Petersburg, yel...	10	10 11 0
,, yellow pine..	2	15	4	0	Finland	8	0 9 0
St. John N.B. yellow	0	0	0	0	Memel.....	0	0 0 0
Quebec Oak, white ..	6	5	6	0	Gothenburg, yellow	8	10 10 10
,, birch.....	3	10	4	10	,, white	8	0 9 0
,, elm	3	10	5	0	Gefle, yellow.....	9	0 11 0
Dantzic oak	3	10	6	0	Soderham	9	0 10 10
,, fir	2	0	3	0	Christiania, per C., 12 ft. by 3 by 9 in.		
Memel fir	3	0	3	10	yellow	18	0 22 0
Riga.....	3	0	3	5	Deck Plank, Dantzic, per 40 ft. 3 in.	0	15 1 4
Swedish	1	15	2	2	PUMICE STONE pr ton	6	0 8 0
Masts, Quebec red pine	8	0	7	0	OILS, &c.		
,, yellow pine..	5	0	6	0	Seal, pale....per tun	40	0 41
Lathwood, Dantzic, fm	4	10	5	0	Sperm body .....tun	103	0 105
,, St. Petersburg	6	10	7	10	Cod	38	10 0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Whale, 8th. Sea, pale	38	10 40
Quebec, white spruce	14	10	21	10	Olive, Gallipoli.....	67	0 68
St. John, white spruce	13	10	15	10	Cocoanut, Cochin, ton	56	0 57
Yellow pine, per reduced C.					Palm, fine	41	0 0
					Linseed	37	10 0
Canada, 1st quality.	17	0	19	10	Rapeseed, Eng. pale..	40	0 41 1
2nd do.....	12	0	13	0	Cottonseed	33	10 39 0

METALS.

IRON:—

Welsh Bars in London .. ..per ton	6	7	6	6	10	0	8	
Nail Rod ..... do	7	10	0	7	15	0		
Hoops ..... do	8	10	0	9	0	0		
Sheets, Single ..... do	9	15	0	10	0	0	2½	
Staffordshire Bars ..... do	7	10	0	7	15	0		
Bars, in Wales ..... do	5	15	0	6	0	0	8	
Rails ..... do	6	5	0	0	0	0	nett	
Foundry Pigs, at Glasg. No 1 .. do	2	15	0	3	6	8	2½	
Swedish Bars ..... do	10	5	0	10	10	0	nett	

STEEL:—

Swedish Keg, hammered .....per ton	15	0	0	15	10	0	2
Swedish Faggot ..... do	10	10	0	12	10	0	2

COPPER:—

Sheet & Sheathing, & Bolts ....per ton	84	0	0	0	0	0	
Hammered Bottoms ..... do	93	0	0	0	0	0	
Flat Bottoms, not Hammered .. do	88	0	0	0	0	0	
Cake and Tough Ingot ..... do	74	0	0	75	0	0	3
Best Selected ..... do	81	0	0	83	0	0	
Australian ..... do	84	0	0	89	0	0	
Y. 1. Metal Sheathing & Rods ....per lb	0	0	7	0	0	0	

TIN:—

English Block .....per ton	93	0	0	0	0	0	
do Bar ..... do	94	0	0	0	0	0	2½
do Refined ..... do	96	0	0	0	0	0	
Banca ..... do	94	0	0	95	0	0	nett
Straits ..... do	89	10	0	90	0	0	

LEAD:—

Pig, English .....per ton	21	15	0	0	0	0	
,, Spanish Soft ..... do	19	5	0	19	10	0	
Shot, Patent ..... do	23	0	0	0	0	0	2½
Sheet ..... do	20	15	0	0	0	0	
White ..... do	30	0	0	31	10	0	6

SPELTER:—

On the Spot .....per ton	21	0	0	21	2	6	net

ZINC:—

English Sheet .....per ton	26	10	0	27	0	0	2
Devaux's V. M. Roofing Zinc .... do	26	10	0	0	0	0	

* And 5 per cent. discount if laid upon the new system.

QUICKSILVER .....per btl	6	17	0	0	0	0

REGULUS OF ANTIMONY

French .....per ton	23	0	0	0	0	0	2½

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AND AT
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,, half case, ,, 250 ,, ,, . 18s.
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THE BUILDING NEWS.

LONDON, FRIDAY, SEPTEMBER 13, 1867.

NORTHERN VANDALS.

A LETTER in our pages describing the damage done in the restoration of a church in Norwich, and of that at Waddington, Lincolnshire, reminds us of our duty once more to protest against this mania of destruction, which is the curse of our time, not only in England, but even to a more distressing extent in France. In Paris it may be said with truth that there is scarcely an old stone in its original state remaining, and at Rouen things are very little better. But it is to more recent instances of this abominable practice in England that we would call attention. We are told that taste for high art, which was once the Englishman's boast, attested from the time of Charles I. almost to our own days by the choice collections made by our connoisseurs—so much so that, in certain of the highest branches, the treasures of the world were well-nigh glutting our market—is sensibly departing from us; and really the statement does not seem to be far from the truth. We cannot, at any rate, shut our eyes to two facts which seem to be capable of no other interpretation. One is the idiotic disregard paid to ancient work—no matter how excellent or interesting, how rare or how lovely—and the astounding poverty, inconvenience, and want of art exhibited in a great proportion of new work. Our correspondent "Th. B." attributes the Vandalism committed in many of our village churches to the want of an architect. But, as a matter of fact, has the employment of architects, some even of considerable eminence, prevented such abominations from being committed? We unhesitatingly say no. The architects have been no more guiltless than clerks of the works or builders' foremen. In fact, not unfrequently, a good clerk of the works has done good service in sparing where others would have destroyed. Restoration is a matter that requires such constant supervision, such constant personal attendance on the spot, that no architect who has not time and opportunity should undertake such work unless a first-rate clerk of the works is appointed. The fact is that whether there have been architects or whether there have been none, shameful damage has been done almost wherever restoration has been taken in hand. In no part of England has more serious damage been committed than in the North, and a writer in the *Times* some weeks back drew attention to the fact by the instance of the utter degradation and emasculation of Conisborough Church, a place endeared to the memory of Englishmen by its having been chosen as the scene of one of Sir Walter Scott's best novels. Those who knew Conisborough will remember that it was as solemn and interesting a building as could be seen anywhere, with its ancient benches and very fine Jacobean woodwork, its lychnoscope, with the original door and ironwork. All this is now no more. The lychnoscope and its door are abolished; the very curious and puzzling clerestory is stopped up; the Jacobean woodwork is old materials, now the property of the contractors, who, we believe, intend selling it. All the old stone of the interior has been re-tooled. The same architect (Mr. Teale), in another case, had all the external stonework also rechiselled. A very curious old tomb was cut up and destroyed. It consisted of a slab upon four pillars, and was apparently of the beginning of the fifteenth century. It had no inscription, but at the corners are faint remains of crosses, so that almost without doubt it was really an ancient altar. It seems incredible that such a relic should be wantonly demolished; but such is unhappily the case. Some other old tombstones, we are told, shared the same fate. The whole thing, we believe, was left to the contractors to do as they listed, the architect being seldom seen on the spot, and the consequence has been a clean sweep. What was once dignified, solemn, and most interesting is now vulgar, glaring, and insipid. The fine old woodwork is supplied by miserably weak and showy deal benches, as vulgar in taste as they are entirely wanting in feeling. All the fragments of old glass are gone, and, though frescoes or tempera wall paintings of considerable interest, and having inscriptions, covered the walls, all have been destroyed, without even a description of them being kept. The very inscriptions themselves were not copied, though we are assured they were of the utmost consequence. The whole walls have since undergone a process of modern plastering by a regular Roman cement man, the plaster projecting beyond the old stone work frequently as much as half or even three-quarters of an inch. To show the ignorant disregard of archæology exhibited in the whole so-called restoration, we cannot do better than quote one especially foolish example. Last year there were discovered at the north-east corner of the chancel, immediately at the back of the old Low Side window, the foundations of a small chamber. On the external face of the lychnoscope stone corbels projected, which could scarcely have been for any other purpose than that of receiving the roof timbers of this chamber. These have all been done away with, and at the north-east corner or angle of the chancel a curious stopping of the plinth (contrived unquestionably to receive the chamber wall) has been destroyed, and an angle buttress built to match the south-west quoin. Such utterly senseless Vandalism is simply contemptible. Surely, in these days of vaunted architectural progress and real archæological knowledge, such things ought to be impossible, but then, unfortunately, our church restorers are lamentably ignorant and careless of all such things. They are, some of them, good ritualists, but as to art or historical interest they understand little about them and care less. They want churches of a particular kind, and so long as they get that they are utterly heedless of the expense to art and history, by which their object has been gained.

It is not, however, at Conisborough alone that Mr. Teale and others have made short work of the archæological features of the churches. At Kirk Sandall he has recut all the external stone work. Another of these churches, which was one of the finest about the Riding, that at Darfield, has been overhauled by Messrs. Pritchett and Son, of York. Its renovation has not one redeeming feature; all the old feeling is destroyed. The old stone work has been very deeply recut, every scrap of tracery, with the exception of the heads of one or two windows, has been knocked out, and tracery of a very different character substituted. Most of the old work was well moulded decorated tracery, in place whereof we now have nothing but weak, wiry, chamfered tracery of the poorest description. The glory of the church has departed; it now remains only as an example of treatment to be avoided. By the way, these gentlemen seem quite prepared to restore modern churches as well as old if they only get a chance, and with as good taste. We wonder whether Mr. G. G. Scott has seen Mr. Teale's idea of improving (!!) his church of St. James, Doncaster, and whether he appreciates the alteration. We think we never saw anything much worse than the new bell turret, which appears to be stuck on the top of the roof in the most uncomfortable position. The management of the buttresses at the angles is curiously unhappy. That a new church by so clever an architect as Mr. G. G. Scott should be allowed already to be tampered with is only another proof how unfit the present custodians of our churches are for that part of their duty. And, now the work is done, the very best and most sensible thing to do next will be to pull it down and rebuild Mr. Scott's simple bell gable.

But to return to the old work. Bolton-on-Dearne is among the greatest sufferers. The chancel screen has been demolished. What a grievous pity it is that there is at present no way of saving the precious things that are turned out by the ignorance or prejudices of architects and others. Unfortunately, too, when any part of these fine old specimens of wood work is preserved, it is sure to be only the carving and tracery. The really most noble portions—the moulded timbers and framing—are almost universally destroyed or utilized. There is some old Norman work, too, in this church, which has been covered over with plaster; and, to crown all, the old font—as, alas! is the case in a tolerably large number of instances—has been turned out of the church, and now does duty as a flower pot in the rector's garden.

The bare recital of such things is enough to make one's blood boil. We hear also of some wretched cases of over restoration at York and elsewhere, but have not space at present to go into them. We have surely said enough to justify our returning to this painful subject, which has so long occupied our thoughts and employed the pens of those among us who can best appreciate the value of genuine fine art, and of the enormous importance, if it is to be of any use to us as a teacher, of preserving all we have of it in its original state. It is astounding that after all that has been said and written upon the subject, it should still be necessary to warn custodians of ancient buildings of their danger of the old material clauses in the contracts. And yet, in the case at the head of this article, we have the evil in its worst form. It must always be a grievous folly to make it the interest of the contractor to remove as much as possible. To save themselves trouble, they will frequently destroy, and, for the good of trade, allow others to destroy; but, if they can, also put money into their pockets by the destruction; it is too much to expect of most of them, unless they happen to be lovers of art, and at the same time unusually scrupulous, that they will forego the chance that fortune may put in their way. We are a little curious to know what will be the future destination of the fine old oak work turned out of Conisborough Church.

In conclusion, we urge upon the public the importance of their taking the matter up, and that no instance of Vandalism be allowed to pass unnoticed. Let architects, contractors, and the clergy know that their folly, greed, idleness, and ignorance are certain to be shown up, and get the derison and reprobation they deserve, and we shall have less of these miserable enormities.

THE RIVERS COMMISSION.

THE commissioners appointed by Parliament in May, 1865, to inquire into the present use of rivers for the purpose of carrying off sewage and refuse, have published their third report. The commissioners are Messrs. Robert Rawlinson, J. Thornhill Harrison, and J. T. Way. Their first report was on the Thames, their second on the Lea, and the one just published deals with two of the rivers in the West Riding of Yorkshire—the Aire and Calder. Like the Thames and Lea, the Aire and Calder are navigable streams; but, unlike those rivers, the Yorkshire streams are polluted "to the utmost limits of which they are capable," mostly by manufacturing refuse instead of sewage, as was the case with the former rivers. The waters of the Thames and Lea are used for domestic purposes; but the waters of the two Yorkshire rivers are in too foul a condition to be largely employed in this way.

The manufacturing industry of the West Riding of Yorkshire has grown rapidly from

the middle of the last century, when it became the seat of the worsted and woollen trades. It has been stated that from one-half to two-thirds of the woollen and worsted trade of this country is carried on there. The rivers supply so much water not only for power, but also for washing, dyeing, scouring, and other purposes, that local manufacturers were enabled to undersell those of other places, and hence the trade of the district has rapidly grown. Then, too, the range of mountains, and the graduated fall afford unusual means for storing water. Upwards of 5,000 mills and dyeworks have consequently been established since the commencement of the present century, a sufficient indication of the natural advantages of this part of the county. The manufacture of "shoddy" is largely carried on in the West Riding. But it is, as the commissioners affirm, beyond all doubt that the pollution of the Aire and Calder is due to the different processes incidental to the worsted and woollen trades. These streams run with a liquid which has more the appearance of ink than water. "In the higher part of the country," we are told, "the water is of the purest description, but as it arrives at any point where conditions for the establishment of a woollen mill are sufficiently favourable, so does the water commence to deteriorate, becoming fouler and more foul after leaving each successive mill," until it becomes so impure as to render it impossible to employ the water for domestic purposes, and the stream "is looked upon and treated as little better than an open drain." "The stench arising from these rivers," says a correspondent, "is something fearful—no words can describe the ill-odour which a breeze brings to you." This is corroborated in the Commissioners' Report, and it is stated as a certain fact that very few persons even in the district possess an intimate knowledge of the causes of this pollution, "or can estimate their individual influence on the general result." The commissioners doubt whether the familiarity of the inhabitants of the towns with the condition of the rivers "may not have rendered them all but unconscious of a state of visible pollution which strikes a stranger from the non-manufacturing districts with astonishment." Before referring more particularly to the character of the pollution from these manufactures, it may be well to state that the amount of solids taken into the streams is enormous. At Leeds, we are told, the volume of sewage passing into the Aire is from eight to ten million gallons per day, the entire weight of solids being swept out therewith; and this is the case throughout the district, wherever main sewers and drains exist. Although most of the towns have been partially sewered, and some houses drained, yet "in no single instance has this necessary work been thoroughly done." The entire volume of the sewage of such important towns as Leeds, Bradford, Keighley, Skipton, Todmorden, Halifax, Huddersfield, Dewsbury, Wakefield, and other places is passed direct into the rivers, no town or village intercepting sewage.

The refuse passed into the two rivers from wool washing is described as a yellowish, glutinous, stinking liquid; from wool dyeing, all kinds of colours are sent into the streams, that for dyeing black goods leading to the greatest amount of pollution. The wool is washed in stale urine and water, and the refuse is conveyed into the rivers. The black liquor which is discharged from the dye-vats is a solution of sulphate of iron, in which insoluble dye is suspended. The commissioners were so convinced of the importance of readily separating the black dye-stuff from the water that they took into consideration every known means whereby this might be done. "The problem is," they say, "the separation day by day of the solid matter in such form that it may be preserved, if of any value, or, if not worth preserving, be readily burnt or got rid of otherwise than by passing it into the rivers." They made a number of experiments with a form of mechanical filter, which has been used with considerable success in the Potteries and in various manufacturing towns. The machine is called Needham's press, and it consists of a number of narrow chambers lined with linen or calico, into which the liquid to be filtered is driven by a small force-pump, the thick matter being arrested, and the liquid passing through the bags. The machine put up for trial was but a small one; and yet the owner of the mills acknowledged that it would enable him to purify all the dye-refuse produced at his mill before it was discharged into the river. The commissioners are of opinion that the solid refuse from the machine, being similar to damp sawdust, might be easily burnt with small coal under the furnaces. "There remains," they add, "after combustion, a red powder, which is almost entirely oxide of iron. It forms from one-fifth to one-fourth the weight of the black stuff, and would undoubtedly find a market, either to be made into red or chocolate paint for external ironwork, or to be used in the purification of gas, or for conversion into perchloride of iron for purposes of deodorization." The refuse might also be used as a deodorizer. It is not the object of the commissioners to recommend this or any other means for the purification of the Yorkshire streams; and there are several means by which this may be done; but it is their duty to report that no solid refuse of any colour should under any pretence be allowed to pass into the rivers. This they have, therefore, done, adding that there will be no want of skill on the part of manufacturers and others to meet whatever difficulties may arise, if the law renders it imperative that the pollution shall no longer be allowed.

But this is not all. In the processes of fulling and washing dyed goods, immense quantities of soap have to be used. Formerly all the soapsuds were sent into the rivers; but as it caused a scum and froth, and coated everything with which it came in contact with slime, the grease has been extracted. But the report proves, from carefully prepared statistics, that the refuse liquid is not nearly so cleansed as to satisfy the requirements of river purification; and the commissioners say that the entire question of dealing with the soap waste must be earnestly and intelligently considered by the manufacturers, and they do not doubt that, "so large an economy may be secured that abundant funds will be forthcoming to deal with the other causes of pollution, such as dye and scour water, till such time as these in their turn become, as they surely will, a source of profit, instead of a nuisance and a disgrace."

We will endeavour to give in a short paragraph some of the leading points of one of the most important and lengthy divisions in this valuable report. The town of Skipton is situated highest on the River Aire. It is partially sewered and drained. "The town sewage is discharged into a stream, the dry weather volume of subsoil water and sewage being about 200,000 gallons per day; mixed and diluted in Ellar Beck with three or four times this volume of water the whole falls into the River Aire." This is in addition to the manufacturers' refuse. Need we be surprised to learn that the sewage in dry weather is the cause of great nuisance at the water-wheels, and that the foul sediment in the dams when flushed out "stinks awful"? Workmen have frequently to leave the mills at Keighley, sick in consequence of the stench of the sewage in dry weather. In Bradford there is an accumulation of stenches and filth. "It has become a Yorkshire proverb of comparison for any foul stream to say of it that it is as polluted as Bradford Beck." The large volumes of inflammable gases given off from the refuse of Bradford Beck have actually been ignited; and one of the boyish amusements of the town is to do for the canal what ambitious people have longed to do in London, viz., "set the Thames on fire." We have before now reported, somewhat fully, on the pollution of the Aire at Leeds; it is only needful to add, on the authority of the commissioners, what has been repeatedly asserted and contradicted, that "typhus fever is one of the most fatal diseases of operatives, and is also most costly to the community," since labouring men in the prime of life are cut off by this fever, leaving widow and family to the care of the parish. We are assured that the property and trade in Leeds "now pay taxes, in the form of poor's-rates and charities, more than would be required to establish and continue preventative measures." Surely it is better to pay sanitary rates than poor's-rates. The Halifax manufacturers now see the evils they have promoted, and are very anxious to remedy them. In summing up, the commissioners say:—"The towns are poisoned in some degree by their own sewage and cesspool matter, and are taxed to a considerable extent to remove this putrid refuse in a most barbarous manner. Manufacturers pollute the water for each other until the streams have to be abandoned for all but the coarsest purposes of trade, and clean water has to be purchased from waterworks companies, or must be sought, at great cost, in well-sinking and boring, to which must be added the charges for extra steam power. In some cases, the manufacture and dyeing of finer sorts of goods has been necessarily abandoned, and in other cases extension of manufacture is rendered impossible because there is no additional volume of clean water to be obtained in the district." These facts alone are sufficient to condemn the existing practice of river pollution.

It is evident that water fit for drinking purposes cannot be plentiful. Worse than that, it is actually scarce. "In dry seasons many of the inhabitants of the West Riding now suffer a water famine, and that even where there is an abundance of good and wholesome water available if it were properly collected, stored, and distributed." The report deals with this pressing subject in great detail. The remedy for all these public nuisances is to be found in altering the law. At present the law relating to river pollution is exceedingly defective. Everyone is dissatisfied with the existing law. It is difficult to enforce, on account of private rights. An aggrieved proprietor can, of course, take the matter into our London courts and bring an action for damages. But no proprietor cares about availing himself of so cumbrous and expensive a remedy. If he were to do so, he might, by a slight technical difficulty, lose his case. Private attempts have been found useless. Cases have been known where a manufacturer, sued for polluting running water, has brought the litigation to a close, not by ceasing to foul the river, but by simply removing the discharge into the river to a point below the works of the complainant. The improvement should be of a permanent character; and to effect this it is necessary that local action should be supplemented by some stronger power. It appears that there is plenty of land suitable for sewage irrigation, and the benefit of this system should be secured. But it is of paramount importance that the pollution of the rivers should be prohibited, and the practice of casting solids into running waters can be readily stopped. The commissioners recommend the appointment of a conservancy board, the duties of which should be to aid the Salmon Fisheries' Commissioners; to prevent all forms of river pollution; to take cognizance of all existing weirs, mills, dams, reservoirs, drains, &c., and of any new or projected works that may affect streams; and also to hear appeals in cases of local dispute as to works of any character affecting the free flow of rivers. They do not, however, recommend the kind of legislation required, as they defer that until they have reported on

ıe condition of other polluted rivers. Still, ·e hope that among the first bills presented to arliament next year will be a bill prohibiting ıe pollution of these rivers by thoughtless ıanufacturers.

AUSTRIAN TIMBER.

XPERIENCE has long demonstrated that the nature of the fuel employed in ıe manufacture of iron possesses a consider-ble influence upon its quality, and its pecu-ar suitability for the various purposes of ›nstruction. As a rule, iron of a superior uality is produced whenever wood is used in s manufacture. In England, owing to the :arcity of timber, and expenses attending the :ocess conducted with the use of wood ıel, coal is universally employed instead. n the Continent, where vast forests still ist, their contents are rendered avail-ıle for the smelting of the ore, and the elimi-ıtion of its precious ingredients, and the re-lt is, that those countries possessing re-urces so valuable may well compete with us the manufacture of a product in which we .ve for ages considered ourselves unrivalled. f all continental countries, Russia, together .th that large tract of territory included in e Scandinavian peninsula, is the most richly dowed with woods and forests, and when ne enables it to open up its enormous mine-l wealth, it will possess a store of fuel suffi-ent to last for centuries, even supposing that plants no young timber to replace that cut wn and consumed. Austria is hardly less nerously supplied by nature in a similar anner, for nearly a third of her whole terri-ry is covered with forests. The eastern rtions of the kingdom are particularly rich timber land, and in Transylvania the ratio tween the wooded area and the open untry is nearly one-half. In addition, arly a quarter of Hungary consists of forests, hich, by a laxity of order and preservation, e left almost at the mercy of the inhabitants the neighbouring land, who cut down, both r domestic and industrial consumption, ıatever trees take their fancy. Precautions, wever, are taken in the German states, ıere, in consequence of the greater develop-ent of trade and manufactures, the forests e of greater value, to preserve the wood, and t allow it to be destroyed at random. In ›hemia, where the regulations are very strin-nt, a proprietor is not permitted to alter e system of culture, or the management of e forest, without the especial sanction of vernment. The Tyrol, Styria, and parts of rinthia possess splendid forests of pine, , oak, beech, and other trees, which are her exported by the government or by ivate parties who have obtained a conces-›n from the State for cutting down por-ns of the timber. Admirable specimens of e same wood are to be found in great abun-nce in Istria, Croatia, and the southern rts of Dalmatia.

A large proportion of these forests is used the purposes of fuel, and for making iron their native country, and the various in-strial branches consume another large share. rge quantities serve for the manufacture ships and their component parts: for rs, capstan bars, and a considerable por-n is absorbed in the making of casks holding oil and foreign merchandize. nong the rest, the precedence for fitness for nstructive and ornamental purposes must be corded to the Alpine and Carpathian wal-ıt trees, to the oaks of Sclavonia and Istria, l to the elms and birches of the district of kowina. For exportation, the descriptions ncipally sought after are the fir and pine of patia, and large quantities of these are ex-rted to France for shipbuilding purposes. ı might be anticipated, the inhabitants of country, although clever enough at the chet, and able to bring down a tree well, either too indolent, or too careless, to e about carrying the work any fur-r. They have neither the skill nor the desire to emerge out of their primitive barbarism; they are satisfied with felling the timber, and leaving to others the task of reducing the rude material into due form, and assigning it the shape and size necessary to adapt it to use. They may be said to be in every sense of the term hewers of wood and drawers of water. The average length of the logs is about 25ft., but there are also others of larger dimensions, which are exported in great abundance from the forests of Trieste, in Illyria, and from the smaller ports of Dalmatia. In the department of Fiume there are fifty saws moved by hydraulic power, and six by steam, constantly employed in cutting up timber. They turn out annually between two and three million planks of two descriptions. The one are termed "payoles," and are about 15ft. in length, 1ft. in breadth, and nearly the same dimension in depth; the other description is called "latisane," and are of a smaller dimension, though of a quality equally good. Recently, owing to the extension of the French railway system, a large demand has been made by the various companies upon the beech trees in Croatia for the purposes of sleepers. They can be delivered on board at 14d. the sleeper, and are 9ft. in length by 9in. in depth, by 6in. in breadth. For the same sleeper in England, we should pay about 2s. 9d., or perhaps 3s.

When once a source of profit, whether it consists of a forest, a mine, or a quarry, is discovered, the two next steps, in order to render it of commercial and industrial value, are to work it and find means of transport to the nearest port. The last step is the most important, and frequently an insurmountable one. It is, therefore, not sufficient for Austria, or any other country, to possess these vast sources of natural wealth if she is not able to transport them to the sea coast. Although the particular portions of the Austrian territory we have been describing are well provided with water communication, yet it is so scattered that it presents serious impediments to the establishment of any complete system of inland navigation tending to unite the separate streams and rivers into one grand arterial route of intercommunication. One of the greatest obstacles towards effecting this result is the chain of mountains constituting the barrier between Croatia and Dalmatia, and, moreover, none of the rivers upon the western side are of sufficient size to serve for the purposes of transporting the timber to the sea. Timber is the most easily conveyed merchandize by water, since there is no necessity for employing boats, but all that is required is to make the logs into rafts and float them down. The most important stream traversing the districts of Carinthia and Croatia is the Lacte, which ultimately debouches into the Danube, and receives during its course many tributaries serving for the transport of timber rafts. From the region of Bosnia it receives the Huna; from Croatia the Kulpa and the Drave. The former passes under the walls of Carlstadt, and the latter empties itself into the Danube. All the timber arriving at Fiume is conveyed along the celebrated Via Ludovica, at a considerable saving of expense. Since the opening of the railway from Steinbruck to Sissek, the duties levied upon unsquared timber have been much lightened. There is no question but that the absurd custom of imposing heavy duties upon articles of traffic, similar to that of timber, has had a great influence upon the prosperity of those countries where it exists in abundance. There is but little use in attempting to preserve a forest for ever, and the plan most sensible is to use it all up as quickly as possible in the most remunerative manner. What would be the use of the most extensive forests to us now in these days of iron shipbuilding, or in any one of those numerous instances where iron has altogether superseded its predecessor of timber? Unquestionably, if we possessed the comparatively enormous tracts of forest-covered land with which other countries are endowed, we should long since have burnt them standing, for the sake of the ground they occupy, had there been no other means of getting rid of them with the requisite degree of celerity.

SKILLED AND UNSKILLED LABOURERS.

THERE are two points brought out in the evidence taken by the Trades' Union Commission which are essential to a thorough comprehension of the trade union question, but which have not received the attention they deserve. The first of these is the proportion borne by the skilled artisans engaged in various trades to the unskilled ones, or mere labourers, auxiliary to those artisans, dependent upon the continuance of their work, rendered destitute when they strike, yet not members of the union nor supported by its funds. The second is the comparatively small proportion of the unionists to the whole number of workmen in each separate trade or industry. Both points are most important—the one as showing the collateral suffering caused by strikes to those unconnected with them and unable to prevent them, the other as showing how small is often the minority which by its organization is enabled to control the majority.

It appears from the evidence of Mr. Mault, secretary to the General Builders' Association, that the entire number of workmen engaged in the building trades is about 900,000, classed as follows:—

Carpenters and joiners	204,133	
Masons, stonecutters, &c.	117,483	
Bricklayers	80,391	
Slaters and tilers	8,586	
Plasterers	20,821	
Painters, plumbers, and glaziers	82,073	
Sawyers	36,264	
Lathmakers	2,083	
Quarrymen	27,067	
Brickmakers and clay labourers	42,623	
		621,524
Labourers		218,695
TOTAL		840,219

The mere labourers, especially if we include the labourers in brickfields who knead the clay, amount to more than one-fourth of the whole number. But of the 621,000 who may be considered as skilled labourers or artisans, it appears that only 90,500 are union men, *i.e.*, about one-seventh, the proportion varying from 6 per cent. among the brickmakers to 30 per cent. among the plasterers. That is to say, putting the two results together, one unionist can coerce six non-unionists, and every three skilled labourers can, according to their will, deprive one unskilled labourer of bread.—*Pall Mall Gazette.*

THE PROGRESS OF THE ORGAN BUILDING TRADE.

A CASUAL glance over the pages of weekly journalism devoted more or less to the interests of organ building and church musical intelligence, will suffice to show the unprecedented activity of the organ building trade at present, and during the past few years. No less than one hundred and seventy accounts of large new organs, or restorations of old ones, mostly of considerable size and importance, have been recorded week by week in a period of little more than two years by the *Musical Standard*, and among these are rebuilds of several cathedral organs (Canterbury, Ely, and Durham); while many are instances of considerable magnitude, either new or restorations. Such are St. Mary Redcliffe, Bristol; Wimborne Minster; Christchurch, Newgate-street, and others. Scotland and Ireland have also been well represented in the history of organ building; while its progress "over the border" is a very marked feature. Many of these undertakings are carried out by organ building firms in the provinces, some, of course, unfamiliar to London readers, but some of a degree of fame which will at least admit of their competing with our great metropolitan builders. —*From a Correspondent.*

The foundation stone of a new harbour at Torquay was laid last week by Miss Palk, daughter of Sir Lawrence Palk, M.P., the lord of the manor. The harbour is estimated to cost £37,000.

MODEL DWELLING HOUSES IN THE PARIS EXHIBITION.

WE are indebted to the courtesy of our contemporary *The Farmer* for the privilege of republishing the following illustrated paper on model dwellings in the Paris Exhibition, more particularly on the arrangement and construction of cottages and dwelling houses adapted for the labouring classes. As the author of the paper remarks, the examples given are in many respects worthy of adoption, and in all are certainly very suggestive.

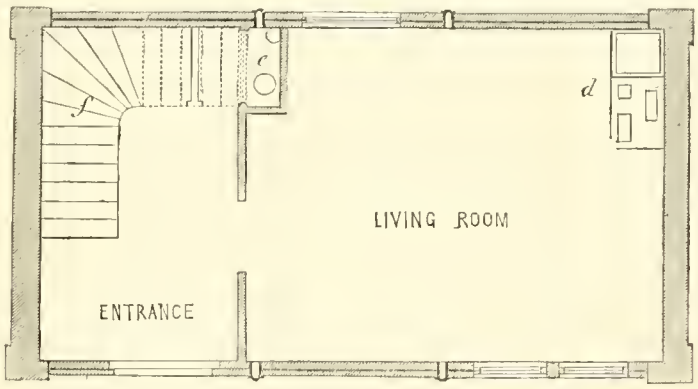


FIG. 1.

As, comprising some of the most suggestive hints—especially in connection with cheap construction—the "model dwelling-house" erected in the Park, a little to the left of the main avenue leading from the entrance at the Bridge of Jena, will occupy our attention in the first place. The model of the building, if the term is indeed applicable here, inasmuch as the building is full size, has been erected by the Paris Co-operative Society (Le Société Co-operative Immobiliére), from the design, and under the superintendence of M. S. Ferrand. The plans annexed will show the accommodation. Fig. 1 is the "ground plan" (plan du rez de chaussee), in which *d* is the cooking stove in the corner of the living room (salle à manger); *e* the privy or water-closet (cabinet d'aisance), and *f* the stairs (l'escalier) leading to the chambers shown in the chamber plan (plan du premiere étage), and in which there are two. We give in fig. 3 a rough type plan of the cellar plan (plan du la cave), in which (fig. 3) *a b* are the stairs leading from the ground floor, and which enter from a door at the side of that of the water-closet *e*, in fig. 1; *c* is the cellar room, and *d* the place of deposit (fosse mobile) from the water-closet above. Small garrets are placed above the bedrooms, in the hollow part of the roof, this being reached by a movable staircase or steps. The staircase is lighted partly by the glass light above the doorway, and partly by the window at the back, the height of which is so arranged that it lights the part in the second floor as well as that in the ground floor. The isolation between the water-closet and the living room is effected by the employment of a hollow wall, thus—the black part representing the hollow, but the sides or separate walls, as *a b*, are themselves hollow, being made of hollow bricks. A few air holes are left in the outside wall next the back court, by which air is admitted from the external atmosphere to the space between the walls; this arrangement being said to be a most perfect "deadening" of all sound. The water-closet is lighted by a small window, which can open and shut. On reference to the plan in fig. 1, it will be seen that the cooking apparatus is placed in the living room. This is found to be better than placing it in a separate room at the back, as being more in accordance with the habits and customs of work-people. The arrangement, moreover, economizes space and construction, and last, not least, fuel—a most important consideration where fuel is dear, and indeed important even where it is cheap, for economy in all departments of household management is or ought not to be overlooked. We translate freely the words of a French author, in giving his adhesion to this plan of having the cooking done in the living room:—"One of the chief occupations of the mother of the family is the superintendence of the fireplace, the cooking which is being carried on at it, the cradle where lies her sleeping infant, and the table at which the family dines. Each of those objects possesses for her a lively interest; she loves to see them reunited in one place; obliged as she is to bestow her cares at the same time to one or another of them, she finds this arrangement of vast convenience." In winter the cooking stove is heated by coal, in summer by gas or charcoal. And we may here note that the use of gas is greatly on the increase for cooking purposes. It is easily applied, and economical where the price does not exceed 4s. or 5s. per 1,000 cubic feet. The ventilation is secured by means of the chimney of the stove and the windows, which can be opened and closed at pleasure. Much, however, is to be done yet before ventilation of cottages is perfect. All the floors of the ground plan are laid in cement. Much diversity of opinion exists on the subject of flooring of cottages, some maintaining that timber or boarded floors are alone to be depended upon for health, others holding the converse of this. Much depends upon the nature of tile or cemented floors; if absorbent, not repellant, of the water which must be used at intervals to cleanse them, there can be no doubt that a very considerable degree of unhealthiness attaches to the tile floor. There can be no doubt of this that a boarded floor feels more comfortable, and, where carpets are used, infinitely more economical than tile or stone floors, which are eminently destructive of all coverings put upon them. But this objection does not apply in the generality of cases of cottages, where carpets are not used; although it does apply to some. The chief peculiarity of the cottages of the Co-operative Society of Paris, now under consideration, is, however, in their construction. The architect avoids the use of solid masses of stone or brick in the construction of the walls and employs hollow bricks, these being used in the construction of walls with a space or cavity between them—the thickness of the wall being only 5in. As this is evidently too thin to bear the weight of the superstructure, iron columns are employed, the position of which are shown at *a a a a* in figs. 1 and 2. The floors rest upon or made of light arches of hollow bricks, which rest upon light wrought-iron beams. By this mode of construction, the whole of the weight is taken by the iron columns; the walls have therefore little more to do than merely to protect the interior from the inclemencies of the weather. The hollow walls perform, however, other important offices—they equalize the temperature and reduce or deaden the noise which may arise in contiguous apartments or in the streets. They equalize the temperature as follows:—the space between the hollow walls is placed in communication with the cellar; the air is thus admitted throughout the space between the walls from the cellar to the garret. The air in the cellar being cooler in summer and warmer in winter than the surrounding or external atmosphere, the temperature in the interior is equalized. This system of wall construction possesses many advantages, not only in the direction named above, but in the economy of construction—a saving of not far from a third being effected as compared with our usual brick buildings—and of space, the difference in the thickness giving a large number of cubic feet of space additional. It remains also to be noticed that this hollow wall—in itself composed of hollow bricks—offers easy facilities for the ventilation of the interior of the apartments, the being placed in direct communication with the external air. We have for long maintained that the question of improved cottages for rural districts depends more upon economy in construction than upon any other consideration; and that, if we are to witness any great degree of progress in this respect, it will be through the medium of improved and economical construction. The houses, as shown in figs. 1 and 2, are designed to be erected in rows, or in blocks of groups of four.

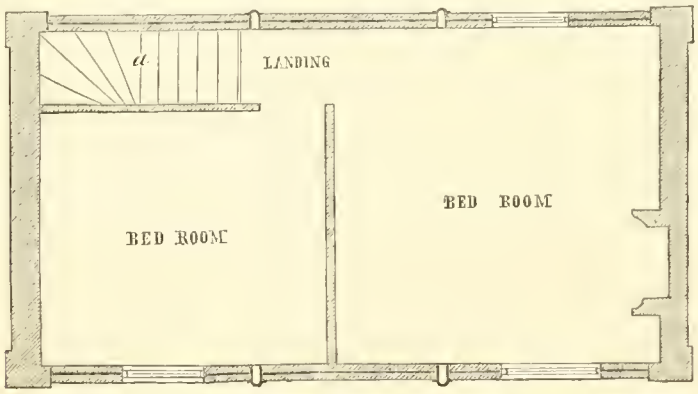


FIG. 2.

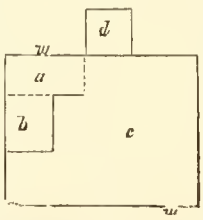


FIG. 3.

As regards rural districts, we have to note that in various departments of the Exhibition, there are plans of buildings possessing characteristics essentially different from those met with in our country, showing quite a different mode of arrangement, and this brought about by different modes of living. Thus, many cottages are adapted not for the dwellings of the mere labourers, but for that of proprietor farmers who farm the small holdings which are so often met with on the Continent, the buildings possessing in common the features of a house and of a farm steading for the accommodation of stock. Of the

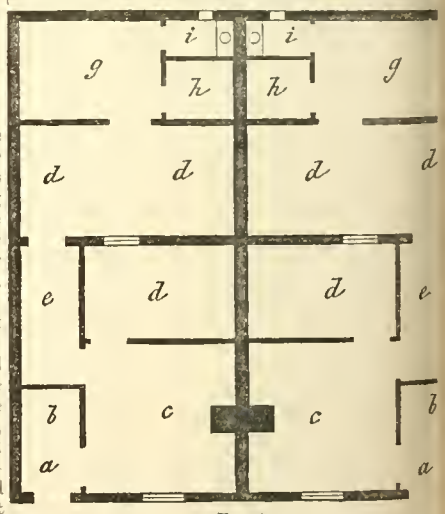


FIG. 4.

MODEL DWELLING HOUSES IN THE PARIS EXHIBITION.

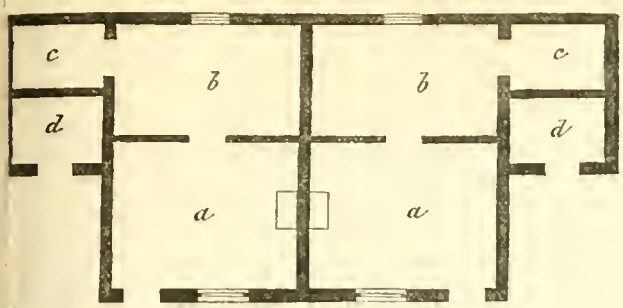


FIG. 5.

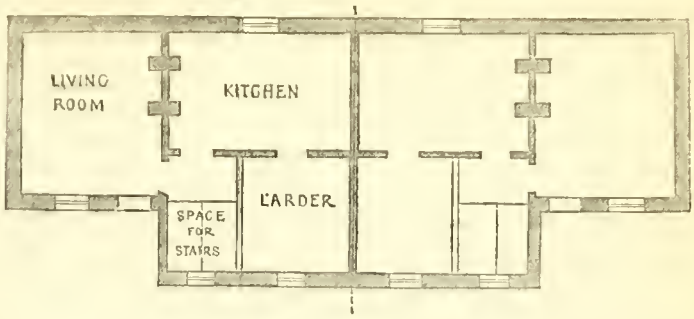


FIG. 9.

nd is the "workman's cottage," as it is called, Conques (Ande), in the Domain de Vie, of hich M. Columbier is the architect. In fig. 4 give the ground plan, in which *a* is the

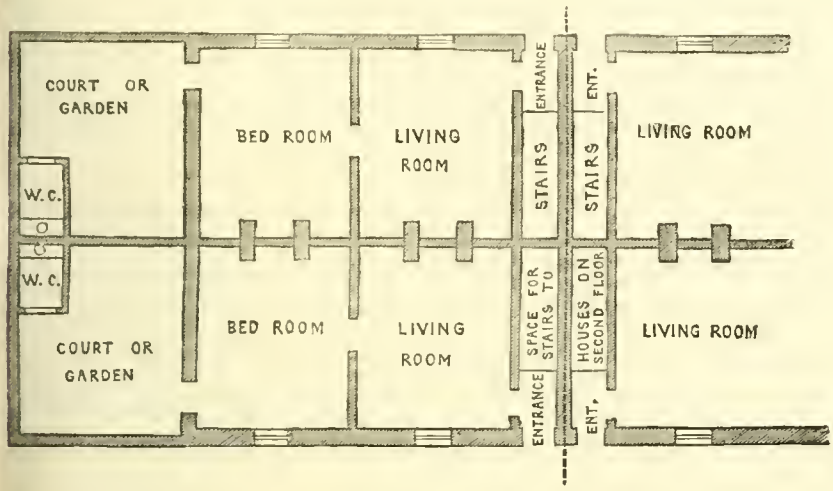


FIG. 6.

rance, *b* the store-room, *c* the kitchen, some t. square; *d* the bedroom, 7ft. wide, with shing-closet *e*, 4ft. 6in. long; *d d* the court; he cow-house; *h* the pig-stye; *i* the water-

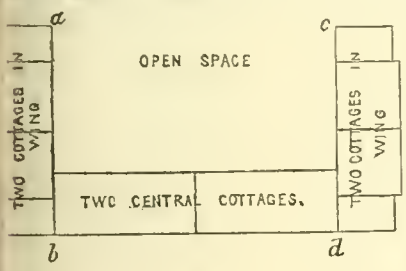


FIG. 7.

et. The same remark applies to the so-called urer's cottage, of which a model and drawings exhibited in the Prussian Annexe, and, to a lified extent, to the Bavarian cottages, of ch full-sized erections are to be not far from the Prussian nexe. The Prussian cottage is eed neither more nor less than armhouse, and gives altogether erroneous idea of what it is nded to convey.

n fig. 5 we give the plan of the king-man's cottages, as erected he Mines of Blanzg, in which *a* e living room, *b* the bedroom, od, and *d* fuel store. In fig. 6 give the plan of working-men's ages erected in Belgium, built airs, the arrangement of which sufficiently explained in the gram. As a contrast to these, give in the following sketches plans of a series of cottages erected at ops Waltham, in England, which are ex- ted in the Prussian department as having been gned by M. Hoffmann, of Neustadt, near tzic. In fig. 7 we give a block plan, to show arrangement of the six cottages of which the k is composed. Fig. 8 is the ground plan of central part of the block, in which there are two cottages, the arrangement of each cottage being as shown in the sketch to the left. In fig. 9 the ground plan of the end part of the block is given. Fig. 10 is the chamber plan of central part of block, of which the ground plan is in fig. 8. Fig. 11 chamber plan of the end part of the block, ground plan of which is in fig. 8.

In his elaborate report on the model dwellings in the French Exhibition, Mr. Edwin Chadwick, C.B., draws attention to a very interesting experiment made in the matter of house construction by a French architect. "I have stated," says Mr. Chadwick, "that the best sanitary construction of a house, apart from any question of cost, would be on the principle of the Crystal Palace, only with thick slabs of opaque glass, and with double walls, enclosing (like double windows) a still air, which would be the best means of meeting external variations of heat and cold, and preventing the evils of the absorption of moisture and miasma. The chief novelty in construction in the Exhibition is in the model dwelling of the Co-operative Society of Paris, made by Mr. S. Ferrand, the architect, to some extent on the principle I have stated. He constructs his walls of hollow brick in this, and make the walls double this. The thickness of the double wall is 5in.,

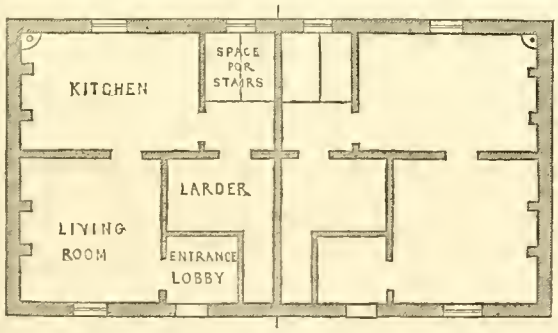


FIG. 8.

which, of course, would be insufficient for bearing purposes. But the wall is held together, and the bearing power is obtained on what I have termed the Crystal Palace principle, by iron column beams, and cross-trees. He claims for this construction the advantages of walls which are thin, and which, therefore, save space, and yet are warmer, resist changes of temperature better, and are better non-conductors of sound than the common brick or stone bearing-walls, and that at a lower cost. Of the hollow brick cottage constructions, with hollow brick flat roofs as well as walls, in England, it is re-

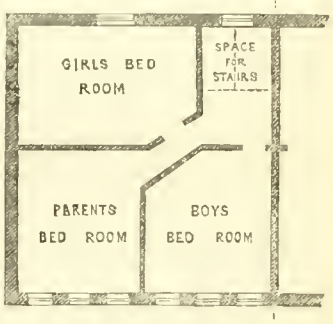


FIG. 10.

ported, that, as anticipated, they are warmer in winter and cooler in summer than the common construction; whilst of ancient hollow floors that are warmed by hot air underneath them, it is declared that the warmth derived from their ex-

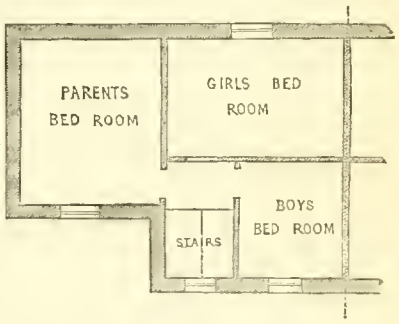


FIG. 11.

tended surface is more comfortable than that derived from any other mode of house warming. The principle of construction has been applied in hospital huts in hot climates, as reported, successfully. The hollow of the double wall is also applied as a means of producing a current of air for interior ventilation, the success of which in Mr. Ferrand's construction I had no means of getting tested. Of the superior quality of the wall itself, of its advantage as a non-conductor of heat and of sound its economy of space, and of the general advantage of this iron-tied construction there can be no doubt. If it were of our common brick construction, the expense of a dwelling of the same size, constructed in the cheapest manner, would not be less than £150. The improved iron-tied, double-wall, detached dwelling, might be constructed in England for £110. Moreover, the substitution of the 5in. wall for the common brick 14in. cottage wall would insure a gain of 710 cubic feet of space, which, as such space is now alloted in cottages, would serve as breathing space for two persons. Instead of facing the interior wall with soft plaster and paper, it might be faced with a light-coloured Scott's cement, in which case, at no great expense, the wall would be washable, and its sanitary quality would be nearly as perfect as if it were faced with an improved and smooth tile surface. On the whole, this construction is eminently worthy of consideration, as being an advance in the principle of construction, and as affording the best promise of any in the exhibition in connection with the sanitary improvement of the dwellings of the general population.

JOTTINGS IN LONDON.—No. I.

(By Our Roving Correspondent.)

I MAY consider myself a wayfarer in London, for I am only a new comer, and may be but a little while in it; yet, on that very account, things which pall on the frequent passer of the streets, changes that are unnoticed, old practices that are lost without being thought of, tell the more freshly on me. I am independent in more ways than one. I have no architects to patronize, and in my want of acquaintance with the profession can make my note without thought of friend or foe. I may tread innocently on a great man's toe, but I can afford to acknowledge merit in the young and unknown, without wanting the authority of a name, or fearing to justify my opinions by facts. The growth and appearance of London in the present day are indeed calculated to strike a stranger. Paris has, it is true, attained a high standard of monumental magnificence; but, then, all Europe is in reconstruction, its great cities—London, Paris, Vienna, Constantinople; its smaller cities—Manchester, Liverpool, Marseilles, Lyons, Florence, Naples, Milan, Brussels, even Athens. In most of these places have I seen the labourer pulling down, and the mason building up—ruins on the one side, unfinished piles on the other, pointing to a future in which the comparison is to be made rather than in the present. There is no place so dead that will not live. Venice, already cleaned and furbished up, looks forward to new works and additions to her treasures—new attributes of her acknowledged immortality. But why speak of Europe in these days? Is Europe a world, when we have the world now accessible to us? There is Asia, with a fringe of cities on its western border taking new shapes. Beiroot, with boulevards and a carriage road which conveys improvement to Damascus; and the Europe of India, with its old metropolises and new capitals under municipal boards. Africa we cannot leave out. Alexandria, with its wide streets near the Place of Consuls, threatens the Arab town on one side; and on the other, by its short railway, creates fresh suburbs in Ramleh, or the sands. Cairo, the city of what is old, touched by railway magic, may preserve her time-honoured treasures, but must add to them new gifts. Even in the Esbekiyeh I saw an English architect building a grand hotel for an hotel company. Algiers is still an Arab city, but an Arab city set in a French frame. Cape Town, slow and sluggish, having parliamentary government, has now its railway, and in its Malay quarter a costly mosque. What are we to say of America, if only of the metropolis being created in New York to eclipse the old world, which to its Croton aqueduct has added a Central Park at a cost of £2,000,000. It is too long a tale for now.

Of all these places, London in reconstruction is not the meanest sight. As a whole, and in parts, it is well worthy to be compared with the greatest enterprises of the day; nor does Paris promise more. Paris is wonderful; never yet perhaps has the world seen a town in such finished and vast magnificence. No oriental city ever compassed so much of what is solid, stately, and beautiful; nor was there ever anything in antiquity. Babylon and Nineveh we may not put forward, for they were of the earth that returns again to a dusty mound. Thebes has left us its great monuments, but not its modest mansions. Ephesus, Athens, nor any city of Greece, rich to perfection in works of art, ever attained any real extent as a town, beyond long streets of sunburnt brick buildings. Rome in its highest glory must have come nearest, with its palaces, its temples, and its islands, but there all that has been swept away in Paris was what filled up the mass in Rome. Those fancy pictures of Rome restored, where all is grandeur and no meanness, are the types of dreams which Paris has given body to.

Will Paris retain this pre-eminence? If political success befriend Austria, Vienna may push her hard. Vienna is, after London and Paris, that place which is most of a metropolis, as much so as Constantinople, more so than St. Petersburg. It is the only metropolis in Germany. The destruction of the walls and the construction of the Ring Strasse unite the old monumental Vienna with its suburbs in one great coherent mass, and that Ring-street, although not presenting the winding length of the Paris boulevards, has what they have not—a happy symmetry. In some respects, Constantinople cannot rival Paris, but then she has features of her own. Those old monumental mosques crowning the hills, now, since the great fires, to be bound together by wide streets, will, if the embankment be carried out as far as the Palace of Dolma Bagcheh, show Stamboul in her grand proportions, stretching along the Bosphorus, which Seine nor Thames cannot vie with.

It is these natural features, which in a monumental aspect will show their mark. Hence, should all Paris be embanked, as London will be, neither embankments nor bridges possessing the same cost of structure, will on the Seine present the like magnificence as on the Thames. This is one point we have in the comparison, and in this way we have the account to make out. Our currency is not the same as the French, and we do not put down the same pieces. They count in napoleons, five-franc pieces, and francs—we in sovereigns, half-crowns, and shillings. If we have not a gold piece so large as they we must even tender change.

The pulling down and rebuilding are on a vast scale in London, even as they are in Paris, but in Paris these are striking, because they are more in the midst, though there are mighty suburban extensions. Here, in the heart of London, while we have cut many wide ways, yet much is being done piecemeal. When is this to end? When this ends we may make our account with Paris. Paris has now this great advantage, that having started last in the race, when she was far behind London in streets, pavements, lighting, sewers, watering, and cleansing, in shops, and setting them forth, she starts anew and afresh with all our improvements, and has the better of us. It is just as if one goes to-day to the tailor's and gets him a new suit; this is glossy, bright, and in the last fashion, whereas his friends, whose older garments are only half worn or not yet worn out, no longer shine by his side.

When London shall have more of her newer part, then will she stride nearer to her great rival. The Thames embankment is just one of those features which will tell in this way. The Courts of Law, however arranged, and the Palace of Government, are other great elements. The Bois de Boulogne may beat us for a time, if we do not choose to trim up Greenwich and Blackheath, and Kew and Richmond; but we must not be ashamed of counting our docks, to which we have added the Victoria and Millwall Docks. We may not perhaps go beyond the Halles Centrales, but the New Meat Market will stand by itself. The Hotel Dieu will from the City Isle overlook the Seine; so will a smaller, but not less well contrived hospital, St. Thomas's, arise by the side of the Thames at Lambeth.

Although the Holborn Viaduct goes on, and Middle-row now meets its doom, there will be much that is paltry left in our streets, and our streets will still be overcrowded and be no fellows to the boulevards, but this very overcrowding, this well-fed pulse of traffic, is that which marks the full blood of London. We must look to our river to give us greater harmony. How much more than a boulevard—or all the boulevards—is the silent highway flowing through town and suburbs, a score miles from Kew to Woolwich. Bridges, embankments, dockyards, docks, arsenals, tiers of shipping, such as our Turkish visitors compared to the Bosphorus and Golden Horn, and did not claim superiority. The groups we have and those which will arise—Westminst Palace and Abbey, Lambeth, the Law Cour Temple, St. Paul's, the Tower, Greenwich not seen from quays, but from the bosom the waters, not spick and span new, brand with the cypher of the last fleeting sovereig but telling their time honoured chronicles history, or connected with institutions dati back from the infancy of our nation. T surface alone gives no sufficient field for d play, nor is it by towering monuments take our measure; the masts and funn lying low tell in our reckoning, but none t less the railways and channels that burr underground. This is what we are now wor ing out—a giant task, noble in its fulfilme but which in its progress presents none t less of interest. The sketch here given sho its general outline, but in the examination details we shall have no such grand picture we shall deal with lesser merits and so blots. In examining these details in fut numbers I shall take them as they occur, a make my notes, large or small, bit by bit, the thought of the day may bring forth. referring to what interests one's self, t opportunity will offer of communicating terest to others.

NEW WORKHOUSE OF ST. MARTIN'S PARISH.

SOME time since, six architects, of well-kno ability in the profession, were invited the Guardians of the above parish to sub designs in competition for the erection of t new workhouse at Wimbledon, to which gentlemen above referred to consented, upon understanding that each competitor received a of fifty guineas, and that the author of the selec design be appointed to carry out the buildi The designs, all of which seem to have been v studied and possessed considerable merit, w sent on June 4 last, and the Guardians, a having held several meetings, extending ove period of three months, for the consideration the designs, have now decided in favour of design by Mr. Cross. The selection was made the 4th instant, at a special meeting called for t purpose, and at which sixteen of the Guardi were present, who voted in the usual manner, name of the competitor receiving the fewest v being eliminated at each voting. The follow gentlemen competed, and the figures represent number of votes recorded in their favour at e separate voting of the Guardians.

Mr. Lee . . .	4...	5...	0...	0...	0...0
Messrs. Kendall and Nced . . .	7...	7...	7...	6...	4...0
Mr. Marrable . .	4...	4...	4...	5...	5...5
Mr. Cross . .	10...	11...	9...	10...	9...8
Mr. Burton . .	0...	0...	0...	0...	0...0
Mr. Burton (alternative design) . .	3...	0...	0...	0...	0...0
Mr. Cotton . .	8...	7...	4...	3...	0...0
Messrs. Cotton & Burton (joint design) .	8...	10...	9...	9...	9...7

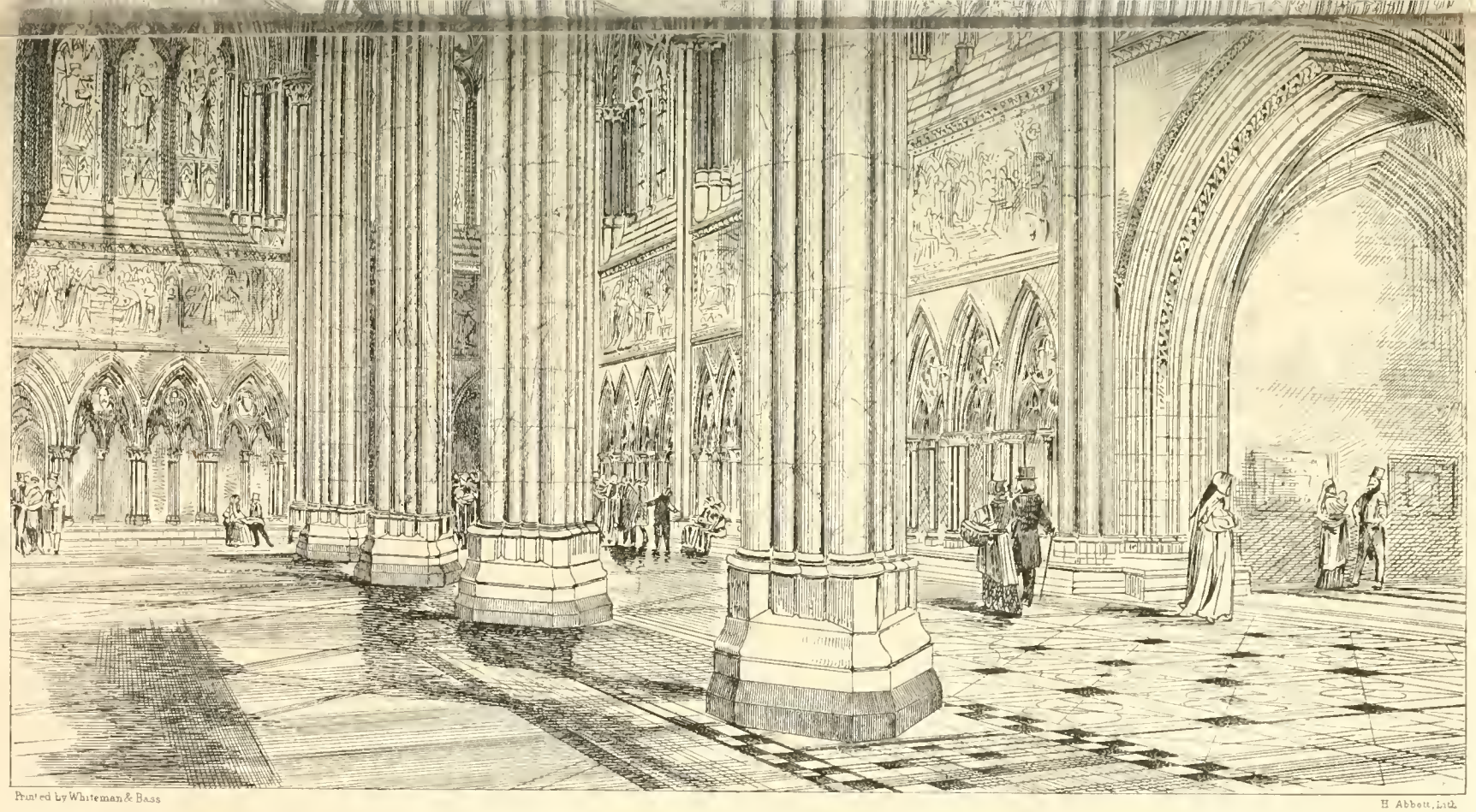
Final majority for Mr. Cross . . .

OBITUARY.

WE regret to have to announce the death of William Walker, the ancient historical engra who expired at his residence in Margaret-str Cavendish-square, on Saturday night. Among numerous works of excellence executed by the ceased artist, the most generally known are engravings of the "Passing of the Reform Bi the "Aberdeen Cabinet," and the "Literary Pa at Sir Joshua Reynolds." The last mentio work must have possessed peculiar interest to Walker, who had married the daughter of S. Reynolds, the engraver of all Sir Joshua's pictu One of his latest productions. "The Distinguis Men of Science," the engraving of which occup him during six years, and cost him nearly £5, before bringing any return, is one that must familiar to our readers as a remarkable specim of that branch of art.

Toulouse Cathedral is to be repaired by me of a lottery, tickets 2½ francs each, giving an vestor the chance of winning £4,000.

The Building News Sep^t 13th 1867



Printed by Whiteman & Bass

H. Abbott, Lith.

The New Law Courts.—Interior of Public Hall.—G. E. STREET, R.A., ARCHITECT.

PROPOSED DESIGNS FOR THE NEW LAW COURTS.

WE give this week a double page illustration of the interior hall for the proposed New Law Courts, as designed by Mr. Street. One reason why we have given this at the present time is, that the plans of Mr. Street and Mr. Barry a short time since were reported to be selected. It was said, and circulated extensively in the newspapers, that Mr. Barry's plans and Mr. Street's architecture were considered to be the best for the intended purpose. We have, however, heard no confirmation of the report, and are inclined to believe that it is only true in a certain sense. No doubt it was the opinion of Messrs. Shaw and Pownall; but has that opinion been confirmed by the judges? At all events, it was given before the report of Mr. Gardiner, the Government surveyor, was made, and we can scarcely see how a final adjudication could have been come to without such an important element of evidence. In fact, nothing is known for certain at the present moment. Public writers therefore had better suspend their judgment before they pen indignation articles and endeavour to write up the designs of any of the competing architects. We are induced to think that the matter will come to something like a deadlock; and, if so, we may look out for another competition. At all events, the Treasury are in no hurry, and nothing will be lost by all interested exercising a little patience over the matter.

GRINLIN GIBBONS.

AS illustrating his extraordinary talent as a carver in wood, it is related of Grinlin Gibbons that he once executed a basket of flowers and foliage as a sign for a shop in Ludgate of such delicate workmanship that they fluttered with every breath of wind. Whether the story be true or not is of little consequence. He has left behind him abundant evidence of his great genius in this particular line, in which he stands first, and, in some respects, alone. Of his personal history, very little is known of this remarkable man. We know that he was born of Dutch parents in Spur-alley, in the Strand, that he lived for some time in Belle Sauvage-court, then on the west side of Bow-street, at the corner of King-street, and died in the year 1721, and that is all we do know. The ornamentation on the pedestal of Le Sueur's statue of Charles I., at Charing Cross (re-erected in 1678), and of James II., at Whitehall, erected in the same year, is the work of Gibbons, who, by the way, is also said to have carved the gilt cock in front of the well-known tavern of that name in Fleet-street. These, however, are among the minor feats of his cunning hand—the lighter efforts of his genius. He owes his great reputation to the marvellous foliated scroll-work with which he has enriched so many of our public churches and private mansions. "This peculiar description of light interlacing scroll work," remarks Mr. W. G. Rogers, the eminent carver, of Greek-street, Soho, in a paper delivered at a recent meeting of the Institute of Architects, "was originated by Gibbons, and is to be met with in most of his important works. It died out with him, and no one has successfully attempted to carry it on since his time." In this paper Mr. Rogers gives the result of an examination of a number of Gibbons' carvings in different public buildings and private mansions which he has visited, with a view to their restoration and preservation. It is a fact to be stated with regret that many of the most exquisite examples of his work to be met with are in such an utter state of decay that unless something be done to preserve them there will shortly be nothing left to bear witness to the genius of Grinlin Gibbons. Where his carvings are not being destroyed by the ravages of the worm, they are being ruined by the hand of the "house painter and decorator." Take those at Cashiobury as an instance. "Having heard," says Mr. Rogers,

Of sundry carvings at Cashiobury, and having obtained permission to see them, I found room after room covered with the finest of Gibbons' work—dead game, wild flowers, scrolls, live birds in the softest plumage, masses of fruit entwined with delicate tendrils—all as pure as when the carver left them. I was well satisfied with my day's work of inspection, presuming on another pilgrimage to this wonderful display of Gibbons' work; but it was not until November, 1865, that I was able to make a second visit to Cashiobury, after a lapse of more than thirty years, when I found that all this charming work had been covered over, and loaded with a thick brown paint and heavy varnish; all the delicate feathering of the birds and veining of the leafage were effaced, smothered up and had vanished: and what repairs had been made, were wrought in plaster or a composition. I could not conceal my mortification and regret at the great mischief which had been done. Examining a flower about the size of an orange, I found it was nothing but a skin of dust, with just enough fibre left to save it from collapsing in the handling.

The fine ceiling and fittings of the chapel of Trinity College, Oxford, "wrought in costly, richly, sweet-scented cedar," is now covered over, we are told, "with a dirty, undrying oil." Over the marble chimney-piece in the great hall at Kirklington Park, near Oxford, is a panel five or six feet square, in the best style of the master. It is nearly in its virgin state, and quite capable of being recovered and brought back from its present dark condition to the rich golden tone of the carvings in the Cedar Chapel at Chatsworth. On the grand staircase, in a rather dark corner, high up, is a second Gibbons panel, the subject of which is a basket of flowers and fruit, with side pendants, covering a space of about 5ft. by 4ft. These two panels are the largest and finest Mr. Rogers has yet seen. At Lyme Hall, near Disley, there is a considerable amount of Gibbons work scattered over the rooms, the great hall and staircase, and Mr. Rogers thinks that though Gibbons' name may not appear in the records of the great works at Chatworth, "nevertheless, this was his school, and there he educated his workmen, who partook of his inspiration." Windsor Castle, St. James's Palace, Hampton Court, Burleigh, and Petworth also contain fine examples of wood work by the same master hand—in no better condition, it is to be feared, than the rest. In speaking of the metropolis, Mr. Rogers remarks that the upper part of the reredos at St. James's, Piccadilly, is a most marvellous specimen. It was injured during the past century by a ladder falling against it, and has been partially mended by bands of wire. Again, the reredos in the church of St. Nicholas, Abchurch-lane, is one of the richest in any of the City churches. Large masses of festoons and pendants of fruit and flowers cover the whole width of the wall up to the cornice. This has been painted over in the same way as the carved work at St. James's. The horizontal bands on the great organ in St. Paul's Cathedral are the perfection of this character of foliated scroll work. The carving in St. Paul's, it is satisfactory to know, is an exception to that in most other places. It has escaped the ravages of the insect, and is in excellent condition. As to the preservation of wood carving, the experience of Mr. Rogers is valuable. To that gentleman was entrusted the restoration of the very fine wood work, by Gibbons, at Belton House, the seat of the Earl of Brownlow:—

The whole of the works were in a serious state of decay, portions being completely honeycombed by the worm. In order to destroy or prevent any future development of the insect within the wood, Mr. Rogers caused the whole to be saturated with a strong solution of corrosive sublimate (chloride of mercury) in water. The colour of the wood, however, suffered so seriously by the action of the mercury that it was found necessary to adopt some means of restoring the original tint. This was effected by ammonia in the first instance, and subsequently by a slight treatment with muriatic acid. After this the interior of the wood was injected with vegetable gum and gelatine, in order to fill up the worm holes, and strengthen the fabric of the carvings. A varnish of resin, dissolved in spirits of wine, was afterwards spread on the surface, and then the dismembered pieces were put together in conformity with the photographs taken as records prior to the work of restoration having been commenced.

Twelve years have elapsed since this restoration was effected, and, on recent examination, not a single worm was to be found in the carvings. Cedar appears to be least susceptible to the ravages of insects, and lime wood the most susceptible. All paint, Mr. Rogers considers, is fatal to the preservation of wood carvings. In the course of an interesting discussion which followed the reading of the paper, Mr. Rogers, in answer to a question as to the best means of restoring old carvings which have been painted over, remarked that it was not possible to scour and wash the paint off in the ordinary way:—

In order to remove the paint it must be eaten off; and for that purpose he made a trough large enough to hold the carving, and to admit of its being covered over with sawdust, which would be saturated with an alkaline solution of a strength varying according to the circumstances of the carving to be treated. By allowing it to remain in that state for a few days the whole of the paint would be eaten off. That was the only method of treatment he was aware of without the risk of breaking. With reference to the restoration of carvings which had not been painted, but had become blackened, in such cases scouring must be resorted to; but it required to be done by the careful hand of an experienced man. They knew that scouring either with strong or weak alkali or ammonia would raise the grain of the wood; nor could they sandpaper it over, to get the raised grain of the wood off: but a number of little tools were required, the ends of which were dipped into a little glue, to which powdered glass would affix itself, and thus make a sand paper at the end of the stick. In that way the burrs which were formed upon the wood by moisture could be removed from the delicate parts of the carving; but this likewise required to be done by an experienced hand. That was the method he had adopted at Chatsworth and elsewhere.

It may be useful to add, for the benefit of those who feel a special interest in Gibbons and his carvings, that Mr. Rogers purposes to extend his inquiries, and he will be glad, as he informs us, to receive any information respecting the existence of Gibbons' work in churches and private mansions, and will inspect it, if at all within the range of his proposed journeys.

TECHNICAL EDUCATION.

FROM every point of the compass we hear that England is gradually being left behind in the application of the arts and sciences to industry, and the chief reason specified is our great want of technical education. The Paris Exhibition has taught this important lesson, and we are glad to see that many amongst us are not slow to profit by it. We see by a pamphlet that has been sent us by George Henry and Arthur Nussey, of Leeds, that it is proposed that a technical institution should be at once formed for Leeds and district. These gentlemen attribute the growth of taste on the Continent to the great attention that has been paid to the scientific improvements relating to various manufactures, and the sound system of technical education for workpeople and employers that has been established by the governments of continental states. Schools for the training of young manufacturers and artizans have been founded in all the principal manufacturing cities. The sons of the principal manufacturers, after being educated in one of these schools, are often sent to England, to acquire as much practical information as possible.

The following extract from a French report shows the cause of superiority of French designs and manufactures. Speaking of Lyons silks, the report says:—"The manufacturers are obliged to visit England to buy most of their raw material, which is sent there direct from India and China. This superiority is, therefore, principally due to the inventive genius of the designers. They have all been educated at the School of Fine Arts, and manufactories where they are taught to weave, to

design, and to paint flowers. In most firms there are two partners, one of whom is an artist who has studied in the School." The following extract from a report shows the success of Mulhouse:—"The Chamber of Commerce has opened a museum of the products of all the principal manufacturing nations in the world, and has also established a School of Art, Designing, and Weaving, in order to instruct the workmen and young manufacturers in the scientific and art instruction necessary for their business."

This pamphlet of the Messrs. Nussey contains a programme for a complete school of art and technical education, which should embrace all the trades of the district, and be a centre of manufacturing instruction for the north of England. The school should include the following studies:—

Specialty No. 1. Mechanical Engineering in all Branches. Principles and Construction of Ordnance and Smallarms. Free lectures.

Specialty No. 2. Spinning, Weaving, Finishing, and Dyeing of Woollen and Worsted Fabrics. Free lectures.

Specialty No. 3. A School of Weaving and Designing. Free lectures.

Specialty No. 4. Spinning, Weaving, Finishing, and Designing Linen Fabrics. Free lectures.

Specialty No. 5. Manufacture, Finishing, Dyeing, and Designing of Leather. Free lectures.

Specialty No. 6. Mining, Metallurgy, Potteries, Brick Making, and Stone Getting. Free lectures.

Specialty No. 7. Building, Contracting, and Furniture Trades. Free lectures.

Specialty No. 8. A School of Art and Design. Free lectures.

The "specialty" relating to the building, contracting, and furniture trades should include:—"Mechanical and architectural drawing, modelling, freehand drawing; arrangement, construction, and decoration of buildings; designs for houses, cottages, factories, forges, tanneries, &c.; construction of staircases, window frames, floors, roofs; building bridges, embankments, walls, roads, tramways, railways, reservoirs; cranes, scaffolding, &c. Designs for rooms, offices, theatres, public buildings. Measurement of solids and liquids; models of various shapes of stones; construction of all sorts of furniture; cloths and woods to be used; nature of different woods; designs for furniture; flower painting; carving and gilding; mixing of various colours, varnishes, &c.; plumbing and glazing; heating and ventilation; draining and plastering. Best situation for buildings; study of effect; situation; contrast with surrounding buildings and objects; gardens, grounds. Bookkeeping. Woodworking machinery in all branches; carving, polishing, and finishing; supply and nature of various stones, cements, &c."

It will be seen, from what we have said, that the authors of this pamphlet contemplate a great enterprize, but not too great for the wealth, the intelligence, and the energy of the Leeds district. Whether an institution on so vast a scale as the one suggested will be embodied or not we of course cannot say, but it is painfully evident that something must be done in this way and that soon.

Since the above was written we have seen a report of a special meeting of the Central Council of the Yorkshire Union of Mechanics' Institutions, over which Mr. E. Baines, M.P., presided, when it was resolved to institute an inquiry into the present means for the promotion of technical education in Yorkshire, and what measures are required to extend those means for the benefit of foremen of manufacturing establishments, as well as the more rudimentary scientific education of artizans. Mr. H. H. Sales was appointed to conduct the inquiry.

MANCHESTER TOWN HALL COMPETITION.

THIS competition, which has from the first excited considerable interest, has now produced considerable dissatisfaction. We have received several letters on the subject, one of which we give in full in another page. As we have not space for all the correspondence, we must content ourselves by giving portions of it. Several correspondents pass uncomplimentary remarks on the referee from London whom the committee appealed to for advice. One correspondent says, "The value of anonymous competition has been clearly shown at Manchester, when, out of 127 competitors, four out of the eight chosen are Manchester men." No fault finding is likely to alter the decision. We prefer to deal with the future rather than the past. Hence we make room for the following:—

SIR,—Permit us, through your columns, to suggest the publication of the mottoes, if not the names of the authors, of the designs which were reported on by the town architect in the above competition. To the many who are among the unsuccessful it would be a great satisfaction to know if they were included in the thirty-five who were thought worthy of a careful consideration by the committee, and also if their designs were among the twelve selected for a final examination, and ultimately reduced to the ten who are privileged to compete again for the great prize. If the committee would favour us with a brief outline of the different stages of the competition, and give the mottoes of the designs as they were weeded out, they would, we feel sure, receive the thanks of a hundred and twenty of our professional brethren, who, like ourselves, have burned the midnight oil for four months for the melancholy satisfaction of signing themseves, as we do,

UNSUCCESSFUL COMPETITORS.

September 10, 1867.

The following suggestion is also worthy of consideration of the Town Council:—

SIR,—From the account published of the Manchester Town-hall competition, I see that the sub-committee selected fifteen designs for the final competition, four of which Mr. Godwin overthrew when he came to inspect the drawings. Would it not be well, either for the Corporation to invite the four architects so disappointed to send in their designs perfected, in the final competition, without being paid a premium; or for Mr. Godwin to forthwith publish his reasons for his selection, in order that the other competitors, and the public, may see whether he was justified in his decision or not? If something of this kind is not done, the competitors will imagine that the final decision was arrived at by some process similar to putting the mottoes into a hat and classifying them according to the order in which they may have chanced to fall out.—I am, &c.,

JUSTITIA.

The following circular has been addressed to the competing architects for the new Town Hall. In the interest of art education we hope the competitors will consent to the exhibition.

Town Hall, Manchester,
9th September, 1867.

SIR,—You will no doubt have observed in the papers that the plans or designs sent in for the new town hall, with the following mottoes or devices, have been selected for the second or final competition, viz.:—

"ST. MICHAEL."
"RING OUT THE OLD, RING IN THE NEW."
O
"TIME TRYETH TRUTH."
"POLYANTHUS."
"MUNICIPAL."
"(THREE HEBREW CHARACTERS.)"
"AU BON DROIT."

Considerable anxiety having been expressed on the part of the public to see the competing plans, I have, at the request of the new Town Hall Committee of the Council, to ask you to inform me during the present week whether you are willing that your plans should, with or without your name being attached thereto, be for fourteen days publicly exhibited.

I need hardly say that it is not proposed to exhibit the designs selected for the second competition, and unless a large proportion of the architects intimate their desire to have the plans exhibited, no public exhibition will take place.—I am Sir, yours most obediently,

ROBERT NEILL, Mayor.

CAVE DISCOVERIES AT GIBRALTAR.

AT a meeting of the British Association, Mr. Busk, F.R.S., read a paper from Captain F. Brome on some recent discoveries in the caves of Gibraltar. The exploration of one of these caves (at one time a sea cave, but now upwards of 700ft. above the level of the Mediterranean), resulted in a discovery, at a depth of from 6ft. to 3ft., of a nalagmite floor of varying thickness, and subsequently of the following articles:—Two portions of a human jaw, two bushels of bones of oxen, goats, sheep, rabbits, &c., several bones of birds and fish, two bushels of broken pottery of the richest kind or unwashed, and 57 pieces ornamented, 61 handles of pots, stone axes, 7 flint knives, 1 flint cone, flint chips, several pieces of worked bone, three guerns, a portion of an armlet and anklet, sea shells, and a few land shells and rounded pebbles. In a small chamber on the north side there were found two ancient swords, both much injured. On a subsequent excavation there was found a small enamelled copper-plate, which appeared to have upon it a design of a bird, with its bill open, in the coils of a serpent. Upon a sketch of this plate being shown to Mr. Franks, of the British Museum, that gentleman, without giving a positive opinion, stated that it was probable that both it and the swords belonged to the eleventh or twelfth centuries. In some of the other caves similar discoveries have been made, and the investigation was being prosecuted. Captain Brome held that it was a fact nearly, if not quite, established that the Gibraltar caves were tenanted by a race having uniform habits of living, and suggested that some convulsion had dispersed the human remains and articles (which were all found in a fractured state) round the sides of the caves. He had found one of the caves stretching away into others not formerly known of, and one of these appeared to sink in water, thus giving the hope that Gibraltar might find in them an internal reservoir.

A PLEA FOR BEAUTIFUL CHURCHES.

THE Bishop of Cork, in the course of an address at the opening of a new church in his diocese the other day, made use of the following remarks:—I feel personally, of course, as bishop, very much gratified at what I see, and I am very glad that this pleasing specimen of architecture is by one of our own communion, and an architect of our own town. The Almighty Creator himself, we may say without irreverence, delights in beauty. All the forms of nature are beautiful. The shape of the heavens is beautiful; the midnight sky is beautiful; the moon walking in her brightness is beautiful; the sun rises and sets in beauty; all creation is formed in beauty; and, my Christian friends, there is no reason why we should not use beautiful forms too. What is architecture? Nothing but the beauty of order, the beauty of shape, the beauty of size, the beauty of proportion. What is music? Nothing but the beauty of sound. What is painting? The beauty of colour. What is oratory? The beauty of speech. What are the higher sciences? The beauty of reason. It is contrary to God's design, and contrary to our nature, that we should not make use of those things that God seems to delight in. Any new church erected in the united diocese must be submitted to me before it can be opened for divine service, and I would cut off my right arm before I would sanction anything that would lessen the benefits to be conferred upon the people committed to our ministers' charge; but if we desire to have, as we have, our houses not only sufficient to protect us from the weather and convenient, but well furnished in every part, and beautifully arranged, are we to except the house of God! If we could build a house to God with stupendous architecture, we ought to do so—with the loveliest shapes, and forms, and colours. I would I could have all our churches beautiful, and I would I could have in them all beauty of sound. The house is for God's honour and the benefit of His people; and the pleasant sounds uttered in it—whether formed by instruments, or that most exquisite of all instruments, the human tongue—are dedicated to the service of God. I think it exceedingly desirable that we should have such churches as this.

PREPARATION OF WHITEWASH.

WHITEWASH is one of the most valuable articles in the world when properly applied. It not only, says an American contemporary, prevents the decay of wood, but conduces greatly to the healthiness of all buildings, whether of wood or stone. Out-buildings and fences, when not painted, should be supplied once or twice every year with a good coat of whitewash, which should be prepared in the following way:—Take a clean water-tight barrel, or other suitable cask, and put into it half a bushel of lime. Slake it by pouring water over it, boiling hot, and in sufficient quantity to cover it 5in. deep, and stir it briskly till thoroughly slaked. When the slaking has been thoroughly effected, dissolve it in water, and add 2lbs. of sulphate of zinc and 1lb. of common salt: these will cause the wash to harden and prevent its cracking, which gives an unseemly appearance

to the work. If desirable, a beautiful cream colour may be communicated to the above wash, by adding 3lbs. of yellow ochre; or a good pearl or lead colour, by the addition of lamp, vine, or ivory black. For fawn colour, add 4lbs. of umber—Turkish or American, the latter is the cheapest—1lb. of Indian red, and 1lb. of common lamp black. For common stone colour, add 4lbs. of raw umber, and 2lbs. of lamp black. This wash may be applied with a common whitewash brush, and will be found much superior both in appearance and durability to the common whitewash.

NEW CEMENT AND BUILDING MATERIAL.

IN a communication to the French Academy of Sciences, M. Sorel describes a new cement, being a basic hydrated oxychloride of magnesium. It is obtained by slacking magnesia with a solution of chloride of magnesium in a more or less concentrated state. The denser the solution the harder it becomes on drying. This magnesium cement is the whitest and hardest of all those known to this day, and it can be moulded like plaster, in which case the cast acquires the hardness of marble. It will take any colour, and has been used by the inventor for mosaics, imitations of ivory, billiard balls, etc. The new cement possesses the agglutinative property in the highest degree, so that solid masses may be made with it at a very low cost, by mixing it up on a large scale with substances of little value. One part of magnesia may be incorporated with upwards of twenty parts of sand, limestone, and other inert substances, so as to form hard blocks; while lime and other cements will hardly admit of the incorporation of two or three times their own weight of extraneous matter. By means of these artificial blocks, buildings may easily be carried on in places where materials for the purpose are scarce. All that is required is simply to convey a quantity of magnesia and chloride of magnesium to the spot, if there be none to be had there, and then to mix them up with sand, pebbles, or any other matter of the kind close at hand; blocks can be made of any shape, and imitating hewn stone. This magnesian cement may be obtained at a very low cost, especially if the magnesia be extracted from the mother ley of salt works, either by M. Balard's process, whereby magnesia and hydrochloric acid are obtained at the same time, or else by decomposing the ley, which always contains a large proportion of chloride of magnesium, by means of quick lime, which, by double decomposition, yields magnesia and chloride of lime containing a certain quantity of chloride of magnesium, and which, with the addition of various other cheap substances, may be used for whitewashing.

GOSSIP FROM GLASGOW.

(FROM OUR OWN CORRESPONDENT.)

IT has been said that in times of commercial depression, amongst the first who suffer are those that minister to not the necessities but the luxuries of life. In Glasgow, however, in the interval between money at 10 per cent. and at 2, while the mercury—the god of merchants—as in every other great seat of commerce and manufactures, has been somewhat low in the mercantile barometer, such other classics as Momus, Comus, Apollo, and Melpomene, who have been spirited from the balmy breezes of the Peneus to the pestilential vapours of the Clyde to stir our sluggish fancies, have been decidedly looking up. The *rationale* of it is, I suppose, that when things are at their worst they are sure to mend; and that, therefore, the "coming" of the good time is very shortly to be passed into the past participle. Be this as it may, while men of business have been dull, men of pleasure have been busy, for within these very few months past no fewer than four large places of amusement have been in progress for Glasgow—the New Theatre Royal, the Prince of Wales Theatre, Mr. Baylis's Music Hall, and Mr. Hengler's Circus.

Your London readers will probably be surprised to learn that the Prince of Wales is but the second theatre for "the second city in the empire," and that there are thus only two temples of the drama for half a million of a population. This further accommodation for Glasgow playgoers embraces a pit and two galleries. In the pit, which is 72ft. 9in. by 73ft., the seats are arranged circularly, radiating from the orchestra; the galleries are upon the "horse-shoe" plan, and the lower is designed for "the upper ten," and the upper for "the lower orders." The pit will contain about 2,000 people easily, and the galleries about the same number. The proscenium is 33ft. wide and 40ft. high; the depth, from the footlights to "the last scene of all" is 36ft., which, however, can be easily increased, if necessary; and for the working of the scenes and mechanism there is available a space of 11ft. below the stage and 50ft. above it. The ventilation is effected by a sun-light and air shafts. Of the decoration of the house little can be said in the meantime; but there are two very important matters in the planning of a theatre, for Mr. Spence's care of which in this, as in other similar buildings from his pencil, he is entitled to very great credit—the ample means of exit from all parts of the house, and the excellent view of the stage enjoyed from every seat.

Mr. Baylis's Music Hall is planned and fitted up in every way as a first-class theatre. Its stage is 42ft. deep with a proscenium 33ft. wide, and that below the stage is a depth of 30ft. for decending scenery, &c. In part of this space beneath the proscenium is a mezzanine floor on which successive scenes can be "set" for the stage, and thereby much delay be avoided in the actual representation. Another means for facilitating movements in the scenery department is an hydraulic scene shifter. The spectatorium consists of an area and two galleries—the area being divided into boxes, stalls, and pit, and the lower gallery being the dress circle, and the upper, the region of the *Dii Minorum Gentium*—and eighteen boxes in the proscenium arch, three tiers, and three upon a side. The galleries and area boxes are upon the "horse-shoe" plan, widening towards the proscenium. All the miscellaneous et cetera of green-room, dressing-rooms, workshops, and library behind the curtain, and cloak-rooms, refreshment stalls, and retiring rooms before it are ample and judiciously arranged. As a safeguard against panic, there are four exits from the upper gallery, and five from the area and dress circle; and, against fire, "Extincteurs" in several convenient parts of the building, and hose attached to water mains with gravitation pressure. Besides, much of the house is fire-proof, the staircases being all of stone and the lintels of the windows of iron, while "red fire" has had an especial iron safe with a ventilating funnel built for it. The theatre itself is ventilated by cold-air shafts, three large funnels in the roof, and a guilloche grating forming a large part of the ornamentation of the ceiling. The ceiling is flat, except where coned down upon an "orderly" entablature, and (which is unusual) extends over the galleries. Another unusual feature is, that this theatre has windows on all sides, and disposed at regular intervals. In the principal staircase there will be a very large three-light stained glass window by Ballantyne, of Edinburgh, the subjects being Thalia, Melpomene, and Euterpe, and which, of course, will be so lit up as to show in the inside. Messrs. Clarke and Bell are the architects. It is calculated that the house will contain about 4,500 persons.

The new circus is upon the site of an old theatre—the original Prince of Wales's, and in which Edmund Glover (son of old Mrs. Glover, of London celebrity) essayed to oppose "Alexander the Great" in his patent "Palace" in Dunlop-street. That is about twenty years ago; and since Mr. Glover himself became lessee of the Theatre Royal, the Prince of Wales's (meanwhile retained by him) afforded a temporary "local habitation and a name" to panoramas, amateur performances, juggling feats, and negro delineations. The building itself is 118ft. in length and 73ft. wide. The "circle" is of the standard diameter of 42ft., and has a concentric space beyond it of about four feet, which will be used for illuminating. One most important matter in the arrangement is that the stables are wholly detached from the spectatory. The architect is Mr. J. T. Robinson, of Hull.

I have said nothing of the exterior of these new places of amusement, simply because there is nothing to say. In such a site as Mr. Baylis's building architecture as a fine art would be a "wasteful and ridiculous excess;" the Prince of Wales's is upon the site of the Colosseum and the Milton Arcade, and retains the original elevation—one of the few instances in Glasgow of "compo," and somewhat of a profusely-ornamented yet ordinary dwelling-house character; and Mr. Hengler's circus, with very slight alterations, makes a second use of the rather poor façade of the original Prince of Wales's Theatre and Messrs. Robb's stables.

"It is an ill wind that blows nobody good" is a proverb as old as Shakspeare. Since I last wrote to you fire has made a good opening for an able architect. A block of between 50ft. and 60ft. of frontage to Buchanan street—the Regent-street of Glasgow—and extending at that width backward into Mitchell-street, has been entirely cleared of buildings wholly unworthy of such a valuable site. It is to be hoped that so good an opportunity will fall into the hands of those best deserving it.

Mr. Mossman, of Glasgow, is busy preparing a pedestal for a bronze group, presented to his native city by a Mr. Kennedy, of New York. The group represents a royal Bengal tigress bringing their first food—a peacock—to her young ones. The figure of the tigress is 6ft. in height and 9ft. in length, and is designed from a sketch specially drawn from life at the Jardin du Plantes, Paris, by Rosa Bonheur. The pedestal itself—of polished red granite—will be 11ft. long and about 7ft. high, and the site chosen—I think judiciously—is the lower grounds of the West-End Park.

There are four ways which Agur, the son of Jakeh, knew not; in the ways of the Gowan Parochial Board he might have found a fifth. In the first place, it sought plans for a new poorhouse, and paid each of the six competitors £50 for his designs; it then had a competition limited to two, but declined to give the unsuccessful competitor anything. It next advertised for estimates and got them, and it now asks the contractors upon what terms they would agree to rescind their contracts. The amounts of the accepted estimates are:—

Excavating and mason work	£16,126	0	0
Brickwork	1,412	19	2
Carpenter and joiner work.....	9,433	13	0
Slater work	1,122	0	0
Plumber work.....	2,665	10	0
Plaster work	1,133	0	7
	£31,893	2	9

and the sums sought for rescinding the contracts are:—

Excavating and mason work ...	£1,600
Brickwork	225
Carpenter and joiner work	1,200
Slater work	200
Plumber work	300
Plaster work	200
	£3,725

Having, without design, rambled from the one extreme of the theatre to the other of the workhouse, I will stop for the present.

MANSFIELD STONE.

THE members of the Nottingham Naturalists' Society last week paid a visit to the district of Mansfield Woodhouse and Pleasley Vale, under the guidance of Mr. William Stevenson, who has so indefatigably worked out the geology and other features of scientific interest in the northern portion of this county. He is known as the author of a recent work on the "Building Materials of Nottinghamshire," and being down in the programme of Thursday last to illustrate *in situ* the various rocks and other points of interest, a pleasant excursion was looked forward to. Arriving at Mansfield, the party proceeded to that lovely district "Rock Valley," to inspect the Red Bunter sandstone, where the justly celebrated Red Mansfield sandstone is obtained. Mr. Stevenson observed, by way of illustration—that since the company present had passed through the tunnel on the line of rails from Nottingham to Mansfield (which marked the highest land in the country), they had changed from the basin or water-shed of the River Trent to that of the River Idle, and the little stream known as the River Maun, which wound its way through the valley, was one of its tributaries. It was worthy of note that the town itself had derived its name from the little river, and that the present term Mansfield was simply a corruption of Mauns-field, which might be understood to imply "a cultivated district by the River Maun." The geological position of the strata under inspection was pointed out as the very lowest of the New Red Sandstone system, being known as the Bunter or variegated sandstone, forming the base of that important system. The overlying strata, which might be found lying in position on the eastern side of the town, was of a less indurated character, and was quarried in an extensive manner as moulding sand for the ironfounders. Beneath

them, and lying to the west of the town, was the magnesian limestone, which they proposed to visit in the course of the day. It was pointed out that Rock Valley, as a place for procuring building stone, was very ancient, and that its present appearance and the distance of the cliffs on either side of the little river, was in a great measure attributable to the industry of the quarrymen, who had been working for centuries cutting back the line of the cliffs. The present workings differed somewhat from those of ancient times; inasmuch, as they procured the stone from depths below the level of the river, and they brought in the powerful aid of machinery to overcome the water. The weight of the stone was given as 149lb. to the cubic foot, and its chemical composition to be grains of silica cemented together with carbonate of lime and carbonate of magnesia, and the red colour to be imported by the presence of iron which was as 3 to 97 of other matters. The white Mansfield stone, which is obtained on the south side of the town, was the same stone as the red, its geological and other features being identical, only that it contained a less admixture of iron and was consequently whiter in colour. This difference of colour was remarked upon as being peculiar to these rocks, and they were generally known as the red or variegated sandstones. He remarked that in other districts the stone was obtained of a mixed colour, and as a good building stone was worthless in an architectural point of view; but with the Mansfield sandstones there was this peculiar advantage—that the red and the yellow stones were marked at separate points—viz., on the south and north sides of the town, the two colours not being intermixed, as is the case at Alton in Staffordshire, and other stone-quarrying districts. In accordance with the programme, the company proceeded by brake to Mansfield Woodhouse to inspect the magnesian limestone, and in an old neglected quarry on the road side, Mr. Stevenson favoured the company with the following remarks:—"Compared with the quarries we have just visited at Mansfield, we are now on a lower and older formation—viz, that of the magnesian limestone, which forms a most important feature in the permian system. To the east, and overlying the limestone, is the new red sandstone, and beneath us and to the west is the lower red sandstone of the permian system, which we shall visit at Pleasley Vale. This stone is remarkable as being the one with which our Norman forefathers erected the minster church at Southwell, and it is held by many versed in the subject that the stone was obtained from some ancient quarries in an adjoining field. The limestone in this neighbourhood does not produce large blocks of stone, and those obtained from the ancient quarries were much smaller than the blocks of the present day, from the simple fact that the old builders contented themselves with the top thin bedded stones. In Southwell Minster large stones are unknown. Blocks, such as a horse or mule could carry, containing from two to three cubic feet, are the largest that can be found in that extensive building. The Royal Commissioners, who visited this district in August, 1838, reported so favourably upon this quality of stone, that it was selected for the construction of the New Houses of Parliament; but, as blocks of the required size could not be obtained at Mansfield Woodhouse, they were procured from Anston, near Rotherham. It is generally understood that Mr. Robert Lindley's great quarry was opened at that time, and some idea of the mass of material removed in thirty years may be estimated. The weight of the stone is 150lb. to the cubic foot, and is composed of carbonate of lime and carbonate of magnesia in about equal proportions; the dark spots seen on the newly fractured stones are iron or manganese. At Mansfield Woodhouse the limestone is highly crystalline, in which state it is termed a true dolomite. In the neighbourhood of York the stone is much softer and is less crystalline, partaking more of the ordinary chalk limestone: it is more easily worked by the masons, but is less durable." After remarking that the surface soil was simply disintegrated portions of the limestone rocks beneath, and some interesting discussions upon the peculiar "pipe holes" or watercourses which penetrate the solid blocks of stone, the company proceeded to Pleasley Vale. On arriving at the stone quarry on the foot road, descending into the valley, the party were met by the officials of Wm. Hollins, Esq., by whose kindness they obtained the privilege of inspecting the various points of interest. The party here halted for a few minutes, when a description of the rocks was given in the following manner:—"The rocks before us for the depth of 30ft. or 40ft. from the surface is composed of the lower strata of the magnesian limestone, below which point the red or variegated sandstone, known as the lower red sandstone of the permian system is seen. It is rarely that sections showing two distinct classes of rocks can be seen, but when such is the case, we have the advantage of judging of their conformability. In this case they are truly conformable, and as the section seen is from east to west or across the line of dip, the manner in which one rises from beneath the other may be seen as we ascend the Valley. Although one class of stone is limestone and the other sand, and they possess a range of colour from red to yellow, they are both durable stones, and used indiscriminately by the local builders. Further than drawing your attention to the fractured condition of the limestone compared with that of the sandstone, I shall dwell upon the lower strata. In some parts of the country this lower red or permian sandstone forms important rocks, but it is remarkable for its inconsistency. In Nottinghamshire it is not an important rock, being used in no other place than this valley. At Annesley, in sinking the new coal mines, it was not found. Its place was estimated to have been 148ft. below the surface. From the circumstance of its being absent in some districts, Professor Sedgwick came to the conclusion that it represented a mass of blown sands which differed from the true sedimentary rocks. This quality of stone was not examined by the Royal Commissioners, as its variegated colour renders it worthless for architectural purposes. Its weight and chemical composition have not been carefully examined, but it may be looked upon as a true sandstone, being composed of grains of quartz cemented together by siliceous matter.

Building Intelligence.

CHURCHES AND CHAPELS.

On Thursday, the 5th inst., the foundation stone of a new English Wesleyan chapel was laid at Lower Cwmbran, Monmouthshire, by Mrs. Bytheway, who officiated in the absence of Mrs. Greenway, of Glantorvaen House, Pontypool. The architect is Mr. Samuel Hancorn, of Bristol and Newport, Monmouthshire, and the builder Mr. Joseph Parfitt, of Cwmbran.

The foundation stone of a new Wesleyan chapel at Key-street, Sittingbourne, was laid last week. The building is to seat 150 persons. It will be a neat little structure, fitted of course more for the purpose of accommodating worshippers, than with any great architectural pretensions. There is to be a school-room beneath, 40ft. long and 22ft. wide in the clear, and the body of the chapel will be of the same dimensions. Mr. W. J. Beaumont, of Milton, is the builder, and Mr. Stephens, of Maidstone, the architect. The chapel will cost about £600.

The church of Stathern, Leicestershire, is about to undergo further restoration under Mr. R. W. Johnson, architect, Melton Mowbray, Wyfordby, Leicestershire. The church here is a small interesting edifice, consisting of nave, aisles and chancel. The lower part of the tower and the arcades are Early English, and the remainder Decorated. It is in a poor connexion, and sadly in need of extraneous help. After much and long exertion, the rector, the Rev. W. Oakley, has succeeded in collecting moderate funds, and the restoration is expected to be proceeded with under Mr. Goodacre, architect, Leicester.

The tower of Hereford Cathedral is being re-leaded, the old lead having become utterly useless through visitors cutting their initials on it, a practice to which the Dean and Chapter will for the future put a stop.

Wymondham Church, Leicestershire, has recently at different periods received improvements and restorations. The chancel is now about to have a new roof and handsome fittings from designs by Messrs. Goddard and Son, architects, Leicester.

BEDFORDSHIRE.—A new ecclesiastical district is being formed near Luton, in Bedfordshire, and sites have been given, and a church and parsonage are being built upon them, by John S. Crawley, Esq., of Stockwood, near Luton. The church is very substantial, and contains a nave, chancel, chancel aisles, vestry, south porch, and warming crypt. The nave is 58ft. long, and 26ft. wide; the chancel 36ft. by 20ft.; and the chancel aisles 20ft. by 10ft, opening to the chancel by a double arcade on each side supported upon polished marble pillars. The walls generally are 3ft. thick; that of the west front, which is surmounted by a double bell cote, being 4ft. thick, and are faced inside and outside with cream-coloured bricks, relieved with bands of red Mansfield stone. All the doors, windows, and arch dressings are of freestone. The roofs are open framed with pitch pine timber; they are boarded with pitch pine above the rafters, and covered with felt and green Pembrokeshire slates, finished with red Mansfield stone ridge tiles. The roofs are intended to show the raw timber without either staining or varnishing. All the seats are in pitch pine, unstained but varnished. A carved oak screen divides the chancel from the nave; and the chancel contains stalls arranged choirwise, a double sedilia, piscina, and credence. The east wall will be decorated with a reredos of enamelled tiles, with a carved stone brattieing over the works, which have now progressed to the level of the window heads, and are being carried out from the designs and under the superintendence of Thomas Nicholson, F.I.B.A., diocesan architect, Hereford.

HAY, HEREFORDSHIRE.—The parish church of this place was re-opened on August 27, after having been closed during a considerable period for the purpose of enlargement and improvement. The church was built forty years ago, after the manner of the Gothic of the day, and the place was very defective, being a parallelogram of about 70ft. by 40ft. for the nave, and a stunted chancel, 24ft. wide, with a chancel arch only 6ft. wide between the two, and so narrow as to isolate the one from the other. It was therefore desirable to improve and enlarge the chancel, and open it to the nave. The former has been effected by throwing out an apse from the east end of the chancel, and the latter by the erection of a triple arch, resting upon pillars. The other improvements comprise the addition of an organ chamber and vestry, and a porch to the nave. All the work has been executed externally out of native stone, neatly tooled, with hard stone dressings, and the internal dressings and ashlarings out of Bath stone. The roofs are of open construction, boarded, varnished, felted, and covered with green Pembroke slates. That over the apse is carried upon massive curved braces, springing from carved corbels. The plaster ceiling over the old chancel has been removed, and an open timber roof set up in place thereof. The apse and organ chamber open from the chancel through spacious arches composed of alternate voussoirs of grey and white stone. The arches between the chancel and the nave are richly moulded, the voussoirs being alternated in grey and white stone, and the pillars and responds finished with carved capitals. The chancel is stalled with open benches, and the floor laid with encaustic tiles. The style of architecture adopted is of the first period of Gothic, treated somewhat after a continental type. The work has been carried out from the designs and under the superintendence of Thomas Nicholson, of Hereford, the diocesan architect. An elegant and costly memorial pulpit has been erected in the church by R. F. Trumper, Esq., from the designs of Mr. Nicholson. It is composed entirely of marble and alabaster resting upon a Mansfield stone base. It is octangular in plan, the lower portion being arcaded, and carried upon polished marble pillars, the upper portion being panelled in quartrefoils, filled with medallions of our Saviour and the four Evangelists. Mr. Trumper has also filled the apse with memorial windows in painted glass; the subjects are the "Agony in the Garden," "The Crucifixion," and "The Entombment."

BUILDINGS.

Lord Kenlis, son of the Earl of Bective, has undertaken to defray the entire cost of restoring the parish church of Kirky, Lonsdale. The work will cost upwards of £6,000.

A new school-house has just been erected at Hawsker-cum Stainsacre, Yorkshire. The cost of the building, including a comfortable house for the residence of the teacher, is £550. The design was furnished by Mr. E Smales architect, and the sole contractor for the erection is Mr. Wood, of Malton. The school-room is capable of accommodating upwards of 200 people.

The Theatre Royal, Doncaster, was reopened on Monday for the season. The building has been reconstructed, and decorated from the designs, and under the superintendence of, Messrs. Thomas Moore and Son, of Sunderland, the architects of the new Theatre Royal and Opera House, Leeds. An entirely new pit has been laid down—nearly twice the size of the former one—and Mr. James Gates has supplied a new act drop. Mr. Thomas Wood, of Doncaster, was the builder, and Mr. F. Jackson, of Leeds, the decorator.

Mr. Titus Salt on Tuesday laid the foundation stone of a block of buildings intended for a tradesmen's home at Bradford. In the first instance, it is proposed to erect eighteen houses, but it is hoped the number will be eventually increased to thirty, and of the latter number Mr. Salt and Mr. Alderman Brown have promised to provide two. The cost of the first eighteen will be £7,500, and nearly the whole of that sum has been promised.

BOURNEMOUTH. — The Convalescent Home, erected at Bournemouth to the memory of the late Lord Herbert of Lea, will be ready for the reception of patients by the end of the present month. The home and buildings have been formed upon Miss Nightingale's plan. The cost has been upwards of £5,000, but the edifice, for convenience, is everything that could be desired, and, with the noble statue of him erected in the city of Salisbury, will fitly perpetuate his lordship's memory. The buildings and land forming the Herbert Memorial Convalescent Home have been conveyed by the Memorial Committee to the governors of the Salisbury Infirmary in perpetuity, upon the undertaking that they be applied to those purposes for which they were originally intended. Mr. T. H. Wyatt is the architect.

HAMILTON (SCOTLAND.) — The Combination Poorhouse, erected for the accommodation of several parishes in this district, has just been opened. The building, which is in the Elizabethan style, has been in progress for upwards of two years. The site occupies about six acres. There is accommodation in the poorhouse for 170 inmates, for all of whom single beds are provided. There are besides three dormitories, which, if found necessary, can be supplied with one single and seventeen double beds, giving additional accommodation for thirty-four boys and girls. The dining-hall and chapel, measuring 40ft. by 22ft., forms a division between the two sexes, and is convenient to both. The ceilings are lofty—the height of the one above ground floor being 14ft. 3in.; above upper floor, 11ft.; and above attic floor, 9ft.; while the cubic feet of space allotted to each inmate is slightly above the maximum amount allowed by the board of supervision. The designs of the building were prepared and carried out by Mr. J. Graham Peat, architect, Hamilton. The estimated cost of the work was £5,500, or at the rate of £32 7s. for each pauper inmate.

LEEDS.—Instances are occurring daily, says the *Leeds Mercury*, in which private enterprise is found to be doing much in the way of following up the efforts of the corporation to materially alter and improve some of the more important thoroughfares of Leeds. A great deal has already been done with this view, and the many large warehouses and other places of business which are being erected with a strict regard to architectural taste and harmony of design, attest how earnestly our leading manufacturers are entering into a project which, if continued to be carried forward with the same spirit, must in a few years raise Leeds to the highest rank as a town famous alike for the magnificence of its private as its public buildings. Negociations, we are given to understand, have just been concluded for the purchase of the vacant strip of ground on the Wellington-street side of the new White Cloth Hall. The strip is not very wide, but has a considerable frontage to the street named, and contains altogether about one thousand square yards. The site is a most valuable one, and naturally there is a good deal of curiosity as to how it will be used. We believe there is an intention to erect a number of warehouses upon the ground, but nothing definite is known, the agreement entered into with the parties concerned being of a private nature.

PARIS.—The exterior of the great new opera-house of Paris, or, to use its official designation, Academy of Music, was cleared of scaffolding and thrown open to public view previous to the day of the Imperial *fetes*, the 15th ult. The ornamental portions are not yet entirely finished, but the work presents an interesting example of the kind of decorative architecture now in vogue; the general surface of the building is relieved by the introduction of marble columns and panels, inscriptions in gold or coloured marble grounds, and gilt busts; the main lines of the building and the architecture, both of the front and side porticoes, are capped with bronze ornaments, that which crowns the parapet of the main face being gilt. The outline of the parapet of the front of the edifice is straight, but the two ends are to be surmounted by bronze groups, which are represented at present by painted substitutes. Crowds of observers are to be seen every hour of the day contemplating the new monument of Paris, and criticising the work of the architect, M. Garnier.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the EDITOR, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty four Words.

RECEIVED.—T. W. B.—R. H.—B. W.—V. K.—G. H. G.—E. W. P.—C. M R. R.—W. M.—T. P.—S. L.—T. L. S.—E. M. B.—S. H. G. (in our next.)—J. N.—G. A.—G. E.—W. O. C.—A. G. H.—W. S.

A. WARE.—The drawing of the five shops at Shepherds' Bush will most likely appear.

J. H. Medhurst.—The article on "Lightning Conductors" will appear.

J. N.—Send the drawings.

Correspondence.

WHO WAS THE ARCHITECT FOR THE HOUSES OF PARLIAMENT?

To the Editor of the BUILDING NEWS.

SIR,—The annexed list, taken from my father's diaries, will give some idea of the immense mass of designs made by him for Sir C. Barry during the years 1836 and 1837. I wish to call attention to the fact that they were done after the competition was decided, in addition to the numerous composition drawings, elevations, &c., with which he supplied Sir Charles from Salisbury previous to the competition. It would appear from them that not only were the original designs produced by my father, but also all the "important changes which," Mr. Wolfe tells us, "decided the character of the building."

1836. October 20.—Sent 5 drawings to Mr. Barry. King's staircase; robing-room, Lords, 2.

October 28.—6 drawings of north door; 22 drawings of west front; 5 drawings of interior, west end; large drawings of west front.

November 13.—Sent 11 drawings to Mr. Barry. Porch, hall, central lobby, stairs, witness-rooms; King's Tower, 2; entrance hall, 2; clock, 2.

November 19.—Sent 8 drawings, stained glass; 6 drawings, stalls; 7, throne.

Towards the end of the year—

1 and 2. Interior of library. 3. Compartments; river front, 2nd time. 4. Compartments; land front, 2nd time. 5. Upper part of centres, 2nd time. 6. Great oriels. 7. Upper part above ditto. 8. End towers. 9. Part above ditto. 10. Upper part of bell tower. 11. Lantern of ditto. 12. Angle turrets. 13. Gable, Westminster Hall. 14. Lower part of great tower. 15. Middle storey of ditto. 16. Upper part of ditto. Drawing on vellum of King's Tower. 17. Entrance-hall from water. 18. Throne and end of House of Lords. 19. End and Speaker's chair, House of Commons. 20. Peers' entrance-hall and dining-room.

December 30.—Commons' entrance-hall; Speakers' dining-room, morning and drawing-room; ditto library—5 drawings.

1837. The following entries occur without date:—24 drawings of compartments; 20 ditto east end; 6 ditto north door; 22 ditto west front; 5 interior, west end; 1 large drawing, west front; 8 drawings, stained glass; 6 ditto, stalls; 7 throne; 1 screen under window; 12 ornaments; 8 exteriors; 9 sections; 6 sections; 2 exterior, river front; 2 designs for staircases.

January 1.—1. Compartment of *new* river front. (The use of the word *new* is noteworthy. It indicates that my father also designed the "important changes" in the buildings.) 2, 3. Centre, &c. 4. Centre tower. 5. Upper part of ditto.

In other places we find named—3 panels House of Lords; House of Lords' windows, cartoons; patterns library ceiling, patterns for Westminster, tiles for Minton for Houses of Parliament, fireplaces, St. Stephen's Hall, landings of staircases, smoking-room, octagon, Commons' lobby, waiting-room, &c.; floor of royal gallery, ditto staircase, wall of royal gallery, &c., &c., &c.

It must be observed that these are only drawings specifying certain portions of the Houses. There are numerous other entries of drawings sent to Mr. Barry in rolls of 12 and 14 each.

If the letters of Sir Charles Barry, still in existence, which ask for, or acknowledge the receipt of, designs for almost everything connected with the building, are considered in connection with this list, the enormous number of drawings my father sent to Birmingham for metal-work, every portion of which was designed by him—from the great brazen gates down to the nails on the chairs; the designs necessary for the whole of the woodwork and carving, all his own—*pace* Mr. Talbot Bury—from the throne down to the most ordinary panel; the hundreds of cartoons for stained glass; the patterns for colour decoration in every department; and, above and beyond all, if we bear in mind the destruction of letters, drawings, and documents of every description—from which unimpeachable evidence could have been derived—they all point to one inevitable conclusion,—that my father's brain was the source from whence emanated the architectural, no less than the artistic, glories of the Palace of Westminster.

If this be thought incredible, let it be remembered that his power of conception, his faculty of production, and his rapidity of execution, were absolutely marvellous, and that he never lost a moment of time. On board a steamer—it was here that he designed the throne for the House of Lords—in a railway carriage, during his walks, his visits, almost during his meals, he worked. And should men think it even more incredible, that while getting ΔΟΞΟΣ, he received only inadequate ΚΕΡΔΟΣ, they little know the fire of that spirit before which honour, wealth, distinction, fame, alike withered up. "I work for a principle," he said, "not to make a fortune;" and towards his end, he added, not without despondency, "the object of my life is partly served, but I shall die without having had a chance."—I am, &c.,

21, Savile-row, London. E. WELBY PUGIN.

MANCHESTER NEW TOWN HALL COMPETITION.

SIR,—Having taken the trouble to make an analysis of the report of the Manchester New Town Hall competition, as given in your impression of the 6th inst., I think the same may prove interesting to some of your readers. It is as follows, viz.:—

Designs provisionally recommended by sub-committee at meeting of August 14. Nos.	Mr. Godwin's selection on August 27. Nos.	Motto.
14	...	
46	46	
67	67	
74	74	
90	...	
98	*98	Municipal.
115	...	
120	*120	Three Hebrew [letters.
129	...	
131	...	
143	...	
Added to the above at meeting on August 20:—		
26	...	
42	...	
55	55	
89	89	
Not provisionally recommended by sub-committee...	82	disqualified.
	*99	Municipal.
	*119	Three Hebrew [letters.
	134	

From this it would appear that the sub-committee of the Town Council provisionally recommended fifteen sets of designs, of which Mr. Godwin selected seven and rejected eight that Mr. Godwin selected four sets of designs not included in the sub-committee's list. Two of these were each by the same architects as two of the seven designs selected by him from the fifteen provisionally recommended by the sub-committee. As these designs—viz., Nos. 99 and 119 respectively—bore the same mottoes as Nos. 98 and 120, as well as consecutive numbers, Mr. Godwin must have been perfectly well aware that in two instances he recommended

two sets of designs by the same architect. Of the other two designs, *solely* selected by Mr. Godwin, one, No. 82, was afterwards found to be disqualified; the other, No. 134, is believed to be by Mr. F. H. Wyatt. (I believe you are in error in stating that *two* sets of designs by this gentleman have been selected; it should be Mr. Salomans.)

From the foregoing facts I draw the following inferences:—

1st. The sub-committee intended that at least eleven architects should be selected for the second competition.

2nd. The sub-committee did not in any case provisionally select two sets of designs by the same architect.

3rd. Mr. Godwin, in his report, submitted two sets of designs by the same architect.

4th. Mr. Godwin thus reduced the number of architects selected for the final competition from eleven to nine, and, by his recommendation of a disqualified design, the number was further reduced to eight.

I may here draw attention to the fact, that, in these double selections, a Gothic and Italian design, by the same architect, have in each case been recommended by Mr. Godwin. I have long thought, with many others, that excellence in both schools could not be attained by the same man, and that the architectural "Jack of all trades" would inevitably be "master of none."

There can be little doubt that the competitors have to thank Mr. Godwin for reducing the selections for the final competition from at least eleven to eight architects. How far such a course was graceful in the editor of a periodical supported in a great measure by the profession, I leave it for architects to decide. Among the 123 who competed, surely more than eight were deserving of a place in the final competition. While the unsuccessful have just grounds for complaint and dissatisfaction, the fortunate eight have little reason for self-congratulation, for the whole affair bears such an aspect of jobbery—six of the ten selected sets of designs being the production of Manchester talent—that being amongst the number confers no credit on any architect. It is possible, after all, that the published reports may have done Mr. Godwin injustice. It may not be correct that he attended the meeting on August 27, and submitted for the consideration of the sub-committee the sets of designs ultimately adopted by the Town Council. But as the question stands at present, Mr. Godwin owes it to himself, as well as to a profession that has some claims upon him, to explain matters so far as he is concerned.—I am, &c., R. R.

September 9.

PARIS EXHIBITION AND ENGLISH ART SCHOOLS.

SIR,—What advance has English art manufacturers made, and in what degree is that advance, if any, to be credited to the influence of our Government art schools, are questions which suggest themselves to all visitors to the Paris International Exhibition, who are at all interested in or conversant with the vexed subject of art education in this country. They are indeed questions asked by the South Kensington authorities themselves, not only in connection with this last and greatest of international shows, but upon all similar occasions when any information is likely to be elicited calculated to correct past errors, or to lead to improved future management; and this fearless invitation to criticism, more than anything else, is a proof of their earnest and honest purpose, and a guarantee of ultimate success. The anxiety evinced by the Government authorities in this respect has, however, led them and the public to under-estimate the real amount of good being effected by the teachings of the art schools, for that work cannot and will not be displayed in the greater superiority of artistic work for many years yet to come. Not until the taste of the lowest stratum of society has risen to the level of the highest will the highest itself mount to a superior level. Thus, if we would gauge the advance of art in this country during the last twenty years, the measure of it will be found, not in those works of superior merit which are before us, but in the absence of that festering mass of meretricious art which a few years since disgraced our markets, and made us the mock or laughing stock of continental critics. The teaching of our schools has not reached the highest development of our national art, because it has wisely concerned itself with the lowest. By educating the masses, it has made, we can scarcely yet say, bad art, but gross and painful abortion impossible. This is the fact that cannot be too much dwelt upon, and it is a fact of so significant a nature, and so strongly in favour of the system of teaching adopted in our art schools, that it is surprising it should be so often overlooked. Let the authorities of South Kensington stand well to this fact, and they need fear no querulous demands for evidence of a higher influence.

Fully impressed, then, with the truth of our position, we were neither surprised nor disappointed with the display we this year make at Paris. Let us freely confess that we do not stand on a pre-eminence, but, on the contrary, still are, as we ever have been, far in rear of our French neighbours in all matters of art. Let us even admit that our best works bear the unmistakable impress of French handling. What then? Before such admissions shall be at all humiliating or disheartening, it must be shown that our competitors have during the past fifteen or twenty years of our schools' teaching made advances, whilst we have remained stationary, or have retrograded. Now there are no such evidences in the works exhibited, nor any assumption of it. Their chief works displayed are confessedly old friends, familiar to us all, and have been so for years. They are masterpieces, and their authors can well afford to stake their own and their country's reputation upon them. With these we have no concern—we admit their excellence; we do more, we confess that we cannot surpass nor equal them. But what does concern us, and go to the very root of the matter, being, indeed, the lesson which we must learn from the Exhibition, is this—that the smallest and most ordinary article of domestic furniture is, in beauty of design, on a par with the most costly and *recherche*. The decorations of the Emperor's pavilion, or his services of plate, are superior only in richness and fullness of detail to the possessions of the humblest citizen. It is this all-pervading element of beauty in common objects which gives to French art, in its highest developments, its vitality. It is this universality which educates the people and makes the highest art possible.—I am, &c.

Birmingham. C. HENRY WHITAKER.

TO FIND THE CIRCUMFERENCE OF A CIRCLE GEOMETRICALLY.

SIR,—Overlooking the heading of "E. L. G.'s" letter, permit me to thank him for the arithmetical elucidation of my geometrical diagram which appeared in your journal of the 30th ult.; and as figures are convincing, I readily admit the correction of one-twelfth, or perhaps one-thirteenth, instead of one-sixteenth of an inch to the foot.

Assuming the ratio of the diameter to the circumference to be as 1 to 3·14159, rather than the Archimedian rule of 1 to 3·1428, "E. L. G." has approximated very closely, by adding one-fifth of the side of the square to three times its diagonal, and it is singular that the same diagram should have afforded him the means of obtaining a nearer approach to the generally admitted proportion; but this, as he asserts, is still on the side of deficiency.

Applying the same diagram, there is, however, another solution, which brings it close to the Archimedian test, and, being a fraction less, is nearer the truth—namely, to the length of the four sides of the internal square add one-ninth, which makes the circumference of the circle (the diameter being 1) 3·1426 instead of 3·1428 according to Archimedes.—I am, &c.,

Southampton. G. H. GUILLAUME.

ZINC ROOFING.

SIR,—As there are one or two statements in the article on zinc roofing contained in your last number, I shall be glad if you will allow me to correct them. The price of No. 14 gauge Vieille Montagne zinc is stated to be 7d. per foot, "not measuring all the zinc used, but stretching a line from ridge to eaves, and from side to side, girting nothing, and adding nothing for rolls, caps, welts, &c." I shall be glad to have the name of a zinc-worker who will work at this price. In my experience, I have found that the practice is to girt everything, and, in fact, ascertain the total quantity of zinc used, allowing for waste in cesspools, &c. The difference between this mode and that of merely measuring the superficial area of the zinc is between 30 and 40 per cent. in flats of an ordinary description. The price charged by good Vieille Montagne zinc-workers per foot on the zinc laid is 7½d. or 8d. per foot for 14 gauge zinc except in roofs of extraordinary dimensions; therefore, if measured, as directed in your article, it should be 10½d. or 11d. per foot super. You state that in flat roofs a fall of 6in. and drip of 2½in. should be obtained to every 7ft. This would give in a roof of 30ft. a fall of about 3ft. I should like to know how this is obtained, whether by merely paring up or by means of trussed rafters. I can fully appreciate the advantages of a good fall in a zinc roof, or, in fact, a roof of any description, but have generally found that 2in. to every sheet was sufficient. Care, however, must be taken, in laying zinc on boards to this fall, that the boards are properly seasoned and well nailed to the bearers, as otherwise they will be found to turn up at the edges and cause the zinc to hold the water, besides forming a sharp angle to be worn through by the feet.—I am, &c., C. H.

Intercommunication.

QUESTIONS.

[569.]—TO COLOUR TRACINGS.—Will some of your readers kindly inform me the proper way to colour tracings so as to give them the uniform and yet deep colour which most possess? Should the paint be laid on thickly and without much water?—IGNORAMUS.

[570.]—ROLLING MACADAMISED ROADS.—Can any one who has had practical experience on the subject tell me if he considers it economical to roll newly-applied material in repairing Macadamised roads in country places, and describe the best kind of roller for the purpose?—C. M.

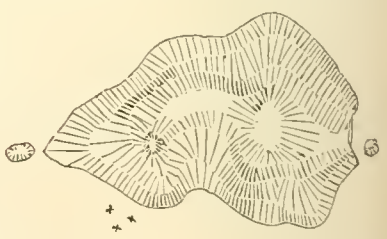
[571.]—ARCHITECTURAL MODELS.—As I am desirous of making some architectural models, I should be greatly obliged by any of your readers informing me of the best and finest material to work in. I propose to cut my models out of the solid, and have tried plaster of Paris, but find it much too coarse for my purpose.—SUBSCRIBER.

REPLIES.

[51.]—Surely there must be something grossly wrong in the statement of this problem or the answer to same as worked out by its author in last week's "Intercommunication" column. As I understand what is to be done, it is given two forces of respectively 12lb. and 2lb., acting on a point at an angle of 60 deg. to find the resultant. The forces are shown diagramatically and wrong. If the reader will please to refer, he will see that if line P O be equal to 12lb. the line Q O cannot be equal to 2lb., though the method adopted by "R. L. B." of finding the resultant is correct, that is, by completing the parallelogram his mathematical part is hardly more happy. Why he should assume line OQ = 9 I am at a loss to conceive; anyhow, he seems brought to the conclusion that the resultant is 18·248lb. A marvellous one, for if we imagine the forces of 12lb. and 2lb. to be fused into one and act to their greatest possible advantage, that is in the same straight line, they would exert a pressure of 14lb. only, and would want a resultant of 14lb. acting in the opposite direction to keep the point at rest, and, therefore, as in the proposition they act at 60 deg., a still less resultant would suffice. The real answer which, owing to the angle chosen in the problem, can be easily worked out by the 47th prop. Euclid, Book I., is roughly 13·115lb.—W. D.

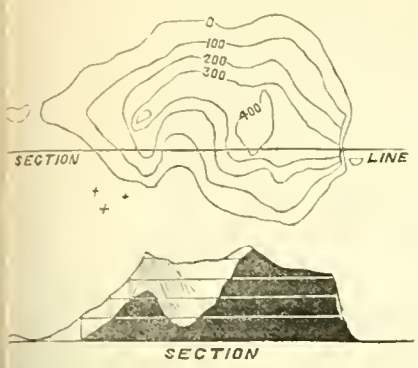
[51.]—In my reply to this query which you were good enough to insert last week, two slight clerical errors occur, which I shall thank you to correct, as follows:—The given forces should be 12lb. and 9lb. in lieu of 12lb. and 2lb.; in the last line but two for CR^2 read OR^2.—R. L. B.

[452.]—CONTOUR LINES.—This subject being an interesting one, a "Tyro" deserves a more extended explanation than "Theodolite" thought it necessary to give. There are two methods in use of delineating upon paper the topographical features of a country—by "nachure lines" and by "contour lines." The first and older system indicates the inclination by lines drawn in the direction of the fall of the ground and the amount of inclination by greater or less thickness of lines or by bringing them closer together or spreading them out. In the second system the relative heights of the various points are indicated by continuous lines of equal level at certain vertical distances apart. This method originated with and is more especially adapted to the requirements of military and civil engineers, but it has the disadvantage of conveying but a faint idea of the true features of the surface. A contoured map will be more readily understood from the accompanying sketch of an island (also represented by old method of nachure lines), the outside line is the water line (all points of which are of course in the same horizontal plane). Now, suppose



the water to rise 100ft., another water line would be made parallel to the former one, and so on, by successive stages of the water we should get a succession of lines until the island is submerged entirely—the 400ft. line leaving only two points. All these water (contour) lines are represented on paper as if we were looking down upon the island, as a geometrical plan, in fact, like an architectural "plan of roofs." Now, the map being drawn to scale, nothing is easier than to make a correct section of the island in any

ection :—Tick off the contour lines on a slip of paper, l set up their respective heights from datum line (or ter-line of the island), and joining the points set up, by ight lines, a sufficiently accurate surface line is ob oed The surface of the ground, the planes of the con-



r and the perpendicular lines forming a rising series ight-angled triangles, the perpendicular always 100ft., base found by scale and the length of the hypotenuse asured or found. The 6in. ordnance maps of Yorkshire, , are contoured, and a sheet has lately been published the neighbourhood of Dorking, Surrey, with contour s 100ft. distant, and faint nachure lines also introduced ; composite system is that adopted by the French and ted States authorities. All the nachure lines are of the e thickness in these maps, but they are always separated n each other by one-fourth of the distance of the contour es apart, and this gives the proper shade for the slope. he South Kensington Museum may be seen four sheets e Austrian Government survey, every contour in which presented by a separate sheet cut out and mounted one the other with a railway cutting and embankment fully represented, although very minute. A geological of a "valley of denudation," where the strata are quite zontal, would present a series of contour lines, though necessarily equidistant. This might have given the of applying them to ordinary maps.—A. S. E., Brompt- September 9.

31.]—WEIGHT OF ANGLE IRONS.—In article No 3 late Girders will be found an excellent table giving hts per foot run and sectional areas of angle and T-irons. don't your correspondents notice and make memoran- s of such things?—T W. F.

37.]—PERIODS OF GOTHIC ARCHITECTURE.—Mr. Fergusson's new "History of Architecture," vol. p. 5, which I had not even seen when answering this uiry, he makes the following arrangement of the English ted styles, which anyone interested can compare with dates of "Provincial" and myself, p. 587:—

E AND WHEN BEGUN.	DURATION.	REIGNS.
Early Pointed, Lancet, or Plantagenet	97 years.	14 years of Henry II., Richard I., John, Henry III.
Perfected Pointed, "Decorated," or Edwardian ...	105 years.	Edward I. Edward II. Edward III.
Late Pointed, Perpendicular, or Lancastrian	108 years.	Richard II. Henry IV., V., VI. Ewd. IV., V., Rd. III.
Fan Vaulted, Transitional, or Tudor Style. To 1602	117 years.	Henry VII. Henry VIII. Edward VI., Mary. Elizabeth.

Transition, of course, that he would associate with the Richard, is not "Provincial's" "Transition to Perpen- lar." but from Perpendicular! which tended to lose its ere vertical lines" under Henry VII. and VIII., at in all but poor and inferior work; the most dis- tive mark of those reigns being an eclectic reaction nst the vertical lines and return to curves; which Mr. man, who treats much of this in his "Window Tracery," "the return to Decorated." "Provincial" may find quite amusing" to see what confusion he can create random "few sentences" or one line on matters he just as much attended to as a New Zealander, but he lly perverts the intention of these "Intercommunica- "columns. As well might the question of American e moving be answered by me, who never was there, question of old styles by a man who, instead of a single ding, refers to two new designs! Where did I say there less thought at the beginning of Edwardian? Is "after " the beginning of Edwardian? But wherever a de- of thought might begin, I can well believe such a per- as "Provincial" cannot see it. There, for once, I hold him perfectly. Perhaps, too, it may be quite ghtly" that our architects choose Early Eoglish to nic, and not Norman or Perpendicular (which might e been decently revived), because, doubtless, it is right necessary for the age's true self-portraiture before men angels, that if there be anything which will make us so little more ridiculous than another thing, the exact t shall be pitched upon. The nobler a style, as Mr. ain says, the baser will it be when built by base people. ood heavens! to think what is presently to be called rly English." But why does "Provincial" say Le ots "there was more lavish thrown away" in Ed- dian, "as 'E. L. G.' asserts?" Where did I assert this? which even he never blundered into anything falser. sh he would keep his agreements to himself.

is true the only thing I quoted from "Fergusson's dbook" I quoted to contradict, it being almost the only leading line in that excellent work. I never supposed author ignorant when "Perpendicular" began, and that transition to it was (not any Richard's reign, but) the 40 years of Edward III. (see his page 864). I did not ct, either, to his remark, p. 476, that "the three ards by a singular coincidence, mark three ages of tran- n," though it would be truer to say "three new styles." y came after each transition was just complete. But t I contradicted was at p. 844, "Plantagenet, Ed- dian, Lancastrian, and Tudor, the periods of transition ween each of these falling, by a curious coincidence, in the reigns of the three Richards." It is plain the first of these three transitions falls near no Richard. I must fur- ther now question if there be any grounds for calling the two years of Richard III., a bit more transitional in art than any other two in that whole century, the steadiest and least transitional we ever had.

The strong "severe" Perpendicular of Wykeham after 1400 gradually weakened. The miscalled "Tudor arch," then already common enough in secular work, slowly crept into ecclesiastical, but never excluded the old arch at any time; the square label or spandrils over doorways grew slowly more general from 1400 to 1500, but never universal; and this is just as true of the fan-vaulting, which was modelled over tombs before 1400, built on a great scale at Peterborough about 1430, but never excluded the old style of vaulting, till vaulting ceased entirely with Wolsey. Therefore, the name "Fan-vaulted" will not do at all for the Tudor period. The only change, I believe, beginning as late as Richard III. was that from Perpendicular tracery and panels, back to curvilinear; and this never descended to poor parish work. The Perpendicular proper continued till Inigo Jones.

As for "Provincial's" questions (1.) "What are the buildings that existed before the Normans?" As far as is known, they are all either lime or dust under our feet, except the carcase of Waltham and a bit or two of Westminster Abbey finished a year or two before the Conquest, and just as Norman as any hing after it. Of course, our Romanesque, then or earlier, was distinguishable somehow from that of continentals. There was a Saxon style, and not "a rather barbarous one," either for the time, or for times in general, or ours. Their writing and drawing was refined almost to effeminacy. They had cathedrals equal in mass to our grandest, now standing on the same foundations. England had more civilization before the Conquest than could be recovered in a full century or two after. And neither Saxons or Normans were ever barbarous enough to let buildings be designed by men paid a percentage on the outlay. But inasmuch as no man living, if he saw one of the Saxon buildings beside a French or a Japanese one of equal age, could tell certainly which was which. I say "there is no Saxon style." That is as generally admitted and plain as that, in another generation, thanks to 5 per cent. on the outlay, and a Royal Institute of British Architects, there shall be (except in photographs) no Early English or Edwardian.

(2.) Of the Street and Barry disguises for nineteenth century work, all one can say is, they differ by one drawing its forms from several varieties of Gothic, Early and Middle French, Venetian, and (in less degree) Early and Middle English, while the other mimics exclusively English and chiefly of Perpendicular times, and is far better designed on the whole, though worse in detail.

(3.) Will I say these "are types of one and the same period?" Of course I will! What on earth can be more certain? I can neither conceive their authors nor anyone but "Provincial" entertaining the slightest idea of their passing on paper, or in stone, or as long as one stone may remain on another, for types of any but one period, the period of percentage designers, of general masquerade, of restoring all realities off the face of the land, and total ignorance what they meant.

(4.) If he wants more authority for dates I will give plenty; and (5.) I have told him "if this is not the age of Gothic revival," what is it. As for "Romish ideas," what did I say about them?—E. L. G.

[555.]—ARCHED WOOD PRINCIPALS.—In No. 660 of the BUILDING NEWS "A Puzzled Student" wishes to know "whether the laminated arched wood principals do or do not exert a thrust upon the walls?" and gives an example. I think that any roof of the same dimensions and proportions as his example would throw a great thrust on the walls. With regard to the arched semicircles, they are the invention of Colonel Emy, a French military engineer, who, in 1825, erected a large roof 65ft. span at Marac, near Bayonne. The laminated ribs in this roof are kept from separating by radiating struts which are in pairs, notched so as to clip the rib between them. The principle of this roof is said, by a very able writer on architecture, to be exceedingly good. The principals, wall plates, and arched ribs form two triangles, firmly braced together, and exerting no thrust on the walls; and the weight of the whole roof being thrown on the walls at the feet of the ribs, and not at the pole plate, the walls are not tried by the action of a heavy roof.—W. H. CUNDY., 55, Sydney-street, Fulham road, Brompton.

[560.]—INDIAN INK.—Dissolve a little gum arabic and mix it with the Indian ink every time you grind it.—E. H. HORNE, Broad-street.

[563.]—PETERBOROUGH CATHEDRAL.—The west front is of three periods—the Norman and Early English of Barnack stone, the Perpendicular portion of Kettin stone, both quarries near Stamford. It is well known that the churches of this district were built of Barnack stone, till the middle or end of the fourteenth century, when the quarries were worked out. Since that time, Kettin and at times Ancaster stone has been used. Barnack stone is a shelly oolite, rather coarse grain, Kettin a fine beautiful oolite, and, if good, very durable. I have not observed the stone of the west front of Peterborough. I have no doubt it is Barnack stone.—E. M. B., King's Lynn, September 10.

WAGES MOVEMENT.

The Lausanne Workmen's Congress has decided with regard to strikes that in the present condition of things it was necessary to maintain wages by giving mutual help, but that the end to be aimed at was the suppression of the principle of wages altogether. The congress also decided in favour of the equivalence of functions—that is to say, that the eight hours' labour of a carpenter or shoemaker is of equal economical value with the eight hours' labour of an astronomer or poet.

CARLISLE.—As winter approaches, the building trade always shows signs of slackness, but this autumn it is very slack. Except a few small houses, there is nothing in prospect. The corporation are about to extend the water works, and it is to be desired that the works should be started this winter, so that the labourers and bricklayers of the town may have a chance of employment.

NEW YORK.—The *New York Sun*, a working man's paper, says that at no period within the last ten years have there been so many unemployed workmen in New York as now This fact has caused the New York Trade Union to be very cautious about "striking" for the eight-hour system. Though their eight-hour law has been on the statute book for a month, no efforts have yet been made by them to enforce it. In Chicago, where the men procured a reduction of hours only by submitting to a proportionate reduction of pay, a general wish is reported to return to the old system. The men want ten hours' pay, and adversity has made them willing to give ten hours' work for it.

STAINED GLASS.

MANCHESTER.—A series of stained glass windows have been put up in the Jews' Synagogue, Cheetham Hill-road, Manchester. They consist of three windows of two semi-headed openings each crowned by large circles, and two smaller windows and gable lights, all of which have been presented by members of the congregation. The style of the building is Saracenic in character, and the windows are designed to harmonize with the architecture. They are composed of an elaborate grisaille heightened with yellow stain, and the bands and borders are formed of rich mosaic of deep effective colours. The circular openings contain emblems of power and sovereignty, with suitable texts in bold Hebrew characters. These windows are from the establishment of Messrs. R. B. Edmundson and Son, of Manchester.

STATUES, MEMORIALS, ETC.

A memorial is about to be erected over the (at present) unmarked grave of the late Robert Brough, in Manchester.

A statue of the late Lord John Scott was inaugurated at Dunchurch, near Rugby, by his brother the Duke of Buccleuch, last week. It was subscribed for by the tenantry, and is the work of J. Durham, A.R.A.

A monument to the memory of Madame Catalini, representing in white marble St. Cecilia, and executed by the Tuscan sculptor Aristodemo Costelli, has just been inaugurated in the Campo Santo of Pisa—the Westminster Abbey of Italy.

LEGAL INTELLIGENCE.

IMPORTANT PROCEEDINGS UNDER THE SANITARY ACT.—Mrs. Caroline Smithers appeared to answer a summons issued against her, by direction of the Board of Works for the Poplar district, for not having complied with the Board's order to carry out certain sanitary works at six houses situate at Hunts-row, Poplar. Mr. Layton, jun., appeared for the Board, and stated that the proceedings were taken under the authority of the Sanitary Act, and the regulations of the Board. The defendant was the owner of six houses at Hunts-row, Poplar, which had been duly registered, and therefore came under the regulations of the Board. The premises were in a very dirty condition, the roofs were out of repair, the ventilation was defective, and the privies had no supply of water. The houses were situate in a very densely populated neighbourhood, and it was absolutely necessary, not only for the inhabitants of the houses in question, but also of the neighbourhood, that the sanitary works required to remedy these evils should be carried out. Dr. Ellison, medical officer of health, and Mr. Shadrake, the sanitary inspector, proved the condition of the houses, and that the works ordered to be carried out were absolutely necessary. Mr. Benson asked the defendant what she had to say. The defendant stated she had not the means to pay for putting the houses in repair. She admitted what had been stated was true. Mr. Benson said that the regulations and the Sanitary Act are necessary for the public health, but this being the first case before him, and seeing that the defendant was but a poor woman, he should only inflict a penalty of 5s. and costs, or seven days' imprisonment; but if the defendant was brought before him again he should be obliged to enfore a much heavier penalty.

General Items.

A gentleman being anxious to get an insight into the opinions of working men passed the greater part of an evening, not long since, at a public-house resorted to by artisans on strike. While there he was greatly puzzled by a toast which was given unctuously and received rapturously. It was the "Four Eights." He did not like to display his ignorance by asking what it meant, so he waited, and by-and-bye his patience was rewarded. The whole company burst into a song, and the refrain of the ballad they sang was this:

Eight hours' work and eight hours' play,
Eight hours' sleep and eight shillings a day.

These were the "Four Eights;" and the "Four Eights," it was subsequently found, was the working men's millenium.

In reference to late accidents arising from the presence of foul air in wells and sewers, a corre-

spondent calls attention to the following invention :—The apparatus is known as Galibert's Patent Respiratory Apparatus, and is sold by the Patent Inventions Company, 45, Little Britain, London, E.C. Its merits consist in this, that, combined with complete protection to the eyes and nostrils, it affords to the wearer a portable supply of air sufficient for comfortable breathing for twenty or thirty minutes; it is always ready for use, and enables the wearer to exist and move about without the slightest discomfort for many minutes under conditions which would be otherwise instantly fatal to human life; it is fireproof, and can be used in the most dense and acrid smoke. My own experience is confined to its use in chlorine, sulphuretted hydrogen, carbonic acid, and sulphurous acid gases, in any of which, however strong, it is possible by its aid to exist for many minutes with ease. By its use, those accidents in brewers' vats of which we so constantly read are avoidable, and therefore when they occur should no longer be called accidents.

On the Thames Embankment wall are colossal blocks of Aberdeen, Dartmoor, Irish, French, and Guernsey granite—for almost every quarry had to be ransacked—joined with the neatness of cabinet work. They are all much of the same grey hue, but the prettiest, hardest, and finest grained of all is that which comes from Ireland.

As a testimony to the efficiency of creosoting as a means of preserving timber, we may mention that the Lancashire and Yorkshire and Lancashire Union Railways are advertising for 40,000 creosoting sleepers. A correspondent says, "It is a curious thing that the Scotch lines are discontinuing this kind of sleepers and the Lancashire and Yorkshire, one of the best paying lines, is demanding them in such quantities."

A barrister-at-law sends us the following :—I hear on good authority that a mean brick house is to be at once erected in the Cathedral Close, at Exeter, from the design of a national schoolmaster. In an ancient city where so few remains of antiquity have been allowed to stand, I should have thought that it would have been almost impossible to erect a monstrosity under the shadow of the old cathedral.

Eighty-seven acres of land at Edgware belonging to St. Bartholomew's Hospital, have been sold to the Midland Railway Company for the sum of £45,000, as settled by arbitration. Up to this time the hospital has derived from it simply an agricultural rent.

At the last meeting of the Liverpool Town Council the recommendations of the Health Committee to pay to certain owners of property sums of money varying from £10 to £30 for demolition of back yards, widening court entrances, constructing trough waterclosets, and for other court improvements, being for the public benefit in a sanitary point of view, were approved and confirmed.

In the Prussian department of the Paris Exhibition, a first and second-class railway carriage made at Berlin is exhibited, which has many novelties and conveniences worthy the attention of our railway authorities. The carriage accommodates six first-class and sixteen second-class passengers. The first-class compartment has a separate retiring-room, with lavatory, and the seats can be made into comfortable beds. Each second-class compartment has a retiring room, and instead of hot water vessels under the feet, vessels of heated sand are fixed under the seats. The lighting is brought near the passengers for reading. There is a passage for the guard through the carriage, and footboards at both ends of the carriage communicating with the next. The price is between £400 and £500 per carriage.

The 7th of September was the sixteenth anniversary of the Conservative Land Society, which has issued 27,525 shares at £50, viz., £1,376,250, on which £1,093,261 14s. has been paid. The sale of land has amounted to £527,528 16s. The society has been the means of enabling thousands of all classes of the community not only to obtain the freehold franchise in counties, and votes for towns and boroughs, but has also promoted building operations in 26 counties, opened new roads and communications, and given free sites for churches.

We announced last week that Buckingham Palace was about to receive a thorough renovation, in which it stands very much in need. Several hundred workmen are now actively engaged in painting the exterior and renovating the interior of the palace. The stone work, as it turns out, is in many places quite decayed.

The following extraordinary mode of advertising has just been invented by a Parisian. He proposes to erect along the Boulevards, level with the lamp-posts, a number of lay figures, on which the bootmakers, tailors, hatters, shirtmakers, dressmakers, and milliners would, in return for a certain sum, have the right of showing off all they have of newest and best in the way of clothing. The promenaders on the Boulevards could in this way judge at once of the beauty of the material and the elegance of the cut. There are to be, of course, both male and female figures, the clothes changed at least once a week, and on each of the articles a placard hung to give the name and address of the vendor, while a high railing would enclose and protect the whole from the *entreprises* of dishonest and mischievous individuals. It is supposed that a cover of some kind will shelter the figures and their attirement from rain, unless this care be left to some umbrella manufacturer, desirous to join in this *ne plus ultra* of puffing.

The foundation stone of the great bridge across the Ohio river at Louisville, Kentucky, has just been laid, and the people there think the bridge will eclipse the suspension bridge at Cincinnati. The total length of the bridge will be 5,220ft., or nearly one mile. The graded approaches will be 2,500ft. in length, and the superstructure, consisting of iron suspension trusses, will rest on twenty-five piers and two abutments. The longest span will be 360ft., 36ft. longer than the longest span of the Victoria bridge at Montreal. This bridge will be adapted to the use of steam and horse railroads, carriages, and foot passengers. The lowest projecting points of the long span will not be less than 90ft. above low water, and 52ft. above the highest point the water in the Ohio was ever known to reach.

You have heard so much of mismanagement and corruption in the city of New York, writes a correspondent that it must be a relief to be told of a great work which has been carried out with perfect success for the free benefit of the public, and without the waste or misuse of a single dollar. I refer to the Central Park, destined in a few years to be the most beautiful park in the world, and already far superior to anything of the kind in America. Those who have only driven round have but a very poor idea of its extent; to see it properly one should explore it on foot. It is full of exquisite walks by lakes, or through miniature woods and plantations, and hours or days even may be spent there (as I can testify from experience) without exhausting their beauties. The trees are young yet, but some idea of the efforts which are being made to get the park well wooded may be gathered from the fact that last year nearly 18,000 trees and shrubs were planted. The park drive is within a fraction of 9½ miles in length, there is a bridle road 5½ miles, and a length of walk available to the public of over 26 miles. The cost of this park to the city, including the purchase of land, has been little over 10,000,000 dollars. In the winter there is an unrivalled skating pond open to the visitors, and in summer bands of music play popular selections on one or two days a week.

Trade News.

Messrs. Clark and Company, of Rathbone-place, have received orders from the Admiralty to fix their patent self-coiling steel shutters to the plate bending sheds at the Dockyard, Woolwich.

TENDERS.

ADDINGTON (SURREY).—For a vicarage and stables. Mr. Ewan Christian, architect:—Adamson and Son, £2,240; Wells, £3,162; Brass, £1,999; Jarratt, £1,962; Charpington and Cole, £1,915; Rhodes and Roberts, £1,862.

CLAPHAM.—For alterations and repairs at Gloucester House, Lark Hall Rise, Clapham. Mr. H. W. Budd, surveyor:—Repairs, &c.—King and Son, £731 10s.; Mills and Son, £725; Colls and Son, £615; McLachlan, £588 10s.; Notley, £550. New sashes—King and Son, £22 15s.; Mills and Son, £20; Calls and Son, £15 10s.; McLachlan, £14 15s.; Notley, £18.

CHORLTON.—For farmhouses and homesteading for Earl Suffolk, Chorlton, near Malmesbury, Wilts exclusive of building stone, sand, &c. Mr. Thos. S. Lonsdown, architect:—Claridge, £6,577; Hallam and Co., £5,950; Liddiatt, £5,495; Smith, £5,118.

GRAVESEND.—For alteration to Prince of Orange Hotel. Bird and Walters, architects:—Kelly, Brothers, £1,385; Newman and Mann, £1,286; Williams and Sons, £1,257; Ebbs and Sons, £1,195; Blake, £1,190; Henshaw, £1,117.

HAGGERSTONE.—For Church of St. Columba. Mr. J. Young, architect:—Perry, £9,065; Longmiro and Burge, £8,867; Fisher, £8,700; Higgs, £8,473; Hill and Keddall, £8,375; Ashby and Sons, £8,140; Ennor, £8,133; Piper and Wheeler, £7,990; Henshaw, £7,894.

HASTINGS.—For the erection of an Unitarian chapel, Hastings. Mr. G. Beck, architect. Quantities supplied:—Howell, £748; Parks, £730; Vidler, £717; Jones (accepted), £710.

MANCHESTER.—For the erection of two dwelling houses in Elizabeth-street, Bheetham. Mr. Herbert E. Tijou, architect:—Neil8 and Sons, £1,160; Thompson, £1,070; Fogett, £1,053; Farrell, £1,028; Heron (accepted), £1,008.

NORTON FOLGATE.—For new buildings, Norton Folgate. Messrs. John Young and Son, 35, King-street, E.C., architects:—

	Refuge.	Residence.	Total.
Ashby and Horner...	£6,661	... £1,995	... £8,656
Jackson and Shaw ...	6,557	... 1,989	... 8,546
Ashby and Sons	6,549	... 1,984	... 8,533
Jackson.....	6,518	... 1,917	... 8,435
Conder	6,184	... 1,931	... 8,115
Brass.....	6,145	... 1,952	... 8,097
Webb and Sons	6,012	... 1,869	... 7,881
Henshaw	5,904	... 1,794	... 7,698
Hart (accepted)	5,622	... 1,797	... 7,419

PURTON.—For additions to Bentham House, Purton, Wilts, for Mr. W. J. Sadler, exclusive of timber, stone, bricks, lime, sand, and slate. Mr. T. S. Lonsdown, architect:—Liddiatt, £420.

SWINDON.—For business premises, New Swindon, for Mr. Collard. Mr. Thos. S. Lonsdown, architect:—Frampton £393 3s. 4d.; Selby, £391; Hopkins, £349.

STOKE-ON-TRENT.—Three houses for Mrs. Mellor. Ward and Sons, Hanley, architects:—Bostock and Hancock £1,220; Wooldridge, £1,250; Steele, £1,190; Matthews £1,187; Lidley, £1,163 10s.; Buxton, £865; Barlow (accepted), £750.

WROUGHTON.—For Wroughton Schools, near Swindon, exclusive of old materials to be reused. Mr. Thos. S. Lonsdown, architect:—Phillips, £545; Harris, £515; Hopkins, £495.

WOOTTON BASSETT.—For Boke House, Wootton Bassett, exclusive of bricklayer, mason, slater, and plastering, for Mr. Watts. Mr. Thos. S. Lonsdown, architect:—Barrett £122 19s. 7d.; Carter, £120 10s.

WILTS.—For alterations and additions to Tackenham Rectory, near Wootton Bassett, Wilts. Mr. Thos. S. Lonsdown, architect:—Brown, £1,096; Wheeler, £895; Frampton, £875; Trine, £860; Barrett, £840; Carter £830; Liddiatt, £825.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depot also Cost for Transit to any part of the United Kingdom furnished on application to Bath Stone Office, Corsham Wilts.—[ADVT.]

PROPERTY SALES.

SEPT. 9.

AT THE GUILDHALL COFFEE-HOUSE.—By Messrs. Fee Cook, and Fenn.—Copyhold estate, known as the Lam Farm, situate in the parish of Chick St. Osyth, Essex comprising house, buildings, and 87a. 0r. 21p. of arable meadow, and pasture land—sold for £5,600.

Freehold estate, known as Cocket Wick Farm, situate as above, and comprising farmhouse, buildings, and 481a. 0r. 1p. of arable, meadow, and pasture land—£17,750

Copyhold two messuages and premises, situate in Mill street, St. Osyth aforesaid, producing £26 per annum—£23

SEPT. 10.

AT THE MART.—By Messrs. Hubberd and Son.—Freehold residence, known as Marl House, Bexley, Kent, held on lease at £52 10s. per annum—£1,000.

Freehold 1a. 3r. of building land, situate as above—£80

Freehold ten plots of building land, situate as above—£105 to £170 per plot.

By Messrs. Garrard and Biddle.—Leasehold six houses Nos. 1 to 6, Sarah Cottages, Duncan-street, Hackney, producing £114 8s. per annum, term 70 years unexpired £17 per annum, and sold subject to a mortgage of £477 1s 6d.—£200.

Leasehold two houses with shops, Nos. 4 and 5, Romsey terrace, Well-street, South Hackney, producing £98 per annum, term 80 years from 1865 at £12 per annum—£90

Leasehold four houses and shops, Nos. 3 and 4, Henry street, and 11 and 12, Cams-buildings, Catherine-street Limehouse, producing £83 4s. per annum, term 35¼ years from Lady-day, 1867, at £21 per annum—£340.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

William Bowen, Norwich, plumber, September 18, at 1—W. Oatley, Union Cottages, Hornsey-road, plumber, September 18, at 11—William Thomas Wenlock, Brightlingsea, shipwright, September 18, at 11—James Bishop, Wellington terrace, St. James's-street, Camberwell, stonemason, September 20, at 11—Abraham Bellott, West-lane, Rotherhithe, dealer in paperhangings, September 20, at 12—Charles Musto Fisher, Twickenham, journeyman carpenter September 20, at 12—Charles Henry Wilcs and William Ebenezer Bull, Frindsbury, brickmakers, September 20 at 12—Thomas Webb, Alexandra-terrace, Victoria Park road, gilder and carver, September 20, at 1.

TO SURRENDER IN THE COUNTRY.

Charles Andrews, Cheltenham, builder, September 18—James Cocks, Bristol, mason, October 4—Charles Moys Fornham All Saints, Suffolk, carpenter, September 21—Samuel Sloan, Carlisle, painter, September 19—Eli Warry, Westbury-upon-Trym, Gloucestershire, journeyman smith, October 4—J. Winter, Gateshead, cabinet maker September 18—John Rawstron Barnes, Haslingden and Accrington, mechanic, September 20, at 12—Henry Owen Cunliffe, Salford, varnish and colour dealer, September 20 at 9.30—Joseph Rigby, Wednesbury, coach axle tree maker September 28, at 12—Robert Mounsey Robson, Liverpool ironmonger, September 23, at 11—James Stott, Rochdale machinist, September 24, at 11—Robert Welch, Stockton-on-Tees, brick manufacturer, October 1, at 12.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

October 28, W. Forman, Francis-street, Waterloo-road contractor—October 28, J. Wiggins, Ham Common, journeyman carpenter.

THE BUILDING NEWS.

LONDON, FRIDAY, SEPTEMBER 20, 1867.

ST. MARTIN-IN-THE-FIELDS NEW WORKHOUSE.

IN our issue of May 24, attention was called to a limited competition for designs for a new workhouse to supersede that at present existing in the rear of the National Gallery. The Board of Guardians invited six architects to send in drawings, for which they undertook to pay fifty guineas each, the successful competitor to be the architect for the building. The instructions provided that the cost should be about £25,000; and that the number of inmates to be accommodated should be 400, with other specified and clearly set forth conditions. The architects who have competed are Messrs. Kendall and Mew, Mr. R. H. Cotton, Mr. Lee, Mr. H. M. Burton, Mr. W. S. Cross, and Mr. Marrable. The instructions, it may be observed, were so framed as to leave the competitors as free as possible to follow the bent of their own inclinations, demanding approximate plans rather than trammelling the architect with conditions impossible to fulfil. The result of the competition (the drawings were described in the BUILDING NEWS of May 24) was that the architects were invited to send in a second set of designs, which they accordingly did about the end of August. To the second competition we alone refer in this notice.

The purposes to which the building will be applied differ widely from those to which almost any existing institution has been devoted. The site of the present workhouse having been taken up for the extension of the National Gallery, and a fair sum paid in compensation, the guardians wisely seized the opportunity for effecting a complete change in the management of a certain class of poor over whose welfare they were bound to watch. The casual poor having been turned over to neighbouring parishes by arrangement, a quota to one and a quota to another, the building at Wimbledon will be an asylum for such of the real parishioners of St. Martin-in-the-Fields as by birth and residence are truly entitled to claim as a right the provision which a humane legislation has allotted them. This institution is neither a hospital nor strictly speaking a workhouse, as no provision is made for the adult able-bodied idler or the casual poor. If it can be compared to anything it must be a convalescent hospital, wherein suitable arrangements are made for the accommodation of three several degrees of infirmity, the most infirm being placed on the ground floor, those somewhat stronger on the first floor, and the comparatively able-bodied on the second floor. It is, in short, a place where the more or less infirm poor of the parish may end their days in peace. To the honour of the guardians, it may be said that they are guardians indeed.

The new designs are so altered from the original that any references to the latter are superfluous; but it may be observed that Messrs. Kendall and Mew have scarcely altered their design in any respect, contenting themselves with shifting the block of buildings somewhat to the east, so as to allow a larger portion of the land to be leased, by which arrangement it is expected a considerable revenue will accrue. Mr. Marrable has materially improved his first plan without making any extensive alterations, but in the plans of all the other competitors great changes in arrangement are visible. In the design of Mr. Lee these changes are most conspicuous. In the first competition his elevations were of too ornate a character to satisfy the guardians, who, in fact, were apprehensive that the actual cost would far exceed the estimate. His present design, in the Gothic style, is not free from objection, and the corridor running through the building from east to west is not likely to meet the approval of the Board. In this matter of corridor, Messrs. Kendall and Mew are offenders in a similar way. A very long corridor is objectionable, as engendering draughts and destructive of privacy or separation of departments. Mr. Lee's plan places the chapel on the first floor, and, as the instructions provide that the most infirm inmates shall be accommodated on the ground floor, it is not easy to conceive how they will be able to attend divine service, as, in order to do so, they must mount a flight of stairs. This objection applies to all the plans with the exception of that of Mr. Burton; and even in his amalgamated design —Burton and Cotton—the same defect exists. Of Mr. Lee's elevations we cannot speak highly. They are in the Gothic style, but have none of the mediæval spirit which alone makes the style endurable. There is a commendable plainness in the elevations, but an absence of all Gothic feeling.

On Messrs. Kendall and Mew's front much praise cannot be lavished, its great recommendation is its simplicity, but while it cannot be classed as a work of art it foregoes its claim to be considered as a purely utilitarian design by a display of useless towers and other superfluous ornament. It is, however, but just to say that the variegated brick banding has been sparingly and judiciously introduced. The front, however, conveys the idea of a hospital rather than such an institution as the guardians required, besides which the brickwork is yellow and the instructions required red. This, however, we regard lightly. Mr. Marrable's plan is peculiar. It consists of an octangular building surrounding a court having projecting bays on each face. This arrangement is in principle very convenient for the executive department, as it permits of ready communication, easy supervision, and prompt service. It is, however, too much crowded, and is unsightly in the extreme. The style is Classical, but very plain. We could not recommend either plans or elevations without such modifications as would amount to an entire remodelling. Mr. Cross's plan is open to the objection that his chapel is on the first floor, and that many of his beds are immediately against the windows. His elevations are decidedly the best in the competition. To assert that they are perfect would be untrue, but they contain a deal of merit, and are eminently suited in character to the purposes of the building. The style is plain. A sort of Gothic character is sought to be given by the use of pointed arches in variegated brickwork over the first floor windows, but the lines are horizontal throughout, and the roofs are hipped not gabled. There is just sufficient of tower and turret to relieve the long horizontal lines, but not too much. The design, moreover, seems to have a rural air which none of the rest possess.

Mr. Burton sends in a plan on the octangular scheme. His chapel is on the ground floor. The octangular system is open to objection, but Mr. Burton has done as well with it as might be expected. A large number of inmates would have a prospect from the windows, and all would have ready access to the outer air, while the service would be compact, and this is, in official eyes, of paramount importance. Mr. Burton's elevations are too much like town buildings—a sort of Peabody-square—but they are better than those he sent in for the former competition. In the amalgamated design, Messrs. Burton and Cotton, the chapel is on the first floor. The general arrangement, with this exception, is satisfactory. Mr. Cotton's original plan was very good; in the first competition, Messrs. Burton, Kendall, and Cotton, were selected for plan. The elevations are plain.

The competition was to have been decided on the 4th inst., at a special meeting called for that purpose, and at which sixteen of the guardians were present. It was on that occasion decided that Mr. Cross was successful, but owing to some informality in the proceedings, due notice to attend not having been given in all cases, the matter was reconsidered at a special meeting, which took place yesterday. The result of the deliberations of this second meeting we do not at present know. Both Mr. Cross and Mr. Burton have many partizans, and, on the whole, their designs seem to meet the requirements of the Board. Mr. Cross's plan admits of improvement, but his elevations are superior to anything in the competition. Mr. West, the clerk to the Board, has given many valuable hints to the competing architects, where his experience of administrative detail could be of service. We hope that some final decision has been arrived at, as much for the credit of the Board of Guardians as for the sake of the architects concerned.

RAILWAY ECONOMY.

THE general depreciation of railway property which the last two or three years have witnessed is very significant, and should be very suggestive. It seems to us that the whole system of railway management requires remodelling, if railway shareholders are ever to obtain fair interest for their invested capital. There is too much ostentation, and too much wasteful expenditure to support it, in connection with most railway directories, to allow of the shareholders obtaining anything more than the crumbs which fall from the tables of the potentates whose slaves they are. Railway companies are really only organized bodies of common carriers, and the duties of their officers are of a very commonplace character. It is, therefore, a huge, and, in many instances, a fatal error to pay railway managers so enormously for their services as they are paid. It is entirely impossible for any railway which has not an extraordinary and exceptional amount of traffic to yield profits sufficient to support the merely ornamental and totally useless grandeur which is considered necessary to give the proper amount of dignity to the Board which governs it.

Why should salaries equal in amount—or nearly so—to those paid to Her Majesty's Principal Secretaries of State, be given to men whose qualifications for office at the best need only be of the most mediocre kind, and whose actual qualifications are not unfrequently far below mediocrity? Are there not to be found in the rank and file of commercial life plodding, careful, and astute people who for one-fourth of the stipends now accorded to railway magnates would execute the functions of their offices much better? The peculiar nature of the work to be done in such cases requires that those who do it should not be proud and inaccessible, but practical and intelligent men. As affairs are conducted at present, on most lines of railway, directors are seldom or never brought into direct communication with those who actually conduct the business of the companies with which they are connected. They have what are termed general managers, and through these alone they obtain what little knowledge they have of the progress of the undertaking which, it is charitably assumed, they govern. The general manager, as a rule, however, is as much in the dark as "the Board." He has under his control (?) a host of district superintendents, inspectors, &c., who frequently do not care one farthing for the poor shareholders, or contribute one jot or tittle to the efficient working of the line. Too often, indeed, they confuse the station master by absurd and unjustifiable interferences with his duties and unwarrantable assumptions of official superiority. Knowing their own practical uselessness, this class of railway officials are in many instances addicted to inventing impracticable alterations and indulging in small schemes for the mere purpose of keeping their superiors up to the knowledge that they are still in existence.

We are not speaking thus plainly of the evils of the present system of railway (mis)-

management without the full warrant of positive experience. One of the largest and oldest lines of railway in England, the shares in which are to be had at one-fourth their original market price, is hampered by a host of such persons as we have alluded to, and who annually pocket profits which legitimately belong to the shareholders. We have no hesitation in asserting that if station-masters, properly selected, and not thrust into their positions by undue influence, were left to manage the traffic of the particular line to which reference has been made—and of other lines as well—and were held responsible when any accident occurred, the results would be advantageous at once to the public who travel over it and to the company to whom it belongs.

If directors exercised a direct and personal supervision over the actual managers of the line, and came to be familiar with the duties they perform in their various departments, yet further good would accrue. It is in the interests alike of the public and of shareholders that we write, and that we have indicated some of the directions in which reformation is strongly needed. To make railways pay they must be officered by efficient men, and not by ornamental nonentities. Reasonable salaries should be paid for the performance of duties which do not demand the exercise of extraordinary talent; and there certainly is no necessity for employing individuals whose sole duty it is to sign annually some few hundreds of documents at a cost of many thousands of pounds a year. In fact, a large importation of the commercial element is needed to give renewed vitality to railway systems. As matters stand, they are languishing, and, in the future, are likely to languish still more. In another paper more symptoms of railway weakness will be indicated, and yet further remedies suggested for reducing them, as a medical man would say. By the application of such remedies, it is to be hoped that a healthier circulation and a better tone may be given to the patient.

JOTTINGS IN LONDON.—No. II.

(By Our Roving Correspondent.)

Basinghall-street is a very narrow street. At the Bank end it is not more than 25ft. wide. It is one of the last places where any one would think of putting up a large elevation either in olden days or now. Wren did not. Although the church of St. Michael Bassishaw was thrown back from the small churchyard, it is a very modest composition outside, the boldest feature being at the other end, in Church Alley. Coopers' Hall was one of the largest façades, but that was low and plain. Girdlers' Hall and Weavers' Hall had in the street only enriched gateways, though the interiors were treated with some kind of luxury. Blackwell Hall, the great woollen mart, produced no architectural effect. Gresham College is near the corner of the street.

In this street, opposite where Blackwell Hall stood, and where stands the Tax Office, a very large pile of offices replaces some old houses, and on them the architect has bestowed some care and some expense. They are lofty and well lighted. The basement windows are enriched with free carvings of birds and foliage, and as they stand about four feet from the ground, and are unguarded by railing or area, they invite the attention of the street boys. Thus they will be early decorated, with painted eyes and beaks, to the extension of polychromy, or may be dismembered by some other worthies having a genius for dissection. This is not a solitary case. In this instance, and in others, there is no æsthetic reason for this mode of decoration. It entails expense to produce what can be only a temporary effect, and instead of yielding gratification to the employer it must soon be an eyesore. The use to be made of buildings must always be kept in mind while laying them out, and no mode of decoration should be adopted which is perishable, or which in its wear will become unsightly. The façade is arranged with two narrow decorated centres for entrance, running up like towers, and marked by a slight projection. Thus, there is an harmonious composition, and, were the street wide enough, the effect would be as good then as when it was first seen by the employer on the drawing board. It is, in the nature of things, lost in its entirety of composition and effect. There was, however, a partial chance for the designer, for opposite the left of his edifice runs a fair street called Guildhall-buildings to the site of Guildhall Chapel and Blackwell Hall, and the vista extends over Guildhall-yard and into the court of St. Lawrence Jewry churchyard, perhaps some 300ft. At any rate, the many thronging into Guildhall see on their right this new and promising building, but it produces no effect, as it stands askew to Guildhall-buildings. Now, my impression is that if the doorway had been shifted 3ft. or 4ft. to the left, it would have made no real structural difference to the building, but it would have made its merits seen to thousands, and given attraction to the building. The author will say that such a measure would have spoiled the symmetry of his façade, but what difference would that have made to a façade which is too long and too high to be seen from the immediate street. As to structural arrangements, it would have made no appreciable difference, for if some rooms to the left were 3ft. narrower, others to the right would have been 3ft. wider, and the rent or letting properties of the building would not be less.

Masks are a feature of decoration for keystones, which are of fatal attraction for snobs in architecture and the poor in spirit. These heads and faces yield decoration without the trouble of design. Buy one of the artificial stone masks, and put it up—that does the owner of the suburban villa, and pleases himself—like Slankenbergius, at the Promontory of Noses, he chooses the goodliest one of the lot, and is satisfied. Meaning commonly there is none, but when it comes, as in Tyburnia and Pimlicovia, to a dozen or a score of these in a row, and all of the same type, it is simply abominable. We can even submit to the lion's head knockers, first manufactured by the maker of the willow pattern plate, and now with it distributed over the world. I have seen a veritable Brummagem lion's head knocker on a door in Cairo, alongside of some bits of wrought-ironwork, which make a claim on one's note-book, and the Marquis of Waterford would have put in his museum.

The United University Club, in Pall Mall, is being cleaned, and the Travellers' and Guards' being painted. I will pass by the University, but I must stay a bit before the Travellers'. This is being painted, but why should it be painted white? As a material for preservation any colour would be as good as white. He would be a bold member of the committee, and not a useless one, who would dare to suggest on the next painting that a little colour should be applied to the architectural details. This would be a wakener. Yet there are admirable reasons, handed down to us by our grandams, why we should stick to the classic and the legitimate, hold to white paint, and put colour far from us. There can be no room for doubt that, according to the true faith, white—pure, clear white—is the only colour for architecture and sculpture, and we are bound to believe that the ancients never painted buildings or statues, though we knew that they did, and many of us have with our own eyes seen witness of it. To paint the stucco of such a classic edifice as the Travellers' with other than white lead or zinc white would be barbarous, and yet as one thinks fair and softly what are the bounds of the legitimate, and how far they may be widened, it is to be found out that colour may be introduced in the Carlton in the shape of polished granite shafts, and that it may be introduced anywhere in grained doors. If Barry had had a fair chance he would most likely have introduced colour in the Travellers'. Ah! but that would be a sophistication to touch up the members and details. Yes! yes! a sophistication, when the whole building is a sophistication, inside and out, painted over outside to simulate stone and marble, and painted inside to simulate marble and wood.

It is consistent to oppose altogether stucco and imitation woods, and marble, but when stucco and paint have been adopted, let us get what pleasing effects we can out of them, as pleasing as those of our Italian friends in the like case. Stucco is the natural surface for paint, and so thought our fathers, as buildings in London formerly told, and as many a rural cottage of the olden days yet tells—coloured brick is but seldom effective. It is commonly dismal in the beginning, and soon gets dingy. It is suggestive of clothing the naked, taking off the plainness and ugliness of a workhouse or a cotton factory. There is a specimen, which is picturesque, and that is the vaulted portion of the high level stations at the Crystal Palace. The curving surfaces of the vaults and the perspective of the thick columns make a crypt of it without dismalness. It can always be pointed and coloured up, and will look clean in a bright light.—Some of the not least pleasing architectural studies in Paris or smaller cities, where fêtes are celebrated, are the pasteboard buildings, palaces, arches, temples, and altars erected for the day or days of the celebrations. The scene painter gives us something of the kind, but though his foreground and wings contribute to the illusion, and give perspective, it is but a flat representation from one point of view. The decorative architect gives you all the lifelike presentment of a building. The body is scarcely wanting, and the edifice lacks little more to the eye than the missing shadow of Peter Schlemihl. Here we seldom get such presentments, and it is to be regretted, for they are good exercises for the public in architecture—nay, for architects themselves—as well those who design as those who inspect. These trials, too, often lead to practical results. The chief practitioner we have is the City architect. He can decorate Guildhall within and without, and for a royal recepton he can monumentalize London Bridge. The hall and banquet room that he improvised for the Sultan were happy hits. The festal hall created for the Sultan, at the India Office, was another success of the same kind, and a legitimate exercise of architectural faculties. If, indeed, architects would make themselves more necessary to the public they would be better appreciated: but architects are very apt to think everything under a church or an assize hall as beneath them, and except in a cathedral, for the preparation of a coronation, a public funeral, or a music festival, who thinks of entrusting decorative arrangements to an architect! These are handed over to the upholsterer and the decorator: and the result is the upholsterers and decorators get in hand a mass of work otherways, which in the end enables them to spoil the work of the architect. To take nothing else, go into one of the giant hotels, and see how the grand hall, on which the architect has relied for his fame, is cut up by the decorator, the gasfitter, and the upholsterer, each fighting on his own hook.

Congruity and incongruity no more affect architects than they do Mumbo Jumbo or the King of the Mandingos. King Pepple or Lord Wellington will put on a footman's livery, a general's cocked hat, and dispense with breeches or boots; so an architect will, as was lately said, lay hold of any little bit of decoration to be found in the market ready

nade to order. The one who designs is not lways safe; he gets a pretty idea, and he ticks it on to the first thing he can, to the reat bewilderment of inquiring and admiring pectators. Indeed, it is not always easy to now what a building is intended for in London. A very large edifice, which has prung up since my time, fairly baffled my omprehension as to whether it were a monastery or a hostelry; at length I was told it vas a distiller's. A coach-builder's I mistook or the palace of the Duke of Marylebone; nd a well-contrived nunnery proved to be he Pandemonium of a finance swindle. In Vinchester-street is a fine range of offices, f which one block has profited by enhanced rosperity in achieving decorations. To the eft, a colossal bull's head presides over a ordon of fruits and flowers of more than rize proportions, and to the right a ram's ead does like duty. The relevance and fitness of these emblems I have not yet been ble to see. The owners of the property are ot Messrs. Bull and Ram; it is not intended or a general shambles, poultry and green narket; nor is it the leather market, nor near . The emblems ought to mean something: hey are a free carving, bold, and must have ost money. The carver has a right to be roud of them. The offices are for honest merhants, but it is possible they were begun hen the sun was in Aries and finished when e was in Taurus, or begun in Taurus and nded in Aries, for in so few months is a reat building like this run up. The bull oes not allude to the Stock Exchange, for he house is not near enough for stockrokers; besides, the bull is not a tossing bull, he other beast is not a bear, and there are o lame ducks. The place was never a ublic-house called the Bull and Ram, nor is t likely to be turned into an inn. If we ould contrive a meaning for the bull and ams' heads, we cannot account for the garnish. It would be curious to know what eads will be put on the other blocks if his decoration be continued.

HAYLING.

IT would be difficult, if a search were made from John O'Groat's to Land's End, to find a pot for which nature has done so much and man o little as the picturesque island of Hayling. Possessing a long extent of beach, which skirts a harming bay and commands a splendid sea view nd affording bathing which cannot be excelled on he south coast, combined, on turning to the intenior of the island, with rural scenery of a picturesque and diversified character, and, to crown all vith a very low rate of mortality, it has often een matter for surprise that some effectual steps ave not been taken to develope the numerous adantages which Hayling offers and to make it a popular seaside resort. It is true that many years ince an attempt was made in this direction, but fter a few houses, totally unsuited to the locality, had been erected the scheme was abandoned, nd the extensive litigation in which the late ord of the manor was so continuously engaged revented him turning his attention to this imortant matter. An insuperable obstacle to the roper development of the resources of the island vas its isolation from the mainland, the bridge at angston, which was erected more than forty ears since, being utterly inadequate to the requirements of the locality. Of late years atempts have been made to give the island the adantage of railway communication, but recently hey were unsuccessful. Various schemes are afoot vhich are calculated to benefit the locality. A ortion of the vast area of Langston harbour has een utilized by the formation of extensive oyster eds, under the auspices of "The South of England Oyster Company," which promises to e a lucrative concern, while on the other side of he island "The Emsworth Oyster Farming Company" is in active operation. In order o facilitate communication between South ea and Portsmouth and Hayling, plans for steam floating bridge to run across the outh of Langston harbour have been prepared, vith a view to their speedy execution. The most mportant of the measures proposed for the delopment of Hayling is a scheme inaugurated by Mr. F. Fuller (who, as is well known, has recently purchased a large amount of property in the island) for laying out 200 acres of land, partly for building purposes and the remainder as a public park for purposes of recreation. Impressed with the many advantages which Hayling possesses, Mr. Fuller appears determined that nothing that a liberal but judicious outlay of capital, combined with energy and perseverance, can effect shall be wanting to produce a successful result. Accordingly, advertisements were issued offering premiums of £100 and £50 and £25 respectively, for the three best designs for the purpose above referred to, the selection of which was fixed to take place on Saturday last, at the Royal Hotel, Hayling, on which occasion the architects and surveyors and other visitors enjoyed the advantage of proceeding from Havant to South Hayling by means of the recently opened railway. The designs which had been sent in in answer to the advertisements had been exhibited for some days previously at the assembly room adjoining the beach, and created no small amount of interest among the residents in the locality and others who inspected them. Thirty-four sets of designs had been furnished by architects and surveyors in all parts of the country. Many of them were executed in a finished and artistic manner, and a casual visit was sufficient to convince that most of the competitors had bestowed a great deal of labour upon their preparation. The following is a list of the designs:—

MOTTOES ATTACHED TO THE DESIGNS.	No. of drawings illustrating each Design.	Amount of Annual Ground Rent estimated by Competitors.	Proposed Building Plots.	
			Number of Houses.	Number of Acres to be used for Building.
		£		
Onward (two designs)	4	3,050	85	...
		3,375	97	...
Fiat	1	2,585	200	...
Houses to Live in and Places for Recreation	1	1,370	28	132
Nothing for Nothing	1	...	...	120
Fair Play is a Jewel	1	1,395	58	...
Dauntless	1	...	159	...
Nil Desperandum	2	2,215	89	...
Postulata	2	3,767	210	...
Spectator	2	4,180	125	...
Kunst Macht Gunst	2	4,752	159	...
Forward Hayling	1	3,596	368	...
We bide our time	5	4,208	146	...
Felix	3	2,213	...	...
Vigilans	5	1,600	...	128
Spes	1	3,150	316	...
Justice	1	3,275	492	...
Excelsior	1	3,037	149	...
Faith	2	14,300	...	143
In Vanum Laboraverunt	3	4,800	...	120
Bodhyfryd	2	3,483	...	120
Woodman spare that tree	2	1,950	71	103
Live and let live	6	1,260	180	91
Finis Coronat Opus	3	1,200	81	193
Nemo	2	1,614	...	...
Ego Sum	1	1,217	109	...
P	13	2,500	614	...
***	2	12,295	611	...
Labour is rest	4	2,317	...	...
Floreat	2	2,500	...	...
Rough and ready	1	3,785	94	...
P & T	2	...	...	...
Quod Erat Demonstratum	1	900	...	...
Charis	3	...	...	...
Attie	4	1,340	133	...

In accordance with the public notification, the competitors who were present, to the number of about twenty, assembled at the Royal Hotel, at one o'clock. A somewhat novel plan had been arranged for the selection of the three best designs. It had been announced that no competitor would be allowed to vote in favour of his own design, but every competitor would be able to give one vote for each of those designs which he might consider entitled respectively to the first, second, and third premiums. Competitors who were unable to attend in person were to be bound by the decision of those attending the meeting, and in case of any dispute or an equality of votes, the final award of the premiums was to be made by Mr. C. J. Longcroft. The latter gentleman presided, and before commencing the business he introduced Mr. Fuller to the company, and explained that he (Mr. Longcroft) was only acting as his agent and as umpire between the two parties. He stated that in the first place there ware 150 applications received by Mr. Trigg (builder of Hayling Island), and himself for the plans, and ultimately thirty-four designs were sent in. No specific rule had been laid down for competition, but competitors had been allowed to exercise their own discretion, either retaining the Manor House in its present form, or sweeping it away, or dealing with it as they thought desirable. The premiums would, of course, be paid after this meeting, if the successful competitors were present, and if not the money would be forwarded to them. There seemed to have been three sets of designs sent in, and it appeared that there was no limit in the advertisements as to a competitor receiving more than one prize. But it would be a question for them, supposing, for instance, that the same gentleman should, by their votes, be entitled to two premiums, whether he should not take the best prize and allow the other to go to someone else. In proceeding to a vote he asked them to take into consideration the largest amount of ground rent to be obtained at the least cost; secondly, the best recreation ground at the least cost of road making, and the least disturbance of the existing estate; thirdly, the least disturbance of timber on the estate, as it was desirable to retain all that possibly could be retained; and fourthly, the best designs as a whole. They had all seen this particular property, which was about to be laid out, and he thought they could have but one opinion that it was capable of considerable improvement, and offered very great advantages, in respect to timber, site and water, and also the fine sea prospect, altogether forming one of the most beautiful spots in this part of the country, and from the improved communication between the island and the mainland, and also the works about to be undertaken on the beach, from one end to the other, contracts for which were about to be entered into, it should become a very desirable residential property.

Considerable discussion ensued as to the details of the proposed plan of selection, and many difficulties were pointed out. There is a trite saying, "When doctors differ, who shall decide?" and the difficulty is, perhaps, greater in the case of architects and surveyors. Ultimately, however, the question was settled by abandoning the proposed plan and leaving the selection in the hands of Mr. Longcroft, who at once proceeded to the Assembly Room, where he remained for upwards of an hour, with closed doors. It may be mentioned that the names of the competitors were kept secret, as the sealed letters accompanying the different designs were retained by Mr. Trigg unopened until after the decision of Mr. Longcroft had been announced. The result was awaited with considerable interest, and the competitors gathered round Mr. Longcroft on his return from the Assembly Room. He said it was with considerable diffidence that he gave his award on the plans. He was addressing men of considerable experience in these matters, and all he could say was that he had exercised his judgment to the best of his ability. He had only this consolation that if they had decided themselves it would not have been satisfactory to every one of them. Therefore, he must do the best he could, and he hoped that those who were not successful would believe he had acted fairly and impartially. As they were all aware, the plans divided themselves into three distinct sections. One set of plans left the Manor House as it stood, allowing the timber and roads to remain very much as they were, only putting additional roads, and, in fact, developing nature. The next series of plans destroyed the Manor House, but retained the general features of the estate, with the timber and fences generally, and the third series of plans treated the entire estate of 200 acres as if it were a plain surface, developing that plain surface in the manner thought best for the situation and size of the place. He thought that, looking at what was likely to be the mind of Mr. Fuller—although he had had no conversation with him as to his views on the plans—and deciding as if he (Mr. L.) were going to find the money, he should select the plan that would seem to answer the purpose best, having regard to cost and preserving the general features of the estate. Having considered these points, he had come to the conclusion that "Vigilans" was entitled to the first prize. The plan that he awarded the second premium to was one of two plans marked "Onward." These two plans carried out what he had referred to, the first preserving the Manor House, and the timber generally in its present form, and developing nature, and the second doing something to the same extent, but removing the Manor House. The third prize he awarded to "Spectator," whose plan treated the estate as if it were a flat surface.

The successful competitors then retired with Mr. Longcroft into a private room, and cheques for the £100, £50, and £25 were handed to them. We append an outline of the main features of the successful designs:—The first premium of £100 was awarded to Mr. A. G. Hennell, 22, Southampton-buildings, Chancery-lane, W.C. He has re-

tained the Manor House and existing cottages, as well as the water now upon the estate, and has introduced some ornamental water in the wood, where he has adopted some pleasant walks and a rustic bridge across the water. One of the plots arranged by him for cricket can at any moment be used for that purpose, being at present a beautiful level field, nicely surrounded with trees of fine growth. His archery ground has an equal description. The buildings for the cricket and archery pavilion are admirably constructed, have ample accommodation for any emergency, and are within the specified cost stated in the circular. Mr. Hennell has thus divided the estate,—

	a.	r.	p.
Park, cricket ground, archery ground, and shrubbery	49	1	11
Existing cottages	2	2	2
New roads and widening	7	3	9
Building land	123	1	7
Manor House and ground	5	3	36
	193	3	35

Having thus arranged his land he values it at from £10 to £15 per acre, and realises about £1,600 per annum. The planning of his houses and their elevations are equally to be admired for their excellent arrangement, beauty, and little cost.

The design marked "Onward," which obtained the second prize, was prepared by Mr. G. R. Crickmay, architect and surveyor, of Weymouth. A design prepared by him was, we believe, selected out of seventy-five competitors and a premium of £100 awarded to it for laying out 340 acres of land at West Worthing, belonging to the West Worthing Investment Company and the Hoene Estate Company. Mr. Crickmay has likewise laid out land for building purposes, and designed and carried out various buildings on land belonging to Sir F. Johnstone, Bart., and other proprietors at Weymouth, Swanage, &c. The principal feature aimed at in the design for the Hayling estate is as much as possible to utilize everything at present on the ground, and to consider the scheme in its commercial and picturesque aspect.

The third premium of £25 was awarded to Mr. E. Milner, Hill Side, Dulwich Wood, Norwood, Surrey, who has taken up the estate with a boldness that neither of the others ventured at. He has in his planning totally effaced any trace of the existing natural beauty of the estate, as it now stands, and has laid it out as if it were but a piece of waste land. In his arrangement he has shown great taste and judgment with winding roads and paths, in which a stranger might wander, not thinking he was travelling within the space of 193 acres. He has given archery and cricket pavilion, both within the stated cost.

The first set of plans that received honourable mention are those prepared and sent in coinjointly by Mr. J. T. Metcalf, 12, Alfred-place, Thurloe-square, Brompton, London, and Mr. Maurice Young, landscape gardener, Godalming, Surrey, with the motto, "We bide our time."

The next plan that received honourable mention is "Live and Let Live," by Mr. F. Whittaker, 3, Palace chambers, Westminster. Like the last three mentioned plans he has totally destroyed the Manor House; the wood he retains, dividing it out, with a circular drive in its centre, with footpaths struck out from its four quarters. He has taken one step in advance of the requisitions by introducing a croquet ground, and has arrived at a ground rental of £1,260.

DIMENSIONS OF BRITISH CHURCHES.

IN a communication to the *Times*, Mr. Samuel Sandars, writes as follows:—Some two years and a-half ago you admitted into your columns a list, contributed by Mr. E. B. Denison, of the dimensions of some of the principal English churches. Having been at some pains to collect a supplementary catalogue, with the addition of several Scotch and Irish examples, I forward it to you, thinking it may interest some of your readers. I do not extend the list to churches with an area of less than 8,000 square feet. This limit excludes several interesting churches, for example, St. Andrew's, Heckington, Lincolnshire, with an area of 7,900 square feet; St. Mary's, Ottery, Devonshire, like Exeter Cathedral, with transepts formed by a tower on either side, and also groined throughout, area, 7,500 square feet; and St. Patrick's, Patrington, which possesses eastern and western aisles to the transepts, area, 6,734 square feet. In reference to the churches in the accompanying list, I may remark the Glasgow, Kirkwall, and St. Cross, are vaulted throughout. St. Patrick's is partly vaulted, Hexham and Milton are without naves. Malvern has no south transept. Austin Friars, London, and Leominster, are the naves of large cruciform churches. Melton Mowbray and Faversham have east and west aisles to the transepts, the former also possesses a western porch. St. James, Bury St. Edmund's, is without a steeple; the adjoining Norman gateway serves as a substitute. The tower at Beccles, Suffolk, stands detached at some distance from the church. St. Cuthbert's, Wells, has five avenues, or aisles, and Sleaford and St. Martin's, Leicester, have four; the addition to the former is recent; the lofty steeple of the latter, just completed, replaces a far less imposing structure. Long Melford has a large, aisled lady chapel, which is not included in its dimensions as given in the list. The choir and transepts of St. John's, Chester, have been shortened, and Great Grimsby has been still more mutilated. I may add, that at Glasgow the transepts do not project beyond the line of the walls of the nave, and that its height and that of Kirkwall are, relatively to the breadth of their avenues, greater than is usual in this country. In the latter church the proportion of the breadth to the height is 1 to 3. Croydon Church has been gutted by fire. As in Mr. Denison's list the letter S denotes a spire; the letter C that the steeple, whether tower or spire, stands in a central position; with no letter prefixed, a tower only is understood. Perhaps some of your readers can give the dimensions of the following large churches, which I have not been able to obtain:—St. Peter's, Sheffield; St. Giles's, Wrexham; Ashbourne, Derbyshire; St. Helen's, Abingdon; St. Mary's, Shrewsbury; Soham, Cambridgeshire; Witney, Oxfordshire; and Terrington St. Clement's, Norfolk.

CHURCH.	Area in Square Feet.	Internal Length.	Internal Width.	Transept Length.	Height of Roof.	Height of Tower or Spire.
Glasgow Cathedral	26,400	319	63	73	85	s. 225 c.
St. Patrick's Cathedral, Dublin	20,010	300	67	157	—	s. 223
St. Giles, Edinburgh	14,600	206	68	129	—	s. 121 c.
St. Mary, Bury St. Edmund's	14,024	213	68	—	60	—
Kilkenny Cathedral, Ireland	13,706	212	60	117	44	100
Hexham Priory, Northumberland	13,645	150	51	156	—	100 c.
Maidstone, Kent	13,500	168	91	—	—	80
St. Mary, Warwick	13,420	180	66	107	42	174
Leominster, Herefordshire	12,915	123	105	—	50	99
Austinfriars, London	12,699	153	83	—	—	—
Halifax, Yorkshire	12,564	175	66	—	—	117
Brecon Priory, Brecknockshire	12,498	198	60	102	—	— c.
St. James, Bury St. Edmund's	12,138	193	69	—	—	90
Malvern Priory, Worcestershire	11,650	177	63	85	63	124 c.
Stratford-on-Avon, Warwickshire	11,484	197	68	94	50	s. 163 c.
Kirkwall Cathedral, Orkneys	11,200	220	45	88	54	140 c.
Faversham, Kent	11,060	160	65	125	—	—
St. Martin's, Leicester	11,030	165	85	85	—	s. 218 c.
Lowestoft, Suffolk	10,840	182	62	—	43	s. 120 c.
Luton, Bedfordshire	10,500	174	57	100	40	90
Armagh Cathedral	10,400	183	60	119	—	s. 150 c.
Rye, Sussex	10,226	159	60	77	—	— c.
Dorchester Abbey, Oxon	10,216	183	60	—	—	—
St. Mary's, Leicester	10,142	152	76	—	—	s. 183
St. Margaret's, Leicester	10,080	180	72	—	—	130
Chesterfield, Derbyshire	9,960	168	59	109	—	s. 230 c.
Melton Mowbray, Leicestershire	9,717	163	56	117	—	110 c.
Lavenham, Suffolk	9,668	140	68	—	—	141
Long Melford, Suffolk	9,486	153	62	—	41	—
Milton Abbey, Dorsetshire	9,432	132	61	108	55	116 c.
Christ Church, Dublin	9,360	220	38	90	—	— c.
St. Cuthbert's, Wells	9,300	160	50	84	—	140
Beccles, Suffolk	9,270	148	62	—	—	92 act
St. Cross, Winchester	9,240	125	65	115	—	— c.
Croydon, Surrey	9,134	130	74	—	—	—
St. John's, Chester	9,088	128	71	71	—	150
Nantwich, Cheshire	8,976	165	57	117	50	108 c.
Headon, Yorkshire	8,693	165	49	103	—	129 c.
Great St. Mary, Cambridge	8,380	142	66	—	—	130
Sleaford, Lincolnshire	8,364	146	78	87	—	s. 144
St. Mary's, Oxford	8,198	163	55	—	48	s. 206
Great Grimsby, Lincolnshire	8,140	144	60	90	—	— c.

DURHAM AND NORTHUMBERLAND ARCHITECTURAL SOCIETY.

THE members of the Architectural and Archæological Society of Durham and Northumberland held their fourth and last meeting of the season on the borders of Durham and Yorkshire, on Monday week. Among those present were:—the Revs. W. Greenwell (president), E. Greatorex, G. R. Bulman (secretaries), T. Rodgers, J. F. Hodgson, G. Lloyd, R. G. L. Blenkinsopp, J. B. Dykes, F. Thompson, and P. Rudd; and Messrs. Pritchett, Dr. Pyle, Bowser. Towns, W. Thompson, J. H. Backhouse, Ornsby, Sterry, Grierson, W. H. D. Longstaffe (Gateshead), F. Newburn (Darlington), &c. Croft Bridge, which connects the counties of Durham and Yorkshire together, was the first work examined. The structure was built to replace the bridge which was known as Pountesse Bridge, when the latter was destroyed. It was in existence in the reign of Henry VIII., but was about that period very extensively repaired, the water having done considerable damage to the piers. It was also greatly widened. It appears to have been built with sandstone, most probably obtained out of the bed of the Tees, over which it is thrown. The bridge consists of seven strong arches, all of which are in a wonderful state of preservation. It had been used as a military road for a great number of years. On it there is an inscription showing the date, 1673. Croft Church was next visited, and in it Mr. Longstaffe gave some interesting historical information respecting the village. The sacred edifice itself is dedicated to St. Peter. The architectural peculiarities of the building were expatiated upon by the Rev. Mr. Hodgson. It was a fine example of a village church, and the most remarkable point about it was the extreme size and splendour of the chancel. With regard to the architectural history of the fabric, it had been originally an Early English church without any aisles. Examination, however, showed that the north and south aisles had been added about the middle of the thirteenth century. From 1290 to 1310 the chancel had been entirely rebuilt in its present dimensions, and than it no more beautiful or perfect work of the kind can be found. Its characteristics were extreme richness and delicacy. One of the windows—the central one on the south—was well known, in consequence of an engraving of it having been published in Sharpe's collection. It was one of the finest windows of its kind in the county of Durham. The sinking in of the tracery was very beautiful. At the same time that the chancel was rebuilt, the whole of the windows of the nave were made to correspond. About the middle of the fourteenth century, the old high pitched roof had been substituted for a flat one of oak, which had unfortunately destroyed the effect of the east window. About the same period as this alteration was made the clerestory of the nave and the western tower had been erected. The wooden roof is covered with religious symbols, presenting a very pleasing effect. On the left side of the church are two litinscopes or leapors windows, the use of which, however, was totally unknown. There were indications that on each side of the last window of the nave there had been formerly two niches, but these had been filled up. About the sedilia, one of the internal seats of the right-hand wall, there was a deal of rich carving, and altogether the church was one of the finest ecclesiastical specimens of a village church. On one side of the edifice was the tomb of Richard Clarvoux, a former lord of the manor, while on the opposite side was the tomb of one of the Milbankes, of Halnaby. The Rev. Archdeacon Dodgson, of Croft, who was present for a short time, was congratulated on having such an old but fine church. The archæologists then proceeded by way of the Croft bridge, along the turnpike, for a distance of a mile and a half, to Hurworth, where the village church was examined. Above the entrance, and on the tower, were shields of arms of the Hurworth, the Talbois, the Clarvoux, and the Dacre families. Immediately in front of the principal entrance there is a monument which distinguishes the last resting place of William Emmerson, the great mathematician, who was born at Hurworth on the 14th of May, 1701, and died in the 81st year of his age. Two monumental effigies, which were lying in the porch, were inspected. One of them was very strangely marked and crimped, and was much later than Norton. Mr. Longstaffe believed it to be the effigy of Ralph Fitzwilliams, who died on All Saints' Day, 1316, and was buried in Neasham Abbey. The other figure bore a shield, which is a valuable example of heraldry. The only family Mr. Longstaffe could identify the effigy with was one belonging to Nottingham named Bugg. The helmet of the figure seemed to belong to the period of the reign of Richard I., but it would be scarcely later than Henry III. Two very old pillars in the anterior of the place of worship led to the belief that there had been formerly a church on the same site. The excursionists, after examining this sacred structure most carefully, commenced a four-mile journey across the fields, by an ancient pathway, to Haughton-le-Skerne.

PRESERVATION OF TIMBER.

VE have recently given some practical information on the preservation of timber. A respondent sends us the following report on : specimens of preserved timber exhibited at t Cologne International Agricultural Exhibition i 1865. The report was drawn up by the Count Westphalia, Juror of Section IV. We think is desirable to give the report in full:—

t does not require a statistical report to prove t t the consumption of timber has increased, ecially in the last twenty years, to such an ent that, in this period, the growth of oak has n less than the quantity used; and since, in all bability, during the next twenty years, the use timber will be yet greater, the question arises w can this want be supplied, seeing that the sumption is always becoming greater than the ural growth of those kinds of wood, which we e hitherto considered available, admits of.

As is apparent from the catalogue, there are ny kinds of timber of small dimensions, which e hitherto been sold as firewood, which can now mand a higher price as pit wood, and the ntity used is by no means so small as to be worthy of notice, as in one district alone the ue amounts to between £150,000 and £200,000 ually. But in so far as the timber required for s purpose is generally of small scantling, the ply can be made up from these kinds of wood, ich the collection of the Cologne Mine Company e brought into notice as opening up a new rce of gain.

The case is entirely different with railway pers. Almost all the oak and pine which is d for sleepers is employed for other purposes: ce it is entirely owing to them that the excess e demand for these timbers has arisen, so that now meet the question—where and how shall get the timber, or by what means can we find ubstitute? To us, as jurors, it was less in our y to answer this question directly than to test experiments and trials made for the solution the question in the exhibited specimens. As ave already intimated, I confined my attention ely to the one side of the question,—what means we use to preserve the timber? although the er side of the question,—where shall we get timber? is indicated by the wonderful collecn of timbers exhibited by the Royal Hanoverian rector of Forests, Herr Burchhardt.

Generally speaking, in this country we distinguish o classes of trees—oak, fir, and pine on the one nd, and all other native trees on the other. nong the latter, the beech is the most important, ich, for growth, could compete with the oak, if e wood were of equal quality, but, as is well own, the beech decays very rapidly through and rough, especially when exposed to the alternate fluence of wetness and dryness, and even more pidly in the neighbourhood of the heart, than e sapwood of oak: and, generally, one can say, at part of a felled tree decays soonest which is llest of sap, and in oak this is the ontside, but beech the whole wood is of uniform texture. e often say that beech has no sapwood; it would more correct to say that beech is all sapwood e theory now maintained is that timber, impregted with a metallic preparation, has all its pores opped, and is thus thoroughly preserved from cay. In this way, although experiments have en made for several years, yet none are so old thoroughly to determine how much value can be aced on the various processes.

The opinion of the jurors must be strictly conned to the specimens before them to enable them determine—

1st. The best process;
2nd. What metallic or other preparation most oroughly impregnates the timber;
3rd. What wood, or kind of wood, can be best ted upon.

There are two distinct methods of impregnaion, first, before the felling of the tree; second, fter the wood has been cut and prepared. The rst has the great disadvantage of causing the hole wood of the tree to be so thoroughly penerated with the impregnating matter as to render he wood not required for the special purpose uite useless, it being very difficult to burn, and f one did attempt to do so the poisonous vapour ould be highly dangerous.

Several pieces prepared in this manner were xhibited by the principal forester at Königsberg, Herr Biermanns, who maintains that the method mployed is quite different from the general proess of Herr Boucheris. The exhibitor, however, declined to give further information as to the process to the jury, so I must confine myself to the remark that the penetration of the metallic salt was very complete, and the process may, perhaps, be worthy of attention should Herr Biermanns be pleased to make his method known. The other specimens exhibited were all prepared by the second method. In this report I must confine myself to those specimens only which were considered worthy of note in the official record.

The Köln-Mindener Railway Company (Sec. IV., No. 6), exhibited twelve prepared sleepers, among which one beech sleeper appeared to us to be wonderfully well preserved. This sleeper was impregnated with chloride of zinc, and had been in use since 1856; decay was nowhere visible, and it might still be used for a good sleeper. The jury considered that it would be highly instructive to show how much of the impregnating matter was contained in the wood, and an analysis found that there was yet three-eighths of the matter remaining. Still more wonderfully the effects of the chloride of zinc were seen in a section of a beech sleeper exhibited by the Hanoverian Railway and Telegraph Company (Sec. IV., No. 139). This sleeper was impregnated with chloride of zinc in the year 1847, laid in the line in the same year, and taken out in the course of this summer to send to the Exhibition. By way of comparison, an oak sleeper was sent in its natural stae, which had been laid beside the beech sleeper, at the same time, and was in precisely the same circumstances as the other. The prepared beech sleeper was thoroughly sound and good, without a single trace of decay, while the unprepared oak was far gone in decay, and was of no further use as a sleeper. On analysis by one of the jury, the beech sleeper was found to contain in the midst of the wood 5-16ths of the impregnating matter.

The Brunswick States Railway exhibited a most interesting collection of prepared and unprepared timber. The timber prepared with chloride of zinc was much better preserved than similar specimens of unprepared timber. Among the former, in particular, there was a beech sleeper which was thoroughly sound, whilst the prepared oak and pine sleepers in similar circumstances showed decay in the heart, the outside being sound, as the impregnating matter had merely penetrated the sap and not the heart. So that here the very part of the oak which naturally decays soonest was best preserved, because it was impregnated with chloride of zinc, while the heart of the same sleepers, which was not penetrated, had begun to decay.

Of the sleepers which were preserved by creosote, those exhibited by the Edinburgh and Glasgow Railway Company were the most worthy of attention (Sec. IV., No. 20). Nominally, the wood was Scotch fir, but on careful examination we recognized it as pine. One sleeper, which had been in use about twelve years, was particularly well preserved, but it had been constantly under water, so one cannot certainly say that the creosoting was the cause of the good condition of the timber, as all wood lying constantly under water (as was the case here) is preserved sound.

On the other hand, a second sleeper, which was also impregnated with creosote, and had been in use for fourteen years, showed decided marks of decay, but was much better preserved than the third sleeper, which was uncreosoted, and had lain for fifteen years. The fourth, a new creosoted sleeper, was most remarkable, as showing by far the deepest penetration of the creosote. Not only the sap wood, as is usually the case, but the very heart, showed the impregnating matter, proving the creosoting process to have been very efficient.

The air is exhausted from the tank in which the sleepers are placed, and subjected to the creosote under the considerable pressure of 60lb. to 65lb. per square inch for three or four hours. Yet even this sleeper was not thoroughly impregnated, for the heart was not quite penetrated, nor was that portion of it which had been reached so uniform as the sapwood.

On the creosoted sleepers of the Belgian railway (Sec. IV., No. 17), we could come to no accurate conclusion as to the effect of the creosote on preserving the timber, as the age of the sleepers was wanting.

Among the previously-mentioned sleepers of the Köln-Mindener Railway was also a creosoted beech sleeper, in which the wood was only partially preserved, as the creosote had not penetrated the whole of the timber; whether the process was not powerful enough, or whether the creosote was not sufficient, we had not the means of judging from the specimens before us.

Of the advantages of sulphate of copper as a means of preserving timber, the jury had not the means of judging, since among the sleepers impregnated with sulphate of copper, some had not been long enough in use, and others had not been thoroughly impregnated.

The Main-Neckar Railway exhibited a pine sleeper which had been laid in 1839, and remained in use till now. The timber was extremely well preserved, and nowhere were any traces of decay. The sleeper is said to have been steeped fourteen days in solution of corrosive sublimate before being laid. But on examination no trace of cyanizing was visible, and an analysis was determined on to ascertain if there were any trace of mercury, and if it were owing to this process that the sleeper had been so well preserved. Unfortunately, this analysis is not yet complete, on which account I withhold my opinion in the meantime.

The Madgeburg-Göthen-Halle Leipsiger Railway exhibited several sleepers, which, however, afforded us little material for forming an opinion. Among these were three, with a description attached as follows:—"Three sleepers from the Madgeburg Leipsiger Railway, from the Salt Work Branch at Stassfurt, laid in 1857. These are moistened by the refuse of the salt which is lost from the load and by the rain. The spikes are left in to show the effect of the salt on the iron. This preparation would cost very little; hundreds of sleepers could be taken out quite as well preserved." The jury paid no further attention to these sleepers, as they saw no connection between this plan and the object they had in view. Indeed, these sleepers proved neither a discovery, nor even the finding a Columbus' egg, because every old table on which fish or meat have been salted, proves that a constant moistening with salt water preserves the wood from decay, but as soon as the process of salting is given up, the salted matter is immediately given out and the timber soon decays. In this case it would have been important to have known that these sleepers, after having been salted, had lain anywhere else than in the Salt Work Branch without getting fresh salt applied, and then to have seen if they would have been as perfect as they now are. They, indeed, prove nothing but the fact that if sleepers be daily sprinkled with salt they will remain sound, but the price paid for this durability might be very considerable. When one speaks of the various methods of preservation, a process which takes effect by a single application is meant, not one which requires renewal every day.

My opinion, in so far as it is based on the specimens exhibited at Cologne, and in which my colleagues concur, is:—

1. That chloride of zinc is the only substance which thoroughly penetrates the timber, and is at the same time the best adapted for its preservation.

2. That the process of impregnating the wood after cutting is more useful and rational than doing so while the tree is growing.

3. That red beech is the only wood which has been impregnated in a uniform and thorough manner.

THE MANCHESTER TRADE UNION COMMISSION.

WE are intensely sorry that the Manchester Commission is revealing facts almost as shocking as the Sheffield Commission. If a knowledge of a disease is half its cure, let us hope that these astounding revelations will awake trade unionists to something like a sense of propriety and improved conduct. We have not room to record a tithe of the acts of violence perpetrated in Manchester, as brought to light by the Commission now sitting, and we give the following merely as samples of the rest:—W. A. Atkins, a master brickmaker in Cheetwood lane, said that one night the roof of his engine-house was blown off by gunpowder because he made bricks by machinery. Witness was under the impression that such outrages were instigated by masters who made bricks by hand. In the progress of witness's works there were frequent breaks down of the machinery, caused by pieces of iron being put in. The bricks were also occasionally spoilt in burning. On subsequent occasions the water was let out of the boiler for the purpose of causing an explosion. His men, who were non-union men, were occasionally beaten, and witness had a letter sent him warning him to prepare for his latter end, and containing a sketch of a coffin. Mr. C.

Hadfield, building agent, who was formerly in partnership with the last witness, said at one time he employed a kiln burner from Durham, and an attempt was made to blow him up by throwing a bottle of gunpowder into his bedroom. The kiln burner picked up the bottle before the fuze had burnt out, and threw it back into the street, where it exploded. One night in November, as witness was going through Salford with his partner, they were threatened by two men, one of whom said they would shoot him.

John Smethurt, a cotton spinner at Royton, said he was, in 1859, a brickmaster and coal proprietor. Employed non-union men. In May, 1860, about 3,000 bricks was destroyed in witness's yard one night when no watch was kept, and in 1862, from a feeling of insecurity with regard to his property, witness gave up brick-making altogether. William Connell, a clay temperer, and a member of the Oldham Brickmakers' Union, said he was secretary to the union in 1864. Remembered the union subscribing, in 1862 towards the defence of the men charged with the murder of police-constable Jump. Witness had heard of a shell being thrown into the house of Isaiah Greaves, but had no idea who perpetrated the outrage. Would swear that the sole purpose for which the money was collected from the other unions was to pay the turn-outs, and the expenses of the delegates, and other matters. The books that had been burned would have shown how the money had been spent. William Burn, secretary of the Oldham Brickmakers' Union, said the ledger had been lost. George Haywood, president of the Oldham Brickmakers' Union, said he was present at a meeting on the 5th instant, when the officers of this court brought him his summons. He went out, and when he returned the business of the meeting was over. The ledger was on the desk when witness went away, and when he came back, but he did not know what became of it. Harrison M'Donald said he was son-in-law of the late Isaiah Greaves, who was a master brickmaker in Oldham. Witness managed his father-in-law's brickyard. Remembered a workman named Davenport being fined by the union, and withdrawing from the union in consequence. Some delegates from the union came to Mr. Greaves and asked him to discharge Davenport, but he would not do so. Shortly after this, in 1858, some clay was "needled," and about 14,000 bricks destroyed. On the 30th of October, 1859, one Sunday night, as Mr. Greaves was going out of his room, a hand grenade was thrown into the room where Mr. Greaves was, and exploded, injuring Mr. Greaves in the leg. The grenade was made of iron, and was about 9in. in diameter, having nipples and caps on. It was loaded with gunpowder, knife-blades, nails, and scraps of iron, and had it exploded nearer to him than it did he must have been blown to pieces. Witness was not present at the time, but he saw the grenade after it had exploded. In 1863 the top of Mr. Greaves's engine-house was blown off by gunpowder. A can of gunpowder was put inside the cylinder and exploded by a fuze, the result being that the engine was blown up, and some of the machinery was sent one hundred yards away.

MANCHESTER. NEW TOWNHALL.

THE following are the instructions to architects for the second competition of the New Town Hall :—

The instructions issued for the preliminary competition bearing date the 12th of March, 1867, and signed by the Town Clerk, are, so far as applicable, and except as modified or altered by the present additional instructions, to be strictly adhered to, and to be considered as in all respects binding in the second competition.

Each design must include not less than the following drawings, viz. :—

Plans of the basement, ground, first, second, and third floors;

Elevations to each of the four streets;

A finished roof plan;

Three sections, and at least one perspective view of the building, taken from such point as will best show the elevations to Albert-square and Princess-street.

To entitle any competing architect to receive from the Corporation the premium of £300, the number of drawings specified, and not fewer, must be delivered, finished, complete, and figured in the usual manner.

The competing architects are in no respect bound by their drawings sent in for the first competition, but are at liberty to send in entirely new designs, or to make any alterations they may think fit in their preliminary plans. They are not bound to send in more than one complete set of drawings, but they may send in any further number they choose; but in no case (whatever may be the number of plans sent in) will the payment to any competing architect exceed the sum of £300.

Each design must be accompanied by an estimate of cost, to include every expense in connection with the building (and the sunk area around) except the finishing of the painting, the papering, and decorating.

As an indication of the views of the Corporation, it is suggested that the total cost should not exceed two hundred and fifty thousand pounds (£250,000), a sum considered to be ample for a building of the first class; and in case the plans selected cannot be satisfactorily carried out for that amount, or for the sum named in the estimate of the architect accompanying the competition drawings, the right of rejecting such plans, and selecting those of another competitor (paying for the first selected plans £300 and no more) is reserved by the Corporation.

The plans of the unsuccessful competitors are to remain their own property, but the Corporation claim the right of adopting any feature or suggestion contained therein if they see fit.

The competing architects may, if they desire, absorb small portions of the external areas at the corners of Princess-street and Lloyd-street next Albert-square, for the purpose of constructing towers or other architectural features at the extremities of the Albert-square elevation. Provision must be made for a public clock in the central tower next Albert-square, with four dials prepared for illumination.

The whole of the areas or courtyards in the interior of the building must have cellars under them, and be so arranged as to form part of the basement storey. Convenient means of approach for hand carts to the basement storey must be provided, and especially to those portions which may be allotted to the gas and water departments, and there must be a cart entrance from Lloyd-street for the delivery of coals, &c.

The council chamber must be placed on the main floor, in the front half of the building. A spacious staircase communicating with every floor must be provided at the Cooper-street end of the building.

The private rooms required on the upper floors for the mayor are as follows, viz. :—On the second floor a sitting-room and two bedrooms, with dressing room, bath-room, and water-closet; and on the third floor three bedrooms and water-closet. Proper kitchen accommodation and cellarage must be provided in the basement for the mayor.

The attention of architects is particularly called to the amount of accommodation required. The building must average four storeys above ground; Mezzanine floors in any part of the building are undesirable.

The depth of the offices must not be more than 25ft. from the windows, where the area of the room does not exceed 56 square yards.

The lavatory and water-closet accommodation for the clerks' office on the main floor, may be placed on the second-floor, and for the clerks employed in the offices on the ground floor, in the basement.

The offices for the messengers in connection with the treasurer's department, containing about 50 square yards, may be in the basement, in addition to which there must be in the basement a messenger's dining-room, containing about 50 square yards.

The size of the muniment rooms in the basement must each be about 40 square yards.

Accommodation for the resident head porter must be provided on the third floor, and consist of a sitting-room, four bedrooms, kitchen, with large cooking range, a commodious scullery, with small cooking range, pantry, and water-closet.

On the same floor, in connection with the head porter's department, must be provided with a dining-room, containing about 120 square yards.

In convenient parts of the building proper housemaid's closets must be provided for the use of the persons employed in cleaning.

Hoist accommodation must be provided for lifting coals from the cellars to each floor of the building.

Separate staircases must be provided for those portions of the basement which are in connection with the offices on the floors above.

The whole of the plans must be delivered at the Town-hall, Manchester, on or before the 14th day of February next.

By Order,

JOSEPH HERON, Town Clerk.

Town-hall, Manchester, September 17.

OFFICES: SIERRA LEONE.

ONE of our illustrations this week represents a building intended for offices at Sierra Leone. The plans, perspective view, and details of porch, are given to a sufficient scale. The projections above the ground-floor windows are for outside sun-blinds, and the lights of the windows on the first-floor are recessed for the same purpose. The covering of the roof is corrugated iron, and the woodwork teak throughout. The masonry is intended to be of local stone. The architect of the building is Mr. Frederick Jameson, of Adam-street, Adelphi.

DUNDEE "OLD STEEPLE."

THIS remarkable tower, which we illustrate this week, is said to have been built by David, Earl of Huntingdon, on his return from the Crusades, in consequence of a vow made to the Virgin Mary at a time of extreme peril. Disembarking at Dundee, he zealously fulfilled his pledge by erecting and endowing a magnificent place of worship, of which no vestige now remains save this "Old Steeple." The height of the whole is 156 feet, being about 40 feet square at the base, and the walls from six to eight feet thick. Pinnacles and parapets richly carved are the chief ornamental features, and, considering the great age, it is in wonderful preservation. Access to these parts is afforded by a circular staircase, having ingeniously-constructed masonry at the top, but the tower is finished with a substantial but, which may have been built later, as a place for signals or watching. This hut forms a very poor termination to so noble a mass, and judging from the strength of the walls, with other indications, it seems to have been the intention of the first builders to have finished the tower with a spire. It is proposed to restore this fine example of the past, but it is to be hoped that no attempt be now made to alter the top, and that the good folks of Dundee will believe more in strengthening than what is commonly named restoration. The churches at the base are modern, and, to the east, exceedingly ornate, but quite out of keeping with the original work. In the lowest compartment of the tower are a few sepulchral cross slabs of very beautiful design.

NEW SYSTEM OF WELL SINKING.

A NEW system of well sinking has been imported into this country—commendable by the facility with which the well is sunk, as well as the cheapness and rapidity of the operation. Its inventor accompanied the Northern army during the late American war, and was instrumental in procuring by his method an unfailing supply of water for the troops. The well consists of an iron pipe 1¼in. in diameter, and about 12ft. long, pointed at one end, and perforated with holes for about 16in. from the pointed end. A movable iron clamp is fitted round the pipe, and upon the principle of pile driving, a 56lb. hollow weight is raised and allowed to drop upon the clamp, and thus the pipe is driven into the ground. The earth, sand, &c., which first enters the pipe through the holes is pumped out, and then the larger pebbles form a natural filter around it. A well formed thus receives no surface drainage, and the water yielded by it is always cool and fresh. No dirt is made in sinking the well, no accident is possible from foul air or falling in of the sides, and the cost of sinking a well 15ft. deep is but £5. Of course, if rock is encountered during the sinking, the operation becomes more costly and tedious.

COMPETITION.

AT the last meeting of the directors of the Bedfordshire Middle Class School Company, the premium of £50 for the second best design and plan at the stipulated cost of £12,000 was awarded to Mr. John Day, architect, of Bedford. Twenty-nine sets of plans were originally submitted to the directors in competition, of which number only four were reserved for consideration and selection. The building is to be erected according to the design of Mr. F. Ack, of London, and the work is to be commenced immediately. Mr. Huddlestone, of Lincoln, is the contractor.

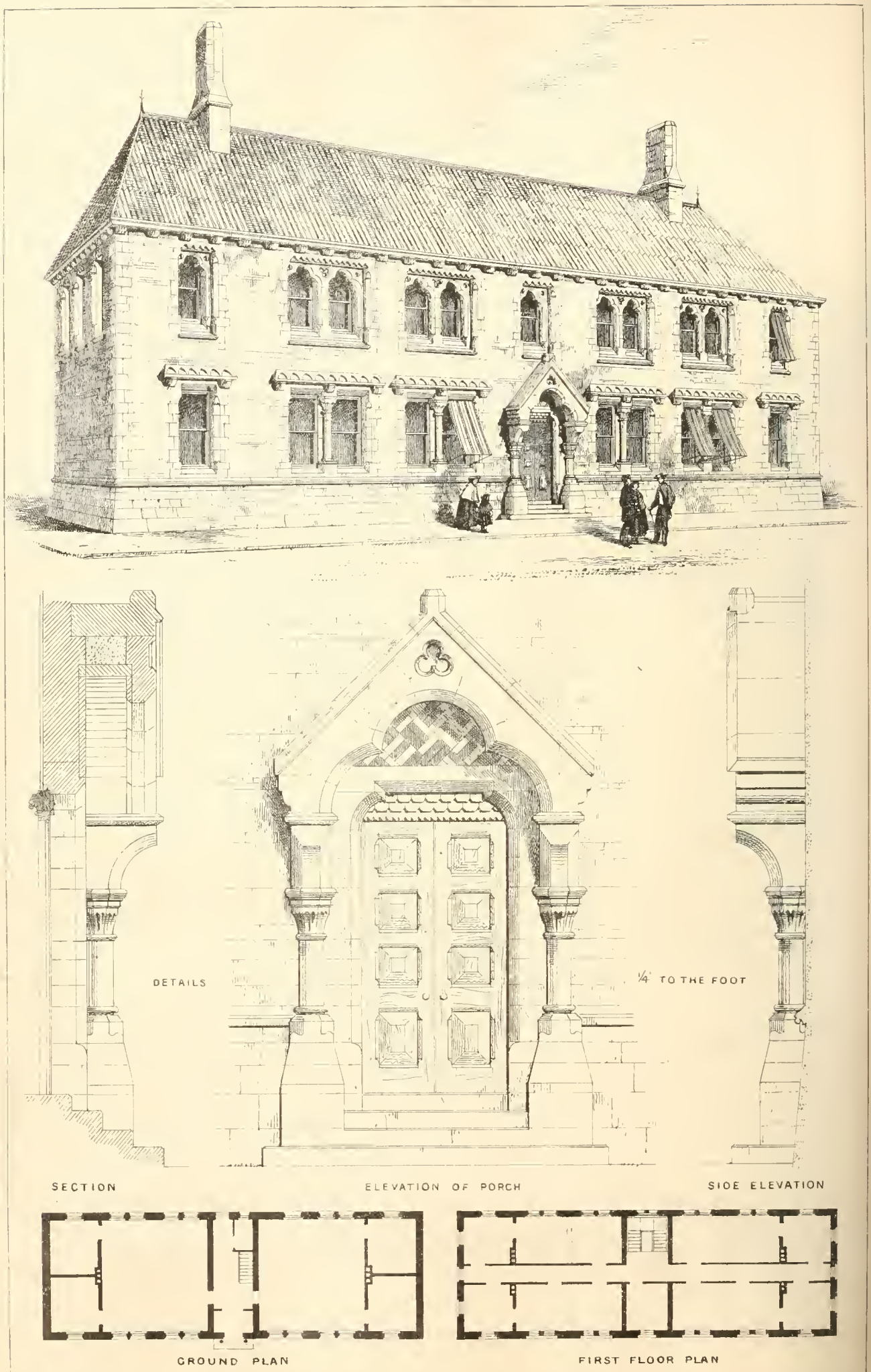
WATER SUPPLY AND SANITARY MATTERS.

THE new water works at Selkirk (Scotland), have cost between £6,000 and £7,000. Mr. Leslie, C.E., of Edinburgh, was the engineer of the works.

The Liverpool Town Council has decided to take 500 shares of £10 each in the Utilization Sewage Company, which has been established to distribute the town sewage of Liverpool—at present discharged into the docks—over the sandy district between Crosby and Southport. The first section of the company's works, that near Crosby, will cost £20,000, of which sum £17,000 has already been contributed by the general public.

The Preston Town Council has adopted the report of the Ribble Committee in reference to improving the navagation of that river, providing much additional dock accommodation, and increasing the facilities of loading and discharging vessels, the estimated cost being £150,000. It is suggested that this sum should be borrowed under the Harbours and Passage Tolls Act (1861)—£100,000 at 3½ per cent., and the remaining £50,000 at such ordinary rate of interest as the Public Works Loan Commissioners may determine. To pay this off in the fifty years allowed by the Commissioners, it is estimated that a rate will be required of 5d. in the pound, according to the present value and extent of property in the borough. It is expected that the improvements will be completed in about four years.

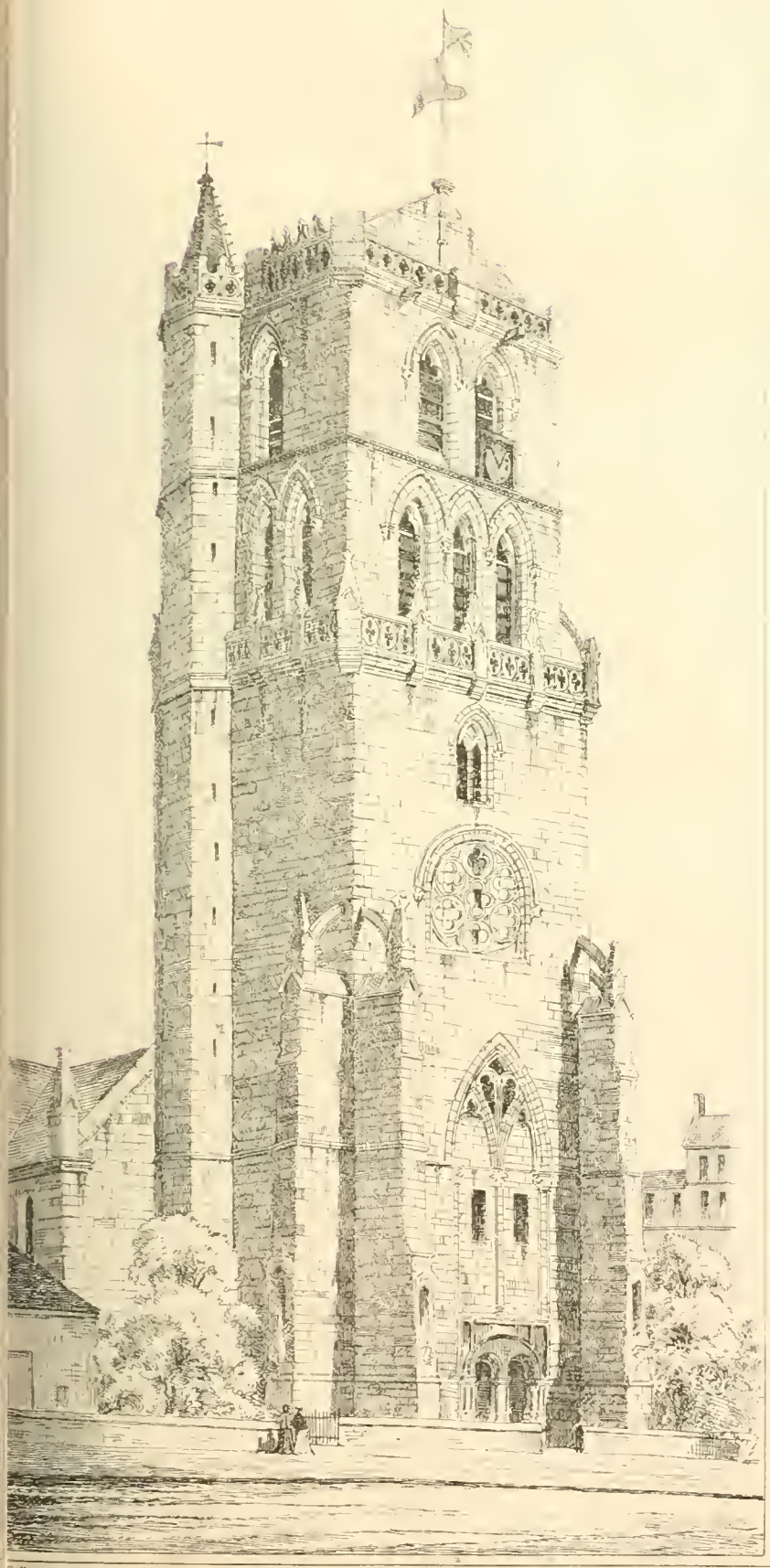
The Duke of Cambridge will lay the foundation stone of the New Town-hall, Preston, on Tuesday, October 3.

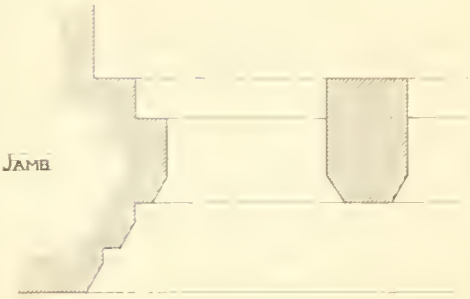


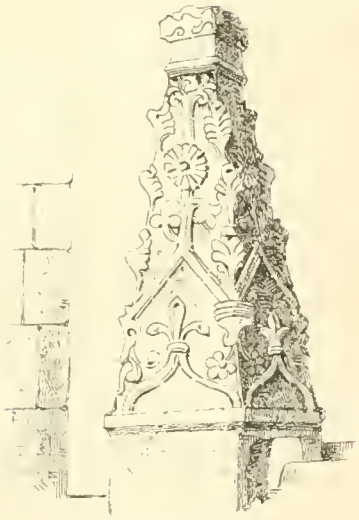
Printed by Whiteman & Bass

Offices; Sierra-Leone. — Mr. FREDERICK JAMESON, ARCHT.

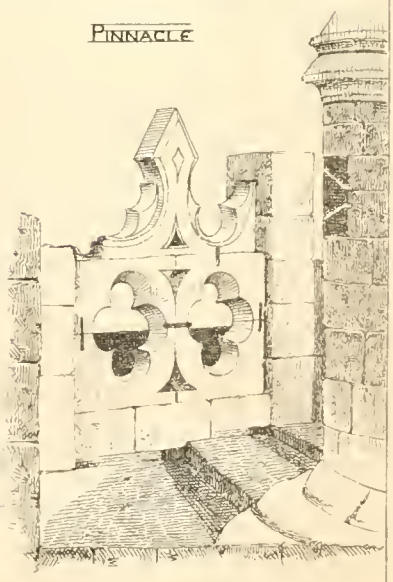
Old Steeple: Dundee:







Pinnacle

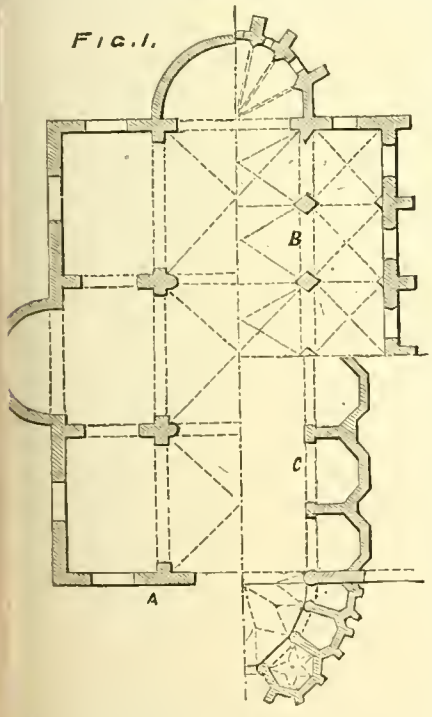


Part of Parapet Inside

Calbert de.

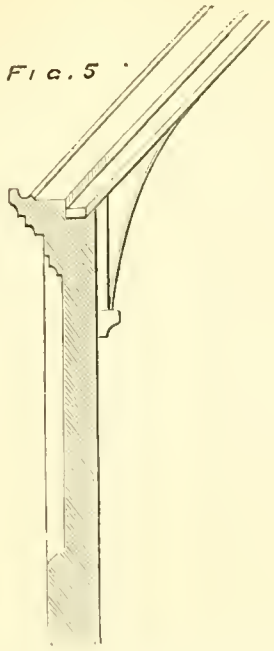
CONSTRUCTIVE AND ÆSTHETIC DESIGN.—No. IV.

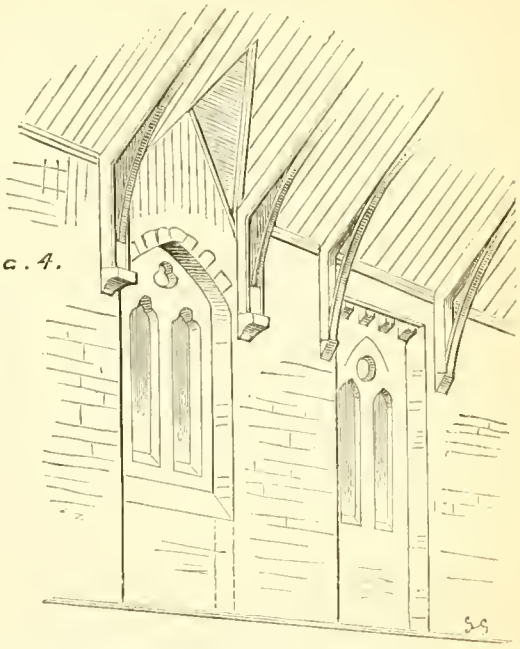
ONFINING our present remarks to the structural functions and æsthetic treatment of brick and stone design, and those eatures which more properly belong to and re developed out of it, it may be useful to otice briefly the wall in its twofold office of ustaining weight and abutting pressure. Primitive architecture, and that which is nown as the Classical, considered the wall n the first of the above conditions, as supporting weight, unless, indeed, we except a ertain thickness imposed by the action of the lements, and, in primitive ages at least, ictated by a material conception and the ggressive hand of man. This thickness, owever, was chiefly imposed by a weighty overing, as the massive beam or entablature. fterwards, during the Romans and the Middle Ages, the arch and vault necessitated he performance of another duty; the wall esides vertical support had to become a ateral abutment. Resistance had to be given o the thrust as well as the weight of the ault, and this was effected either by increased thickness or by buttresses. The rge areas the Romans had to cover, and eir need of a scientific timber or iron roofg equal to our own, soon led them to roin their vaults and collect their thrusts nto available points for abutment and support. Hence, in one example at least, the asilica of Maxentius, we find as noble a specimen of homogeneous constructive masonry, nd with the walling and supports minimized



as great a degree compared with the space overed, as any of the great examples of the ediæval builders, but without that æsthetic eling for stability which led them to reuce the spans and thrusts by multiplying e component supports. At present, in ngland at least, the adoption of timber and on trussing for our roofs in place of stone aults has greatly superseded this last condion of the wall, the expense of materials nding to economy, and to a reduction rather an an addition to its thickness. But, for l this, we are not altogether justified in disrding thick walls. Lateral stiffness is often portant, for it is not always that our roofs e so securely and constructively tied as to arrant the supposition they exert no thrust the side walls; besides, the flatter the tch of the roof the more necessary the preution, and such a doubt ought to be satisd—apparently, at any rate—particularly hen direct ties are absent.

CONSTRUCTIVE AND ÆSTHETIC DESIGN.

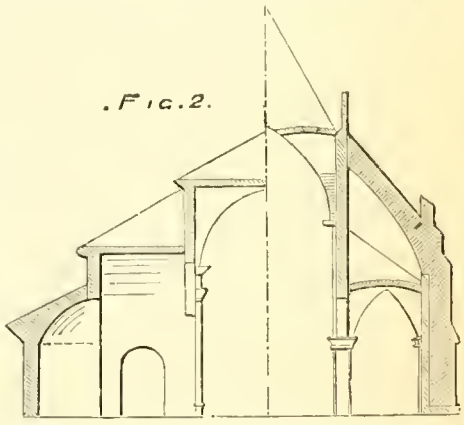




There are two ordinary methods of obtaining lateral strength, and both, I think, deficient in regard to economy; the first is by thickening the walls, the second by external buttresses. Unless the first be obtained by building the wall hollow and filling in the interspaces, the thick solid wall is the clumsiest, most expensive, and least constructive method of securing transverse strength; while the second plan—the external projecting buttress—though more scientific and in the Pointed styles, a feature of some beauty, requires an extended area on plan not always obtainable in crowded localities, and, I may remark, an area practically valueless, that can seldom be utilized except as a nuisance. Having no need for such lateral abutments to prop expansive vaultings and lofty clerestories, we are wisely dispensing with buttresses; and our recent church architecture is distinguished as much for their absence as the first attempts at revived Gothic were for their props, parapets, and pinnacles.

Internal buttressing, when that expedient can be obtained, is infinitely preferable, as a scientific and economical arrangement of material, to projecting masses of work externally, and the Roman as well as the Middle Age builder practically got over the difficulty of abutting the nave vault without sacrifice of interior space by arching these inner abutments, as in the case of the basilica of Maxentius (fig. 1, A), thereby obstructing but slightly the continuous passage of the aisles, the intersecting vaults or groins bringing the weight and thrusts just to the proper points for support. The French *chevet* or apsidal arrangement (fig. 1, C) may be considered as a very pleasing instance of internal buttressing, and the plan of the cathedral at Alby, shown by Mr. Fergusson, in his Handbook, is a notable example of windowless recesses open only to the nave; while other churches in the South of France and in Italy show this constructive arrangement of the wall as a favourite means of resisting their wide vaults. The decagonal temple of Minerva Medica at Rome, and the circular baptistery at Nocera dei Pagani, are other instances of the same method applied to circular plans.

The flying buttress, with its usual accessories, was unquestionably a most perfect adaptation of materials, constructive and æsthetic, for the purpose of abutment, and for counteracting externally a middle vault, was probably the best method that could be devised. Repose, constructional and visible, is one of the leading essentials to architectural design and beauty; and, however much that attribute is conveyed to the mind in the grand pyramidal outline the flying buttress and accessory pinnacles gives to the mediæval



cathedral, there is still a self-destructive principle in this masterpiece of mediæval statics, apparent in and suggested by it, that cannot be overlooked in spite of the equilibriated mass sustained. Our churches, halls, and public rooms do not require such extreme means of preserving equilibrium or repose, though, as I have said, a certain amount of lateral stiffness in walls is needed, if not for absolute emergency, at least for apparent stability; for we must not regard brickwork or masonry otherwise than performing functions which demand weight and mass.

The process which converted projecting buttresses into lateral cells was apparently simple, and when this was done intermediate walling could be reduced to a minimum or dispensed with altogether. For lateral strength, transverse footing or buttress area is quite as effective as a continuous wall thickness, a principle well understood by the Gothic builders in the transverse strength they gave to their vaulting piers, ensuring both rigidity and beauty. I will here introduce to my readers a plan of constructing walls which at least possesses the merit of securing lateral strength and apparent solidity, at about half the thickness and cost of the continuous thick wall, capable of resisting the same force. The plan I allude to is based on the cellular or internal buttress principle above noticed, which utilized space and gave all the lateral support required: it consists in alternate recessions of the wall, forming a species

of corrugation (fig. 3). The windows may occupy either the internal recess or projection; if the former, the square reveal or return could be splayed or shafted, an arch or corbel

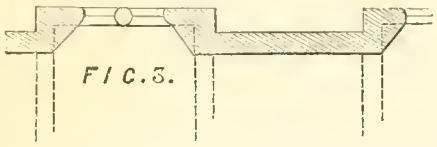


table bringing out the wall just under the cornice; and a similar or partial filling-up may also be resorted to under the sills if necessary. Externally, the recesses could be treated in the same way, arched under eaves or brought out to an uniform face by a corbel

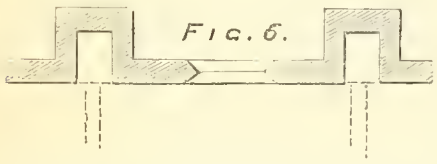
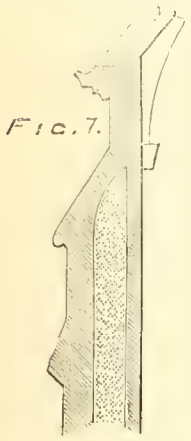


table (fig. 4). If still greater abutment is necessary, hollow buttresses may be constructed on a similar method, though of less width, and the cavity be filled up, as shown in diagrams (figs. 6 and 7). In some churches the continuous aisle roofs form a sufficient abutment to the clerestory or nave wall; but in buildings where height of walling and single spans are adopted the above method obtains at the least expenditure of material sufficient rigidity of structure and pleasing variety of effect, quite in unison with the Pointed style. In our next article we will notice a few instances of the application of this economical, constructive, and highly æsthetic principle.



G. H. G.

Archæology.

THE Annual Congress of the members of the Wiltshire Archæological Society commenced at Hungerford on Monday. The interesting collection of ancient objects found in Wiltshire at different periods was carefully arranged in the Town Hall, and the museum was visited by a number of ladies and gentlemen in the afternoon. The general meeting for receiving the report of the secretaries, and transacting other business, was held in the Corn Exchange, and was well attended; Sir John Awdry, the president, occupying the chair. The Rev. A. C. Smith, Yatesbury Rectory, Calne, read the report, from which it appeared that the society was in a satisfactory condition, both as regarded the number of members (between 300 and 400), and also the funds, the balance in hand amounting to about £250. The officers and committee having been re-elected, Sir John Awdry delivered an address of considerable length, and which was listened to with much attention. A vote of thanks was presented to Sir John, after which Mr. W. L. Barker read an able paper on "Hungerford," and at its close the *savans* visited the various objects in the town. In the evening, the members dined together, under Sir John Awdry's presidency, at the Bear Hotel, and a *conversazione* was subsequently held in the Exchange. Mr. Godwin, F.S.A., of Newbury, read an interesting paper; and a paper was also read by the Rev. A. C. Smith, on "The Ancient Earthwork Enclosures on the Downs, supposed to be British Cattle Pens." On Tuesday the *savans* visited Chilton Church, Ramsbury Church (the mother church of the diocese of Salisbury); Ramsbury Manor House, the property of Sir Robert Burdett, who ceased to occupy it 20 years ago, although it is well furnished and contains a valuable collection of paintings, choice ware, &c. Aldbourne Church was visited, and Mr. Roberts complimented Mr. Cleather, the vicar, upon the completeness of the recent restoration. The site of the hunting box of John o'Gaunt, on the downs at Upper Upham, was examined, and the adjoining cockpit was also visited. The excursion was altogether very pleasant, and perfectly satisfied the archæologists. On Wednesday, Avington Church and several other places of interest were visited, and the Congress of 1867 closed.

The Bucks Archæological Society held its annual meeting on Thursday last at Wolton, one of the seats of the Duke of Buckingham. An excursion was made to Boarstall, Brill, and several other places of historical interest. The duke presided at the business meeting, in the course of which Sir Harry Verney, M.P., made some remarks on the destruction of valuable antiquities through neglect, and suggested that these remains should be under the care of local authorities, and the supervision of a responsible Minister of the Crown. A vote of thanks to the Duke of Buckingham for his hospitality, and also for his kindness in presiding, having been passed, in acknowledging the compliment his Grace remarked:—Sir Harry Verney has alluded to the destruction of many monuments of antiquity in various parts of England. I have seen in Cornwall a great deal of this going on under the eyes of persons who, if their attention were drawn to it, would be the first to say it should not continue. There are, close to Buckingham, farm buildings erected in great part by my own family out of the destruction of most ancient Roman remains. We discovered very curious pavements, rooms, and so on, showing that if the search had been made 50 or 60 years before we might have laid open the *arcana* of a Roman house, and all its domestic arrangements, as perfectly as any preserved in Herculaneum and Pompeii. I have much more faith in the voluntary efforts of persons interested in the preservation of these relics than in Government taking charge of them. The first thing in the way of State interference would be the employment of a great number of people to do very little. These persons would not do a great deal of work without many other good people to look after them, and I do not think that would be found extremely pleasing to the House of Commons. There is another point of disadvantage. Government have the care and direction of large museums in London and the neighbourhood, national collections into which it is their duty to get every valuable relic, showing the past history of the country, and exemplifying the progress of art. The first thing that would result from Government care would be the centralization of everything in London, on the plea that it is impossible to take care of it in the country. I want rather to see these old relics preserved in their own localities, and I really think it will be done far better by local associations calling the attention of local residents to them, than by any possible Government provision that can be devised. There are many things in our own county; for example, the curious works thrown up in the civil war, near Muswell Hill, in front of these windows, and Boarstall Tower, which you have seen to-day. Their preservation must depend upon how the tower is occupied, and as to the earthworks, or whether the farmer is allowed to plough over them. These are not matters which can be trusted to Government. If we look at what Governments do in other countries—for example, in France—I doubt if you will find this work better carried out than in England.

In the course of the work connected with the erection of a new clock in the Sheffield parish church, it has been necessary to cut a circular hole on the south side of the tower for the reception of one of the dials. In doing this a stone was found embedded in the rubble filling of the wall, measuring 11in. by about 12in., and about 9in. deep. The face of this stone was carved with a simple variety of the indented chevron moulding, and had evidently formed a portion of an arch in the Norman church. Judging from analogous cases, this stone had probably been fixed in the chancel arch, and its site indicates that the span of the arch would be 16½ft. The pattern upon the stone fixes the date of the church as in the twelfth century.

A most important and interesting discovery of a number of Roman funeral urns has been made at King's Newton, on the line of new railway now in course of construction to connect Derby with Ashby. About 30 funeral urns, deposited by threes and by fives on their bases, not inverted, as was the mode of burial with the Celtic tribes after the cremation, have been discovered, but nothing was found except the urns; neither coin, weapon, or ornament. The contents of a number, unavoidably broken during the process, were human bones which had been submitted to the action of fire and ashes. The urns or vases were in every instance filled up with soil, not a trace being left of the usual covering adopted by the Romans, namely, the skin of some animal secured round the mouth of the vessel by a tendon, probably of the same animal; and they were all made from the same dark red clay which is now in use in the neighbouring pottery, their insides being quite black. Some are of very rude shape, without any mark whatever on the outside of them, others having the true Etruscan form so dear to lovers of the classic. In one instance only they found that true type of the Roman mode of interment for a distinguished person—the urn placed within an urn; and this, the most beautiful classical shape of the whole number was, to the great regret of lovers of antiquity, broken nearly all to pieces, the two urns being only held together by the damp soil closely adhering to the large piece of sandstone upon which it was necessary to remove them. This beautiful specimen, as well as others, is now at Dr. Massey's residence at Melbourne, and it is to be photographed.

Building Intelligence.

CHURCHES AND CHAPELS.

IN July, 1864, the Lord Bishop of Hereford addressed a pastoral letter to the clergy of his diocese, inviting them to make collections in their respective churches on behalf of the Hereford Diocesan and the Incorporated (Parent) Church Building Societies. In the meantime, 140 parishes have complied with the invitation, the sum collected amounting to £448 17s. 2d. These figures refer exclusively to the Archdeaconry of Hereford. The collections average £3 4s. 0d. for each church. From 87 parishes no response has been made, and this, notwithstanding an earnest appeal from the Right Hon. and Ven. the Archdeacon of Hereford. In these 87 parishes are included some of the most populous and wealthy in the Archdeaconry, and 26 of them have received grants from the societies to the extent of £3,335.

Bishop West's Chapel at the south end of Ely Cathedral is being adorned with an encaustic pavement by Minton. A large monumental slab embellished with a foliated cross and inscription in brass (by Field of London), to the memory of the late Bishop Sparke, is placed in the centre of the floor.

The memorial stone of a new Wesleyan chapel at Hereford was laid last week. The front of the building will be built with Lyde stone, rubble work, with Bath stone dressings to the doors, windows, &c., the general character of the architecture employed being Early English. Mr. G. C. Haddon, of Hereford and Great Malvern, is the architect; and Messrs. Lewis and Day, of Hereford, are the builders.

The memorial stone of the new church of St. Jude, Wolverhampton, was laid last week. The church is in the style of the thirteenth century, and consists of nave, north and south aisles, and chancel, vestry on south side of chancel, organ chamber on north side of chancel, and a tower, through which is the principal entrance at the west end of south aisle. The height of the tower will be about 70ft. The walls are faced with Codsall stone, and the dressings of Boa Ground stone; the roof timbers stained and varnished. The seatings provide for 812 adults. The design has been prepared by Mr. Bidlake, architect, of Wolverhampton, under whose superintendence the works will be carried out. The contract has been taken by Mr. Nelson, of Dudley, at £4,250.

The church of Hathern, Leicestershire, is undergoing restoration. The works comprise the rearrangement of the interior, with new benches in oak, new pulpit, opening out the tower arch, removal of organ, new oak benches in chancel, new reredos, encaustic tile paving, heating apparatus, &c. The works are being carried out under the superintendence of Mr. R. W. Johnson, architect, of Melton and Leicester.

ALL SAINTS, CHIGWELL ROW.—Chigwell Row is a scattered hamlet of the parish of Chigwell, in Essex. It is situated on very high ground over-

oking the valley of the Thames. The site of e new church, which was consecrated on Tues- y, is within about a stone's throw of the famous aypole inn, upon ground recently reclaimed from e Forest, immediately opposite the 40 acres set art there as a public recreation ground for those ıo frequent this favourite spot. The church, ac- rding to the design, comprises a nave 73ft. long by ft. 6in. wide and 50ft. high, having an arcade of ur bays and a lean-to aisle on each side. Along the ıole width of the west front of the nave is an en lean-to porch (in fact, a continuation of the le aisles returned), with three arches on red one columns and richly carved capitals. A tower d spire, which will rise to the height of about 0ft., intended to be built hereafter, are post- ned for the present, as is the chancel with its nseptal aisles. The construction, as far as it s been proceeded with, is exceedingly substan- l, all the walls being 3ft. thick; richly moulded ches of freestone of that width, borne upon cular columns, with very richly carved capitals, pport the clerestory, which is treated in some- ıat a novel manner, the windows of each bay ing a group of a large cusped circular opening d two small lancet windows, one on each side of Internally, two red Mansfield columns sup- rt their triple rear arches. Above, from a deep ıulded cornice, springs the arched boarded ceiling der the arched roofed braces. This is divided moulded ribs, and is intended to be painted. e chancel arch is lofty, and has rich mouldings, inner order of which is borne by bold triple- ıfted corbels. A very large and highly enriched e window forms the principal feature of the st end. The style of the church is Early Gothic, ated with great breadth and bold detail. Mr. ldon was the architect employed, and Mr. omas Williams, of Canton, near Cardiff, the ilder.

DERRY (IRELAND.)—Clooney District Church s opened for Divine service on the 2nd inst. e style adopted is Early English; the designs by Messrs. Lanyon, Lynn, and Lanyon; the ilder being Mr. Alex. M'Elwee, Derry. The ırch will seat about 400 persons, and the cost ıbout £5,000.

HEADGATE.—The consecration of the new church l burial ground at Redwells Hills, near Head- e, took place on Monday, the ceremony being formed by the Bishop of Durham. The build- is capable of holding from 400 to 500 persons, l is built in the French Gothic style of the rteenth century, and consists of a nave and les, five bays with chancel, with south aisle and an chamber on the north side. The church oughout is seated with open benches. The hitect was Mr. C. Hodgson Fowler, architect to Dean and Chapter of Durham; Mr. Gradon, Durham, contractor, and Mr. J. Thornton, nemason, being entrusted with the work of rying out the designs of the architect.

SMALLTHORNE.—The ceremony of laying the ner stone of a new Wesleyan chapel in course erection at Smallthorne, Staffordshire, took place Monday last. Messrs. G. and J. Moss, of ıallthorne, have contracted to erect the new ilding from the designs of Mr. George Ford, hitect, Burslem. The style of the erection is to Italian. It will be 56ft. by 33ft., and its height ll be 30ft. It will be so constructed that leries may be introduced when required. Ac- nmodation will be afforded for about 300 per- ıs on the ground floor. In front there will be ee bays, with white brick pilasters and arches, centre being filled in with three-light windows l the side bays with two-light windows. The al cost of the land, building, heating and fittings ll be upwards of £1,000.

ST. DENIS.—The ancient cathedral of St. Denis, venerable stones of which date from the gus of Dagobert, Charlemagne, and St. Louis, been restored to its primitive condition by M. ollet Leduc, the Emperor's architect. All the nbs which had been so unhappily placed in the mp crypts under the chancel have been replaced the chapels which surround the choir and in the nsepts. Amongst them are several remounting the Roman and Byzantine epochs; the tomb of edegonde particularly is a marvel of art. This ge and beautiful building now resembles a superb *nposanto* of crowned heads. Unfortunately it ll be necessary to demolish the grand portal and two towers flanking it, which date from arlemagne, and which still bear the battlements that time on their summits. They are going be reconstructed almost entirely, as they are it in several directions in consequence of the tlements in the masonwork in the building.

ST. JOHN'S CHURCH, KILLINGWORTH. — The foundation stone of this church was laid last week by Matthew Bell, Esq., of Woolsington, who gave the site. The tower and spire and north aisle are not in the present contract, for want of funds. The accommodation will be for 350 adults all free, and when the north aisle is added there will be seats for 400. The church will be built of local stone, quarried within half a mile of the site, with bands, bosses, and springes to nave arcade, and columns and voussoirs to chancel, arch, and other details of red Carlisle stone. The style adopted is Early French Gothic. The contractors are Messrs. Middlemiss, Son, and Stafford, of Morpeth; and the architect, Mr. Bassett Keeling, of Gray's Inn.

STOCKTON-ON-TEES.—The new Wesleyan Methodist chapel, in North-terrace, Norton-road, was opened last week. The chapel (which is in the Early English, of the period before it was developed into Middle Pointed or Decorated) is 72ft. in length (exclusive of buttresses) and 50ft. in width, with a further extension at the back for an orchestra, and in the basement there is provision for a Sunday school. At present there is accommodation for 500 sitters on the ground floor, and it is in contemplation to erect a gallery at a future time. The cost will be about £2,700.

DEMOLITION OF AN ANCIENT CHURCH.—The present week has seen the destruction of one of the few ancient churches now remaining in North Yorkshire—the church of All Saint's, Slingsby—which, consequent on decay, it has been found necessary entirely to pull down, although a partial restoration was only at first contemplated. The church is an ancient rectory, and formerly belonged to the patronage of the abbot and convent of Whitby, a payment to them being confirmed A.D. 1263, by John Thoresby, Archbishop of York. The old church contained a cross-legged effigy of one of the Wyvills, who, tradition and the Dodsworth MSS. say, slew the famous snake of Slingsby, which is reputed to have been so terrible, that the highway to Malton was diverted one mile to the south to miss the snake's lair. In the tomb below the effigy, a skeleton was found, the bony hand of which wore a splendid and massive gold ring, having the death's head and cross-bones picked out in coloured enamel. The tomb, the skeleton, and the effigy, have been preserved, and will be restored to the chancel of a beautiful transition Norman church which is to be reared, on the old site of which the Hon. Mrs. Howard will lay the foundation stone on Tuesday next. It is curious, that from below the foundations of the old church, coins of the Hanse Towns Federation (twelfth century), were dug up.

BUILDINGS.

New schools are about to be erected at Finedon, Northants. They are in the Gothic style, and will be of brick with Bath stone dressings. The basement will be occupied by class room, lavatories, &c., and the school will be over the same. Mr. R. W. Johnson, architect, of Melton and Leicester, has prepared the plans for the same.

A new almshouse has just been completed in Magdalene-street, Taunton. There are rooms for thirteen inmates, a spacious dining room, and a large airing ground behind. Messrs. Giles and Robinson, of London, are the architects, and Mr. J. Spiller, Taunton, is the builder. The estimated cost is £2,000.

A letter from Melbourne says:—Our new Post-office, which has been about nine years in building, is finished at last. It is a really magnificent structure, and would be an ornament to any capital in Europe. It was opened for the first time for the reception of the last European mails.

The new Tyne Theatre was opened last Monday. This theatre, is being built in the Westgate, is calculated to accommodate 3,000 persons, distributed as follows:—gallery, 1,100; pit and stalls, 1,000; dress, upper, and private boxes, 900. The front is of fire-brick, with bands of black bricks and freestone dressings, and the theatre generally is constructed with all the modern appliances for comfort, &c.

The schools and master's residence, built in connection with St. James' Church, Jersey, were opened last week by the Bishop of Winchester. The schools are built of Island granite, in courses red and white. The dressings are of white granite fine picked. The architecture is very simple. The effect is obtained entirely from the construction and the colour of the stones, and the result is very satisfactory. The contract was carried out by Messrs. Benest and Pirouet from drawings prepared by Mr. C. W. Ramie, architect. The cost of the buildings and site is above £2,000.

FINEDON.—A new temperance hall is about to be erected at Finedon, Northants. An eligible site, in a central situation, has been secured, and plans have been prepared by Mr. R. W. Johnson, architect, of Melton and Leicester. The plans comprise a reading room, club room, and ante room on the ground floor, with large hall over the same; a dwelling for the hall-keeper is also attached to the main building. The style chosen is mixed Italian, and as the building will be bounded by a road on each side, it will form a prominent object. It is intended that it should answer the purpose of a public hall, to be used by all classes.

LEEDS.—The Mechanics' Institute and School of Art, the foundation stone of which was laid in 1865, is now completed. The architect of the building is Mr. Cuthbert Brodrick, the architect of the Leeds Town-hall, and other important buildings. The style of architecture adopted is the Italian. The west and south fronts are of stone—the principal entrance, approached by a circular staircase, being in the first named. The frontage to the west and east is 152ft. in length; that to the south and north 120ft. The contractor for the building work is Mr. D. Nichols, Leeds; for the joiner work Mr. W. Britton, Leeds; for the stone carving, Mr. Joseph Holmes, Leeds; and the whole is being carried on under the direction of Mr. J. T. Brown, the clerk of the works. The original estimated cost of the erection was £20,000, but it is thought this may be exceeded by £2,000. Including the sum to be derived from the sale of the present institution, the total amount in hand is £14,000, thus leaving a balance on the wrong side of £8,000. Strenuous efforts will be made next year to clear off this debt.

MARYLEBONE.—A new building for the reception of "casuals" was opened on Wednesday, at the north east corner of Marylebone workhouse. The architect is Mr. H. Saxon Snell. The appliances for fumigation of clothes, and for the insuring of general cleanliness, appear to be very efficient. On each side of the main buildings are ranged the working sheds, where the "casual" in the morning picks oakum, or performs such other task as may be assigned him. These sheds are about 12ft. wide and 9ft. high, and are well lighted and ventilated by skylights. The total cost of the building, including the payment of the architect's commission, has not exceeded £1,300. The importance of this department of relief may be estimated by the fact, that in the last half-year no fewer than 11,183 casuals—men, women, and children—have been housed and fed in this parish alone.

NEWPORT, MONMOUTHSHIRE.—The New Corn Exchange project, which has been for some time in abeyance, is at length likely to enter a practical channel, by means of which we may hope soon to see it an accomplished fact. On Wednesday last, a meeting of merchants and others interested in the subject was held, when it was determined to form a limited liability company to raise the capital. Mr. Hancorn, architect, was requested to prepare a plan for the erection of a building on a suitable site at the back of the Steam Packet Inn, in the Old Green, and close to the market place.

A Jacksonville (U.S.) paper gives an account of a great natural curiosity. Several of our citizens, it says, returned last week from a visit to the Great Sunken Lake, situated in Cascade Mountains, about 75 miles north-east of Jacksonville. It is thought to average 2,000ft. down to the water all around. The walls are almost perpendicular, running into the water and leaving no beach. The depth of the water is unknown, and its surface is smooth and unruffled, as it lies so far beneath the surface of the mountain that the air-currents do not affect it. Its length is estimated at 12 miles, and its breadth at 10 miles. No living man ever has been, probably never will be, able to reach the water's edge. It lies silent, still, and mysterious in the bosom of the everlasting hills, like a huge well scooped out by the hands of the giant genii of the mountains, in unknown ages gone by, and around it the primeval forests watch and ward are keeping. The visiting party fired a rifle several times into the water at an angle of 45 deg., and were able to note several seconds of time from the report of the gun until the ball struck the water. This seems incredible, but it is vouched for by some of our reliable citizens. The lake is certainly a most remarkable curiosity.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the EDITOR, 166, Fleet street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—F. and A.—H. S. and L.—J. S. P.—T. C. E.—S. and Co.—W. W.—O. N. S.—E. W.—J. L.—B. C.—T. F. M.—J. H.—F. B. and Co.—W. A. R.—J. H. T.—W. H.—J. R.—E. W. G.—E. W. P.—E. D. (Abingdon).

E. B.—Send the drawing.

Correspondence.

PUGIN *v.* BARRY.

To the Editor of the BUILDING NEWS.

SIR,—With the remark in the BUILDING NEWS of September 6, that Mr. Pugin had not made out his case, most people will agree. He certainly furnished a string of probabilities, but no absolute proof. There were weak points in his statement which it was impossible to overlook; and his style of writing was more energetic than is usually employed in advocating a thoroughly sound cause. Having always entertained the highest admiration for the classical works of Sir Charles Barry, and never having heard of his performances in the Gothic style in the Pentonville and Islington districts, I was inclined to think that Mr. Pugin's claims on his father's behalf were excessive. When I saw his letter in the *Times* of September 7, where he says, "Giants are not to be met with every day, and their youth and growth, as well as their middle age, are generally known to those around them. The great results achieved by my father were foretold in his early childhood; and his drawings and his works all lead up and point to the greatest of them all—the Palace of Westminster. What, on the other hand, has Sir Charles Barry got to show? Where is there one executed work of his which would induce the belief that he was, in very truth, the art architect of that noble pile?" Now, I must confess that my belief in Sir C. Barry was not shaken by learning that Pugin's nurses predicted that he would achieve greatness, because soothsaying of that nature is neither rare nor reliable, but I was certainly struck by the plain question, "What, on the other hand, has Sir Charles Barry got to show?" When Mr. Pugin instances St. Peter's Church, Hatton-garden, and asks if it be possible that the same man could have designed the Palace of Westminster, he puts a question very much to the point, and one which can be answered by any one who takes the trouble to inspect the said church. I had previously noticed from the Farringdon-road a very ugly church of the date when most churches were ugly, but, until the appearance of Mr. Pugin's letter, was unaware that it was the work of Sir C. Barry. I, therefore, determined to pay it a visit, and to inspect other of his earlier buildings, believing that the youth and growth of giants will be traced in their works. St. Peter's Church, Hatton-garden, was consecrated in October, 1832. The style is Perpendicular, of the worst kind, exhibiting all the faults that an utter absence of Gothic feeling could crowd into one building. That the reveals or splays are insufficient may be attributed to the thinness of the walls, but no considerations of economy can account for the form of the window labels, which, as Ruskin says, "are like windlasses." In utter disgust I entered the church, in hopes that the interior might present some redeeming feature. In this I was disappointed. The very form of the arches of the nave, and the pillars supporting them, is of the most debased character; and, as to the woodwork, the roof, galleries, pulpit, reredos, pinnacles, crockets, and panelling, are of the rudest and most ignorant description. I left the building satisfied that the man, who in 1830 or thereabouts designed this church, could by no possibility have had anything advantageous to do with the Palace of Westminster. I thence proceeded to inspect Holy Trinity Church, Cloudesley-square, finished early in 1829, at a cost of £11,535, where the same hand was manifest. Criticism upon these buildings is thrown away. They are as good as the average of Gothic works of that date, but they do not show a particle of Gothic feeling. A tablet bearing the name of the architect existed for many years in this church, but owing to some alterations being made in opposition to Sir Charles's advice, he caused it to be removed. For his fame's sake it were well if everything Gothic he ever did could be hidden from sight; certainly the other churches that I visited—St. John's Church, Holloway, consecrated July, 1828, cost £11,890 7s. 8d., and St. Paul's, Ball's Pond, consecrated October, 1828, cost £10,947 11s. 6d.—can add to no architect's reputation. The result of my inspections, which were not all effected in one day, was a confirmation of the opinion arrived at the moment I entered the first church and the latest in date, namely, that the same hand could not have designed buildings of such opposite character as Barry's churches and the Westminster Palace. Knowledge of an art is picked up frequently enough—feeling, rarely. I was now thoroughly convinced of the justice of Mr. E. W. Pugin's claims, but I could not acknowledge that he had proved his case. The ugly letter of September 6, 1845, was not satisfactorily explained away, but the evidence of the churches was so conclusive that my faith was not for a moment shaken. When, however, Mr. Mares's letter appeared in the *Times* of the 16th, the missing link in the chain of testimony was supplied, and few will now be found to doubt who was the art architect of the Palace of Westminster.

That the elder Pugin kept Sir Charles Barry's secret well is shown by the difficulty now experienced in absolutely proving his title to the fame which is his due; but the secrecy which was binding on him could not justly be transmitted to his son. Mr. E. W. Pugin has an inalienable right, and he conceives it a duty, to obtain for his father that fame of which, during his life, he was deprived. The plea that an assistant is in honour bound, for the sake of a most inadequate compensation, to conceal, if not deny, his own share in his employer's reputed work is scarcely decent. The position of an assistant would be anomalous. He must be able to do the work as well as his employer—in too many cases he does it much better—and he must at the same time conceal from clients the part he really plays. How, under these circumstances, is he ever to rise? And without the hope of rising an assistant will not be of much use. The architectural profession will be elevated in proportion as the actual authors of works are known. There are at present many buildings which are known not to be the work of their reputed authors, but which, nevertheless, have brought them fame. Pugin's case is not a solitary instance; let us hope it may be the last.—I am, &c.,

J. A. H.

SIR,—I am reminded that I have not yet answered Mr. Charles Barry's challenge to refer my father's claims to have been substantially the designer of the Houses of Parliament to a committee of the Royal Institute of British Architects. I think it will be time enough to answer any such challenge when Mr. Barry produces the seventy-six letters from his father to mine, which, as I stated in the *Times*, of the 7th inst., Sir Charles Barry got from me under a promise to return them immediately, and he never did so. The Messrs. Barry have quietly passed over this statement uncontradicted and unnoticed. They know better than I can, whether these letters still exist or have been destroyed. If they do exist, the Messrs. Barry know that they are my property, and they are professing to challenge me to a reference to arbitration while they are illegally withholding both my property and my evidence. If, on the other hand, the letters have been destroyed, I believe that I need not write another word on the subject, but leave Sir Charles Barry's reputation and my former statement to the judgment of the public.

No proof that I am likely to discover now can be so decisive as the destruction by Sir Charles or his family of all the letters on the subject which could be got hold of—first, all my father's letters to him (as Sir Charles confessed to me), and then, all his own letters to my father, which he could get out of my hands, under a promise—and a repeated promise—to return them.—I am, &c.,

E. WELBY PUGIN.

Ramsgate, September 19.

TERRA COTTA.

SIR,—I find in the *Somerset House Gazette* for March 20, 1824, an account of a visit to "Coade's Gallery of Artificial Stone Ornaments." The writer states that "the manufactory, though still known by the name of Coade, the original founder, is now conducted by Mr. Croggon." From the description given of the material, it may safely be assumed that the so-called artificial stone was nothing more or less than what is now called terra cotta. We are told that "some articles are first formed roughly to give them the external shape in a mould; they are then polished (*sic*) by the chisel while in a soft state, which they endeavour to preserve by wrapping the block carefully in wet cloths. * * * * The process seemed very much like what I had observed in Mr. Chantry's workshops in modelling the designs in clay for the future marble to embody. After the figure is completed in all its parts it is cut into separate pieces, for the convenience of introducing it to the oven, and is afterwards put together, firmly cemented, and iron rods introduced into the arms or other parts that may require to be strengthened." Among the objects which were exhibited were vases, fonts, fountains, and capitals of pillars of the different orders of every variety of size. In the *Architectural Magazine* are several articles referring to artificial stone made by Austin, of the New-road, and other makers, and although no actual description of the material anywhere transpires, there can be very little doubt that it was all terra cotta, and that fifty years ago, under the name of artificial stone, this article was extensively used in London.

Having recently been informed that the caryatides of St. Pancras Church were of terra cotta, I have examined them carefully, and find this to be the case. The figures are made in large segmental blocks, and neatly joined with cement. They have stood the test of 46 years' exposure to the atmosphere of the metropolis most satisfactorily (much more so than the Portland stone with which the main body of the building is ashlared), and they afford a striking proof of the fitness of terra cotta for resisting the corrosive action of London smoke. I have since found, in Britton and Pugin's "Illustrations of the Public Buildings of London," the following passages with regard to the terra cotta work of St. Pancras:—"The capitals to the columns and antæ, and all the external ornaments, enriched mouldings, &c., are of terra cotta. * * * * Imitations of Greek tiles in terra cotta are ranged along the coping of the side walls, as well as round the circular part of the east end." In a footnote, referring to the caryatides, it is stated that "the figures are of terra cotta. They were formed in pieces, and cemented together round pillars of cast iron, which in reality support the entablatures." It is elsewhere stated that the terra cotta was made by Messrs. C. and H. Rossi, and that they were paid for the same £4,300. The total cost of the church is given as £76,679 7s. 8d. It would be extremely interesting to find out something more of Messrs. Rossi, as to where their works were situated, whence their clay was obtained, and any details of their manufacture. They seem to have possessed kilns capable of burning successfully larger blocks than are now attempted, and to have turned out a material of good quality at a comparatively moderate price, as there is an enormous amount of ornamental work in St. Pancras Church for £4,300.—I am, &c.,

GILBERT R. REDGRAVE.

VANDALISM.

SIR,—Your excellent article on "Northern Vandalism," of last week, has induced me to mention some other cases in connection with the subject. A Norfolk incumbent of a small parish, with an Early Perpendicular church, having a rude Norman round tower, actually told me that he had procured an estimate from a local builder for pulling it down and rebuilding it of the old materials, and all this without consulting an architect. Another idea of his was to sell the old materials, and to build altogether a new church. The present church contains some curious terra-cotta work in the south porch, a fine open timber roof, and screen, and a curious late pulpit, and many finely-carved bench ends; the latter are most skilfully brought in as strengthening pieces to the modern square pews. The local builder, in scraping the walls—the better, I suppose, to give his estimate—came upon some fine old English black lettering, part of which he has obliterated through clumsiness. At Trunch Church, in the same county, the finely-carved choir seats are decaying and dropping out of their places for want of a little care. They are illustrated in the view of that church in Brandon's "Parish Churches." Cley Church, a most beautiful de-

rated fabric with Perpendicular porches, also in e same county, has suffered in the parvise of the uth porch from being used as a school-room or stry, in the open timber roof by candles being ing directly under the bosses at the intersecons, many of which are charred and spoilt, and I a told that, at the late restoration of the church, any trusses were taken away by the workmen. am bound to say that the present rector is ry proud of the beauty of the church, and takes ery care of it, and that the things I have entioned took place before his time. In speaking an incumbent about the necessity of preserving l old work, he confessed that it was a great mptation to the clergy "to make a clean sweep the chancel;" which I am afraid is but too ten the case, for how often do we miss the iests' door, piscina and sedilia, in our village urches, all of which have been blocked up and vered under a neat coat of plaster. I think it ould be a very desirable thing if the Institute's structions about restorations were sent to the rgy through the different local archæological and chitectural societies throughout the kingdom.—m, &c., TH. B.

PPROXIMATE RATIOS OF THE CHIEF GEOMETRICAL LINES.

SIR,—Mr. Guillaume has now given us an proximation to the circle new to me, and ich certainly appears well worth a place among ose every designer and measurer should bear in nd. It seems that the cord of a quadrant is to s arc practically as 9 to 10. The error is someat less than that of the Archimedian circmference, about 1 part in 3,000, instead of 1 in 500, but both on the side of excess in the curve. ey connect themselves with the still closer and ost useful approximation to the ratio of a square's agonal and side, 70 : 99; so that if either of ese were assumed time, the others would llow.

The 70 and 99 are the ninth approximation obined by the following very compendious way of terpolating a mean proportional between two umbers, or finding the ratios most nearly the ubduplicate of a given ratio. We write under ch other the simplest series of three numbers hose first and last are in the given ratio. Thus, r the ratio 1 : 2, the three we take are 2, 3, 4. hen form a second column of three thus:—the o upper figures of the first column are added to rm the top one of the second; the two lower the first column form the next; and the bottom gure is supplied of course by doubling the top. rom this second column you derive in the same ay a third, and so on *ad libitum*. Thus:—

2	5	12	29	70	&c.
3	7	17	41	99	
4	10	24	58	140	

ach middle figure here approaches nearer to a ometric mean between that above and that elow it; and each pair of figures would form a action nearer and nearer to the value of $\sqrt{2}$. The 2 : 17 : 24 are worth remembering, because they conveniently fit our measurement by feet and ches; but the 70 : 99 : 140, are more so, be use their error being little more than 1 part in 0,000 of the longer line, they really suffice for very conceivable practical purpose, and give this ery ready rule for finding either of two lines hich are as the side and diagonal of a square, hen the other is given. Whether we seek the nger line or the shorter, the operation is the me. From ten times the given line, deduct a nth of it, and divide the remainder by 7. The uotient will be either the line sought or its ouble.

If the ratio whose subduplicate we sought y the above method were a much greater ne than 1 : 2, the approximations would be too low to make the method very available. But it to be observed now, that we can, in all other ses, arrange that the ratio divided shall be less an this of 1 : 2, and this makes every other case ore advantageous, the approximation being ore rapid. Thus the next commonest ratio of nes in geometry is that of 1 : $\sqrt{3}$; occurring henever we have angles of 30 deg. or 60 deg., or ything to do with the equilateral triangle; and lso between the side and diagonal of a cube. Instead of finding directly $\sqrt{3}$, we can find its half—amely $\sqrt{\frac{3}{4}}$; that is, instead of a geometric mean etween 1 and 3, we bisect the much smaller ratio f 3 : 4; thus:—

Col. I.	or	Col. II.	or tripled	Col. III.	Col. IV.	
3	6	13	39	84	181	&c
3½	7	15	45	97	209	
4	8	&c.,	52	112	&c.	

Here, after every alternate column, we triple the figures to avoid a fraction in the bottom one, which of course must always be the top with a third added. Now, of these figures, the very first derived pair 13 : 15, are exact within a thirteenhundredth part; and the next approximation, 84 : 97, or 7ft. to 8ft. 1in., is so exceedingly near that probably no means of measurement applied to a triangle of that size would detect the error. This latter ratio is even easier to apply to feet and inches than the former; for it is easier to add a seventh of a dimension, and then a twelfth of that seventh, than to add two thirteenths; and perhaps easier to make the former operations and then diminish the whole by a quarter, than to diminish at once by two fifteenths. This ratio, then, between the base and altitude of an equilateral triangle, 8ft. 1in. to 7ft., should be remembered by all who measure ancient churches, as enabling them to verify any two dimensions that they suspect to be derived from a triangulation like those that have been found to govern Milan Cathedral, Salisbury, Westminster, and others of the noblest buildings. I fully believe, with Mr. Scott, that this pervades all the best proportioned Gothic work.

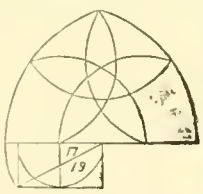
Taking the 13 : 15, however, as enough for most purposes, it follows that the areas of an equilateral triangle and square on the same base are practically as 13 to 30; and a square, hexagon, and dodecagon, all on the same base, as 5, 13, and 56; the dodecagon being divisible into the same hexagon, six triangles equal to it, and six of the same squares.

The next remarkable fact is that the two radii of an octagon happen to be as 12 : 13, within a twelve hundredth part of either.

The diagonal of a double square, or the line from one angle of a square to the middle of one of its further sides, is important, because it is only by means of this measure that Euclid's cutting of a line "in extreme and mean ratio" is effected, and the pentagon constructed, or any angle divided into five. This line, being the hypotenuse to 2 and 1, is $\sqrt{5}$; but we approximate it, in the above method, by seeking a bisection of the ratio 4 : 5; thus:—

Col. I.	or	II.	or	III.	IV.	
4	8	17	68	144	305	&c.
4½	9	19	76	161	341	
5	10	&c.	85	180	&c.	

Now, here the very first approximation 17 : 19 is nearer than the Archimedian circle ratio, and, therefore, practically enough for almost any use. If we assume this ratio in the length and diagonal of the double square employed to draw a pentagon, we shall see it makes the side and diagonal of the pentagon as 34 : 55, which is a very close approach, being the eighth pair of numbers in the series derived from 0 and 1 by adding every two to form the next (as in the margin), which continually approach nearer the "extreme and mean ratio," or that between the side and diagonal of a pentagon.



0
1
1
2
3
5
8
13
21
34
55
&c.

It is truly remarkable, therefore, what close approximations to all the commonest ratios occurring in geometrical design are expressible in numbers below 20, which I will recapitulate, as they appear all worth remembering.

3 : 4. The ratio of the spaces between a circle and enclosing square, to those between the same circle and enclosed square; exact to 1 part in 2,500.

9 : 10. The ratio of a side of the latter to the quadrant it cuts off, within 1 part in 3,000.

7 : 11. The area of enclosed square to that of circle; or the lengths of a radius and a quadrant, to 1 in 2,500.

11 : 14. A circle and its enclosing square, the ratio either of their areas or boundary lines, to the above degree of exactness.

13 : 15. The base and altitude of an equilateral triangle, or the two diameters of a hexagon, exact to 1 in 1,300.

5 : 13. The areas of a square and hexagon on the same base, to the above degree of exactness.

12 : 13 : 17. The two radii of an octagon, and that circumscribing its enclosing square, the former exact to 1 in 1,200; the latter only about half as near, but its use is superseded by the equally easy 70 : 99.

Lastly, 17 : 19. The length and diagonal of a double square (whence all pentagonal figures are derived) within 1 in 2,500.

Only just exceeding the score, we have 11 : 21, the contents of a globe to its enclosing cube, to the same exactness.

To these should be added the remarkable closeness of 50 and 63 to the old Delphic altar problem. If an artizan has to make one object, (say a bell) similar to another and twice its weight, by increasing every dimension as 50 to 63 he will not exceed the double weight by 1 in 5,000.—I am, &c., E. L. G.

MANCHESTER TOWN HALL COMPETITION.

SIR,—Will you allow me to make a few remarks in your journal on the above competition. It is stated that the letters received in answer to the mayor's circular are chiefly in favour of an exhibition, therefore we may suppose that the unsuccessful designs will be exhibited; but it is also stated that the selected designs will not be shown until after the award has been made. Will the public be satisfied with this? I should emphatically say *no*, but let the chosen ones be shown with those rejected; then the public will be enabled, by comparison, to judge of the superiority of the selected ones. The reasons given for not showing them at present is frivolous, for what disadvantage could arise to those who have produced the best plans by their being shown? It would be impossible for others to copy from them without being detected. It would be a source of great satisfaction to the unsuccessful competitors and the public if the various stages of the proceedings were published, especially the report of the referee, as it would then become known what were his reasons for rejecting eight of the designs recommended by the committee, and for choosing those which he subsequently did. It appears strange to one, having but a small share of common sense, that Mr. Godwin should, amongst others, select a plan in which the author had not complied with the instructions, but had placed the treasurer's department on the wrong floor. I should have supposed the plans were the first and principal things to be examined, and the elevations, &c., afterwards, as utility in a matter like this stands before beauty; and there is little doubt that in that large number other plans could be found in which the instructions had been carried out. Does it not also appear strange that architects were allowed their discretion in point of style, and then all Gothic should be chosen? But as Gothic is all the rage now, Manchester must needs follow the fashion. Then why was it not stated in the instructions that Gothic would be preferred?—I am, &c., ONE OF THE PUBLIC, AND A LOVER OF JUSTICE.

Halesworth, Suffolk, September 17.

SIR,—It appears that the question of exhibiting the unsuccessful designs is to be decided by the competitors themselves. So far good; but the public voice demands the exhibition of the selected ones as well. The only reason alleged against it is that a competitor may appropriate, in the final competition, the features of another's design; whereas, to exhibit the selected ones, would so publish and identify with the designer the right of specific property in the details of his own design, that the competitor would indeed be a daring pirate who should venture to appropriate what could be instantly proved not to have originated with him.

I also ask for the publication of the official reports, wherein certain designs selected for consideration are mentioned numerically; and for an identification of these numerals with the names of the authors. For it is an honour to the competitors not to have been distanced in the race, and those who were in the foremost ranks deserve to be rewarded by the commendation of their names.—I am, &c.,

September 11. A COMPETITOR.

SIR,—Mr. Allom, Barnes, Surrey, and Mr. Hibbert, 19, Fishergate, Preston, present their compliments to the Editor, and beg to state that the enclosures are copies of a memorial, &c., forwarded by them to the Mayor and Corporation of Manchester, and they hope the matter involved will be considered of importance sufficient to warrant publication in the BUILDING NEWS.

September 17.

19, Fishergate, Preston, September 17.

TO THE WORSHIPFUL THE MAYOR OF MANCHESTER.

SIR,—Mr. Thomas Allom and myself have this day forwarded to the town clerk a memorial, of which the en-

closed is a copy. We doubt not that it may be taken as expressing the wishes of other competitors as well, and trusting that it may be considered in a gracious spirit, we venture to ask you to bring it before the council.—I am, &c., JAMES HIBBERT.

P.S.—As respects Mr. Allom, I may refer to his high reputation and to the fact that he was the second premiated competitor for your Assize Courts.

The memorial of James Hibbert and Thomas Allom, F.R.I.B.A., architects provisionally selected for the final competition—under the mottoes, "*In honorem Urbis*," and "*Con Amore*" (with star)—and numbered in the official report 26 and 42 respectively, desires to show:—

(1.) That whereas twelve designs may be selected according to the conditions for the final competition, eight architects alone contributing ten designs are so selected.

(2.) That of this number, four are Manchester architects, contributing six designs of the selected ten.

(3.) That in a national and renowned competition, wherein the best architectural ability of the kingdom is represented, it conveys an appearance, if not the substance, of favour, to award more than one half the honours and prizes to Manchester.

(4.) And therefore your memorialists—included of those in the provisional selection—respectfully seek to have the present list extended to the full number allowed under the terms of the competition.

(Signed) THOMAS ALLOM, F.R.I.B.A.
JAMES HIBBERT.

September 16.

Intercommunication.

QUESTIONS.

[572.]—QUEEN ELEANOR'S CROSS.—Can any of your readers inform me in what work I can find a view of Queen Eleanor's Cross at Waltham.—W. R.

[573.]—PERSPECTIVE.—Will any of your correspondents kindly inform me the method of putting up interior perspectives from the ground plan in parallel and angular perspective?—S. B. F.

[574.]—THE "LIMNER."—Will you or any of your readers kindly inform me if they have any knowledge of an invention of G. Bell, Esq. (late of the Government School of Design), called the "Limner," which is supposed to enable any person to sketch landscapes, architecture, painting, &c., without any knowledge of the common rules of perspective; also to copy drawings, portraits, and photographs?—E. W.

[575.]—ARCHITECTS' PUPILS.—Could any of your readers inform me on the following point:—Suppose a pupil has been articled four years, and still has a portion of his term to complete, he is offered plans to prepare for a dwelling-house, &c., merely for submission to a local board previous to erection, could his master hinder him from doing them and receiving pay for the same? He does them out of the office, and after office hours; and, moreover, the principal would not get them even if the pupil did not.—RECTUS.

[576.]—LICHFIELD CATHEDRAL.—Britton's plan of this building represents the choir deviating from the line of the nave. Is that an engraver's inaccuracy, or does it really exist, as at St. Denis, and in a much greater degree at Whitby Abbey? If the story told at St. Denis, of its intentionally symbolizing our Lord bearing His head on the cross, were well founded, would not the bend be more common and always to the same side? At that building the choir bends southward, but at Whitby, the only other case I know, and in Britton's plan of Lichfield, northward. Can any reader name other examples of this? Village churches with the chancel many inches out of centrality, but not out of parallelism, are common enough; and the irregularities of two cathedrals, Chichester and Bayeux (the latter perhaps the most elaborate great Norman church ever built), are something marvellous, but do not involve this non-parallelism.—E. L. G.

[577.]—METROPOLITAN BUILDING ACT.—Will any of your readers inform me which is the best and latest edition of the Metropolitan Building Act, where it is published, and the price?—BETA.

[578.]—DRAWBRIDGE.—Will you kindly inform me in your "Intercommunication" column, how I can calculate the weight to be lifted by the chains in closing a drawbridge? I find by experience that it is considerably more than the dead weight of the flap.—C. E., Melbourne, Victoria, July 27.

[579.]—RAILWAY WORK.—Will some of your readers enlighten a young engineer as to the usual terms adopted by the profession for the following services connected with railway work, viz.—1. Surveys and levels. 2. Preparation of parliamentary plan, &c., and attendance during progress of bill through Parliament. 3. Booking plans, specifications, including all details of bridges, &c. 4. Superintendence of works, and making up accounts?—C. E., junior.

[580.]—ADULTERATION OF WHITE LEAD.—Will some of your correspondents kindly inform me, through your "Intercommunication" column, the best method of detecting adulteration in white lead without the aid of a chemist; also if it can be detected after the colour is made up, and how.—J. T. J.

[581.]—LINING FOR MALT STORES.—Will you or any of your readers oblige by telling me what is the best lining for a malt store or large bin that receives the malt from the kilns. The present store is lined with match boards nailed to bond, about half an inch clear of the 14in. brick wall, and that makes a nice harbour for mice and weevil, with which it is infested. What is desired is a durable and dry lining, and proof against vermin or insects. Two sides of the building are outside walls.—J. D. W.

[582.]—DEADENING SOUND.—I am continually annoyed by my next-door neighbour, who is very partial to playing the piano, and the party-wall being thin I can hear every note. If any of your readers could tell me of any means of deadening the sound they would have the thanks of—J. H.

[583.]—GAS METERS.—As I am having the gas laid upon my premises, I would take it as a very great favour if one or more of your readers would inform me what kind of gas meter is considered the best, a wet or a dry one; and their reasons for recommending either. I have inquired of persons connected with our gas company, who recommend wet; and also of various private individuals who prefer dry. So I know not which to have.—THOS. WM. TAYLOR, Park-street, Dyvenhoe, Sept. 18.

[584.]—WROUGHT-IRON ROOF.—Some four months since I wrote asking (through the medium of the "Intercommunication") for the calculations for a wrought-iron roof (say) 40ft. span with an 8ft. rise from the tie rod, and covered with slate on boarding; but I have not yet received a reply thereto. Would you be good enough to further my object by again inserting the request.—GEO. E. WALTERS, 74, Gopsall-street, St. John's-road, N., Sept. 12.

[585.]—PICTURES ON WALLS.—Could you or any of your readers be kind enough to inform me of any method by which pictures painted in oil can be removed from a plastered wall and placed upon canvas or other material, so as to admit of their being framed. They have been painted some twenty or thirty years.—E. W.

REPLIES.

[526.]—PRESERVATION OF TIMBER.—The worm to which your correspondent alludes is probably the *Teredo navalis*, which commits great ravages in timber piles of bridges and foundations. In the short space of twelve years these destructive insects were known to make such havoc in the fir piles of a bridge at Teignmouth, that the whole bridge fell suddenly, and had to be totally reconstructed. The *Teredo navalis* enters the timber by a small hole, and then perforates it in every direction, but preferring that of the run of the fibre. They commit their ravages between low water mark and the bottom, and some have been found of the extraordinary length of 3ft. Another mischievous insect of this class is the *Lymnoria teretrans*, which is nearly equally fatal to uncreosoted and unprotected timber as its neighbour.—J. L.

[530.]—SEWERAGE.—Sewerage must be, of course, in all cases—to be effective—adapted to the peculiar localities in which it is intended to apply it. This condition is, at the outset, a *sine qua non*, and unless it be scrupulously observed, all subsequent labour will be useless. Then again, the question arises as to whether an entirely new arrangement of sewers is to be constructed, or whether it is simply proposed to modify and improve upon an existing system of drainage. "Sub-stratum," however, refers particularly to "the lower parts of towns," and these present the greatest difficulties to the sanitary engineer. Here the levels must be carefully taken, the sub-soil thoroughly examined, and the outfall facilities taken into account. The depth at which, as a general rule, main sewers should be placed, ought not to be less than 10ft., but 20ft., if circumstances permit, will be far better. At any rate, they should be kept as low as possible, consistently with the proper amount of fall for their self-clearance. As to the shape of sewers to which your correspondent makes allusion, there exists among practical men considerable difference of opinion. The Metropolitan Board of Works have adopted, as I think wisely, the egg shape, which certainly seems to afford the best section for securing the maximum of scouring force to the water passing through it. In some other towns of England, however, the circular form has been applied, the argument in its favour being that the greatest area is thus obtained at the least cost of original construction. For very large sewers it may be that the circular form is the best. The strong claim on behalf of the egg-shaped sewer, with the broad end down, is that it affords facilities to the workmen employed in repairing or cleaning it which the circular sewer does not. The inverts of sewers should be built with the best hard bricks and Roman cement, the bricks being put together in quadrant blocks before being lowered into the trench. In the lowest districts, where the sewers are frequently full of water, they (the sewers) should be entirely built with cement. Medina cement is useful in extreme cases, as it sets under water quicker than ordinary cement. For the smallest class of sewers vitrified stoneware pipes may be used. These do very well for short streets, lanes, avenues, and the outskirts generally of towns. Much more might be said on this question of sewerage, but your space must also be taken into account, and I close by saying that the broad essentials for effective house drainage are—that the sewer should have a good fall, and be laid with regular inclination from the highest to the lowest point. When it is necessary to change the direction this should be done by regular curves and not sharp angles or bends. Impermeability is of the last importance to prevent the exudation of noxious effluvia and moisture, and all openings should be effectually trapped. No fall ought to be less than one inch in ten.—DRAIN-PIPE.

[532.]—POLISH.—"J. P." can polish with fine emery and oil.—FITTER.

[537.]—PERIODS OF GOTHIC ARCHITECTURE.—I will now merely remark that what I first wrote is an exact copy of the dates given by R. S. Burn in his "Series of Architectural Designs," whereas those by Mr. Fergusson are somewhat different, the Early English being 28, Decorated 23, and Perpendicular 85 years earlier, and other authors might be quoted giving different dates to both, which only goes to prove that in this two "opinions differ." I don't pretend to defend either the one or the other—the authors are, I suppose, quite able to do that for themselves, but here are statements given by men of note, neither of whom do agree.

With respect to the first difference, Mr. Fergusson gives no Transition, but jumps at once from Romanesque to Gothic. C. Wickes, in his "Memorials of English Mediæval Churches, says, "Pointed architecture, with its new principles and different ideal of beauty, would, not without a long and severe contest, succeed in supplanting its time-honoured predecessor, which was become consecrated by hallowed associations and unquestioned success as the one ecclesiastical style. . . . . Gothic, as it first appeared, was in no way fit to assume the ascendancy, even if the Norman architects were prepared to yield without a struggle. Accordingly, a series of buildings, that may strictly and appropriately be denominated 'Transitional,' present themselves to notice . . . . Between the two extremes almost every combination of Norman and Gothic details may be found. . . . . An admirable example of this early style of Transition may be seen in the circular part of the Temple Church, London" (which "E. L. G." says is "already become thoroughly refined English, all but the windows") "also at St. Cross, where every pier arch and vaulting arch is pointed, but Gothic forms do not show themselves elsewhere in the building, except in the manifest addition of a later period. . . . Early English in less than half a century had become universally adopted, and lasted about 70 years." Mr. Fergusson says 97 years, but the above passages (which are somewhat abbreviated) may account for the first difference, which was a transition not from one Gothic to another but from the Circular to the Pointed.

In Decorated, the authority above quoted comes near Mr. Fergusson. "The Decorated, in its two characters of 'Geometrical' and 'Complete,' flourished during the reigns of the Three Edwards." But, then, what becomes of R. S. Burn's authority, whom I first quoted? Again, one puts down Perpendicular as having lasted 80 years, another 109, another 169, and "E. L. G." 200 years!

In "Glossary of Architecture," page 410, there are enumerated 118 examples of existing Saxon architecture in a many different places and in 28 counties, and they also say that "further research will doubtlessly bring other examples," says, page 641, "They are all either lime or dust into notice." I say there is no Saxon style. "E. L. G. under our feet, except the carcase of Waltham and a bit or two of Westminster Abbey." But all this comes quite naturally from one who, passing the present, looks wizard like into the future, and discovers that in a few years more "thanks to the Royal Institute of British Architects, there shall be no Early English or Edwardian."—PROVINCIAL.

[537.]—I have noticed in your journal the letters of "Provincial," in the latter part of which he associates the Gothic style with "Romish ideas." Perhaps it is well to state that if there is any one style associated with the Roman Church it is the "Romanesque style." During its prevalence in England and France all the architects were monks, who at that time, were almost the only enlightened members of society. When, however, the Gothic system of construction was adopted, architecture had left the walls of the cloisters and was practised by artists who were lay members of the community.—H. RENAULT-MANGIN, Sept. 19.

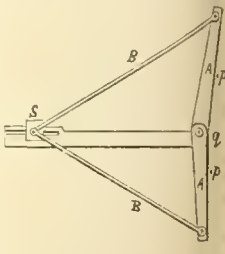
[542.]—DRAWING ON WOOD.—Allow me to use your columns to reply to "A. L." In the first place, the block must be got. Put a little powdered flake white over the surface, and commence with a simple design. The pencil must be very hard and fine, and can be got at any artists' colour shop on describing for what purpose they are wanted. The tinting and dark lines are put in with Indian ink and this is a point where the beginner must have patience as it is not an easy matter to get the tints uniformly washed in. There is no more real difficulty in drawing upon wood than upon paper, except that it is more tedious and tries the sight more.—ENGRAVER.

[561.]—REMOVING PAINT.—Your correspondent "R. L. B." will never be able to clean stone that has been painted and repainted for years. The only way to remove it would be to redress the surface of the stone, but this he does not want to do. Even if he succeeded, by the use of turpentine and acids, to clean the stone partially, it would always be permanently discoloured, and look much more patchy and unsightly than if it had been left alone. Stone fresh painted, may be cleaned, because the paint has not become, as it were, incorporated with the stone, but if once it has had the time to act chemically upon the composition of the stone, the case is hopeless.—DECORATOR.

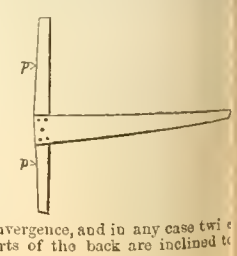
[562.]—POTASH.—All granites contain potash and soda the two ingredients invariably being present together, and amounting, in the older formed beds, to as much as 7 per cent. I do not see any method, except that of analysis, of detecting the small quantity of potash and soda that may be found in sand, supposed to be the result of the disintegration of granite containing those ingredients, nor do I see any objection to using it for mortar, as the proportion is so small.—STONECUTTER.

[565.]—ARCHITECTURE.—"A Country Builder" should obtain Parker's sixth edition of Rickman's "Attempt to Discriminate the Styles, &c.," published by J. H. Parker, in 1862.—E. L. G.

[566.]—CENTROLINEAD.—"S. T." would thoroughly understand this very clumsy tool by referring to reply 384 p. 605, and observing that it is merely the two straight edges E B, B D, of the board there represented, with the addition of a ruler continuing the line *Bb* or *bB* toward or from the centre of curvature. As this instrument is commonly sold, there could hardly be a ruder expedient for its purpose. It should not give the user the trouble of setting the ruler at equal angles to the two arms, and adjustment almost impossible to make with any accuracy, but should be self-adjusting, thus:—



The bars BB, being of equal length, and their joint sliding in a groove of the ruler at S, they necessarily keep the two arms AA always equally inclined to it. Having the two points *p q* at equal distances from the centre whence your lines are to diverge, you have but to set one arm against one of them *p*, the fork of the arms at *q*, and the ruler in a line with this and the centre, and clamp firmly the slide S. Two pins *pp* being then driven, one about the mid-length of the edge of each arm, you keep the instrument pressed against these pins. A mere T-square with a longer stock than usual, formed on the back to two straight eges inclined only 5 or 10 deg., will be found quite as useful as the common jointed centrolinead. If the angle at the back be 170 deg., or the two edges inclined 10 deg., the two bodies against which you press at *pp*, will subtend 20 deg. at the centre of convergence, and in any case twice the angle that the two parts of the back are inclined to



h other. Thus, by bringing pp nearer together, the ishing point is brought nearer, in just the same ratio.—L. G.

568.]—WHAT IS CUSTOMARY?—In my opinion, the hitect can only charge the usual 2½ per cent. for prepar plans, specifications, and estimates for work that was carried out. No *bona fide* architect would take out antities for builders, and he certainly has no right to do it the expense of his employer without his consent and horization.—ANOTHER CHIP.

570.]—ROLLING MACADAMISED ROADS.—In wer to "C. M.," in your "Intercommunication" column o rolling macadamised roads, I have had some experience forming roads, and find rolling binds the material, king it an even surface and smooth travelling. Immetely the road is metalled, the expense in keeping the d in repair, and also in material, is lessened: the saving horses and vehicles is something considerable. The best er, undoubtedly, is that patented by Amies, Burford, Company, having water-ballast. All the roads where ken materials are used are rolled in Paris, and I should to see the same carried out in London.—J. R.

571.]—ARCHITECTURAL MODELS.—I always use Parian cement for models.—JAMES SAXBY, Ramsgate.

STATUES, MEMORIALS, ETC.

he inauguration of a statue to M. Billault, the celeed French minister, has just taken place at Nantes. few days ago a monument was erected at Paris in the Campo Santo, to the celebrated Catalani. The monument esents St. Cecilia, the patroness of musicians. he large monument to Luther, at Worms, will not be gurated for a year. This composition, by Reitschel, ists of twelve statues, eight medallion portraits, thirty-four coats of arms, and twenty-two bas-reliefs.

STAINED GLASS.

ree stained glass windows, executed by Thomas Baillie Co., of Wardour-street, have just been erected in the aisle of Edenham Church, Lincolnshire, as a meial to the late Lord and Lady Willoughby de Eresby, n commemoration of their worth. They are couplet ows, with tracery lights, and are divided in the centre one transoms, so that there are four openings in each ow.

LEGAL INTELLIGENCE.

decision of great importance, in connection the sanitary condition of large cities, was n in the Recorder's Court, Dublin, last week. e persons, owners of dairy yards and pigs, who had been directed by the police magates to abate nuisances arising from the condn of their premises, appealed against the r so made. The question before the court whether there existed any right of appeal r the Act—the "Public Health Act, 1866,"—cordance with the provisions of which the rs had been made. The Recorder decided st the appellants, thus sustaining the summ jurisdiction of the magistrates.

r. Joseph Howe, a master bricklayer at rpool, summoned one of his apprentices for nding from his service. On Tuesday he I to be allowed to withdraw the summons, on round that the union had threatened to force his men to quit his employment if he proed against the lad. The summons was ngly withdrawn.

EACH OF THE BUILDING ACT.—Mr. Reynolds, erpool builder, was summoned, the other for a breach of the Building Act (42nd Sec, which provides that any person who, having commenced any building requiring comce with the provisions of the act, should nd progress towards completion of such ling for any period exceeding two months, should again go on with the same without g notice to the building surveyor, shall be to a fine not exceeding £20.—Mr. John one of the borough building surveyors, d that the defendant began to erect storeos at the rear of the house No. 84, Pitt-street, y last, but as the building was not proceeded in conformity with the plans, the work was nded for about three months, when opera were resumed without any notice being to the proper authorities.—Mr. Thornley, appeared for the defendant, said his client no intention to evade the provisions of the ling Act.—Mr. Raffles said he considered the proved, and would inflict a mitigated fine of nd costs.

LLUTING THE THAMES.—At Wandsworth, on day, Mr. Dayman disposed of two summonses n had been taken out by one of the officers of hames Board of Conservancy, against Price's le Company, for allowing a quantity of offenmatter to flow from their premises into the The defence was that the discharge of the ive matter into the Thames was accidental, ot wilful. Mr. Dayman held that it was the duty of the company to provide against accidents. He said that persons who had materials which would pollute the river ought to be more careful, and to mark his sense of what he considered the company ought to do he should fine them 20s. in each case, with costs.

General Items.

As an evidence of the abundance and cheapness of money, we may observe that the Temperance Permanent Land and Building Society, Moorgate-street, following the example of the great banking institutions, has reduced the interest allowed its depositors from 5 to 4 per cent. This society may be regarded as one of the most remarkable of its kind of modern times. During its existence it has advanced on house property alone above £800,000. The number of members interested either as investors or borrowers is about 7,500, and the number of houses erected, completed, or purchased by members, with the assistance of the society, exceeds 3,500. In consequence of the plethora of money, the society has now large funds on hand waiting for appropriation, which is, of course, good news for builders and others requiring help and possessing acceptable securities.

The Pugin *v.* Barry controversy still goes on, and at present Mr. Pugin appears to be getting the best of it. Several letters have appeared in the *Times* and elsewhere, which no doubt will be reproduced in the intended pamphlet. The matter, at all events, is not to be snuffed out so easily as the *Pall Mall Gazette* imagined. The controversy, so far as it has gone, shows that Mr. E. W. Pugin did not take up the gauntlet thoughtlessly, or without a vast amount of data; and no one can deny that he exhibits remarkable ability in conducting his case. He is determined that his father's fame shall not, if possible, suffer in his hands, and if he is unsuccessful in establishing his position, it will not be for the want of ardour, industry, and eloquence. In to-day's impression of the BUILDING NEWS will be found a letter from a correspondent, who, in the first place, thought that Mr. Pugin failed to prove his case, and that Sir Charles Barry was the architect of the Houses of Parliament, but after a careful examination of the churches erected in London by Sir Charles—when he had apparently every opportunity for the display of his ability—our correspondent has altered his opinion. He says there is an impassable gulf between these churches and the Houses of Parliament, and that it is next to impossible for them to have proceeded from the same architectural brain. We can only testify that our correspondent, who is one of our regular contributors, speaks disinterestedly and impartially in the matter.

A correspondent says:—I sincerely hope the rector of Llantrissant, South Wales, and Mr. Prichard, architect, have read your leader of last week, which will, I think, induce them to reverse their intentions. At the church there (which I have just visited) one of the pointed struts of the roof—which is a good specimen of Decorated—having fallen, and another showing signs of weakness, the architect, instead of repairing the same, or at least inserting similar ones, and thus retaining the original forms—purposes to sweep the entire roof away and insert a bran new one. Unless the new one is a great improvement on the porch roof which Mr. Prichard has erected, it will scarcely match in the twentieth part the beauty of the present venerable one.

Mr. John Roddis, of Birmingham, has completed the last of a series of figures, thirty-three in number, for the chapel of St. Andrew, in Gloucester Cathedral, at present being restored under the direction of Mr. T. Gambier Parry and Mr. Gilbert Scott, R.A. The same artist has just erected a reredos in St. Luke's Church, Cheltenham, from a design by Mr. J. Middleton.

Her Majesty has presented £100 towards the fund for the restoration of St. Machar Cathedral, Aberdeen, one of the most interesting religious edifices in Scotland.

It is contemplated, on the completion of a new railroad from London to Liverpool, to run express trains which will surpass anything yet realized in railway travelling in any country. The whole distance between these stations—over two hundred miles—will be run without a single stoppage, and the time occupied will be four and a-half hours, the speed being at the extraordinary rate of eighty-one miles an hour.

The adjourned annual general meeting of the Builders Clerks' Benevolent Institution will take place at 14, Bedford-row, W.C., at half-past seven o'clock on the 23rd inst., Mr. Wm. Henshaw, president for the ensuing year, will take the chair.

At Bootle, Mr. Bell, a master joiner and builder, while engaged in overlooking some work on the upper storey of some new buildings, by some means missed his footing and fell to the ground. His head came in contact with the ground with such fearful force that his skull was smashed in, and death was almost instantaneous.

At a meeting of the committee of the Abbot Orphanage, Newcastle, on Wednesday, it was decided to accept Mr. Walter Scott's tender for erecting the building. The tenders amounted to £4,030 for the building, and £134 11s. 7d. for the boundary wall.

According to the *Athenæum* Mr. Watts proposes to exhibit at the next Royal Academy gathering an heroic-sized bust of Clytie turning to the last rays of the Sun. The bust represents the lover of Phœbus as issuing from the sunflower; and with an admirably conveyed expression of languor and delightful longing for rapture that is fleeting, rolling her head sideways and backwards on the neck and lifted shoulder; the throat in front makes a rich curve as, with the action of the basking head, the exuberant shoulders thrust it forward. The bosom is uncovered. The arms are brought close to the sides of the figure, as if it drew all itself together in a final ecstatic sigh.

The importance and practicability of a tunnel beneath the Mersey, in order to bring into more effective union the Birkenhead and Liverpool Docks, has been brought before the Mersey Dock Board by Mr. Hawkshaw, civil engineer. Mr. Hawkshaw thinks that the best point for crossing is between New Brighton and Bootle, as the existing dock lines could be thus connected more easily and cheaply, while the rock at New Brighton offers certain facilities for working. Though the river is wider at this point, Mr. Hawkshaw thinks less tunnelling would be required than if the work were undertaken further south. He estimates that the cost, allowing for contingencies and excess of estimates would be under one million sterling, and that the importance both to the railway interest and the Mersey Board of placing the Liverpool and Birkenhead Docks in direct communication with the most important lines in the district would fully justify the expenditure.

Messrs. F. Braby and Co., of Fitzroy Works, Euston-road, write:—In reply to "C. H.'s" letter in your last number, we beg to state that we are prepared to cover straightforward flats of good dimensions with No. 14 gauge Vieille Montagne zinc (laid to the satisfaction of Messrs. Fishers', the company's architects), for 7¾d. per square foot, "not measuring all the zinc used, but stretching a line from eaves to ridge, and from side to side, girting nothing, and adding nothing for rolls, caps, welts, &c." We are also prepared to give a written guarantee to keep such roofs in repair for periods of from 10 to 25 years, according to the gauge and circumstances. A fall of about 5in. in the length of a sheet is sufficient, but we do not think it necessary to make a drip to more than to every second sheet 8ft. long, and as there are few flats having a length from ridge to eaves of more than 16ft., drips are seldom required.

The annual meeting of the General Builders' Association, which was to have been held on the 26th inst., at Harrogate, is postponed to the 10th of October, on account of the continued presence of the secretary at the inquiry into Trades' Unions at Manchester.

The authorities of Paris are said to have under consideration a project for throwing foot-bridges over the most crowded for the many crowded thoroughfares of that city. This is becoming extremely necessary, especially in the Boulevards.

Mr. Grove publishes a report which he has just received from Lieutenant Warren, R.E., who is conducting the explorations in Jerusalem for the Palestine Exploration Fund. At the Dead Sea he found, with some difficulty, the Ordnance Survey Bench mark, which is in good preservation, but is covered up. The level of the sea is within a foot of what it was when Captain Wilson levelled there, but during the spring months it must have been 5ft. 6in. higher. Lieutenant Warren has surveyed on the other side of Jordan about 400 square miles, which, with 600 to S.W. of Jerusalem, and 250 in Jordan Valley, will make in all 1,250 square miles.

The North London Railway, in making the approaches to the terminus in Liverpool-street, removed a brick wall in which was a stone with the following inscription :—"Thomas Rowe, miles, cum prætor esset Londinensis, hunc locum reipublicæ in usum publicæ sepulturæ communem suo sumptu dedicavit. Anno Domini 1569." This was one of the most memorable of London's Lord Mayors. The family of Roe, or Rowe, came out of Kent; Sir Thomas, the son of Thomas Rowe, of Penshurst, was sometime Lord Mayor of London, settled at Shacklewell, and died in 1570. He was buried at Hackney old church, where was a monument of him in the south aisle until 1798, when in pulling down the church his monument was broken and the fragments of his figure were removed into the Rowe chapel, which was preserved with the tower. He was buried in a most splendid manner, having directed by his will that there should be 20 priests to sing psalms, to these he gave 2s. each; that two heralds should have two black gowns worth £2 each or £4 in money, for ceremonies; that 40 black gowns worth 20s. each be given to 40 "pore men" to accompany his corpse; 26s. 8d. in money, or a black gown of that value "to a godly man for making a sermon."

A cute Yankee at Dayton has concocted a new advertising scheme. He sent a silk balloon several hundred feet in the air, when a patent fuse exploded a large bag full of circulars, and they came fluttering down to all parts of the city.

A large portion of land near the Lyndhurst-road station in the New Forrest has just been enclosed for the purpose of growing timber. Only oaks and beeches are planted in the forest, and their growth is protected by the previous planting of firs. There are now only about one hundred deer in the forest, and they are chiefly met with in the neighbourhood of Fritham and Beaulieu Manor, where there is good cover for them. Foxes abound in the forest, and they keep the game from being too pleutiful. Formerly they used to feast on the sick and weak deer.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

277. G. RUSSELL. IMPROVEMENTS IN STEAM CRANES. Dated February 1, 1867.

This invention relates to steam cranes, and also to cranes which are moved by any other power which swing or slew the load in a circle by means of gearing, and has for object to prevent breakages or accidents by arranging the slewing gear in such a manner that, should the jib or other part of the crane be obstructed while in process of slewing, the crane may cease to swing, while, at the same time, the engines or motive power continue in motion, and also that, when the slewing motion is put in gear with the motive power, the crane will start gradually, and not be suddenly jerked. *Patent completed.*

297. J. STUBBS. IMPROVEMENTS IN FURNACES OR FIREPLACES FOR THE PREVENTION OF SMOKE. Dated February 2, 1867.

This invention relates to a peculiar construction and arrangement of furnaces or fireplaces applicable to steam generators, salt pans, and other purposes, whereby the prevention of smoke is effected. According to this invention it is proposed to construct at the back ends of the firebars, and on each side of the furnace, two abutments or projections of firebricks or fireclay lumps, in order to prevent the smoke and gases from passing along the side wall of the furnace, and to deflect the same under an arch or bridge, also built of firebrick or fireclay blocks, and spanning the space between the said abutments or projections. This arch or bridge may be either solid or perforated, and the burning fuel is to be pushed under it whilst fresh fuel is thrown on to the front portion of the grate. The smoke and unconsumed gases from the fresh fuel pass under and over the firebrick arch or bridge where they are ignited and effectually consumed. *Patent abandoned.*

306. M. COCKERELL. IMPROVEMENTS IN LOCKS. Dated February 4, 1867.

This invention is particularly applicable to those descriptions of locks in which a latch or catch is employed, such as mortise or lap door locks. According to the present invention the latch is thrown back on one side by pressing the handle on the spindle, and on the other side by pulling it. A convenient arrangement for carrying the invention into effect is the following :—In the end of the horizontal bar forming the latch the inventor inserts a lever having its fulcrum at some fixed point within the case, to allow sufficient room for the play of the horizontal bar, with a spring between the lever and the frame of the case, which always tends to keep the latch or bolt shot. This lever abuts against a sort of balanced quadrant, and through which the door spindle passes. By pushing the spindle in one direction, or drawing it in the other, the quadrant presses against the lever, which itself draws back the latch, and on releasing the spindle the spring at the back of the lever again shoots the latch. To give sufficient play to the handles when mounted on the spindle, he forms a socket in the handle plate, into which the handle is free to move to and fro when pushed or pulled, or when the latch has motion otherwise imparted to it. *Patent abandoned.*

Trade News.

TENDERS.

ABINGDON.—For boundary walls and gates to the proposed new vicarage erecting at Abingdon. Mr. Edwin Dolby, architect:—Selby (brick wall), £224; Cleft (oak fence), £110.

BIRMINGHAM.—For the Masonic Hall and Club Buildings, in New-street:—Naden and Son, £17,000; H. B. and N. Smith, £16,950; Hardwick and Son, £15,985; Matthews, £15,850; Parnell and Son, £15,500; W. and J. Webb, £15,078; Moffat, £14,896. (The tender of Mr. Moffatt, not being in accordance with the form of instruction issued, the next lowest—that of Messrs. W. and J. Webb—was accepted by the directors.

BARKBY THORPE.—For alterations and additions at Barkby Thorpe, near Leicester. Mr. R. W. Johnson, architect:—Halliday and Cave, £1,415; Fast, £1,310; Herbert, £1,199; Osborne, £1,183; Neale and Sons, £1,122 10s.

CLAYDON.—For alterations and additions to the Parsonage House at Claydon, Oxon, the incumbent providing stone, sand, and hauling. Mr. Edwin Dolby, architect:—Waller, £307.

CROYDON.—For villa residence for Mr. John Moore. Mr. W. Lambert, architect:—Glaskin, £5,011; Mansfield, £4,685; Adamson, £4,666; Calls and Son, £4,636; Francis, £4,590; Higgs, £4,517; Webb and Sons, £4,516; Newman and Mann, £4,502.

EXETER.—For house and smithy, at Cowley, near Exeter, for Mr. Thomas Blackall. Mr. Edwin Dolby, architect:—Woodman, £230; Mitchell, £227; Stevens, £226; Godbeer and Coles, £219 14s. 11d.; Inch, £207.

FINEDON.—For temperence hall at Finedon, Northamptonshire, Mr. R. W. Johnson, architect:—Whittering and Wallingdon, Finedon, £774; Watkin, Northampton, £900; Wilson, Kettering, £888; Burton and Co., Rothwell, £886; Perkins, Leicester, £826; Hendon, Finedon, £797.

FINEDON.—New schools, Finedon, Northamptonshire, Mr. R. W. Johnson, architect, Melton and Leicester:—Watkin, £690; Wilson, £695; Barlow and Britten, £665; Hensen, £660; Whittering and Wallington, £639.

HOLBORN.—Alterations to the Coach and Horses, High Holborn, for Mr. Charles Shalless. Mr. H Roberts, architect and Surveyor, Greenwich:—F. Fenn, £400; S. S. Josephs, £317; Messrs. Hoare and Postlethwaite, £265.

ISLINGTON.—For building a dining hall, &c, at the Agricultural Hall, Islington:—Carter and Sons, £11,850; Wiltshire, £11,697; Perry, £10,777; Williams, £10,610; Axford, £9,984; Shawman, £9,863; Webb and Sons, £9,598; Hill and Keddell, £9,205; Richardson, £9,150; Brass, £8,887.

KETTERING.—For works in addition to premises at Kettering, North Hants. Mr. R. W. Johnson, architect:—Hawthorn, £365; Wilson, £352 10s.; Buswell and Henson, £339.

KETTERING.—For works at Kettering. Mr. R. W. Johnson, architect:—Wilson, £451; Hawthorn, £439.

KINGSCLERE.—For alterations and additions to Woodlands Parsonage, near Kingsclere, Hants. Mr. Edwin Dolby, architect:—Rabbitts, £175.

LONDON.—For alterations at 15, Bridgewater-square, for C. Berg, Esq. Mr. Thomas J. Hill, architect:—Moreland and Burton, £765; England, £749; Perry (accepted), £568.

LONDON.—For a manufactory, Norman's-buildings, St. Luke's, for R. Sheppard, Esq. Mr. Thomas J. Hill, architect:—Moreland and Burton, £3,398; Page, £3,220; Taylor, £3,150; Anley, £2,725; Perry, £2,675; Sabey, £2,390.

LONDON.—For works in Boundary-street, Shoreditch, for R. C. Nettlefield, Esq. Mr. Thomas J. Hill, architect:—Pritchard, £275; Brown and Sons (accepted), £198.

LONDON.—For works at Tottenham, for W. Robinson, Esq. (Second Contract). Mr. Thomas J. Hill, architect.—Pattman, Bros. (accepted), £948.

NEW BUILDINGS FOR LEWES UNION.—H. Curry, Esq., architect:—Jabez Reynolds, £15,152; Myers and Sons, £14,677; Keeble, £14,365; Howell, £13,955; Hart, £13,894; Kirk, £13,715; Nightingale, £13,484; Sawyer, £13,333; Heritage and Son, £13,305; Henshaw, £13,301; Higgs, £13,272; Simms and Martin, £12,946; Card and Son, £12,875; Cheeseman and Co., £12,810; Peerless, £12,552; Berry, £11,903; Thorn and Co., £11,733; Chappell, £11,397; John Perry, jun., £10,651.

PUBLIC HALL AT SOUTH NORWOOD.—C. T. Barker, Esq., architect:—Carter, £2,300; Carter, £2,250; Myers, £2,200; Nixon, £2,198; Henshaw, £2,145; Higgs, £2,065; Pollard, £1,775.

ROTHWELL.—For farm premises at Rothwell, North Hants. Mr. R. W. Johnson, Melton and Leicester, architect:—Sharman, Kettering, £675 10s.; Barlow and Hanyon, Harbro', £668; Austin, Rothwell, £628; Wilson, Kettering, £619; Barlow and Britten, Rothwell, £560 16s.; Haycock, Rothwell, £493 18s.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

PROPERTY SALES.

SEPT. 11.

AT THE MART.—By Messrs. J. and E. Baddeley.—Leasehold three houses, Nos. 10, 32, and 34, Richard-street, Commercial-road, producing £63 16s. per annum—sold for £385.

Leasehold, two houses, Nos. 51 and 53, Jane-street, Commercial-road, producing £44 8s per annum, term similar to above, at £15 18s. per annum—£255.

Leasehold house, No. 18, Walburg-street, Cannon-street, St. George's in-the East, let at £21 12s. per annum, term 28 years unexpired, at £7 4s. per annum—£135.

Leasehold house, No. 24, St. George's in-the-East, let at £18 per annum, term 25 years unexpired, at £6 12s. 3d. per annum—£105.

Leasehold premises, No. 10, Alfred-terrace, Alfred-street, Mile End, let at £18 per annum, term 50 years unexpired at £4 6s. 3d. per annum—£165.

By Messrs. Temple and Moore.—Leasehold, two residences, Nos. 3 and 4, Rose-villas, Chonmert-road, Peckham, producing £68 per annum, term 77 years unexpired at £8 per annum—£620.

Leasehold, four houses, Nos. 1 to 4, Hannah Cottages, Norfolk-street, Chonmert road, producing £61 4s. per annum, term expiring in 1945, at £6 8s. per annum—£480.

Leasehold plot of land, situate in rear of Bedford-street Norfolk-street, aforesaid, term about 80 years unexpired, at a peppercorn—£25.

Leasehold residence, No. 2, Belle Vue-villas, Nunhead lane, Peckham, let at £50 per annum, term 46¼ years unexpired, at £13 10s. per annum—£300.

Leasehold residence adjoining the above, being No. 1 Albert-villas, let at £58 per annum, term and ground-rent similar to the above—£390.

SEPT. 12.

AT THE MART.—By Messrs. C. C. and T. Moore.—Freehold business premises, No. 184, Brick-lane, Spitalfields let on lease at £60 per annum—sold for £1,000.

Freehold house, No. 14, Brown's-lane, adjacent to above let at £30 per annum—£410.

Freehold house, known as Alice-cottage, and 8 acres of land, situate near Bagshot, Surrey—£800.

Freehold residence, known as Arno Cottage, Luton-place Greenwich, annual value £50—£790.

Leasehold two houses Nos. 12 and 13, South-terrace Grosvenor Park, Camberwell, producing £64 per annum term 52 years, at £10 per annum—£710.

Freehold house, No. 7, Sugarloaf court, Leadenhall-street City, let at £27 per annum—£700.

Freehold house and shop, No. 32, George-row, Bermondsey, let at £21 12s. per annum—£300.

Copyhold house, No. 1, Rhodeswell-road, Stepney, let at £12 per annum—£170.

Leasehold house, No. 1, Prospect-row, Back-road, St. George's East, and a house, No. 1, Prospect-place, in rear producing £32 per annum, term 18 years unexpired, at £ per annum—£200.

Leasehold three houses, Nos. 7, 8, and 41, Essex-street Commercial-road, producing £39 per annum, term 19 years unexpired, at £3 3s. per annum—£155.

Leasehold house, No. 24, Morpeth street, Victoria Park annual value £22, term 59 years unexpired, at £4 10s. per annum—£150.

Leasehold twelve houses, Nos. 3 to 14, Industrious-place Beadonwell, Kent, producing £124 16s. per annum, term 99 years from 1859, at £4 10s. per annum—£990.

Leasehold 19 houses, being Nos. 1 to 12 on the west side and Nos. 3 and 4, on the east side of Bere-street, Ritchill also Nos. 1 to 5, Garden-place, in the rear, producing £209 19s. per annum, term 26 years unexpired, at £70 per annum—£480.

Lease and goodwill of the business premises, No. 4 High-street, Whitechapel, term seven years unexpired, £50 per annum—£300.

Leasehold four residences, Nos. 9 to 12, Coborn-terrace Bow-road, producing £159 per annum, term 50 years unexpired, at £62 per annum—£1,115.

Leasehold two houses, Nos. 45 and 47, Jane-street, Commercial road, producing £42 18s. per annum, term 99 years from 1801, at £4 15s. per annum—£250.

AT THE LONDON TAVERN.—By Mr. Fuller.—Freehold building land situate in the parish of Dorking, Surrey: Lot 1, sold for £400. Lots 2 to 15, together, £1,930. Lot 16, £460. Lot 17, £230. Lot 18, £185. Lot 19, £21 Lot 20, £210. Lot 21, £360. Lot 22, £110. Lot 23, £1 Lot 24, £120. Lot 25, £175. Lot 26, £800.

SEPT. 13.

AT THE MART.—By Mr. Thos. Dracott.—Leasehold hou and workshops, situate in West-street, Hackney, producing £67 per annum, term 50 years unexpired, at £11 per annum—£350.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Charles Davis, Selhurst, builder, Oct. 3, at 11—Oswa Morgan, Albert road, Kilburn park, builder, Sept. 24, 11—Henry Anthoney, Allen road, South Hornsey, pl terer, Sept. 27, at 12.

TO SURRENDER IN THE COUNTRY.

William Bellringer, jun., Truro, painter, Sept. 28, at John Martin, Reading, general smith, Oct. 5, at 11—El Roberts, Penrhyndendraeth, Merionethshire, joi Sept. 27, at 11—Henry Vernon, Hartford, Cheshire, joi Sept. 28, at 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

Nov. 8, J. N. Bodley, Avenue road, Camberwell, carp ter—Nov. 14, J. E. Copper, Plumstead, builder—Dec. 5, E. Matson, Kingsland road, mason—Nov. 8, J. W. Gra brook, Walbrook, iron merchant—Nov. 15, G. W. Jenki Finchley, builder—Nov. 15, J. Wadson, Hammersmi carpenter—Nov. 19, J. Anstee, Chipping Barnet, bri layer—Oct. 10, S. Marsland, Sale, Cheshire, joine Oct. 22, W. Rees, Merthyr Tydvil, builder—Oct. 15, Gamble, Middlesborough, joiner—Oct. 7, E. Davies and Hailes, Birmingham, engineers—Oct. 14, J. Morgans, W cester, carpenter—Oct. 15, C. B. Wright, Leicester, carp ter—Oct. 8, H. Penfold, Marden, builder.

PARTNERSHIPS DISSOLVED.

Harrison and Fergusson, Manchester, iron manufactur —Smeeth and Beard, iron merchants, Bilston—Carter a Sons, Upper Holloway, builders—Coles and Turn Southam, Warwickshire, ironmongers—Dean and Sheffie Chancery lane, architects—Burgess and Gayton, St. Joh road, Hoxton, house decorators—The South Wales Ir mongery Company.

DIVIDENDS.

Oct. 1, G. Hodgson, Sunderland, timber merchan Sept. 28, J. Weston, Horsely Woodhouse, Derbyshire, manufacturer—Sept. 23, M. Harvey, Heage, Derbysh blacksmith—Sept. 27, J. Pickles, Halifax, builde Sept. 27, S. Butterfield, Halifax, gas engineer—Sept. J. Jordan, Darlington, house painter—Sept. 23, S. M'K zie, Liverpool, builder.

SCOTCH SEQUESTRATIONS.

William and Andrew Murdoch Kelly, Glasgow, slat Sept. 17—David and William Lockerbie, builders, Sept. at 11.

THE BUILDING NEWS.

LONDON, FRIDAY, SEPTEMBER 27, 1867.

HAYLING ISLAND, AND ITS PROPOSED IMPROVEMENTS.

ANOTHER Brighton, but without its glare of artifice and fashion! was the impression made upon us as we stood the other day on a splendid beach facing an expansive sea near a great British citadel. Devoid, at present, of stately crescents and glistening esplanade, the island of Hayling, comparatively isolated, and, till lately, only accessible by a ferry, yet possesses on its southern coast a far firmer beach, of gentle declivity, than that of its better known eastern rival—a sort of compact, sandy shingle, in which the foothold of the seaside promenader is much firmer and infinitely more endurable, besides offering to the sea-bather unequalled advantages. More than this, as a watering place, destined, in a few years, to take an enviable position, when some of its more fashionable sisters of the coast have satiated the pleasure-seeker of seasides, and have sunk in the scale of public favour, South Hayling, from its bay-shaped coast line, has charms and advantages peculiarly its own. Though one object of our visit was to inspect the designs submitted in competition for laying out 200 acres of land for building and recreation purposes, we will here devote our attention to the island itself—its capabilities and prospects. With Spithead to the right, bounded in the distance by the undulated outline of the Isle of Wight and the wide expanse of open sea to the left, the spectator upon Hayling beach has a far more varied prospect than that presented by other watersides, where a monotonous and unbroken sea view becomes tiring to the eye. Although Hayling is insufferably flat, sheltered from the north by Portsdown Hills, and the east by a jutting promontory, we found the air salubrious and invigorating; while the scantiness of vegetation on its outskirts is compensated for by the fertility of the central part, judging from the growth of timber and the rich foliage. From information we gathered on the spot, the soil and subsoil appear favourable for building purposes, being gravel with a clay subsoil. Both kiln and clamp bricks are made—the price of brickwork averaging from £12 to £13 per rod. We were unable to obtain the datum levels, but from a trustworthy informant the rise and fall of tide is considerably less than at many other places, which we think may be attributed to the proximity of the Isle of Wight, doubtless influencing the flux and reflux of the tide. The price of land, we are informed, facing the sea is about £350 an acre; and, comparing this with land similarly situated at Southsea, Brighton, Hastings, &c., is very inviting. It is strange, indeed, that the sea frontage of Hayling, upwards of four miles in length, has scarcely been built upon, save a few fragments of crescents and terraces, with commonplace Classic exteriors, and a large villa in the Italian style, the marine residence of G. G. Sandeman, Esq., and in this catalogue we must not forget the Royal Hotel. An exposed and unsightly range of coal vaults, marking an unfinished row of houses, rather detracts from the merits of this particular site; and if, as we are informed, this portion of the sea front is about to be purchased by a Land and Investment Company, the sooner this blemish is removed the better. Are we to surmise that the basements of these interrupted buildings are too low for efficient drainage, or from a defective system of sewerage?

Such are the general features of a locality well calculated to enlist the attention of capitalist, architect, and landscape gardener, and the competition just closed may indicate how the capabilities of one portion at least have been dealt with by the competitors. Of the designs submitted for laying out and utilizing 200 acres of land in the southern part of the island, the instructions and conditions appeared in the BUILDING NEWS. Thirty-four sets of designs have been sent in response to the invitation, and some of these from landscape gardeners—at least, it would be considerate to suppose so from the ludicrous and childish travesties of buildings, or attempts at architectural design displayed in a few instances. We may here ask, in reference to the selection, why the plan of allowing every competitor to vote for those designs he thought entitled to be premiated was set aside? and we ask this, not from any desire to undervalue the decision arrived at, but simply from our inability to discover the abandonment of a mode of selection approved of generally as faultless. Generalizing the plans sent in, they may be arranged under two classes—those which have retained the existing features of the estate, preserving the Manor House and standing timber; and those which have supposed a clean sweep to be made of the property, and treating it *de novo*. Now, of the two treatments, that which commends itself as the most common sense, and which unquestionably, to our minds, evinces the soundest judgment and taste, is that which preserves, as far as practicable, the features of the estate. It struck us forcibly, indeed, that any unnecessary destruction of foliage or trees would be a sheer and irreparable blunder in a neighbourhood whose outskirts are bereft of folial shelter. Many estates have been relentlessly denuded of their timber when judiciously-left clumps and belts might have added to their marketable value and attractiveness. Unquestionably, the problem, as placed before the competitors in the present instance, was wide and not very easy. To obtain a financial result in the shape of large ground rent, at the same time keeping up the rural character of the estate, presented at the onset a difficulty too aptly surmounted by the weighty consideration of return.

We think, however, that in the case of the first and second premiated designs an excess of caution has been exercised, and neither of them would be the worse for a judicious—not ruthless—opening up of the wood by cutting more paths and a few vistas. We are sure also that if the curves of the roads were made a little more tortuous the beauty of the drive would be greatly increased without sacrificing utility. There is no need to have sharp or frequent curves, but by shifting portions of roads to the north or south by so little as twenty yards, the flowing lines dear to the landscape gardener would be obtained without appreciably adding to the cost of construction. We make these remarks because the plans of Messrs. Hennell and Crickmay are of merit, though they may be much improved by very trifling alteration. The special merits seem to be these—that the existing roads are widened and improved, and that few new ones are made; that the wood, which forms the chief natural feature of the estate, is scarcely meddled with; that a large number of sites for houses are provided, and that a class of house not too costly is contemplated. Mr. Hennell shows about 230 houses for which he furnishes plans and elevations, including nine or ten of different styles and pretensions. These are very neatly executed, as is the bird's-eye view of the whole estate, with indications of its situation relative to Portsmouth and other places. The pavilions for the cricket and archery grounds are tasteful. It is proposed to introduce a small lake near the centre of the wood; this would have a very good effect, and could be accomplished without difficulty. The second premiated design, "Onward," is the first of two, by Mr. G. R. Crickmay. It bears a strong likeness to that by Mr. Hennell, having the same merits and defects, but the number of houses proposed is only 97, and the amount of estimated ground rent £3,375, whereas Mr. Hennell has about 230 houses, whence he reckons on clearing a ground rent of only £1,600. The more moderate estimate must have gone a long way with the experienced Mr. Longcroft, than whom few are better acquainted with the value of land in the neighbourhood. This design introduces a small lake of artificial character in the wood, and proposes foot bridges and picturesque pavilions on a somewhat extensive scale. A winter garden and hotel are also contemplated. A well coloured view is given. It may be as well to say here that all the competitors have provided the required archery and cricket grounds.

The third premiated design, under the motto "Spectator," differs entirely from the other two, and, though of considerable merit, from a strictly landscape gardening point of view, has been treated as if it were for a span new place, without a tree existing on it. The planting is therefore too artificial, and the plan gives no indication that a large and well grown wood has been in existence for a long period. The roads are much curved, but the communication, if more elegant, is less convenient than that provided in the two other plans. Mr. Milner, of Norwood, the author of this design, was, we believe, a pupil of Sir J. Paxton. The beauty of this plan for laying out the ground is incontestible, but although deserving a premium, it is not one which we should recommend for adoption. The figures of the estimate are also against it. Houses 125, ground rent anticipated £4,180.

Among the unsuccessful plans we were enabled to inspect was one marked "Onward," No. 2, by Mr. Crickmay, of Weymouth. The author wisely retains the trees, utilizes the present roads, forms other more or less "picturesque" roads, proposes the erection of an hotel on the site of the Manor House, forms a winter garden, pavilion, and park. Indeed, the prominent features of this design seem to make it almost identical with the premiated one by the same author. The plan seems studded with detached villas of decent size, the central Manor wood being simply traversed by circuitous walks. The principal suggestion in this plan is that of throwing the footpath and ditch into the road, and forming a new path within a reserved belt of trees, shrubs, and grass, which thus constitutes an effective screen of foliage between the road and its footpath—a good idea for all suburban roads where comfort is preferred to dust. Following the same simple suggestions of common sense, "Woodman Spare That Tree" is conceived. A cleverly coloured bird's-eye view shows the design. The villas, which seem to be well-considered Gothic erections, are sparsely scattered, and we think the author has been rather too sparing of some of his principal sites, the foreground near the beach being left, apparently, for the growth of timber. The central plantation, thick with foliage, is divided into quarters by two straight roads at right angles, a fountain occupying the centre. Altogether, the author has studied picturesque effect in his general disposition of the estate, devoting about half the area to building, and the rest to woodland scenery.

"Fair Play is a Jewel" gives us a pedantic design conceived from a speculative builder's point of view, with the idea uppermost of developing the central space, which is entirely swept of its timber, into circular cricket fields and ornamental water, the latter occupying the central position, and being a large quatrefoil-shaped pond. The author has certainly developed the geometrical garden style at the expense of shelter and rurality. The north, east, and west sides of the ground are crowded with semi-detached houses which, the author tells us, are arranged so that no house overlooks the rear of its neighbours, while all command a view of park and sea. The only redeeming part of the plan is its provision for a bye-wash in case of heavy

floods; and the competitors generally seem to us to have ignored the sewerage, or provided for it each after his own manner. Stiffness and rectangles seem to possess the minds of some competitors, probably because easier of accomplishment than curvilinear forms; at any rate, their ideal of beauty seems to consist in straight roads and crescents, whatever Price or Repton may have said to the contrary. It is of little use telling some men that a straight line is the most uninteresting of all lines, and that a wave line is the most beautiful because varied—certainly the most appropriate on a dead flat where variety is more in unison with the rural aspect of the scenery.

The author of "Labour's Rest" certainly seems to have spared himself the labour of designing anything save that which squares and set squares did for him, so simply childish is it; while "Nemo" gives us a straight road intersected by others, a large pond dotted with circular islands, whose submersion would be an improvement. His elaborate report, that would have been better unaccompanied by the plan, shows us a moderate ground rental, building plots of respectable size, besides dealing with existing features of the estate in detail. "Quod erat demonstrandum" solves the problem geometrically, at least, regardless of the present features; while "Fiat" indulges in parallelograms great and small; though we must not forget his right-angled triangular archery ground, the longest side of which he considerably overmeasures in his report as 1,300ft.; the actual available length, if we correctly scaled his drawing, being not more than 800ft. "Bodhyfryd" is an overbuilt design of detached villas, appropriating the present wood as an archery ground. The design for the pavilion is poor, of an Assyrian type. Turning from those plans which show the square and compass development, we may notice one which exhibits to an excess the suburban and winding style of landscape, if we may so term it. Detached villas, crescents, and rows mingle with clumps of trees promiscuously, the centre space being occupied by a church. The author of "Kunst Macht Gunst," we should imagine, would have consulted his interest better if his vivid show plan had been unsupplemented by the wretched and abortive attempts at greenhouse Gothic that accompany it, nothing being in more ridiculous taste than the overgrown finials to the gables of the cricket and archery buildings. "Houses to Live in and Places for Recreation" is the motto of a plan too bad to look at; the mixture of classic pilasters and embattled parapet in the archery building being beyond comment. "Rough and Ready" shows a rather more artistic conception, retaining the ruralesque character of the estate by avoiding repetition and multiplicity of parts.

Overlooking a few other unimportant contributions, the plans as a whole show a latitude of treatment that might have been expected when we consider the terms of the competition and the discretionary power given to the candidates. As we have said, ground rental and the retention of a rural aspect were conflicting considerations in the solution of the problem, a remark borne out by the wonderful discrepancy the competitors show in their estimated yearly rentals—the highest estimate being £14,300, the lowest only £900. The selection, at least, has fallen on those who have had the common sense, at any rate not to efface the natural beauties that at present exist—a merit Mr. Longcroft seems to have wisely considered. One feature developed to an extraordinary degree by some competitors is, to our minds, the least attractive in a sea-skirt locality where the sight of water at some periods of the year would be almost insufferably monotonous—there is ,however, no reason why the existing moat should not be made available for the purpose of ornamental water. Another remark we must make is the defect of acute angles in laying out roads, noticeable in some designs—a mistake to be avoided both for building plots and in the landscape arrangement of a park.

We have yet other jottings to make, more particularly touching this happily situated neighbourhood, which we shall reserve for another article, simply adding in conclusion that the means of communication now making Hayling accessible from the mainland, by the London South Western and South Coast Railways, the establishment of a South of England Oyster Company—already, we hear, a successful undertaking—are contributing to make this hitherto deserted island a fashionable retreat and suburb. We may here add that obligation is due from the people of Hayling to Mr. Longcroft and Mr. Trigg for their energetic services to attain this result.

THE SPRINGS AND WELLS OF LONDON.

A PARAGRAPH, copied from the *Parochial Critic*, to the effect that water conduits on the ancient principle of such contrivances, ought to be re-erected throughout London, has gone the round of the press. The same authority contemptuously disparages the drinking fountains of the metropolis, which are really of much value. It is difficult to reconcile the two theories thus advanced, and it would certainly be found impossible to reduce the first to practice. Their propounder appears to be oblivious of, or to have forgotten that the method of obtaining water for the use of the people of London, like the habits of the people themselves, have been revolutionized since the days of conduits.

In those remote and primitive times, springs existed in many parts of the city and its suburbs, and limpid streams bubbled from them down to the margin of the silvery Thames. The bubblings which prevail on the banks of that noble river now are of a far different kind. Those who expect to find any stream flowing in the neighbourhood of Walbrook, and "serving the heart thereof" will be disappointed. Where the Old Borne, which flowed from St. Giles's, down to the Fleete is, High Holborn may answer. The Holy Well in the Strand is by no means so pure a fountain as it once was. Clarke's Well is not now remarkable for translucent fluid, and the same may be said of Skinner's Well, Clement's Well, Fagge's Well, Bagnigge Well, and many others. The river of Wells which, running under Old Borne bridge, and Fleete bridge, once floated "ten or twelve ships of the navy" at the same time, and then flowed on to the Thames, is nowhere. Perilous pond (Peerless Pool) is gone, and, in short, the whole of the sources whence conduits were supplied are dammed up, or have disappeared for ever. Old fashioned conduits are an impossibility therefore; and it is only surprising that in the year 1867, when water companies are in full swing, and artesian wells have pierced the chalk seams and the green sand beneath them in search of water, that any sane individual should dream of their resuscitation.

The immense run upon the chalk and sand springs of the metropolis has almost dried them up too, and at any moment they may stop payment altogether. But for the "backing up" of old Neptune this catastrophe must have happened indeed long ago. The outcrop of the sand of the London basin flows down towards the sea, and is supported by its waters, just as in the delta of the Ganges, the rain water falling on the sand is backed, and kept in that sand by the salt water, and whence arises the popular notion that sand removes salt from water.

The springs of London are in communication with the sea, through the medium of the River Thames, but they depend for their supply to the rain falling on a small portion of the outfall.

With the sea, through the medium of the river and our well water, levels rise and fall with the tide. It is believed by some that by penetrating through hundreds of feet of chalk, fresh supplies of water may be obtained. We believe, on the contrary, that, so far as the London basin and its lower strata are concerned, we know exactly the extent of their yield—whether for the purpose of supplying water conduits in our streets, or liquor vats in our breweries, no amount of extra boring or tapping will cause mother earth to give up more fluid wealth than she holds in trust for our use.

JOTTINGS IN LONDON.—No. III.

(By a Roving Correspondent.)

IT is strange to muse on the glories of the past. What raptures did stucco awaken; and the stuccoists achieved immortal glory. There is not a pile of stucco in terrace or in block in the Regent's Park, in Regent-street, or in Belgrave-square, which does not figure among the monuments of London on steel plates, adorned with the name of Nash or Decimus Burton. These things were really received as the memorials of a new era—the Georgian era—and they were indeed heavenly after the dreary brick of the pig-tailed age.

There are miles and acres of this grandiose work now in Tyburnia, South Kensington, South Belgravia, and other places formerly decorated with the extinct names of Bayswater, Pimlico, Brompton, Notting Hill, &c. Who thinks of engraving these places, although the hundred porticos of Burlington-road are of the Ionic order, succeeded by one hundred more of the composite order at Saxe-Coburg Gate! It occurs to nobody to inform us in a description of London that the windows of Alexandra-terrace are chastely modulated with rows of pork-pie pediments on the first floor, and of cocked hats on the second floor; and that the style of Tidbury-square is Ionic on the ground floor, surmounted by Doric on the first floor, or *vice versa*, for it is much the same thing. It cannot be that familiarity breeds contempt, for if all these edifices had been truly monumental, each one would assuredly have been described and engraved. I am inclined to look upon it as an advance in taste, not that I can say much on that head: but the snake is casting a skin. Whoever will look back to an Illustrated London of 1825, 1830, or 1835, will find a mass of shams paraded as monuments and now relegated to oblivion. There were, however, people who felt self-satisfied to pay up for half of a Roman cement wing of a Regent's Park-terrace.

Gilding has many times been asked for, and but little of it obtained, although it is one of the most effective modes of external decoration. We have heard something about the climate of London, but it was 130 years before the old ball and cross of St. Paul's were relegated to the Colosseum, and 140 before the dragon of Bow fulfilled the prophecy of meeting the grasshopper of the Royal Exchange in a builder's yard, thereby bringing down on the latter building the doom of burning. Indeed, the weathercocks of what used to be a forest of spires, now thinned down, show a goodly array; and their sheen, in a summer's sun on a bright day, is one of the features of the fair display from the waterway or bridges. Gilding will last long enough in London at the head of a steeple above the coal smoke, and it will last long enough in it. The introduction of gilding on the Houses of Parliament has answered well; it gives a still life to the view, and it is much to be wished that gilding should be still further applied to that building. Its application to the British Museum, as well to the pediment as the railings, was a commendable deed; but not the least marked instance is that of the Charing Cross Station. Gilding is, indeed, one of the most striking means by which that effect of brilliancy is produced in

ris in its street scenes, for Paris does not fer itself so much in prospect, though there e views from some of the approaching railays and neighbouring hills. Where a city s a waterway, as London, there gilding tells; ich is the case at Venice when seen from front rear, at morn or eve; such are those magical intings of Stamboul in the rising or setting n, with the crescents gleaming from every me and subsidiary cupola, heightened at ndown by the flashes of light from the any casements of Scutari. These effects in enice and Constantinople are greatly deendent on the inspiration of the sun, but lding is a constant sunlight, gleaming at ght under gas or moonlight, as even on a ll day.

The group in Trafalgar-square of the Union ub and College of Physicians is an admired ample of the Georgian era. These Siamese ins, thus linked, were noted for different iosyncracies. After their birth, and while ey were bran new, they paired, indeed, well ough; but, as time went on, the club stored from year to year its wonted purity, it the College advanced to sooty and grimy ackness, held to shadow forth the solemn ack of its learned members and its underkers. Covered with the unlearned dust of ars, it long dimmed the square. Lately, me new light having broken in upon the llege folk, they have beset themselves to aning it, and it must be owned it looks ne the worse. With a little care on the rt of architects, much of the dinginess of ndon might be spared; and this is worth oking to, seeing that stone is at length spread g into every street. The neighbourhood of e Mansion House is not noted for brightss, but there is one building which, whater may be the plight of those around, is ways clean—as clean as any building in Paris, d far cleaner than many—and that is the nk of England. Look at it any time you ll, and it is clean and clear, and Sir John ane's reputation owes as much to this as to s design. Many folks know why, but it ay be worth telling. As the Bank managers, ne of whom live in the building, have no sh to be burnt down, they keep their gines ever ready; and so that this may be right, once a month they are turned out in e early morning, and set to play. With a tle wisdom they are set to play on the outer d inner walls, and as these are washed down m time to time, so soot and grime fade ay, and the stone and its carvings are kept er new.

The Bank has, it is true, opportunities for do g this which other buildings have not, and that ses from its outer wall being made, so far may be, without openings, so as to be held ainst onslaught from without. The engine se can, therefore, break few windows. ere are, however, other buildings where s can be done in many parts, as St. Paul's. here there are windows, nothing is easier n to make ready boardings, which can be up on the cleaning and washing days, and ry little work will dislodge a lot of filth. fitting care of buildings—not only mending d repair, but cleaning—is most needful, for it doing little to heap up wealth in new uses and buildings, if we do not make the st of those we already have; yet it too often ppens that we leave a church or a statue to k after itself until it is lost in utter filth.

Those who like to see ghosts have a chance. fair bit of old London has started back to e light, and we may see what our grandsires w. At the corner of Lothbury and Old wry—we believe where the Jews' synagogue the Jewry once stood—is a range of dim and ly houses, thrown into one group, called w Bank-buildings till Old Bank-buildgs were swept away, and now, we believe, they named Bank-buildings. Who was the hitect I cannot at the moment find—Taylor Soane, or who between the time of the ams and Soane—but it belongs to that classic time, a monumental structure of its kind. It is chiefly of stone, streaked with long stripes of stone, and slightly marked with meaningless ornament, which may belong to Dance. For a long time it has been little thought of, though it has been brought out by the opening of Moorgate-street and Lothbury, so that it stands in what may be called the Bank Place, where is the pleasing Corinthian corner of the Bank.

Many have thought it ugly, and have wondered if our grandsires ever thought better of it, for its bare lines were marred by its dusky coating as well on stone as brick. What our fathers thought we may now, for whereas other portions have been doctored, and the symmetry broken in upon, the centre has now lately been cleaned up. It is bright, fresh, and spick and span new, and, we cannot help saying, pleasing—quite as much so as many of the new buildings. Indeed, newness, freshness, and smartness in a building draw one's eye as much as the freshness and youth of a girl, although the features may be bad, and the outline showing a marked defect. When the girl becomes an older woman, and a building shows the wear of time, then we see all the faults unredeemed. If we could see London with its new Bank wings by George Sampson, Sir Robert Taylor, or Mr. Soane, its Harley-street houses—all fashionable, and with newly-married couples—we should acknowledge a springtide freshness, redeeming our grandfathers from much suspicion of diseased eyesight.

Talking about bygone architecture, the new lodges in Hyde Park and the Park-lane side belong to it in style, and will belong to it in oblivion. After a protest in the House of Commons, these examples of the neat and simple are now staring out in naked ugliness.

We owe many things to revivalists and ritualists. Who knows, we may, before long, have to design confessionals, if indignant fathers do not forbid the practice. The floral decoration of churches for old and fantastic celebrations has, however, enlisted many of the gentler sex in the cause of art more profitably than in church embroidery, which too often repeats old patterns, without demanding artistic composition. The arrangement of flowers does, however, awaken the sensibilities of those having minds; and as flowers have colour, so that artistic element colour—too much forgotten by many who call themselves artists, I may say architects—must be brought into play. It may happen, when mediæval mummery and the manufacture and reproduction of designs, taken up only because they are mediæval, shall have passed away, that we may find art truly a handmaid of the church, and that in consistent decoration we shall make its various branches tributary in just and becoming homage.

BUILDERS' CLERKS BENEVOLENT INSTITUTION.

WE have before us the first annual report of the committee of this useful society. In presenting their report, the committee remark that the claims that recommend this Institution to the support of the benevolent are many, but they can urge none more forcible than the fact that it represents an educated class who are engaged in a trade where permanency of employ is very uncertain and the occupation very sedentary, and who are, in many cases, unable to make any adequate provision for the necessities of old age, and to meet the requirements of occasional illness, family troubles, or loss of employ. They regret the absence of support of many employers in the trade, but earnestly hope that as the principles of the Institution (non-union ones) become known, it shall number them amongst its supporters. The committee announce that Mr. William Henshaw has consented to act as President of the Institution for the ensuing year, and they desire it to be known that the meetings are held on the last Monday in every month, at 8 o'clock, p.m., in the Society's offices, 14, Bedford-row, W.C.

The report was read at the first annual general meeting of the Institution, which was held on Monday, the 23rd inst., Mr. William Henshaw, President, in the chair. The balance-sheet showed an amount to the relief fund of £109 8s. 6d., and to the asylum fund £227 11s., making, with interest on the banking account, a total amount of £638 13s. 4d. a highly respectable income for the first year of a benevolent institution, especially when the financial reminiscences of the past year are taken into account, and shows that nothing but great and unwearied perseverance on the part of the committee, aided by the favourable countenance of their employers, could have placed this society in such a prosperous condition. The disbursements for the year amount to £161 1s. 11d., and the balance at the bank and in the hands of collectors to £477 11s. 5d. Mr. E. Conder, in moving the adoption of the report, congratulated the committee on its highly favourable nature. Mr. G. J. Pritchard seconded the motion, which was carried unanimously, and the report and balance-sheet were ordered to be printed and circulated among the donors and subscribers.

The Secretary then read the list of officers who retired at this meeting, and also a long list of vice-presidents and governors, which showed to what an extent the Institution meets with the sympathy and support of the trade generally, concluding with the officers for election. The adoption of the list was moved and seconded, and carried unanimously; votes of thanks to the officers retiring from office having also been passed.

The Chairman said he considered that the present was an opportunity not to be lost by the builders' clerks. In the working of this their own Institution they had never been interfered with. They had started it themselves, they had drawn up their own code of rules, they had the entire management of it from the commencement, and, save with the encouragement of their support, the employers had not interfered in the slightest degree with whatever they chose to do. From the commencement, the objects of the Institution had been most ably advocated, and with what success he would leave the balance-sheet to tell, as it did most effectually. The society was now well afloat, and it only needed the personal exertions of the clerks to keep it so. He wished particularly to call the attention of all present to Rule 5. That rule struck him forcibly the first time he read it. It was the most liberal rule he had ever seen, and he admired the principles of it exceedingly. It gave the committee entire power when any case of urgent distress is brought to their notice of a builders' clerk or his family, through accident, illness, or loss of employment (except through his own misconduct), to grant from the funds of the Institution a sum not exceeding £10; also, in the case of the death of a builders' clerk leaving his family in destitute circumstances, to grant a sum not exceeding £5 towards the expenses of his funeral, and a further gratuity not exceeding £10 towards assisting his family. This he thought the most admirable feature in the Institution, and it received his warmest support. It was applicable to the most unforeseen circumstances that could occur. There was no delay, no trouble, no unnecessary obstructions towards its working, but it was quick and good in the aid it afforded, and excellent in the manner in which it was arranged. It was not confined in a party idea to those only who had been subscribers to the Institution, but with the true spirit of Christianity was applicable to all. He concluded by calling upon all the builders' clerks to come forward and show their earnest sympathy with such a cause by firmly and enthusiastically supporting the Institution that held such objects in view.

The Secretary desired to draw attention to the rules generally. He had found during his connection with the Institution—which was from the commencement—that a general misapprehension of the objects of the Institution existed amongst the clerks, and he wished to do away with this. The society was pre-eminently a benevolent one, not a benefit club. Its object was to assist the destitute at a time when that assistance was most needed; and the rules had been very carefully drawn up to enable the committee to carry out that object in the best manner possible. Some had found fault with the rules. He could only say to such publicly what he had told many personally, "come down to the committee meetings, and if you have any complaint to make, or any alteration to suggest, you will have a respectful hearing, the question will be candidly discussed, and if room is found for improvement it will be made."

After a cordial vote of thanks to the secretary and treasurer, and the chairman, the meeting broke up.

HERNE'S OAK

WE wonder how many celebrated oaks there are in the world. In England alone there is a whole forest of them, each one remarkable for its gigantic size, and still more deeply interesting on account of the historical or traditional associations which attach to it. No tree has, properly speaking, a history except the oak. The Winfarthing Oak, in Norfolk, for instance, is believed to have been called the "Old Oak" in the time of William the Conqueror. Indeed, according to the opinion of learned writers on the subject, this more than venerable—this very ancient—tree is probably fifteen hundred years old, and thus seven hundred years older than the Conquest. Its circumference at the extremities of the roots is 70ft.; in the middle it is 40ft. The Threeshire Oak, near Worksop, was so situated that it covered part of three counties—York, Nottingham, and Derby, and dripped over 777 square yards. But even this tree was a sapling compared with the Spread Oak in Worksop Park, which dripped over an area of nearly 3,000 square yards, or more than half an acre, and could have afforded shelter to a regiment of a thousand horse. On one of the estates of the Duke of Bedford there is a tree now growing called the Oakley Oak, having a head measuring 110ft. in diameter. Another, in Rycote Park, is said to have been extensive enough to cover 5,000 men. The Great Oak at Magdalen College, Oxford, which fell in the summer of 1788—its rushing sound alarming all the college—must have been a tree of goodly proportions in the time of Alfred the Great. This magnificent tree could have sheltered 3,000 men, for it flung its boughs through a space of sixteen yards on every side from its trunk. And in the village of Ellerslie, Renfrewshire, the native place of Wallace, there still stands the "Old Oak," among the branches of which, tradition says, that the Scottish patriot, with 300 of his men, hid themselves from the English. But more interesting than all these, if the interest be of a different kind, is Herne's Oak, which Shakspeare, in "The Merry Wives of Windsor," has made immortal. The identity of this celebrated tree has long been the subject of discussion. The result has not been eminently satisfactory. It is well known that there were two oaks in Windsor Park, both locally known as the Oak of Herne the Hunter—that is to say, opinion is divided as to which of the two was the tree supposed to be described by Shakspeare. A great deal has been written by Shakspearian commentators and others in favour of both trees, and it appears to us that the claims of both have been urged with equal ingenuity and ability. The latest writer on the subject is Mr. William Perry, wood carver to the Queen, who has recently published "A Treatise on the Identity of Herne's Oak, showing the Maiden Tree to have been the Real One."* Without entering into the details of so erudite a question, we may state briefly that Mr. Perry is strongly of opinion that the tree which stood near a spot called the Fairies' Dell, in the Home Park, Windsor, and which fell in 1863, was the tree, and not the one which was cut down in 1796. Mr. Perry argues his case very ingeniously, and at the same time very honestly, and we must say that he has produced better proof on his side of the question than the majority, at least, of his opponents have done on their side. We believe the balance of evidence to be decidedly in favour of the oak which fell in 1863. Among the believers in this tree is her Majesty, as was also George III., and Mr. Perry has executed a bust of the great dramatist out of the wood for the Queen. The neat little work before us contains several illustrations of the oak itself, and also an engraving of a casket which the author designed and executed out of it for Miss Burdett Coutts, to whom he dedicates his book. In a statement which accompanies Mr. Perry's book he appears to think that he finds incontrovertible evidence that he is right. The statement is certainly singular. It is this:—While working up a portion of this venerable tree into covers for the book under our notice, looking on the end he observed a great peculiarity. The annular rings accumulated in a healthy and vigorous manner up to a certain point, when they suddenly ceased, became almost imperceptible, then increased again in size, till they attained nearly their former width, afterwards gradually diminished towards the outer edge of the tree, where they finally became undistinguishable. Upon mentioning this phenomena to an intelligent gardener of fifty years' experience, without informing him in what wood he had observed it, the gardener remarked that the tree must have been struck by lightning, or blighted in some way, so as to have stopped its growth, otherwise such an appearance would not have been presented. It was in the nature of trees, as with human beings, when they arrived at maturity they began to decline, just as man does, but it was generally a gradual process; the rings in the trunk would become smaller and smaller by degrees, as the sap flowed less and less up the tree. Mr. Perry has since examined the wood more closely, and from the healthy part of the tree to the outside of the piece he has counted 164 annular rings. If to these are added 20 for the sap which was wasted away from it, and 44 years, which time at least it is known to have been dead, we are carried back as far as 1639 as the latest time when the tree could have been scared or blighted. How much earlier than this it may have been Mr. Perry is not in a position at present to prove, but considering that the rings are so small as to be scarcely discernible, and that some of the outer portion of the tree had been wasted away, he submits that it is not a very preposterous idea to assume it not improbable it happened during Shakspeare's time. Referring to the first edition of the "Merry Wives of Windsor," published 1602, we find no mention made of Herne's Oak, neither do we in the reprint of 1619. The first mention of it is in the first folio edition, 1623, so that the probability is that the story of Herne the Hunter existed before the tree was attached to it, which, subsequent to 1602, being blasted, the superstition of the age imputed it to the evil power of the spirit of Herne, who, according to the previous tradition, "walked in shape of a great stag, with huge horns on his head." We are, therefore, led to suppose that between 1602 and the date of Shakspeare's death, 1616, he perfected the first sketch of the play, by adding to it such information as he could gather, and such improvements as his maturer judgment suggested, and if we take the period of his retirement at New Place as the probable date when he calmly set himself to revise and improve his plays, collecting them together in the form in which they were given to the world in 1623—say, 1610 or 1612—we are thus brought to within 27 or 29 years of the date to which we can satisfactorily trace the blasting of Herne's Oak to have taken place. This evidence, says Mr. Perry, is not sufficient in itself to identify this tree with the play of Shakspeare, yet, when taken in connection with all the other points in favour of the tree which he has previously advanced, forms a powerful collateral evidence which the most sceptical cannot deny.

* London: L. Booth, 307, Regent-street, W. 1867.

THE ANCIENT CITY OF URICONIUM.

WE last week gave a summary of the proceedings of the Archæological Congress at Hungerford, in which mention was made of a paper on Wroxeter, "The Ancient City of Uriconium," read by Mr. H. Godwin, F.S.A., of Newbury. The following is a more extended report of that interesting paper. Mr. Godwin said:—I feel that some apology is due to the members of the Wiltshire Archæological Society for obtruding upon them a subject so foreign to their ordinary local researches. I assure you, gentlemen, that I should not have taken you so far out of your county had it not happened that I received the first intimation of your proposed meeting when I was at a considerable distance from my own. I was actually at Wroxeter, in company with its great explorer, Mr. Thomas Wright, and other members of the British Archæological Society, when the invitation to join you would have reached me, had my erratic movements been better known. As it was I did not receive it until some days later, when I had extended my peregrinations into Cheshire and Lancashire. To this invitation I replied that it was impossible for me to do justice to a local subject, for I had everything to learn and nothing to impart relative to this portion of Wilts, and that it would be alien to the very constitution of your society to descant on remote antiquities. My objection was overruled. I again declined, remonstrated, protested, but finally yielded. I put it, therefore, to you, whether in being thus thrust upon you I may not consider myself in the light of the aggrieved party. However, to compose our differences and mutual complaints, will you allow me to suggest that you should kindly consider my paper as substituted for one somewhat cognate, which might have been expected from this society on the Roman villa and tesselated pavement discovered at Littlecote, which I much regret are not accessible to us. These ancient remains are to be seen on the Watling-street road about five miles from Shrewsbury. The wall is upwards of 20ft. high and 75ft. long, and of a slender character (3ft. thick) compared with the massive wall of Silchester, which is nearly 15ft. in thickness. Watling-street is supposed to have nearly equally divided the city east and west. Three other walls which do not rise to the level of the ground, enclose these spaces. The first of these enclosures was nearly a parallelogram 226ft. long and 14ft. wide. The walls were much ornamented, and it was now paved with fine mosaics of varied and exquisite geometrical design—not so beautiful as those of Woodchester or Littlecote, but the most extensive yet discovered in England. The second or central enclosure was 30ft. wide, and paved with small bricks laid in zigzags; on the floor were found portions of broken pillars, the head of an axe, &c. This building is thought to have been a basilica, or public hall. The third enclosure was an open alley, 14ft. in width. Mr. Godwin then referred to the old wall, which reached a depth of 14ft. below the surface, and was connected with a series of vaulted rooms, in one of which was a quantity of burnt wheat, as though it had been a store room. To the south of these rooms were hypocausts, or chambers of hot air. In the sudatorium, or sweating room, were found two skeletons. In another room were discovered three skeletons, two of females and one of an old man in a crouching position. Near the latter lay a heap of Roman coins—132 in number, ranging from Claudius to Valens. In a small square chamber, in a rubbish hole, were found coins, hair pins, fibulæ, needles of bone, nails, bronze articles, stags' horns, tusks of wild boars, oyster shells, &c. Some steps led to a more important series of hypocausts. One apartment contained a reservoir of water. A wide gallery ran partially round the square, probably used as an ambulatory—an important feature in Roman baths. When it is remembered (remarks Mr. Godwin) that the mode of using the bath embraced the four gradations of the laconium, or heated room, the lavacrum or hot batch, the tepidarium or warm chamber, and the frigidarium or cold water bath, and concluded with exercise in the ambulatory, we are struck with the completeness of the ground plan of a public bath thus laid open by these excavations. The buildings on the west side of the bath are of a more private nature. From remains found, one of these apartments is thought to have been occupied by a worker in glass and fine metals. The remains of what is supposed to be the forum have been discovered. It is worthy of remark that the rooms must have been lighted from above, as no windows are visible in the walls. Two new kinds of pottery were discovered. Many curiosities have been brought to light, including artists' pallettes, metal mirrors, combs and pins of chignons (no new invention); also an oculist's stamp, used probably as a kind of patent or quack ointment for the eyes, called dialibanum, prepared by a physician named Tiberius Claudius, probably a Romanized Briton. The classical student is reminded of Horace's journey to Brundusium, when he had to lay by for a day to rest and doctor his eyes, while poor old Virgil took physic. Mr. Godwin here dilated upon the uses of the building described, illustrating his remarks by quotations from Martial, concluding with the following observations:—The city was mentioned by Ptolemy, the geographer, who flourished A.D. 139—171, that it was included in the Itinerary of Antoninus, A.D. 320, and that in one series of coins found in it, extended from Claudius A.D. 61, to Valens 364, the latter of which must have many years allowed for such remote circulation. Uriconium was large, for its walls, of which traces yet remain, formed a circuit of three miles. Uriconium was rich and flourishing, for it had public buildings, and domestic luxuries, and possessed some of the newest and rarest coins both in silver and gold. Uriconium was civilized, for its ruins display in the elegance of some of the capitals of its columns and statues, and in the beauty of the designs of some of its pavements and frescoes, considerable proficiency in art. Such was Uriconium, placed upon a slight eminence, sheltered in the rear by its guardian Wrekin, its painted walls, and glazed and glistening roofs,

›ping gently towards the Severn. The purple d grey hills of the Long Mynd, and Caer Cara-c, formed a bold panorama in front, and the ›ore remote mountains of Wales gleamed softly the shadowy distance. Such was Uriconium, ›en the sun rose upon it some 1,400 years ›; but sudden destruction came down upon it s a whirlwind. The shouts of the sons of Walla ›o Saxon was heard; fire and slaughter were in eir train; and the inhabitants fled before them. cloud of blue smoke enveloped the fair city, and l the horrors which ensued; but the roofless and orless buildings, the fragmentary columns, the rntwheat, the uncompleted vessel, the unfinished ›airs, the crouching skeleton of the old man and casket, and those of the panic-striken women. e remains of the child dashed from the wall, l those of the men massacred in the passages, woman's abandoned vessel of money, and the rious broken chariot wheels, leave little to the agination to fill up in the last act of the ancient gedy which involved the fate of the ancient y of Uriconium.

A cordial vote of thanks was presented to Mr. dwin for his able paper.

HE GOVERNMENT AND RAILWAYS.

HE question "What action, if any, ought the Government to take with regard to rail-ys?" formed the subject of a very able and borate paper written by Mr. Edwin Chadwick, ., and read last week before the Trade and onomy Section of the Social Science Congress. ilways, said Mr. Chadwick, were usually profit-s, like common roads. Though they might fail pay good dividends, they increased the value of acent property. Of all taxes, he contended t those on the means of communication, and exactions beyond the payments for construc-n and working were the worst; and that by the stitution of Government security for that of vate traders, by the unity of management, and relief from local and general taxation, share-ders might be satisfied, and funds provided for reduction of fares and extended accommoda-n to the public. Impartial persons had pro-nced the report of the recent Railway Com-ssion a failure. Lord Stanley had not signed report, nor had Mr. Roebuck; while Mr. sbuck and Mr. Rowland Hill had made inde-ndent reports much in accordance with his (Mr. adwick's) views. He considered the composition the Commission objectionable. It assumed t the interests of directors were identical with se of shareholders, which was a mistake. He nplained that the Commission had not examined portant cases in which extreme reductions of es had been compensated by increase of traffic; t they had not inquired into increased value en to land by making railways, nor into the blic administration of railways on the Continent, ich Robert Stephenson, Mr. Locke, and others l cited as examples to be followed. After oting some questions addressed by Mr. Lowe l Mr. Galt on the supposed perversion of Parlia-ntary influence, Mr. Chadwick observed that question assumed that the administration of railway directorates was generally unexcep-nally pure and superior, and, on the other hand, vernmental administration under the existing stitution was generally corrupt and inferior, l that its corruption passed legislative skill to nedy. This was consistent with Mr. Lowe's ently expressed opinion that promotion by merit the army would be promotion by job. The last ficulty had been resolved in the French army, l was resolvable here. He (Mr. Chadwick), how-r, denied the relative inferiority and greater ual corruption of Governmental administration. the chief Government executive officers, he ver knew nor heard of one who lived beyond modest salary, or his ostensible private means; l he did not believe that a purer set of officers uld be found in Europe. There was already a ge amount of money expended in contracts to ich no reasonable suspicion attached. In the neral railway administration, instances were torious of officers who had depressed and ruined lways, with immense fortunes. No Govern-nt or party in this country could have existed der such gigantic mismanagement as has been played in the courts of law and public investi-tions with regard to railways. If such was the racter of our Government, that it could not trusted to make contracts for the means of ernal communication (as Mr. Lowe supposed), ought not to be glorified as the perfection of islative wisdom. The railway property of Ire-land, on a liberal estimate, was worth £17,750,000. If the Government gave £19,500,000 they would get the property for £634,650 per annum. It now yields a net profit of £900,592, or a gain of £266,032, added to which £120,000 was to be saved by unity of management. This would leave a prospect of a total saving of £386,032 to compensate for considerable reduction of fares and rates for goods. The Government have taken the important step to ascertain by a second Commission the exact financial condition of the Irish railways, with a view to ascertain their actual value for a purchase. In an agricultural country like Ireland, he maintained it as an administrative principle that the extension of the means of communication should anticipate the demand, and that they would create it if made judiciously. The extension of conveniences should be made by the construction of light and cheap horse railways, as in the United States, which in and about cities equal in extent the lines for locomotives. Probably the full extension of these branches would equal in extent the main lines now in existence. The position of the railways operates as a barrier to these important and useful extensions, and prevents the railways being put on their proper footing as public highways. Mr. Chadwick recommended the union of the postal and railway systems, and its employment for the distribution of parcels and telegraphic messages. At present, all the railway stations were not above one-third of the postal stations; while the telegraph companies had not above one station to every eight or nine of the postal stations. Mr. Chadwick showed that to a large extent the same persons might be employed in delivering letters by post and telegraph messages. In Switzerland, Belgium, and other places on the Continent, one station served for the three purposes; and in Belgium the uniform telegraph rate was only half-a-franc. The charge for small parcels in these countries was very light, and the effect upon trade had been very considerable. Business was often transacted with one-third of the stocks formerly necessary. In Ireland, while there are 1,625 postal stations, there are only 92 telegraph stations. In Prussia, which in many respects was the best administrated country in Europe, the Government intends to extend the telegraph system to every place with 1,500 inhabitants, or double the extent of the postal service in Ireland. By a complete telegraphic system, he could state, as a Commissioner of Police, the efficiency of the police might be doubled. He was assured, on good authority, that by a recent invention of Mr. Donald Nicoll, underground telegraphs might be laid and maintained as cheaply as the present overground system. The objections to cheap telegraphy by practical officers were of the same sort as the old practical officers made against postal reform. But in Switzerland halfpenny posts pay. In Belgium, telegraphy was commenced, as in England, by trading companies. They were proceeding in a poor and unsatisfactory way when the Government established postal telegraphy on the uniform franc-message principle. This succeeded so well that a uniform half-franc principle has been adopted. America was moving in the same direction. As a whole, it followed that the conveyance of telegraphic messages, of letters, of passengers, and of goods should be combined under one chief and responsible public authority. Mr. Chadwick trusted that in this respect Ireland would lead the way. He proposed that the Council of the Association should appoint a special committee, to meet in London, to support this reform, and to make representations from time to time in furtherance of the public interest in it.

INTERNATIONAL COINAGE.

IN the Jurisprudence Section of the Social Science Congress, Professor Leone Levi read a paper on this subject. He set out by referring to the two conferences on this subject held in Paris in the month of June last, both conferences being agreed as to the necessity and utility of uniformity of coinage throughout the world, and also upon taking the gold standard as a basis of international currency. They were further unanimous on the advantage of the decimal division, on the desirability of having equal types or coins, and upon the adoption of coin of the same fineness and alloy. As for the unit, they made no specific recommendation except that the five francs in gold should be taken as a basis of the coinage of the countries entering into the convention. The most important point to be considered was, in what measure could these resolutions be made applicable to the United Kingdom, or what steps should be taken to bring our coinage in relation to the five francs. Three modes were open for consideration. The first would be the adoption of the 5 franc piece, or of a gold coin of the value of 100 halfpence, or 4s. 2d. The second was to reduce the sovereign to the exact value of twenty-five francs. The third was to adopt the 10franc piece. His own opinion was quite settled in favour of the last mode. The 5-franc gold piece would be too small, easily lost, too costly to produce, much more subject to wear and tear and diminution in value, and too small for large transactions of commerce and finance. In his opinion, England should take the ten francs as a unit, since it so happened that 100 of her present pence were, in fact, equivalent to ten francs, the penny being very like the 10-centime piece.

A paper was read from Mr. Tito Pagbardini on the question whether it was desirable that there should be an international currency. He said that public opinion was now almost unanimous upon the subject; and four of the principal nations of Europe (France, Belgium, Switzerland, and Italy) had lately given a practical solution to the question by adopting an identical coinage; while Germany was taking steps in the same direction, and Russia and America had declared their readiness to adopt the decimal metric system of measures, weights, and coins, as soon as England shall have led the way. The field of discussion was, therefore, considerably narrowed, for it now only remained to consider on what basis other civilized nations could join the new monetary convention. Two methods alone seemed worthy of consideration:—First, a transitional one, which consisted in each nation preserving its own coin of account—viz., England her pound sterling, the United States their dollar, Austria her florin, &c., but all agreeing to make such slight alterations in their intrinsic value as should make them easily interchangeable with the coins of the decimal metric system, and, therefore, with each other. There were, however, disadvantages attending that method; and the other method, which he proposed on his sole responsibility, consisted in at once adopting that absolute international uniformity and logical application of the decimal system that the previous method only reaches indirectly; nor did he believe that its introduction would offer more serious difficulties, while it would settle once for all a most important international question. This method consisted in proposing that all nations wishing to join the monetary convention should adopt as their standard coin of account, or unit, a gold piece of nine-tenths fine, equal to ten francs (the French franc was too small for this purpose, and the sovereign was still worse.) This coin, named in England a lion, in France an eagle, in Germany an adler, in America a star, &c., would be divided into ten parts represented by silver tokens, each equal to a franc, and declared to be equal to 10d. —this silver coin to be called a Briton in the United Kingdom, as it was called a franc in France. This would leave in circulation that important British coin, the penny; and, for the benefit of the working classes, who dealt chiefly in the smallest subdivisions, the penny would be divided into ten parts, each equal to the French centime. For calculations of the national revenue, and large commercial, banking, or statistical calculations, the Imperial, of the value of ten lions (equivalent to 100 francs or £4), might be used, thereby expressing large amounts by numbers more easily apprehended, without deviating from the simplicity of the pure decimal system. This method would abolish at once all the complications of money tables and all their distressing consequences, all operations being performed by the mere displacing of the decimal point. It would, moreover, have the practical advantage of leaving all the present coins in circulation until in the course of time it should be found convenient to call them in. Threepenny, fourpenny, sixpenny, and shilling pieces would all be serviceable, and the sovereign would pass current as twenty-five Britons, and the florin as two Britons and a half, the latter becoming to the new coinage what the rapidly disappearing half-crown was to the present coinage.

Some workmen engaged in digging a drain in the court yard of the Lycée Napoleon, Paris, recently discovered 36 coins of the reign of Julius Cæsar, besides some articles of jewelery of the Roman occupation of Paris.

MANCHESTER NEW TOWN HALL.

ABOUT one hundred of the competitive designs sent in for the new Manchester Town Hall are now open to public inspection in the town hall of that city. They will remain on view till next Wednesday week. It is remarkable that the *selected* designs are not exhibited; consequently, there are no means of establishing a comparison between the selected and rejected designs. What the public is most interested in is whether the best designs were selected—whether the referee had done justice to the competition. There is a wide-spread feeling that justice has not been done, and this feeling will deepen now that the unsuccessful competitors cannot compare their own designs with those which were more fortunate. No doubt this exclusion was intended to prevent "odorous comparisons," as *Mrs. Malaprop* would say, and to shelter the council and the referee from a shower of, it may be, hostile criticism. To all appearances, there is a dash of jobbery in the matter. It certainly would have been a more intelligible way to have exhibited all the drawings or none. Here we have the play of "Hamlet" without the principal character, which looks, to say the least of it, a little absurd.

THE PUGIN AND BARRY CONTROVERSY.

THIS controversy is assuming a definite shape. Mr. Pugin states that he "will accept Messrs. Barry's proposal to submit the matter to any impartial and authoritative tribunal, provided they will at once place in his hands the seventy-six letters which he delivered to Sir C. Barry, under a promise that they should be returned at once." This promise was never fulfilled, and its non-fulfilment has cast an ugly shadow on the Messrs. Barry's case. Mr. Alfred Barry, in his last letter to the *Times*, and which is reproduced in another column of our impression to-day, says:—"We are perfectly willing to submit all our evidence, to give any date, and to produce any document before a proper tribunal." Of course the seventy-six letters are included in this offer. If not, any impartial and thorough investigation would be simply impossible. But if they are to be included, why not have said so? It is very probable—in fact, almost certain—that these letters contain much evidence in favour of one side or the other. If they be forthcoming, we may expect that the dispute will be submitted to the Council of the Institute of Architects or some members of that body, who may be appointed for the purpose. If, however, the letters are not to be produced, the public will inevitably come to the conclusion that they could not be without damaging the fame of Sir C. Barry. The public will remember the manner in which they were obtained, the general silence in which Messrs. Barry have passed them over, and will, in all probability, magnify the importance of any evidence they may contain. Mr. Pugin says, "give me the letters which were lent under a solemn promise to be returned; keep copies of them if you like." If, however, the Messrs. Barry refuse to surrender the letters, and shelter themselves behind the extraordinary pretext borrowed from the *Pall Mall Gazette*, which states that written letters belong as much to the writer as the receiver, then judgment will lean to Augustus Pugin's side. People want the truth, and the whole truth, in a matter of this kind. It is purely a question of historic truth, and will be decided without consideration of personal friendship or partizan feeling. We hope the next step in the controversy will be the institution of an impartial tribunal, before which will be submitted *all* documents necessary for an elimination of the truth.

SHOPS AND OFFICES, LORD-STREET, LIVERPOOL.

THESE buildings, as represented in one of our engravings, are in course of erection in Lord-street, which is one of the leading thoroughfares of Liverpool. They have a frontage to Lord-street of 92ft., and run in depth backwards about 80ft., including the areas for lighting the back portions of the shops, which are five in number, and have good cellaring beneath. The two spacious entrances to the passages and staircases leading to the offices above the shops, occupy a portion of the Lord-street frontage. The divisions of the ground floor are marked by banded pilasters of polished red Aberdeen granite, with carved stone caps. Behind the granite pilasters iron piers are inserted the thickness of the division walls, and 4ft. in depth, to insure solid bearings for the ends of the wrought-iron beams upon which the front is carried. The iron piers have solid stone bases, and the internal walls of the buildings are built upon broad hard stone landings, to extend the bearing surface. These precautions were called for by the unequal nature of the site of the buildings, it being crossed by the line of the old pool from which Liverpool is said to derive its name. We may here mention that in digging the foundations for these buildings the trunks of a large oak tree and an acacia tree were found, which had been here embedded in the silt for a period of 500 or 600 years. These buildings are being erected for William Earp, Esq., of Eastbourne, by Messrs. Haigh and Co., of Liverpool, from the designs and under the direction of Mr. Henry H. Vale, of Central Chambers, Liverpool.

The front is of the best Cefn stone; the shafts of the second floor windows of polished red granite, with circular panels of Lizard Serpentine in several colours. The whole of the openings are to be glazed with polished plate glass, and the principal lines of the storeys picked out in bold conventional carving, which is being executed by Mr. Rogerson, of Chatsworth-street, Liverpool, from sketches by the architect. The three large circular panels or pediments above the level of the main cornice are to be filled in with life-size figure carvings representing Art, Science, and Commerce. The chimney stacks are taken up boldly above the lines of roof, and formed with two campaniles, with ornamental terminals and pierced arches beneath, the flues being brought up between the fireproof safes to dry the walls of the latter. The offices on each floor are lighted at the back from spacious courtyards above the glass roofs at the rear of the shops. The staircases and landings are of polished Yorkshire stone, with moulded nosings and oversailing ballusters. The old buildings which these are to replace formed a part of old Lord-street when it was but a narrow lane, it having been widened on the opposite side; and when the remainder of the old houses are removed (as they will shortly be) Lord-street will contain some of the principal commercial structures in the town.

PETROLEUM.

A VERY interesting paper on this subject was read a short time ago at a meeting of the Parisian Society of Civil Engineers by M. Foucon, who tells us that last year he passed six months in the American oil districts for professional purposes. The lines of petroleum wells, says M. Foucon, generally follow a N.E.—S.W. direction, and in sinking a well, a stratum of soap-stone is always found before reaching the oil deposit. In America it is generally admitted that the origin of petroleum is not mineral, but organic. Dr. Sterry Hunt, of Montreal, believes that seaweeds and gelatinous animals having no nitrogenous matter in their composition were, at a period anterior to that of the formation of coal, accumulated in caverns afterwards closed up, and in the course of ages converted into petroleum by a process of slow distillation. In Europe, geologists are more inclined to attribute an eruptive origin to petroleum. M. Berthelot, who has paid great attention to the almost unexplored field of chemical synthesis, has obtained in his laboratory results, which it is not unreasonable to consider as microscopic imitations of the work performed by nature on a large scale in the bowels of the earth, for the production of petroleum. M. Charles Ste. Claire Deville has shown the existence of wonderful regularity in the distribution of volcanic emanations, and especially the connection between salt, sulphur, and bitumen. M. Daubrée having, for the space of a month, subjected deal shavings in contact with water to a high temperature, obtained anthracite and evident proofs of a formation of petroleum. In 1861, the quantity of petroleum exported from the United States was not more than about 1,200,000 gallons; in 1866, the quantity rose to 67½ millions. But now, owing to the low prices, the production has declined—a well not yielding more than fifteen barrels a-day does not pay, and is, therefore, given up. For a similar reason, fewer wells are sunk than formerly. At all events, European merchants have discovered it is no longer their interest to get unrefined oil from America. Such is the report we have from *Galignani*. But the *Scientific American* now doubts the practicability of using petroleum as a substitute for coal, or a fuel. It considers the experiments that have been made with the former article quite unsatisfactory as regards economy of burning.

WATER SUPPLY AND SANITARY MATTERS.

A contract for draining the valley of Mexico has been let to General G. W. Smith, formerly of the Confederate army, who is promised 3,000,000 dollars for the work.

BRIDGEWATER.—At a committee meeting of the town council held on Wednesday, Mr. Hawkesley's report touching the water supply was discussed. His estimate of the cost of procuring the water from the Severn Wells stream, six miles distant from Bridgewater, was now altered from £18,000 to £20,000. The stream is situate 200ft. above the level of the sea, a sufficient height to supply the town by gravitation. The present population of Bridgewater is 12,000, but in Mr. Hawkesley's opinion the water should not be obtained from any source that would not supply sufficient for 16,000 inhabitants, which, according to his calculation, should be 40,000 gallons per day, and the Severn Wells stream would meet that requirement.

HALIFAX.—At a recent meeting of the town council the following resolution was unanimously passed on the motion of the mayor:—"That notice be given by the town clerk of an intended application to be made in the ensuing session of Parliament for an Act to raise additional moneys for the completion of the present waterworks, and for the extension of the same; also for amending the powers of the corporation in relation to their markets and gasworks undertakings. To provide for the acceptance from Sir Francis Crossley, Bart., of the sum of £6,300 for the maintenance of the People's Park; and for other purposes affecting the improvement and local government of the borough; and that Mr. Bateman, C.E., be instructed forthwith to prepare the necessary plans of the waterworks extension for Parliamentary deposit." Alderman Collinson remarked that the sum of money which the corporation was about to borrow to extend the waterworks and gasworks of the borough was a very large one, but he believed that the improvements which he would effected would amply compensate for the extra expense incurred. The corporate common seal was ordered to be affixed to various mortgages of the rates of the borough for about £4,000; to a contract with Messrs. Brook and Mann, for the construction of a sewer in Pellon-lane and Hanson-lane.

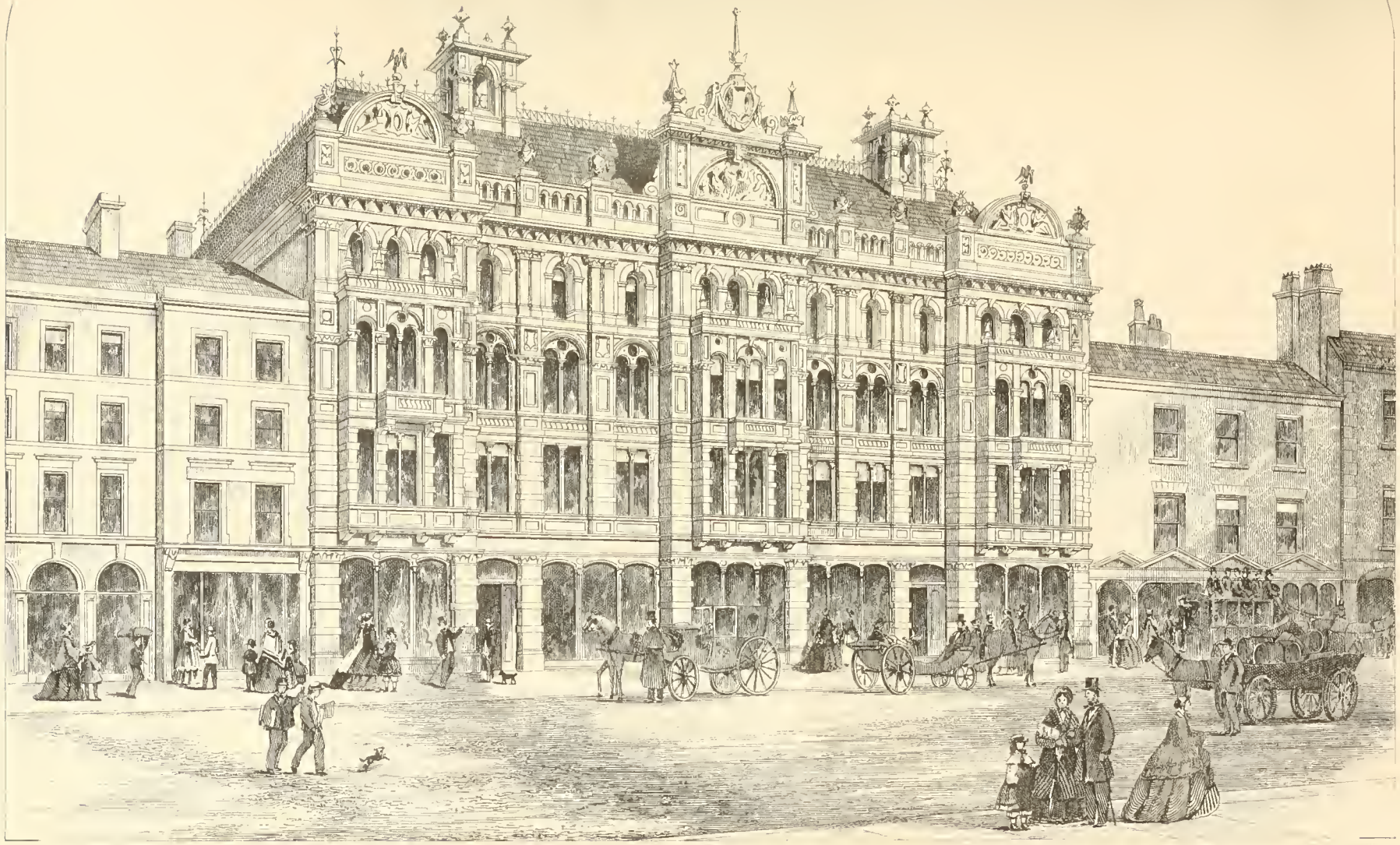
PARIS.—Another immense reservoir, similar to the one at Menilmontant, is about to be constructed on an eminence at Montrouge, near the Barrière Saint Jacques, to receive the waters of the valley of the Vanne, the subject being announced for adjudication on September 25 at the Hotel de Ville. It is estimated that the valley of the Vanne, which is rich in springs emanating from the chalk beds, will furnish easily, at a maximum altitude of 70 metres, 100,000 tons of excellent water. A third reservoir, constructed at Passy in 1858 to receive spring water, completes the triangle by means of which the houses of Paris may eventually be supplied with water as high as the fifth floors.

An interesting discovery of thirty Roman funeral urns has been made at King's Newton, on the line of new railway now in course of construction to connect Derby with Ashby. They were deposited by threes and by fives on their bases, not inverted, as was the mode of burial with the Celtic tribes after the cremation.

The Building News Co

Offices and Shops, Lord Street, Liverpool.

H. H. VALE, ARCHT LIVERPOOL.



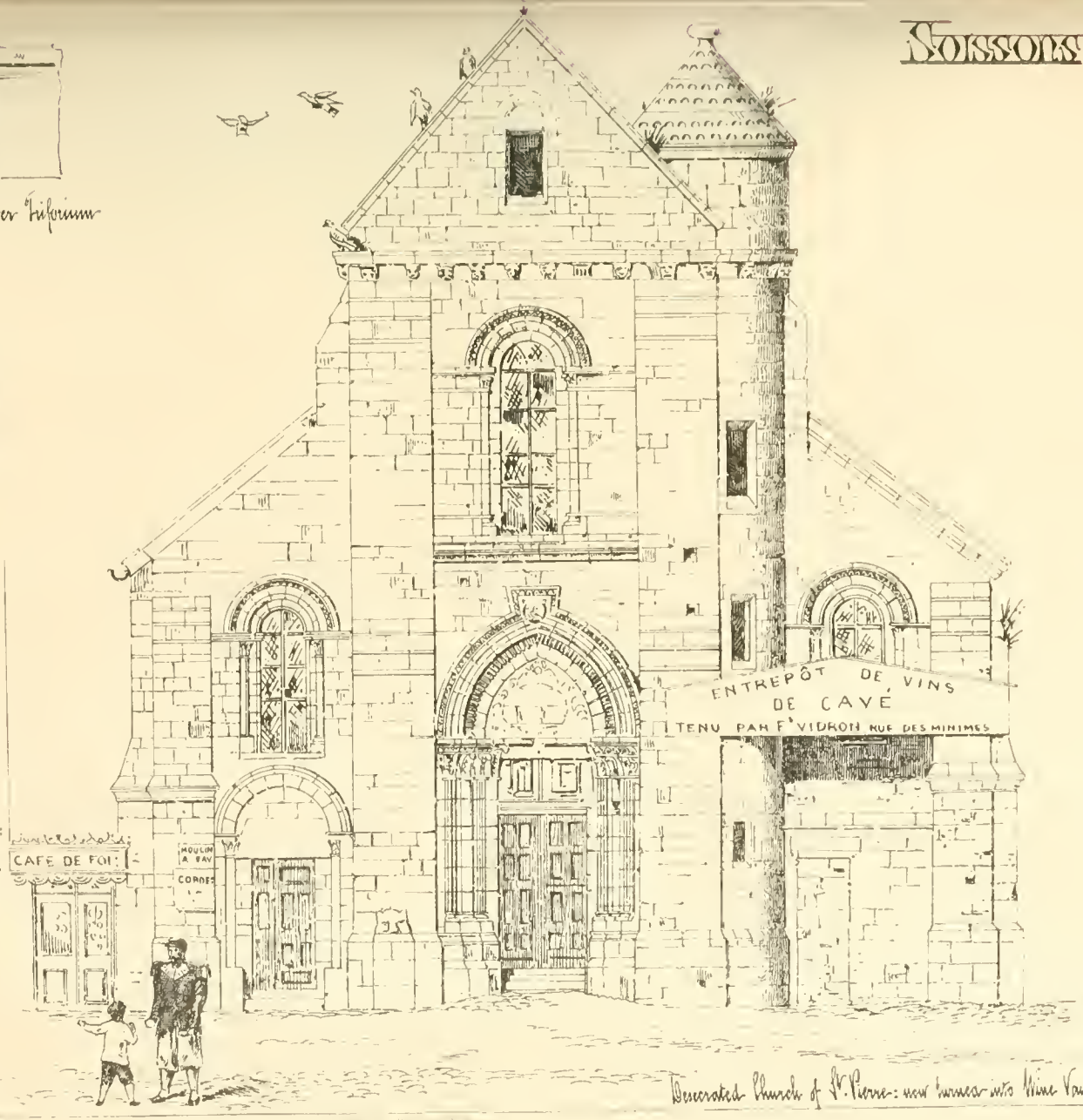
Printed by Whitfield

Soissons

Ornament in String course under lower Triforium
S. Transept - Cathedral:

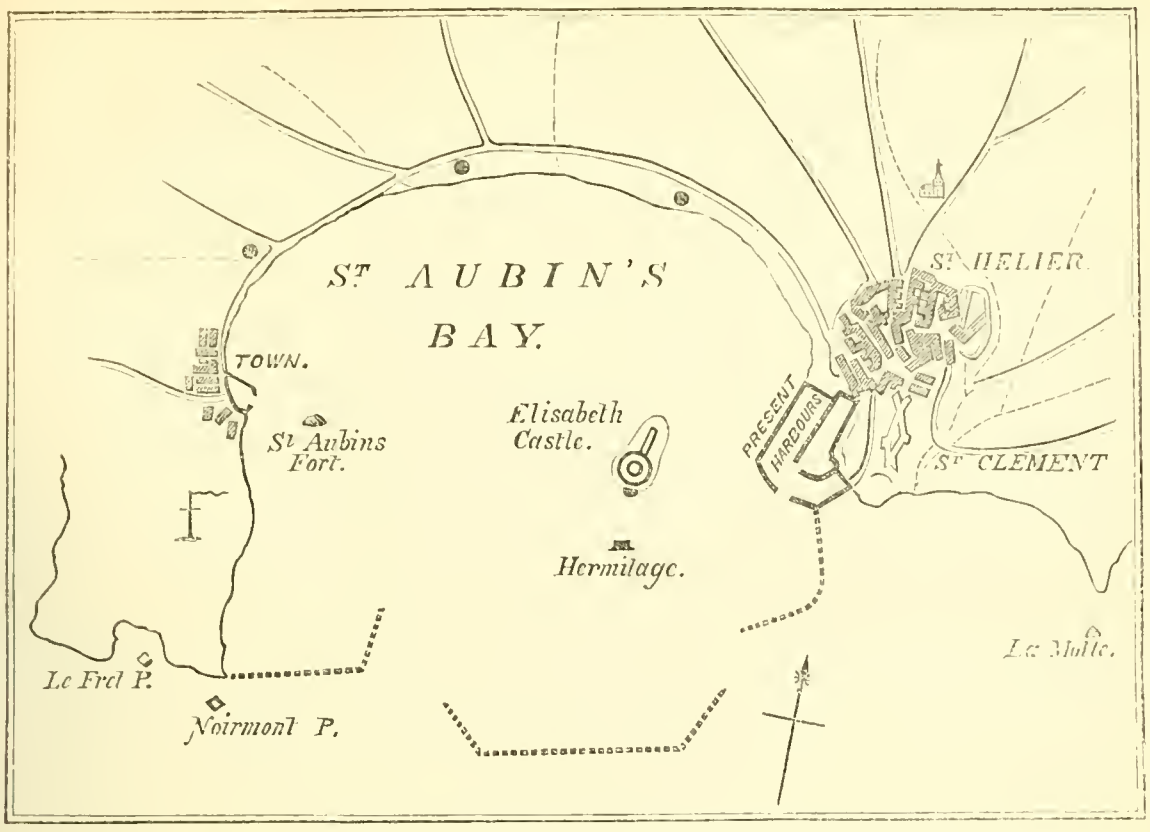
Cap in Apsidal transept:

Soissons: Church of Notre Dame: very good - date about 1190 - carving very simple: Another church here - the east end very nice: date about same as Cathedral: The nave and west end of Church destroyed and a classic abortion remains: Desecrated Church of St Pierre: very good:



Desecrated Church of St. Pierre: now turned into Wine Vaults:

HARBOUR OF ST. HELIER, JERSEY.



ICREASED HARBOUR ACCOMMODATION FOR JERSEY.

(FROM OUR SPECIAL CORRESPONDENT.)

THE rapid growth and development of commerce and trade in the island of rsey, which the last twenty years have tnessed, and the steadily increasing populaon of its capital, St. Helier, have led, or ther compelled, "the states" to take steps r the purpose of augmenting the harbour om at the latter place. It is an unfortunate rcumstance for the islanders—so far as the st of the proposed new works is concerned that in 1841, when some additions to the l harbour were effected, and when the Vicria Pier was constructed, none of the thorities concerned foresaw the necessity hich has now arisen for extending yet further e harbour accommodation of St. Helier. hose who were then entrusted with the sponsibility of the undertaking may be rdoned, however, for their lack of preience, and they could scarcely have imagined, dless gifted with supernatural powers of dgment, that in a quarter of a century the mmerce carried on by means of the island ipping would increase, as it has done, fourld, or that the number of inhabitants of rsey would in the same period become twice large.

Reckoning the shipping absolutely perning to the island by its tonnage, I d that at this moment it is fairly enled to take rank as the sixth port of eat Britain. In every port of the United ngdom and the British colonies in North d South America, on the coast of Africa, d the continent of Europe, Jersey vessels e to be found. The position of the island s no doubt something to do with this fact. is the largest of the group commonly own as the Channel Islands, and the st southerly. It forms, therefore, an mirable intermediate shipping depôt beeen the coasts of France, Newfoundnd, and the south and west coasts England. The present population of rsey is estimated at over 60,000, some ,000 being located in the township of St. Helier; and judging of the future by the light of the past, it is quite legitimate to predict that the island has not yet reached its maximum of prosperity.

Without entering into the peculiarities which distinguish the government of the Channel Islands, and which appear to confer upon their inhabitants many privileges which are not enjoyed by those of Great Britain generally, it may be said that there exists in Jersey but one opinion as to the absolute necessity for further harbour accommodation at that place. It is true that there are some persons who doubt the advisability of extending the harbour of St. Helier, and who suggest other localities for the formation of a totally new harbour, as, for example, Bouley Bay, four and a-half miles N.N.E of St. Helier, and which would involve also the construction of a short line of railway to St. Helier. As it seems certain, from the action already taken by the executive, that St. Helier will be really the scene of future operations for augmenting the harbour space of the island, it is scarcely essential for us to discuss the relative advantages of other positions.

During the early part of last year the "Committee for Piers and Harbours of the Free States of Jersey" solicited many eminent civil engineers of England and France to survey the Bay of St. Aubin, on the eastern side of which the town of St. Helier is situated, and to furnish plans for the extension of the harbour. No less than thirty-seven gentlemen responded to the application, and the consequence is that the committee have now before them such a multiplicity of designs, drawings, models, and reports, as will probably furnish them with matter for discussion—and, it may be, of contention—for months to come. Had each member of the judicial body in question the wisdom of Solon and the engineering knowledge of a Rennie or a Smeaton, he would find it a difficult task to select the best from among so many excellent and highly practical plans as have been sent in for consideration. It is not surprising, therefore, that the committee have felt themselves quite unequal to the duty of making a final selection, and have come to the determination of fortifying themselves for the work as far as possible, by enlisting into their service that potent agent, public opinion. For one day in each of seven successive weeks the plans are to be open to public inspection and criticism.

On one of the exhibition days I took advantage of the opportunity, and examined the designs and models *seriatim*. It was impossible to withold one's extreme admiration from a considerable number of them, and all bear witness to the skill and forethought of those by whom they were executed. It will scarcely be expected that I should anticipate the final decision of the committee by recording a verdict in favour of any one particular plan. Such a course would indeed be somewhat unfair to the various competitors. The names of the authors are openly appended to the drawings and models, and this fact again imposes a certain amount of reticence on those who are not officially invited to furnish a professional opinion on the subject. It was manifestly impossible for those who entered into competition for the accomplishment of a work which left so little scope for variety of design as the extension of an existing harbour, to avoid similarity of features in their respective plans. This circumstance is strikingly apparent to those who examine them. In several instances it might have been imagined, at a first glance, that there was no difference whatever in the schemes proposed, and only on a minute investigation of details did the distinctive characteristics of each become visible.

It is somewhat unfortunate, too, that—whether designedly or by accident we know not—some of the reports which must have, in all cases, accompanied the harbour plans, were not to be found, whilst others were at hand. Much more satisfactory would it have been had all the engineers' reports been produced, or none at all. In some cases proposed deviations from ordinary practices in the construction of hydraulic and marine masonry presented themselves, and these might have been explained or accounted for had the projectors been allowed to speak for themselves. It is probable that I may have some further remarks to offer upon this point, unless the

committee see fit to render an equal amount of favour to every competitor. I am not acquainted with the members of the committee, and do not know whether they are personally qualified to act as arbitrators in a question of so much moment to the interests of the island, but they should, at any rate, have the advantage of the counsel of one or two engineers of eminence, and who are perfectly disinterested in the results of their cogitations. It would be then impossible for any charge of favouritism to be laid at their doors, and the public mind would be relieved of all doubt as to the honesty, if not the discretion, of their decision.

In order to place your readers in complete possession of the requirements of the island authorities, a plan of the harbour of St. Helier, together with an outline and general sketch of the proposed extension of the harbour accommodation, is subjoined.

It will thence be seen that it is proposed to enclose an immense additional area—many thousands of acres, in fact—and to utilize space which is now much more ornamental to Jersey than advantageous to its commerce.

The names of the various civil engineers and others who have forwarded designs for the new works will form a fitting conclusion to the present paper, which must be supplemented by one or two others. The competing parties are Messrs. J. F. Tuson (two plans); A. Doull; Réné Bonnin; H. Hooper; J. S. Cooke; Livingston Macaulay; Captain Goodridge; A. Gifford; P. C. Lihou; A. A. West; Murray and Brooks; J. C. Wilcocks; — Tuson; Burke and Burleigh; T. Knox; J. A. Clements; R. Beach; A. M. Rendel; F. W. Shields; W. Wilson; W. R. Kinipple; J. Plews; — Abernethy; Le Sueur and Boyer; E. R. Jones; R. P. Brereton; J. Carter; J. B. Redman; Law and Blores; J. Goode; A. Giles; — Elliot; T. Renouf; W. O. Brown; and — Lyster.

The illustration, it must be mentioned, is not intended to do more than indicate the position of the harbours at present in existence. The dotted lines give an idea only of the proposed alterations. The estimates vary in amount from £280,000 to £421,000, and the material to be used is granite, the product of quarries in the Channel Islands.

NEW METROPOLITAN STREETS ACT.

THE following Act of Parliament for regulating the traffic in the Metropolis, and for making provision for the security of persons passing through the streets, was passed on the 20th of August last, and will come into operation on the 1st of November next:—

BE it enacted by the Queen's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the Authority of the same as follows:—

PRELIMINARY.

"Metropolis" shall mean the City of London and all Parishes and Places within the Jurisdiction of the Metropolitan Board of Works.

"Magistrate" shall mean the Lord Mayor or any Alderman sitting alone or with others at the Mansion House or Guildhall, and any Metropolitan Police Magistrate. "Commissioner of Police" shall mean "the Commissioner of Police of the Metropolis" and "the Commissioner of the Police Force of the City of London."

"Street" shall include any Highway or other public Place, whether a Thoroughfare or not; and any of the Royal Parks, Gardens, and Possessions which are managed by the Commissioners of Her Majesty's Works and Public Buildings.

The Word "Cattle" shall include Bull, Ox, Cow, Heifer, Calf, Sheep, Goats, and Swine, also Horses, Mules, and Asses, when led in a string or loose.

"The general Limits of this Act" are in a circle of Four Miles from Charing Cross.

PART I.

PROHIBITION OF SCAVENGERING EXCEPT BETWEEN CERTAIN HOURS.

It is enacted that no Person shall, after the First Day of January One thousand eight hundred and sixty eight, between the Hours of Ten in the Morning and Seven in the Evening, in such streets as may be named by the Commissioner of Police, remove any Ashes, Dust, or Refuse from any House in any Street, or be liable to a Penalty not exceeding Forty Shillings.

AS TO THE DEPOSIT OF GOODS IN STREETS.

It is enacted that no Goods or other Articles shall be allowed to rest on any Footway or other Part of a Street for a longer time than may be absolutely necessary for loading or unloading such Goods or other Articles, or be liable for each offence to a penalty not exceeding Forty Shillings.

The surface of any space over which the Public have the right of way that intervenes in any Street between the footway and the carriage-way shall, notwithstanding any claim of any person by prescription or otherwise to the deposit or exposure for sale of any goods or other articles on such surface, be deemed to be part of the footway.

CATTLE NOT TO BE DRIVEN THROUGH STREETS WITHIN CERTAIN HOURS.

It is enacted that no person shall drive or conduct any cattle through any street between the hours of Ten in the Morning and Seven in the Evening, except with the permission of the Commissioner of the Police, or be liable to a penalty not exceeding Ten Shillings for each head of Cattle so driven.

REGULATIONS AS TO STAGE CARRIAGES.

It is enacted that the driver of a Metropolitan Stage Carriage shall not stop such carriage for the purpose of taking up or setting down passengers at any part of a street except as near as may be to the left or near side of the roadway, or be liable for each offence to a penalty not exceeding Forty Shillings.

PROHIBITION OF ADVERTISEMENT CARRIAGES.

It is enacted that no Picture, Print, Board, Placard, or Notice, except in such form and manner as may be approved of by the Commissioner of Police, shall, by way of Advertisement, be carried or distributed in any Street by any Person riding in any Vehicle, or on Horseback, or being on Foot, or be liable to a penalty not exceeding Ten Shillings.

This does not apply to the Sale of Newspapers.

POWER OF COMMISSIONER OF POLICE TO MAKE SPECIAL LIMITS.

It is enacted that the Commissioner of Police, with the approval of one of Her Majesty's Principal Secretaries of State, may direct that any Street or portion of a Street be deemed to be within the special limits of this Act, and may take any Street or portion of a Street out of the special limits of this Act: Provided—

That an order made by the Commissioner shall not come into effect until the expiration of Ten Days from the date of the approval thereof by the Secretary of State:

Notice that an order has been submitted for the approval of the Secretary of State in respect of any Street, shall be affixed to a lamp-post or otherwise placarded in some conspicuous position in or near the Street to which such intended order relates, and at the principal office of the local authority having charge of such Street and of the Metropolitan Police and of the City Police respectively, for not less than twenty-eight days previously to the approval of the said Secretary of State being given to the said order:

That a copy of such order when approved by the Secretary of State shall be published in the *London Gazette*, and affixed to a lamp-post or placarded in some conspicuous position in or near the Street, and shall, during the time that the order is in force, be kept so affixed or placarded.

REGULATIONS.

It is enacted that the Commissioner of Police, with the approval of the Secretary of State, and the Commissioner of City Police, with the consent of the Mayor and Aldermen, and the approval of the Secretary of State, may make regulations to be observed by all persons with respect to the following matters:—

With respect to the route to be taken by all carts, carriages, or other vehicles, with power to prohibit any cart, carriage, or other vehicle from coming into any Street for the purpose of passing to some other Street, and with respect to the line to be kept by persons riding or driving:

And may, with the like approval, alter, vary, or repeal any regulation made by them, and make new regulations in addition to or in lieu of any existing regulations; but this section does not authorize the Commissioner of Police or the Secretary of State to limit the number of Metropolitan Stage Carriages that may pass down any Street in pursuance of their ordinary trade.

PENALTY FOR DISOBEDIENCE TO REGULATIONS.

It is enacted that any person wilfully disregarding any regulation made in pursuance of this Act shall incur a penalty not exceeding Forty Shillings for each offence; and any Constable may take into custody any person who within view of such Constable wilfully disregards or refuses to conform to any such regulation, and refuses to give his name and address to such Constable.

PUBLICATION OF REGULATIONS.

A printed copy of all regulations made by the Commissioner of Police shall be hung up for public inspection in such places within his district as the Commissioner of Police thinks advisable; but it shall not be necessary in enforcing any regulation to prove that the provisions of this section have been complied with, nor shall the non-compliance therewith invalidate any regulation.

REGULATION OF METROPOLITAN STAGE CARRIAGES.

It is enacted that within the special limits of this Act no driver or conductor of a Metropolitan Stage Carriage shall take up or set down Passengers at any place where he may for the time being be prohibited by regulation of the Commissioner of Police from taking up or setting down; or be liable for each offence to a penalty not exceeding Forty Shillings.

AS TO THE LOADING AND UNLOADING OF COAL AND CASKS IN STREETS.

It is enacted that between the hours of Ten o'clock in the Morning and Six in the Evening no coal shall be loaded or unloaded on or across any footway, and between the same hours no casks, whether empty or full (wine or spirits in casks excepted), shall be lowered or drawn up by means of ropes, chains, or other machinery passing across the footway or any part thereof, or they will be liable for each offence to a penalty not exceeding Forty Shillings.

PROHIBITION OF CARRIAGE OF TIMBER AND OTHER LARGE ARTICLES.

It is enacted that no person shall, between the hours of Ten in the Morning and Seven in the Evening, except with the permission of the Commissioner of Police—

Drive or conduct along any street any cart, carriage, or other vehicle laden with timber, metal, or any article which exceeds in length 35ft., or which protrudes more than 8ft. 6in. behind the vehicle or more than 1ft. from the sides of the vehicle, nor carry in any way along any Street any ladder, scaffold pole, or other article which exceeds 35ft. in length or 8ft. 6in. in breadth, nor drive or conduct along any Street any cart, waggon, or other vehicle used for conveying goods or merchandise, and drawn by more than Four Horses, or be liable to a penalty not exceeding Forty Shillings.

No penalty shall be imposed on any person for acting in contravention of this section if such person prove to the Magistrate that the alleged act was done on the occasion of a fire or other sudden emergency with a view to prevent accident, or to save life or property.

Any bye-law, rule, order, or regulation made or to be made within the City of London and the liberties thereof that is inconsistent with this section shall be void.

PART II.

REGULATIONS AS TO HACKNEY CARRIAGES.

It is enacted that during such portion of time between sunset and sunrise as may be fixed by the Commissioner of Police from time to time no driver of any Hackney Carriage shall ply for hire unless the carriage under his charge be provided with at least one lamp properly trimmed and lighted, and fixed outside the carriage in such manner and position as may be directed by the Commissioner of Police, or be liable for each offence to a penalty not exceeding Forty Shillings.

The portion of time fixed by the Commissioner shall be made known by notice posted up at every standing for Hackney Carriages in such position as may be directed by the said Commissioner, but in any proceedings for enforcing the foregoing regulation as to lamps it shall not be necessary to prove that such notice was given.

The Commissioner of Police may cause to be affixed a plate or mark in such position as he thinks expedient to any Hackney Carriage certified by him to be in a fit condition for public use, and may cause to be removed such plate or mark whenever such carriage has been determined to be in a condition unfit for public use. If any plate or mark is affixed to any Hackney Carriage without authority, the owner of the carriage, and also the driver (unless such owner or driver proves that he was ignorant of the plate or mark being affixed to the carriage in contravention of this section), shall be liable for each offence to a penalty not exceeding Forty Shillings.

For the purpose of this Act the expression "Hackney Carriage Acts" shall mean the following Acts:—

"An Act to amend the laws relating to Hackney Carriages, and to Waggons, Carts, and Drays, used in the Metropolis; and to place the collection of the duties on Hackney Carriages and on Hawkers and Pedlars in England under the Commissioner of Stamps." "An Act for regulating Hackney and Stage Carriages in and near London." "An Act for consolidating the office of the Registrar of Metropolitan Public Carriages with the office of the Commissioners of Police of the Metropolis, and making other provisions in regard to the consolidated offices." "An Act for the better regulation of Metropolitan Stage and Hackney Carriages, and for prohibiting the use of Advertising Vehicles." "An Act to reduce the duties payable in respect of Hackney Carriages used in the Metropolis, and to amend the laws relating to the granting of Licences and payment of Duties in respect of Metropolitan Stage and Hackney Carriages, and to make provision as to the charge for the Hire of Hackney Carriages in certain cases."

DOGS.

REGULATIONS AS TO DOGS.

It is enacted that the Police may take possession of any Dog found in the Street and not under the control of any person, and may detain such Dog until the owner has claimed the same, and paid all expenses incurred by reason of such detention.

The Commissioner of Police may issue a notice requiring any Dog while in the Streets to be muzzled in such a manner as will admit of the animal breathing and drinking without obstruction; and the Police may take possession of any Dog found loose in the Streets without such muzzle, and may detain such Dog until the owner has claimed it, has provided a proper muzzle, and has paid all expenses connected with such detention.

Where any Dog taken possession of by the Police wears a collar with the address of any person inscribed thereon, a letter stating the fact of such dog having been taken possession of shall be sent to the address inscribed on the collar.

The Commissioner of Police may cause any Dog which has remained in the possession of the Police for Three clear days without the owner claiming the same, and paying all expenses incurred, to be sold or destroyed. Any monies arising from the sale of any dogs shall be applied in the manner in which penalties under this Act are applicable.

When, upon complaint that any Dog has bitten or attempted to bite any person, and it appears to the Magistrate that such Dog ought to be destroyed, the Magistrate may direct the Dog to be destroyed, and any Police Constable may destroy the same accordingly; and all dogs detained by the Police shall be properly fed and maintained.

SHOEBLACKS AND MESSENGERS.

SHOEBLACKS AND MESSENGERS TO BE LICENSED.

It is enacted that the Commissioner of Police may license Street Shoeblacks and Commissionaires or Messengers, to exercise their calling, and appoint places at which they may stand to exercise their callings, and direct the numbers of each class who may stand at the appointed places.

OBSTRUCTIONS AT STANDINGS PROHIBITED.

It is enacted that every Shoeblack and Commissionaire or Messenger, other than those authorized by the Commissioner of Police, who occupies the standings appointed by the said Commissioner, or who remains there after being required by a constable on duty to leave, and every person molesting any authorized Shoeblack, Commissionaire or Messenger in the exercise of his calling, and every person not being an authorized Shoeblack or Commissionaire who imitates the dress, or takes the name, designation, or character, of any authorized Shoeblack or Commissionaire, shall be liable to a penalty not exceeding Forty Shillings.

It is enacted that it is expedient to amend the thirty-ninth and fortieth sections of the Act of the Session of the second and third years of the Reign of Her Present

jesty, chapter forty seven: The Word "holden" shall substituted for the Words "usually holden" through- the said sections.

Placard, etc., may be affixed to Lamp-post.

The Secretary of State or the Commissioner of Police y cause to be attached to any lamp-post any placard or nal he may think expedient for the purpose of carrying o effect the provisions of this Act.

Prohibition of Betting in Streets.

t is enacted that any three or more persons assembled other in any part of a Street within the Metropolis for purpose of betting shall be deemed to be obstructing Street, and each of such persons shall be liable to a alty not exceeding Five Pounds; and within the City London and the liberties thereof any Constable of City ice Force, and without such limits any Constable of Metropolitan Police Force, may take into custody hout warrant, any person who may commit such offence view of such constable.

Extension of Sect. 52, of 2 and 3 Vict. c. 47.

The powers vested in the Commissioners of Police by the -second section of the Act of the Session of the second third years of the Reign of Her Present Majesty, pter forty seven, with respect to keeping order in the ets, may be exercised within the City and the liberties reof by the City Commissioner of Police on all occa- s when a street is thronged or liable to be obstructed.

abitants of the City of London to Place Dust, etc., on the Curbstone before Eight o'Clock in the Morning.

is enacted that it shall be lawful for the Inhabitants ll streets within the City of London or the Liberties reof as may be named by an order of the Commis- ers of Sewers to deposit before Eight o'clock in the ning on the curbstone in a box or barrel all ashes, , or refuse, so that the same may be removed by the enger.

No Fare to be less than One Shilling.

is enacted that where the Fare now payable on hiring Hackney Carriage standing on any stand shall not unt to One Shilling the driver shall be entitled to ge One Shilling.

Penalties.

is enacted that penalties under this Act shall be reco- ble and applied in manner directed by a local act passed e session holden in the second and third years of the n of Her Present Majesty, chapter ninety-four, and alled "An Act for regulating the Police in the City of don," and beyond the limits of the City of London l be recovered and applied in manner directed by the relating to the Metropolitan Police.

ll powers conferred by this Act shall be deemed to be dition to, and not in derogation of any other powers erred by any other Act of Parliament, and any such r powers may be exercised as if this Act had not ed.

Construction of Act.

is Act, so far as is consistent with the tenor thereof, l be construed as one with the Acts relating to the ropolitan Police and to the City Police.

Commencement of Act.

is Act shall not come into operation until the First of November, One Thousand Eight Hundred and y Seven.

SMOKE AND STONE.

HOW to get rid of smoke—visible smoke—from the atmosphere of our towns and cities is a iestion that has often been proposed, and so as manufacturing chimneys are concerned, has n in a great measure solved. Visible smoke is, point of fact, nothing more or less than an aregate of carconaceous or combustive particles, —escaping into the atmosphere—have shirked combustive work they had to do. Practice h shown the possibility of disposing of smoke the adoption of naturally suggested appliances; so great has been the smoke consuming mea- of success in manufacturing establishments, re suitable means have been taken, that hopes e been entertained of smoke annihilation in private dwellings also. One little circum- ce, however, has been either forgotten or red by most, if not all, the advocates of smoke ition; the circumstance, namely, that—smoke o smoke—the combustion of pit coal evolves, must necessarily evolve, a certain agent that, ough invisible, exerts a most destructive power things around. A paper read at the British ociation on the decay of stone, its cause and vention, and of which we gave an abstract in last number, places this matter in a true light. facts specified by Mr. Spiller, although not , will come with all the force of novelty to y. He long ago came to the conclusion that corrosive action of sulphurous and sulphuric s in the atmosphere—resulting from the com- ion of coal fuel, operate—in large towns cially—in a destructive manner upon dolomite the numerous classes of limestones employed public buildings. There are but few persons could not form an idea of the stability of a built up of blocks of tightly impacted Epsom Evidently such a wall would dissolve and n away—exposed to the action of such con- ous moisture as our watery climate supplies. hen, it can be proved that any of the stones monly used for building are subject to influ- ences whereby their material—wholly or in part—is convertible into Epsom salt, then the succeeding stage of dissolution will be a matter too plain for comment. Unquestionably this often happens. It happens in respect to our Houses of Parliament; the stone of which edifice, holding magnesia as a constituent, and this latter coming into contact with atmospheric sulphuric acid, union between the two ensues, and Epsom salt is the result. Whence comes the sulphuric acid or oil of vitriol with which the atmosphere of English towns and cities is laden? It comes from coal combustion, as chemists have all along known, but as Mr. Spiller—for the first time, perhaps—has made evident to the public. The presence of sulphur in coal is a well recognised fact; but what becomes of the sulphur after burning, is a question that has been slurred over; as if thereby the evil consequences of its evolution could be mitigated or evaded. Evasion there cannot be. Laws of nature are inexorable; and the law with which we have now to deal is one. Every pound of sulphur burnt—no matter where or how—yields a gas that, whether evolved amidst visible smoke or invisible products, changes inevitably to oil of vitriol, under the combined action of air and water; the quantity of oil of vitriol being nearly three times the weight of the sulphur originally consumed. Knowing, then, the average amount of coal consumption in any specified locality, and the average quantity of sulphur in such coal, it is easy to demonstrate by an unerring calculation, the corresponding amount of sulphuric acid that combustion ultimately lets loose. According to Mr. Spiller, even the best sort of coke and coal usually contains about 1 per cent. of sulphur; whence it follows that every ton of such combustible burnt generates about 70lb. of oil of vitriol of commercial strength. Here in London the better sorts of coal are mostly employed, still the 1 per cent. complement of sulphur on the quantity used can be demonstrated to yield an acid product that is enormous. In certain manufacturing localities—Manchester, for example—the coal and coke mostly used hold sulphur to the amount of 2 per cent. Manchester consumes about two million tons of coal yearly, from which datum it is easy to arrive at the certainty that Manchester primes its local atmosphere with no less than 120 tons of sulphuric acid daily. Well might the speaker remark this was a very fearful thing if fully seen. The first shower that came brought down the acid. It lay under the cornices of the buildings, and then it commenced to seize on the stone, especially if there were any iron in it; and in this way began the disintegration. What will surprise many who have casually turned their attention to the smoke-abolishing problem, is the opinion held by Mr. Spiller, that the mere obviation of black smoke—smoke, that is to say, in the ordinary acceptation of the term—would intensify the objectionable acid reaction. He looks upon the fuliginous carbon, smoke-deposited, as being rather a protection than otherwise against the corrosive action of oil of vitriol simultaneously evolved. Be this as it may, there can be no doubt that any consideration of the best means of abating the deleterious action of smoke that stops short with a means of consuming visible black smoke only, taking no cognisance of invisible acid products, fails to attain the limit of innocuity which circumstances require, and which probably will some day be achieved. We should have been gratified if Mr. Spiller, in the course of his remarks, had expressed some opinion as to the practicability or impracticability of collecting the sulphuric acid evolved—or rather produced—by coal combustion; and, whilst abating what now is a nuisance, turning the redeemed acid to commercial account. Oil of vitriol constitutes the starting point for at least nine-tenths of the chemical arts. It is not over much to affirm that, either directly or indirectly, sulphuric acid is concerned in the well-being—nay, the very existence—of ninety-nine hundredths of all chemical manufactures. For sulphuric acid there is no fluctuating market. A ready sale is commanded for all now manufactured, and if double or treble the existing quantity could be economically produced it would be made readily available.

Coming to the mode of specific manufacture, every pound of English oil of vitriol made and sold is produced either by the burning of sulphur in the first instance, or something holding sulphur. Now, after listening to Mr. Spiller's exposition, the first question to present itself to a speculative mind will probably be the following, viz:—Whether, instead of burning sulphur, or minerals containing sulphur, in factories specially arranged, with the object of collecting an invisible product of combustion and changing it into oil of vitriol, it may not be possible, through the adoption of some mechanical device—and none else is needed, the chemical conditions being plain enough—to utilize the vast amount of sulphurous fumes to which coal combustion gives rise. It would be a grand solution of the smoke difficulty if at some future period—the sooner the better—some clever engineer should devise a means for intercepting the smoke of cities and towns, turning it into oil of vitriol.—*Engineer.*

OBITUARY.

Henry Thomas Ryall, historical engraver to her Majesty, died on Saturday, the 14th inst., at his house at Cookham. Mr. Ryall began his career as an engraver by the production of Lodge's Portraits, the work by which he is best known, perhaps. Subsequently, he engraved Sir William Ross's miniature portraits of the Queen and Prince Albert, also Sir George Hayter's Coronation picture, and Leslie's picture of the Princess Royal's christening. These semi-public commissions procured for him the title of Historical Engraver to her Majesty.

Mollinger, the distinguished Dutch landscape painter, died on the 14th inst. Although it is only about three years since he first exhibited in the Royal Scottish Academy, his works have attained a large amount of popularity, and generally form one of the chief attractions in the landscape department of the exhibition. In the International Exhibition of 1862 his works were among the best and most characteristic of those exhibited by the modern Dutch school, and were warmly eulogized by Palgrave, in his celebrated handbook. Mollinger died at the early age of thirty-four.

M. Heiser, the architect of the Austrian Department in the French Exhibition, has just died. He was only forty-four years of age, and received the Legion of Honour at the hands of his Majesty only in July last.

Building Intelligence.

CHURCHES AND CHAPELS.

Holy Trinity Church, Trinity-square, Borough, has been restored under the direction of Mr. Sayer, of Great Dover street. The church was re-opened on Sunday last.

The church of Amberley has been entirely restored at the cost of Lady Lindsay. The work was carried out from the designs and under the superintendence of Mr. Thomas Nicholson, diocesan architect of Hereford.

The church of St. John the Evangelist, Milborne Port, near Sherborne, Dorsetshire, has just been enlarged. It is one of the smallest and oldest churches in England, having been built in the Saxon times. It is estimated that at least 100,000 services have been performed in the church.

"P. Q. P. V." writes:—A little while ago you kindly allowed me to call attention to the Vandalism that had been perpetrated at Conisborough. May I now beg for a little space to expose another instance of irreparable mischief that is being done under the pretence of restoration? The little village of Darton, near Barnsley, possesses a splendid old church. This church is a very fine example of Late Perpendicular work, and consists of nave, aisles, chancel, and chancel aisles. It is all built of ashlar, from a local quarry, and is in as perfect condition, as far as the stonework goes, as it was the day it was built. There is not a bad stone in the whole building. Now, at the present time, some half-dozen men and boys are engaged in roughly recutting—bolstering—the whole of the internal stonework, so that the interior of the church is entirely nineteenth, instead of fifteenth, century work. All the mouldings now, instead of being sharp and bold, are irregular, flat, and weak in the extreme. There is no excuse for this, as the whitewash comes off very easily indeed. Here, Sir, is another fine church ruined, and no one seems to care a straw. If the present rage continues unchecked we shall soon have no old buildings in the land. Cannot some protecting hand be thrown out before it is too late? The architect in charge of this church is Mr. Perkins, of Leeds, and I will fain hope all this mischief is being done without his knowledge.

Baden-Baden.—The new English church (All Saints) just erected at this famous resort was consecrated by the Archbishop of Armagh on the 14th

inst. The church was designed by Mr. Thomas Wyatt, who furnished all the drawings gratis. It is a perfect model of an old English church, with spire and belfry.

HEWORTH.—The foundation stone of a new church (the Holy Trinity) was laid here last week. It will be in the Early English style, with nave, chancel, tower, and spire. There are to be no side aisles, as the interior will be sheltered by one roof of 35ft. 6in. span, which will be the breadth of the church, and its length is to be 114ft. It is to seat 300 adults and 150 children, and will cost upwards of £5,000. The architect is Mr. G. F. Jones, of York, the contractors being Mr. Joseph Keswick, mason, and Mr. John Holmes, carpenter, both of York.

WOLVERHAMPTON.—The foundation stone of St. Jude's has just been laid. The edifice is to be in the style of the thirteenth century, and to consist of nave, north and south aisles, and chancel, vestry on south side of the chancel, organ chamber on north side of the chancel, and a tower (through which is the principal entrance) at the west end of south aisle. The contract has been taken by Mr. Nelson, of Dudley, at £4,250.

BUILDINGS.

It is intended to erect a Masonic Hall and Club in New-street, Birmingham, and a limited liability company has been formed for carrying out this object. A tender for the erection of the building for £15,070 has been accepted.

The magistracy of Berlin has asked the Town Council for a further grant of £30,000 for the building expenses of the town hall there. It has already cost the small sum of £283,000.

In describing the opening of Colston Hall, which took place the other evening, with an audience of over 3,000 persons, the *Western Daily Press* says:—"With a vivid remembrance of the Town Hall, Birmingham; St. George's Hall, Liverpool; the Free Trade Hall, Manchester; and St. James's and Exeter Halls in London, we may, without vanity, accord to our own city a distinguished pre-eminence over all of them. Colston Hall may not be capable of holding so many people as many places in England, but for chaste and effective elegance of architecture there is not a public room in the country to surpass it. This was the general verdict last night." We are glad that the Bristolians are so thoroughly satisfied. The architect of the new hall is Mr. John Foster, of Bristol.

The Queen's Theatre (late St. Martin's Hall) is in a very forward state, nearly all the heavy work being done, and a week or two will see it in the hands of the decorators. In size it will be quite as large as the Adelphi.

BALA.—The Welsh Calvinistic Methodist College at Bala was opened on the 5th and 6th inst. The building is situate on the road to Festiniog, about half a mile from Bala, on rising ground, and forms a prominent feature in the landscape. The style is Gothic, and the front is composed of a main building with centre tower and two wings, the latter being the residences for the principals. The building is designed to accommodate 60 students. The walling is of green porphyry, and the dressings of a flesh-coloured limestone from Egarth on the Denbigh, Ruthin and Corwen Railway. The total cost, including entrance lodge, fence walls, &c., is £7,000. The architect is Mr. W. H. Spaull, of Owestry. The builder is Mr. W. Morris, Rhyl.

The latest American papers inform us that the new aerial railway over New York is to be supported upon wrought-iron columns, 1ft. diameter and 14ft. high, secured in blocks of iron. Streets are to be spanned with ornamental bridges. The motive force is to be supplied by engines of 30-horse power, placed in vaults beneath the streets at intervals of half a mile. These are to work an endless chain of wire rope revolving over large drums, extending about a quarter of a mile each way from the engines, and returning by an iron tube placed beneath the pavement. The carriages are to be of a peculiar construction, capable of being stopped at any moment by the conductor, with the application of a lever. The stations are placed at equal distances from each other, and waiting-rooms are to be on a second floor of buildings adjoining. The railway passengers ascend and descend by staircases. It is said that the mayor of New York has some doubts as to the legality and powers of the company, and has not sanctioned the works.

TO CORRESPONDENTS.

NOTICE.—On and after the 11th October next, the "BUILDING NEWS" will be Published at the New Office, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the EDITOR, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—Rev. J. C. J.—A. G. H.—E. L.—J. R. K.—M. F. and Co.—W. H. S.—J. W. B.—J. T.—E. W. P.—A. C.—C. W.—F. F. M.—T. E. J.—G. H. G.—R. M. B.—J. P. P.—F. L. S.—W. J. E.—F L. S. (next week).—K. and Co.—"A Chip."—T. H.—H. and K.—M. and C.—J. C. J.—E. W. P.—F. F. M.—A. B.—S. H. H

W N. has not put his question on "Non-conducting" sufficiently clear. Perhaps he will try again.

A. H. will find his question answered on July 5, 1867, No. 652.

Correspondence.

THE NEW PALACE AT WESTMINSTER.

To the Editor of the BUILDING NEWS.

SIR,—I see that Mr. E. Pugin has returned to your columns after his unsuccessful enterprises in the *Pall Mall Gazette* and the *Times*. We should have thought it better to carry on the controversy in the architectural papers only, because there it would have been better understood. May I ask you to do me the favour to insert the accompanying letter, written originally to the *Times*, as showing the line which Sir C. Barry's representatives believe to be the only one by which the "whole truth and nothing but the truth" can be elicited?—I am, &c. ALFRED BARRY.

To the Editor of the *Times*.

SIR,—It is quite time that this controversy was brought to an issue. This can be done only in one way—by reference to some impartial and authoritative tribunal.

Correspondence in newspapers, where statements and evidence cannot be tested and cross-examined at the time of their production, can lead to no satisfactory result, especially with an antagonist who, when the controversy has been worked out in one newspaper, and the newspaper has summed up against him, immediately opens ground in another.

If you will grant me a short space, I will show why such a reference is absolutely necessary. Mr. Pugin rests his case as to the competitive designs simply on a diary of his father's. The only witness he ventured to call (in his first letter to the *Pall Mall Gazette*), Mr. Talbot Bury, has contradicted him so flatly and conclusively that, till that contradiction be answered, it is absolutely fatal. I demand that this diary be produced and scrutinized before it be admitted in evidence. I pledge myself to prove, before any proper tribunal, that, where dates are all-important, he has either misdated or misquoted it, that he has given in different letters dates for entries in it wholly inconsistent with each other, and that he has, on its authority, made statements as to Sir C. Barry's movements which can be proved, from documents in my possession, to be absolutely incorrect.

He rests his case, as to the drawings subsequent to the competition, on certain letters of my father's to Mr. A. W. Pugin. I demand that these letters be laid in their entirety, not in garbled quotations (which may be skilfully arranged to give colour to anything), before a proper tribunal. Even as they stand they will not maintain his claim for a moment; let them be read as a whole, and they will show exactly what we have all along stated to be the case.

The witnesses brought forward on our side are men of character and reputation. He has produced only one witness, unknown to fame. It is necessary that her antecedents be examined, and her credibility tested by cross-examination.

We are perfectly ready to submit all our evidences to the same test—to give any date, and produce any document before the proper tribunal.

Hitherto, I observe that Mr. E. Pugin has declared himself fully able to prove his case. But his last letter shows that he feels the insecurity of his ground, and prepares his retreat by reference to the letters which he states that he lent Sir Charles in 1860, and that which he chooses to suppose that they contain. On the main point I will simply quote the editorial notice of the *Pall Mall Gazette*:—

"Is Mr. Pugin not aware that the letters were not his own to lend, and that the joint ownership of all letters rests, by law, with the writer and the receiver? Pugin might, of course, have bequeathed his half of the ownership of the letters to his son, but, even in this case, Sir C. Barry would have been equally entitled to their custody."

As to what passed at the interview, we have at present only Mr. E. Pugin's unsupported assertions. He said no word while my father was alive and able to answer for himself; nor have we any memorandum on the subject. But it happens that we have written evidence, which we will produce, that in the month of February, 1860, Sir Charles Barry had been appealed to for his testimony to bar an extraordinary pecuniary claim of Mr. E. Pugin's on one of the firms engaged in ornamental work at the New Palace. This may possibly throw some light on Mr. Pugin's object in making application to Sir Charles at that very time; it will certainly show why Sir Charles was unwilling that letters of the most confidential kind, referring to "current controversies, unfinished works, and living persons," should remain in Mr. E. Pugin's hands.

I therefore challenge him to do what has been already three times suggested—to bring his charges before an impartial tribunal, such as the Council of the Institute of British Architects, or (if a single arbiter be preferred) the President of that distinguished body. If he declines the challenge, he will deserve no further notice, but must be content to sit down under the imputation of having brought a charge of a most injurious nature, which he is unable to substantiate, and unwilling to submit to the test of examination.

I think, Sir, that you will agree with me that if the challenge be not accepted he must "for ever hold his peace."

I am, Sir, your obedient servant,
ALFRED BARRY.

P.S. I have to apologise to you for introducing a fresh party into this discussion. I have been requested to write, because all my father's diaries, &c., have been placed in my hands.

BARRY *v.* PUGIN.

SIR,—Whatever may be thought of the letters of Mr. Pugin and Mr. Crace, quoted in the *Builder* of September 14, it is evident that at the time they were written they did not affect the convictions of people generally. On September 27, 1845, a correspondent wrote thus to that journal.—"The statements made in your columns of Mr. Pugin and Mr. Crace were ingeniously framed so as to let it be inferred that Mr. Barry makes the designs of all the ornaments, both for the carved and painted decorations, Mr. Pugin being his draughtsman for the carved work, and Mr. Crace for the painted work. Mr. John Crace's declaration that he drew with his own hand the sketches of Mr. Barry, is calculated to excite some apprehensions for the execution of the painted decorations amongst those who are conversant with Mr. Crace's powers of delineation; and though it is possible that Mr. Crace may have taken lessons in drawing lately, so that his performances may no longer cheit the laughter of the foreign artists, as they used to do, still the difference between Pugin and Crace is rather too great for their performances to be on a level. If Mr. Barry finds it necessary to engage such valuable assistance as Mr. Pugin's for the carved work, when the feeling and skill of the carver would supply some deficiency, how much more important is it to have the working drawings for the painters made by masterly draughtsmen." If Mr. Crace really "drew out Mr. Barry's sketches full size with his own hands, and directed the execution of them under Mr. Barry's immediate instructions," how is it true that "Messrs. Crace have both the honour and profit accruing from the painted decorations of the House of Lords, which are being executed by foreign and English artists from designs furnished by Mr. Pugin, and under his directions." This statement appeared in a number of the same journal in the same year, which also details Sir C. Barry's answer to certain artists who called on him for employment. He is described as bowing them out with the remark, that Mr. Crace was employed by Mr. Pugin, and he was not accountable for Mr. Pugin's acts.

These extracts, most people will think, very plainly indicate Mr. Pugin's real position as regards "the internal fittings and decorations of the House;" and although they in no way affect the question of the original competition designs, they have a measure of importance of their own now that efforts are being made to deprive him even of this comparatively poor merit. I never saw Mr. Pugin in my life, and have no interest one way or the other in the present discussion; but in common with many others I am disgusted at the present attempts to generalize Mr. Pugin's artistic labours as "assistance," as though he were only a kind of superior foreman. It is rather too absurd for belief that a man like Sir C. Barry, who was constantly writing—as we have seen in the *Times* of September 7—to Mr. Pugin for designs of every kind for the internal fittings and decorations of the Houses, should nevertheless at that very time be making "large detail drawings" himself for wood carvings, and sending sketches for decorations to another person—not Mr. Pugin—to be drawn out full size, when Mr. Pugin was actually holding an official appointment under Government for the very purpose of doing what he is here denied ever to have done at all. At the time of Mr. Pugin's death, the more important question of his claim to be considered, at least, joint-architect with Sir C. Barry, was then alluded to in the *Builder*. "From some statements which have been made, it would be inferred that he should divide with the ostensible architect the whole merit or otherwise of the work; and one writer goes even further still." Mr. Talbot Bury also, in his notice of Mr. Pugin, says that "Pugin rendered assistance to two architects, who at this time were preparing designs for the

Nv Houses of Parliament," forgetting, I imagine, h statement in the *Pall Mall Gazette* of August 2 ast, that his drawings were not made till after S Charles' original design had been selected. Ts same gentleman also says that "Mr. Pugin s wed him, at the Millbank Works, large detail d wings prepared by Sir C. Barry himself," when t whole body of witnesses have been impressing o is that Mr. Pugin was expressly engaged to do "tail drawings" only.

take this means of calling Mr. Welby Pugin's a ntion to the above extracts, which bear upon rch that he has advanced, and at the same time e lain the garbled quotation, and nullify the a urd conclusions, given us in the *Builder*.—I a &c., W. E. Gaine, C.E.

Bognor, September 24.

ART AND TECHNICAL EDUCATION.

Sir,—The want of technical education having l n acknowledged on all sides, we have only now t consider where the want is most felt, and how i an best be supplied. We do not possess any r ular means of diffusing art and technical know- l ge through all classes, and in such a manner t t beauty of form and finish rules in our articles c common use. If our domestic articles are a stic and beautiful we may be certain that our n uments and buildings will have the same a stic finish. We appear to require an English c er of style and design, and we have no distinct s ool of architecture, sculpture, and ornament. A proof of this we have endeavoured to make l glish ladies into Roman matrons with very l le success. Our mistakes in statuary must be r ibuted to the same reason. Roman togas do n follow the natural rotundity of the British t esman. Our designs have nothing to distin- g sh them from those of continental nations. Our t le should be known and so copied by other n ions. We have a standard style for ma- c nes, engines, machine tools, and shipbuilding t t all foreigners copy, and as long as they copy n we must have the advantage. Let the British n nufacturers of textile fabrics endeavour to take t same position, and then what foreign compe- t on have we to fear, with the best supply of n, coal, and raw material, and the finest ship- l g in the world to carry our goods to the most t tant countries?

.t does not appear necessary to visit France for .terns in cloths, paper hangings, &c., when we ld design them ourselves. The French have y an educated taste; the country has nothing itself to produce refined taste. The manufac- ing districts of the North of England are far re beautiful than those of France, for it would difficult to find any continental manufacturing y (except Lyons, where the most exquisite rics are produced) to compare in beauty of uation to Halifax, Huddersfield, Sheffield, dmorden, Skipton, or the valleys intersected the Lancashire and Yorkshire, or the London l North Western Railways, where the great lk of our manufacturing industry is carried on. l the taste and appreciation of beauty is national re; and is not taste as capable of being im- oved by cultivation as a naturally fine voice? en in architecture we have not found any ler entirely suitable to either the climate or tes of the country. The Tudor may be con- ered as the only one that has been a success in s country. Most people, native and foreign, knowledge that an old Tudor hall is one of the st beautiful objects in the world. And why? cause it agrees with the surrounding scenery, d the tastes of the people. This can only be a rk of time, but we must commence somewhere, d no doubt we shall succeed; for it is well own that the earliest Greek statues had neither ms nor legs, and no doubt resembled the ginger- ead men that delight the children. To accom- sh this everyone should try to obtain some eal of beauty, something connected with the story, romance, or poetry of the country, some ntiment taken from the actions and thoughts of bygone age, but still embodying some prin- ple applicable to the present day. Every tree, atue, fountain, picture, has a certain influence; we should endeavour to increase the number of ch objects in our towns. We have many admir- le sites for fountains and statues in our towns we only had the objects. One might go on ultiplying instances for ever if only people were tent upon the general improvement of the asses. When once people see the necessity of ese things we shall find many willing scholars.

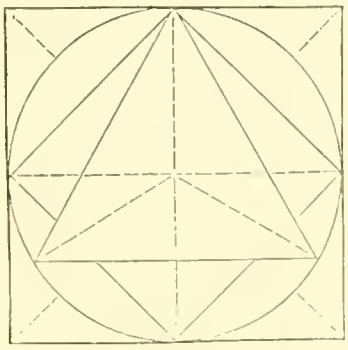
I am, &c., Arthur Nussey.

4, Park-lane, Leeds.

THE CIRCUMFERENCE AND AREA OF A CIRCLE GEOMETRICALLY.

Sir,—As your correspondent "E. L. G." has favoured us with some highly interesting ratios relating to the circle and square, permit me through your columns to submit one more diagram bearing upon this subject.

The diagram is composed of three of the principal geometrical figures, the circle, square, and triangle, the combination of which affords the means of the solution of many valuable problems; and among them the nearest approximation to the circumference of a circle probably hitherto discovered, as described below. To the length of two sides of the internal square add two sides of the equilateral triangle, and the result equals the circumference of the enclosing circle near enough for all practical purposes, but, for strict accuracy, deduct therefrom one thousandth part.

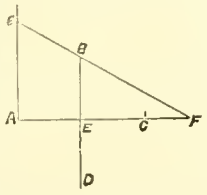


To find the area of a circle:—To the length of one side of the square add one side of the triangle, and the product multiplied by half the diameter equals the superficial area of the circle.—I am, &c.

Southampton. Geo. Guillaume.

CIRCUMFERENCE OF A CIRCLE.

Sir,—A good method of approximating geometrically to the circumference of a circle whose diameter is given, will be found in "Gregory's Mathematics for Practical Men, Prob. 18, 'Practical Geometry.'"



Let A C and B D be two diameters at right angles to each other. Produce A C to F, making C F equal to three-fourths of the radius E C. Erect the perpendicular A e and draw the straight line F B e; then A e is nearly equal to a quadrant of the circle. This method gives us the Archimedean ratio of 22 : 7. For

$$\frac{A\,e}{B\,E} = \frac{A\,F}{E\,F} = \frac{11}{7}$$

and if we call the diameter "units," then B E $= \frac{1}{2}$, and the circumference $= 4\,A\,e = \frac{22}{7}$.

This will be found in practice to be both simpler and more accurate than the method given by Mr. Guillaume. E. W. T.

CHURCHYARD DESECRATION.

Sir,—Will you allow me to call the attention of the Incumbent, or whoever may be the person responsible, to the very disgraceful condition of the burying ground in Clerkenwell-green? A portion of the railing has been torn down to afford an entrance to the juvenile population of the neighbourhood, who have turned the sacred place into a playground, evidently much to their own satisfaction. A dozen ragamuffins may be seen at any hour of the day playing at leap-frog over the tombstones, which are being defaced and mutilated in a most shameful manner. How such things are tolerated close to a public thoroughfare, and within a stone's throw of Clerkenwell Sessions-house, where there is generally plenty of policemen, is unaccountable. For many months past this sort of thing has been allowed to go on without let or hindrance. It is true, that some time ago, by way of warning, several small handbills were stuck up—where do you think?—on the very tombstones! This, in itself, was a piece of stupid desecration; and I observed the bills—they might easily have been mistaken for quack advertisements—were all carefully removed a few days afterwards. Of course, what is wanted is a conspicuous placard, which ought to be placed on the outside railing. First, however, let the burying ground be cleared of all the filth and rubbish which have been shot into it, and let the place be rendered somewhat decent for decency's sake. I should say that Clerkenwell churchyard is the best neglected churchyard in the metropolis. This is saying a great deal.—I am, &c.,

Old Mortality.

NORTHERN VANDALS.

Sir,—A friend has shown us in your issue of a week or two back, an article with the above heading, in which you soundly abuse us for destruction we have perpetrated in Darfield Church. We, therefore, write to inform your readers that we have never had anything to do with any works whatever at Darfield Church; and, further, that such destructions as you allege are utterly opposed to our feelings and practice.—We are, &c.,

Pritchett and Son.

York and Darlington, September 20.

[We willingly give insertion to this letter, and, at the same time, beg to express our sorrow that we should have associated the names of Messrs. Pritchett and Son with an act of Vandalism. Our informant, who on all other occasions has been found to be reliable, was, in this instance, mistaken. Ed. B. N.]

TERRA COTTA.

Sir,—Mr. Redgrave's letter on Coade's Artificial Stone reminds me that I met with a considerable quantity of it in a church which I was employed to restore. It had been executed about 60 years, had stood well, and was a fair imitation of a white and very fine-grained stone—so much so, that had I not been struck by the circumstance that the "tool marks" upon the moulded work ran in a different direction from that which they must have taken if done by a mason, I might not have easily detected the nature of the manufacture. It was terra cotta, of course, and I now see that it might be executed by dragging a notched tool over the wet surface, producing what is probably meant by the "polished" surface mentioned. This was not a bad sample of the kind of mistake which manufacturers of imitation articles are often led into. If the material had been left, as it came, smooth from the mould, it would have been a much better imitation of wrought stone than it was after being laboriously marked or tooled.

Thos. Blashill.

10, Old Jewry Chambers, E.C.

LLANTRISSANT, SOUTH WALES.

Sir,—A correspondent in your last impression has associated my name with what reads very like an act of Vandalism contemplated in the repairing of the church roof of Llantrissant, in the county of Glamorgan. I have not had the honour of being consulted on the subject; had I, I should have been governed by a rule I have established in connection with church-roof restorations, namely—Preserve an old roof, if possible; failing this, make a close copy of the original; but if funds should hopelessly fail, then put the most appropriate roof under the circumstances. Apart from the archæological, I have reason to take a lively interest in what may befal this church, as some of my forefathers rest within its altar rails, and I think I see my way to prevent the mischief which your incautious correspondent so justly complains of.—I am, &c., Jno. Prichard.

Llandaff, September 24.

BEDFORDSHIRE MIDDLE CLASS SCHOOLS COMPETITION.

Sir,—In your paper of last week we see a notice of this competition which is not quite correct. As our design was one of the four reserved for consideration and selection, we send you a copy of a letter we have received from the secretary.—We are, &c., Mayhew and Calder.

BEDFORDSHIRE MIDDLE CLASS SCHOOL COMPANY (LIMITED.)

Bedford, Beds, September 16, 1867.

Messrs. Mayhew and Calder.

Gentlemen,—The directors received four designs for their consideration: those of

Mr. F. Peck, of 15, Furnival's Inn, London;
Mr. John Usher, of High-street, Bedford;
Mr. John Day, of Gwyn-stret, Bedford; and
Your own.

They selected Mr. Peck's design as the most suitable for the school buildings. They felt a difficulty as to the claims of Mr. Usher and Mr. Day for the premium of £50 for the

design and place the best of those rejected, and, therefore, paid them each a premium of £50. Your design they considered the fourth in merit.

I beg to express the thanks of the directors for the time and trouble bestowed by you upon the design and plans you submitted, and

I remain, Gentlemen, your obedient servant,
THOS. W. TURNLEY, Secretary.

RENAISSANCE AND GOTHIC.

SIR,—There is no one more one-sided than the genuine Gothic architect; he will not see anything except through his own spectacles. The sixteenth century Renaissance architects did not care to show their construction, but in the present age we do care to show it—different times, different ideas. There is nothing, however, in the Renaissance style to prevent the construction being distinctly visible, the outside bearing witness to the inside; the square arched window with its pediment may just as easily be made to show its construction as not. The Renaissance architect did not desire to do it, but there is no reason why we should not; there is nothing in the style to prevent it.—I am, &c., A. B. C.

MANCHESTER NEW TOWN HALL.

SIR,—Do not both your correspondents on page 657 strangely mistake the Manchester Corporation's reasons for not exhibiting at present the sketch designs that they desire to have finished? I should think the sole reason was because they are not the Corporation's to exhibit. If "the public voice demands" the exhibition of them, as the letter of "A Competitor" says, surely this voice must address itself to the proprietors of the things it wants exhibited. The Manchester Council has no more ownership in them than the Tycoon has. As for the Corporation's liberal offer to exhibit gratuitously the rejected sketches, if I were their authors I should vote for keeping them till the ordered ones are finished, and then, but not earlier, opening an exhibition of them in Manchester, which, at the same time with the Corporation's exhibition, would, I doubt not, pay its expenses. For I assume that, of course, all the premiated designs will be submitted to public criticism for as long a time as possible between their reception in February and the final selection. Exhibitions "after the award has been made" would be a mere farce; and I cannot doubt your correspondent from Halesworth has been misinformed about the intention on this point.—I am, &c.,

September 24. A LOOKER-ON.

THE HOUSES OF PARLIAMENT.

SIR,—Can any of your readers inform me what are the Gothic works designed by Sir Charles Barry besides those named by your correspondent "J. A. H." in your columns of last week. It is clear from Mr. Pugin's statement that High Clere can no more be included in this category than it can be considered the type of the Parliament Houses. If there are no executed works of Sir Charles Barry's which can in any way lead to the supposition that he was the art architect of the Houses, there will, doubtless, exist sufficient of his compositions and drawings to prove the case in one way or the other.—I am, &c.,

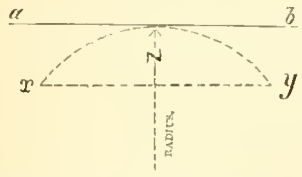
W. COLLINGRIDGE BARNETT.

Edinburgh, September 26.

Intercommunication.

QUESTIONS.

[586.]—ARCS OF DIFFERENT RADII.—Having a small rod of spring steel, I want to form with it arcs of different radii. Could you or any of your readers kindly inform me if there is any rule or formula by which (given the length of the rod A B and the radius of the required



are both in inches) I can find the length of the chord $x\,y$ and the height z? Any information with regard to the above would greatly oblige.—Yours, &c., A PUZZLE.

[587.]—TRANSFERRING PRINTS.—Can any one inform me of how to transfer a print on to drawing paper? I have once seen an instance of this, but never have got the desired information.—A. X.

[588.]—BOX GIRDERS.—Can any of your numerous correspondents kindly inform me what ought to be the sectional area of a box girder, and of what thickness the iron should be to sustain a weight of 50 tons when loaded? The span of the girder is 13ft., and it has to carry 18in, brickwork.—E. E. C.

[589.]—PENCIL DRAWINGS.—What is the best means of keeping from injury—by rubbing or otherwise—pencil drawings, without discolouring the paper or deteriorating from the sharpness and brilliancy of the pencil marks? I have rather a "foggy" idea about applications of alum, white of egg, or isinglass, but do not know whether they are the most satisfactory preservatives, or how to apply them.—SEEKER.

[590.]—VOUSSOIRS.—Has the number of its voussoirs any influence upon the strength of an arch or not? Example—is an arch formed of (say) twenty voussoirs or arch stones—involving, of course, double that number of joints—any stronger or weaker or of the same strength as an arch having but (say) ten or fewer voussoirs, both arches being of the same span, height, &c.—INQUIRER.

[591.]—WATER COLOURS.—What do water colour artists use to give that depth of tone and gloss to the colours of their works, which, when finished, most of them seem to bear, appearing nearly like oil paintings? Is it some preparation of gum which deepens and also gives a brilliancy, applied in the manner of a wash?—SEEKER.

[592.]—OX GALL.—Would some of your numerous correspondents kindly inform me how to prepare ox gall so as to be able to keep it fit for use, as it is very inconvenient to have to send out for it every time it is required?—J. F. G.

[593.]—BLASTING POWDER.—I have heard that there is a blasting powder made, which, when ignited does not make any report. Will you please say if you have heard or know anything of it, and oblige your constant subscriber, FRANK L. SCOTT, Netherton, near Highfield.

REPLIES.

[322.]—CIRCLE.—Having, in your issue of March 29, put a query, but having not received a true answer, I then gave it, but as you did not insert my explanation I left off further communication on the subject. But seeing the circle again introduced by G. H. Guillaume, and replied to by "E. L. G.," please insert a few figures for me.

And, first, the true proportion between the diameter and circumference of a circle is as 7 : 22, together with a supplement of 1 : 3.

Then

$$1:3 \mid \frac{1}{7} - \frac{1}{791} = \frac{16}{113} = \cdot 141592, \text{ \&c.}$$

or,

$$1:3 \mid \frac{1}{8} + \frac{15}{904} = \frac{16}{113} = \quad \text{do.}$$

or,

$$7\frac{1}{16} = 113 \text{ and } 22\frac{3}{16} = 355 = 3\cdot 141592, \text{ \&c.}$$

The true proportion thus far is easily found geometrically, which I may show hereafter, if approved of by your readers.

To progress nearer truth,

$$355 \div 56 = 411 \times 10 = 4110.$$

Then

$$\frac{113\frac{7}{8} \text{ reduced}}{4110} \text{ and } \frac{355\frac{21}{8} \text{ reduced}}{4110}$$

$$= 3715447 \text{ diameter} = 11672421 \text{ circumference.}$$

Quotient 3·141592653589 true to 12 decimal places.

The underneath diameter and circumference found by the same rule will give a quotient true to 36 decimal places:—

			this	less	this		
Scheme to be reduced.	$\frac{355}{113}$	$\frac{7}{8}$ this less $\frac{1}{4110}$ $\frac{9\frac{1}{2}}{107}$ $11\frac{1}{2}$	1 / 162	$11\frac{1}{8}$ / $12\frac{1}{8}$	1 / 304	$34\frac{1}{7}$ / 184 $35\frac{1}{7}$ / 185 $34\frac{1}{7}$ / $35\frac{1}{7}$	

Circumference 359023615680170363547.

Diameter ..... 114280766244448032305.

Quotient ..... 3·141592653589793238462643383279502884.

Remainder ... 107806912430432970.

WILLIAM BUTLER.

[528.]—MEDALS.—I think that the answers which have been given to the question of "A. C." on this subject are not by any means exhaustive of it. There is no doubt in my mind that architects, and even builders, might derive many valuable hints from an examination of the ancient medals and coins exhibited in the British Museum. It is scarcely necessary that members of those professions should make medals a distinct study, but I feel confident they would be gainers in many ways by paying some attention to them and at the same time to old Roman and Greek coins. Michael Angelo and Rubens possessed cabinets of medals and coins, to which they no doubt often referred with advantage. The representations of many ancient edifices are to be found in very perfect preservation on medals in the national establishment above named. The coins of Tarsus, again, are remarkable for a kind of perspective in the figures. On others are to be found temples, triumphal arches, fountains, aqueducts, circuses, palaces, columns, obelisks, baths, pharoses, amphitheatres, seaports, harbours, and the like, and most of these have been admirably drawn and engraved. To those who question the usefulness of a knowledge of ancient medals and coins, to the architect I would say, pay a visit of inspection to the department of the British Museum devoted to their preservation, and get rid of your scepticism on the point.—PECUNIA.

[537.]—PERIODS OF GOTHIC ARCHITECTURE.—Thanks to "M. Renaudt-Mangin" for treating the last letter of "Provincial," for which time failed me. M. Viollet-le-Duc, the only learned architect living, has made it very probable that the great cathedral-building movement, and the resulting Pointed style, sprung of anti-clerical sentiment, employed lay architects, and was, in fact, the Protestantism of its day! But, however that might be, before "Provincial" pointed out the wonderful "coincidence" of its being "invented by Romish worshippers," he should at least have told us what style yet among us was not invented by them. The Saxon and Norman, as "M. Renault-Mangin" says, were pre-eminently monkish; and the Renaissance—the choice of all modern Popes and Mr. Spurgeon—arose and spread with and by the Jesuits, who, at least, profess to be "Romish worshippers."

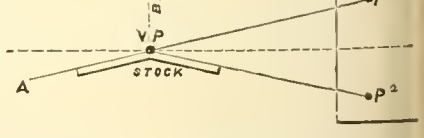
It is a curious pendant to the late Augustus Pugin's life, that Pointed Gothic should now be precisely the only style whose origin any inquirer has thought traceable to a Protestant spirit!

As for the dates, when I said "Provincial" had be unlucky in his authorities, it was in the vain hope awakening him to the ludicrous absurdity of making it modern author-quoting question. The sole authorities it are old English buildings and their dating documents things of which "Provincial" showed he had just as mu personal knowledge, love, or care, as of Hindoo building Another such oracle or two would totally subvert the d sign of these columns; which I take to be, that a que should elicit a reply, if possible, from some one having personal acquaintance with the matter; but if, in a we or two, this do not happen, then some reader really i terested in it, to refer to, or quote at length any passa thought to bear on it, in a named and not antiquated boo but in no case a hash to be served up of we know not wh by we know not whom. Supposing, however, this h been a matter for book quoting (as a question of Russi styles might be), and that the books named were "auth rities," what earthly reason should we have, after seei what "Provincial" thinks quoting (as from "Mr. Fergu son" or from my replies), for supposing R. S. Burn wro anything the least resembling his "exact copy?" If did date "Perpendicular" from 1460 (with a 4 for a 3) was simply a careless scribbler; but I know not who w think the fact worth inquiring into. For, why shou "Provincial" know any better whether he is quoting misquoting Mr. Burn, than when he thinks himself co ing and "agreeing with" me? or than when he says t Oxford "Glossary" gives 118 examples of Saxon archit ture," the fact being that it tells him no works, besides t bits I named, are "really known" (emphasizing the wo I think, with capitals) to date before the Conquest? (A some of these 118 examples, as those of St. Alban's Abb are positively known to date after it!)

As for how long Perpendicular lasted, he should not st at my "200 years," but add that Mr. J. H. Parker (authority, if anybody is), makes it 280. In his l edition of "Rickman," he begins that style with "E ington Church, Wilts, founded by Bishop William, Edington, in 1352, and consecrated in 1361;" and adds the final table, "This style used in additions and rebuil ing, but often much debased, as late as 1630 or 1640. E ington Church, indeed, is only semi-Perpendicular, but t commencement of remodelling Winchester nave, by t same bishop, who died in 1366, are as fully Perpendicul as anything ever built. On the other hand, Wren carri on the style in three or four of his London churches aft the fire. So there you have a round three centurie though for little more than half that time was it a bran of real Gothic—that is, vaulted architecture. The sa author divides the previous periods precisely as I do, givi three reigns to the pure Early English, but calling Tran tional or semi-Norman, not the first of these, but t whole reign of Henry II., which is undoubtedly right, t St. Cross dates from Stephen's reign; and the Temp Rotunda, the last thing with a vestige of Normanism, least in Southern England, was dedicated in 1185, not Richard's reign, as I stated. Strictly, the whole career real Gothic in England, was from the first fully vault building, St. Cross, to the last, Wolsey's Chapel, or t House of Commons cloisters. Nothing but the profound ignorance of what any real architecture means cou prompt the remark that in the Transition "almost eve combination of Norman and Gothic details may be found Where may pointed niche or doorheads be found in wal bearing a round vault? There were never two styl either to "struggle for ascendancy" or combine, but t only style known was rectified and developed into anothe And this, like all true growth, by rigorous law and s herence to consistent principles. There were no su creatures as modern architects or modistes "de nouveaute concerned.—E. L. G.

[562.]—POTASH.—The question is not one of quantit but turns solely on whether quick lime is capable of deco posing the granite sand, so as to set its alkali free. A soluble matter, much or little, would spoil mortar, but t potash or soda in any natural stone or pulverized stone s so combined as to be insoluble, and I never heard of qui lime disengaging them.—E. L. G.

[566.]—CENTROLINEAD.—The following diagram sho an easy way of finding the angle of the stock or guidi part of a centrolinead. Let P1 – P2 be the points or pi against which the centrolinead works, chosen at will, a



equidistant from the horizontal line. Let V P be t vanishing point. Draw lines from P1 – P2, to V P, an prolong one of them, as at A. The new angle forme A, VP, P2 will be the angle of the stock of centrolinea It will be observed that the two angles are always equ to two right angles, *i.e.*, if the first were 20in. the secon would be 160in.—W. J. E.

[572.]—QUEEN ELEANOR'S CROSS.—"W. R." wi find geometrical elevation, with plans and details, of Quee Eleanor's Cross, at Waltham, in Nicholson's "Practic Builder," Vol. III., plates 85 and 86.—J. O.

[572.]—"W. R." will find a view of Waltham Cross r stored, in vol. 3, No 113, of the *Penny Magazine*, publishe January 3, 1834, and in vol 22, No. 81, of the *Saturda Magazine*, published March 11, 1843, a view of the Cro previous to its restoration. Vol. 22 of the *Saturday Maga zine* also contains views and an historical account of a Queen Eleanor's crosses. The second vol. of the *Mirror* published between 1820 and 1830, contains a view of th Cross.—C. S.

[572.]—"W. R." can find a view of Queen Eleanor' Cross, at Waltham, as restored by W. B. Clark, togethe with details, in "A Theoretical and Practical Treatise o the Five Orders of Architecture, with the Opinions of Si W. Chambers and other Eminent Architects, both Ancien

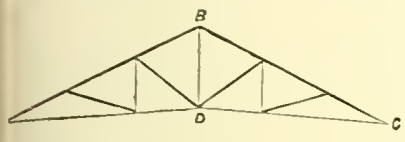
l Modern. Published by Thos. Kelly, 17, Paternoster-
r, 1834-5."
P.S.—The price of book is not stated. I bought the one
ave at a second-hand book shop a short time since for
—W. N.

78].—DRAWBRIDGE.—Multiply the weight of the flap
the distance of its centre of gravity from the hinge, and
ide by the shortest distance from said hinge to the sus-
ding chain. This will give the pull necessary, which
y be anything above half the flap's weight. "C. E."
y make the pull whatever he pleases above that limit
working this proportion. As the intended pull is to the
ight, so is the distance between the hinge and centre of
vity to another distance. Draw a circle round the hinge
this second distance, and let the chain be attached where
i like, but touch the circle without cutting it. The
t place of attachment is always at two-thirds of the flap's
gth, and then the least possible pull is three-quarters of
weight—namely, when the chain ascends vertically to a
cule. With chains passing over pulleys, more force
st always be required than for a bascule bridge, inde-
dently of the difference of friction.—E. L. G.

81.]—LINING FOR MALT STORES.—If "J. D. W."
its a thorough good job made of his stores I would ad-
him to have the walls and floors asphalted, which will
vent the damp coming through, and make it difficult
the mice.—SEMAJ.

83.]—GAS METERS.—In selecting a meter, the position
ld be considered. If it be placed where it will be ex-
d to the frost in winter, a dry meter is preferable, but
rather a warm place, a wet meter should be used.
ler any circumstances, but exposure to frost, I would
the preference to the wet meter, as I find its action
e regular. The usual objection made by consumers to
wet meter is the trouble of keeping the water to its
er line, but this is always attended to by the gas com-
y.—T. HOPE.

84.]—WROUGHT-IRON ROOF.—The usual construc-
of a roof of 40ft. span is shown in the annexed dia-
a, where the thick lines are in compresssion and the
lines in tension:—



The load on the roof per square of covering will be
- 3½cwt. ironwork
- 2½ ,, ¾in boarding
- 8 ,, slates
- 36 ,, add for wind

50 cwt., or 2½ tons.

osing the trusses to be placed 6ft. apart, the area of
ing supported by each will be 43ft. × 6ft. = 258
re feet, say 2½ squares.

oad on each truss, or $L = \frac{5}{2} \times \frac{5}{2} = \frac{25}{4} = 6\frac{1}{4}$ tons.

G test strain on rafter $= \frac{L}{2} \times \frac{AB}{BD} = \frac{25}{8} \times \frac{43}{2} \times \frac{1}{8} = 8{\cdot}4$

ining the iron in compression at 4 tons per square inch,
ave,

section of rafter $= \frac{8{\cdot}4}{4} = 2{\cdot}1$ sq. in. effective
add ... ... 1·0 bearing of pins.

3·1 sq. in.

h section, in the form of T-iron, the dimensions will
in. × 7-16in. top, 4in. × ¾in. depth.

G test strain on tie-rod $= \frac{L}{2} \times \frac{AD}{BD} = \frac{25}{8} \times \frac{20}{3} = 7{\cdot}8$

ming the iron in tension at 5 tons per square inch, we
h,

ea of tie-rod $= \frac{7{\cdot}8}{5} = 1{\cdot}56$ sq. in., say rod 1⅜in. dia-
er.

S in on king bolt $= 4{\cdot}\frac{L}{N} = 4{\cdot}\frac{25}{24} = 4{\cdot}1$ tons.

Wre N = the number of spaces formed on the rafters by
the intersection of ties and struts = 6 in this case.

S ion of king bolt $= \frac{4{\cdot}1}{5} = {\cdot}8$ sq. in.; rod 1in. diameter.

Strain on minor bolts $= \frac{L}{N} = \frac{25}{24} = 1$ ton.

S ion of minor bolts = ·21 sq. in.; rod ⅝in. diameter.

G test strain on struts $= \frac{3}{2} \cdot \frac{L}{N} \times \frac{1}{\sin.a}$

$= \frac{3}{2} \times \frac{25}{24} \times \frac{1}{6} = 2{\cdot}6$ tons.

Wre a = the angle of inclination of the strut = 37 deg.
his case.

Section of struts $= \frac{2{\cdot}6}{4} = {\cdot}65$ sq. in. effective
add . . 1·00 pins and cutting

1·65 sq. in.

rm of T-iron the dimensions are 2½in. by 2½in. by ⅜in.
e section of rafters and tie-rods may be decreased
rds the centre of the truss, without interfering with
strength, but I would not recommend it.—F. HOPE.

scaffold has just been erected around the Wellington
ue, at Hyde Park Corner, to enable of certain altera-
which have been decided as necessary, in the Field-
hal's hat!

WAGES MOVEMENT.

STREET LABOURERS.—The labourers in the employ of Messrs. Mowlem, Burt, and Freeman, the contractors, having struck for an increase of wages, the firm, on Wednesday morning, as an experiment, tried an engine on a piece of street paving in the New Kent-road. The engine was manufactured by Messrs. Aveling and Porter, of Rochester, for the corporation of Liverpool, with a nominal power of 12 horses. The engine weighs 28 tons, and the experiment, in utilizing labour and expense in setting and fixing the stones, was very successful. The engine can also be used as a traction engine, having drawn 40 tons on a fair road.

THE GAS STOKERS.—Another meeting of the gas stokers was held on Wednesday, Mr. George Hawk in the chair. Mr. Holder, the secretary, reported that they had not as yet obtained favourable replies from the companies. What they wanted was, that instead of two there should be three sets of men, who should work eight hours per day, which would, including four hours for Sunday labour, make sixty hours per week. That they considered to be a reasonable request, but the companies had as yet refused all concessions, and would not even receive a deputation from the men on the subject, so that there was nothing left for the men but to persevere in their agitation. Mr. Upsall then moved a resolution pledging the men to persevere in their demand for sixty hours per week instead of ninety. The resolution having been seconded, was put to the meeting and carried unanimously.

STAINED GLASS.

GLASTONBURY.—A stained glass window has just been placed in the south transept of St. John's Church, Glastonbury, Somerset. The principal subjects are full-length figures of Noah, Moses, Elias, and St. John the Baptist, beneath which are some important events in the history of each—Noah building the Ark, the passage through the Red Sea, Elias preaching to Ahab, and St. John baptising our Lord. The tracery portion of the window is occupied with a representation of our Lord in Glory, beneath which are four angels with crowns and scrolls. The window is the gift of J. J. Rocke, Esq., one of the churchwardens, and was designed and executed by Messrs. Clayton and Bell.

LEGAL INTELLIGENCE.

IMPORTANT TO BUILDERS.—A legal decision of some importance to builders has just been given by Mr. Dinsdale, of Warwick, in the case of "Wildigg and Brown *v.* Leach." In the year 1864, the plaintiffs, who are house agents at Leamington, were employed by the defendant to procure a tenant for the defendant's house and premises in Leamington, called Spotland Villa. They introduced to him Mr. John Wackrill, who took the premises under a written agreement bearing date July 16, 1864. The tenancy was to be from August 12, 1864, to March 25, 1865, and for three years next ensuing the latter date, and defendant paid to the plaintiffs the sum of £4 10s. as their commission on such letting. On settling the terms of the agreement, Mr. Wackrill appears to have required the insertion of a clause giving him the option during the continuance of the tenancy of purchasing the premises for the sum of £700, to which the defendant reluctantly assented, and on which Mr. Wackrill has elected to purchase the property, whereupon the plaintiffs, relying upon an alleged custom in their business, claim the sum of £17 10s. as their commission on a sale, at the same time giving him credit for the sum of £4 10s., the commission on the letting previously paid to the defendant. In giving his decision, the judge said—There is no question that if, in the language of Chitty, there be an unvariable certain and general usage or custom of any particular trade, persons contracting with members of such trade upon a matter to which such usage or custom has reference, are bound by it, whether they have such knowledge or not; but it is incumbent on the plaintiffs relying upon such a custom to prove its evidence to the satisfaction of the Court clearly and undisputedly. That the plaintiffs in this case have failed to do. I therefore direct judgment to be entered for the defendant. Mr. Overend applied for costs, which were allowed by the Court.

THE BUILDING BYELAWS.—A number of owners of property at Oldham were summoned the other day for not complying with the byelaws referring to the construction of buildings. The town clerk stated that in some cases it appeared that parties had erred in ignorance of the law, but in others there was a disposition to set the regulations of the corporation at defiance; and whilst in the one case it might be sufficient for the bench to inflict nominal penalties, yet in the other it would be necessary to make it felt that the byelaws must be complied with. Several cases were then heard, there being among the defendants an alderman and a town councillor. The present being the first proceedings taken before the bench, the whole of the cases were withdrawn upon the parties paying costs, and undertaking to comply with the regulations of the corporation.

General Items.

The Royal Commission appointed to enquire into the pollution of rivers, &c., will resume its sittings next month. The Commissioners will proceed, in the first instance, to Lancaster and Blackburn, and will then extend their enquiry into North and South Wales.

Messrs. Bracher and Sons, contractors, of Great Ormond-street, are constructing a timber viaduct in the Great Northern goods yard at King's Cross, and will span the Regent's Canal with a wrought-iron plate girder bridge. This arrangement will enable the Imperial Gas Works Company to run their coal waggons straight into their own works, thereby causing a saving of both time and money.

The quaint old house, once the residence of the poet Dryden, in Fetter-lane, will this day be sold by auction. A portion of the premises escaped the great fire of London.

The *Athenæum* is very severe on the new Clyde statue by Baron Marochetti, which has been placed in the garden of the United Service Club, Waterloo-place. "The group in bronze," remarks our contemporary, "is intended to commemorate Lord Clyde. It may serve this purpose so long as we continue ignorant of the art of sculpture, but it will certainly degrade the reputation of the artist, and signalize his low opinion of English taste." The writer, after examining the various parts of the work, some of which he considers "beneath serious criticism," concludes, "truly and briefly, it is the worst of amateur workmanship in London. The miserable lion sets at rest the question of the authorship of the Nelson lions." The *Athenæum* is not far wrong. For the most unsatisfactory productions Baron Marochetti has received higher sums than have been paid to any other sculptor.

It is said that a committee has been formed at Berlin for the arrangement of a plan for a universal exhibition to be held in that city in the year 1872.

The directors of the Underground Railway have effected important alterations with a view to purifying the atmosphere in their tunnels, the vitiated state of which has recently been the subject of much complaint. The glass has been removed from the various skylights, and these have been converted into open areas. The result is a great improvement; the air is not so dense or dangerous to the lungs of delicate persons, and the smell occasioned by the products of combustion is not so offensive.

In St. Louis preparations are being made to build two suspension bridges across the Mississippi. These bridges are to be elevated at least 50ft. above high-water mark, and will be 2,000ft. long, while both railways and ordinary roads will pass over them. In Brooklyn, borings are now being made to find firm ground for the abutments of the bridge that is to cross the East river from that city to New York. This bridge will, it is said, terminate at Franklin-square, in the heart of the business portion of New York, and it is to be erected high enough to permit large vessels to pass beneath it without interfering with their masts. No work, beyond the borings mentioned above, has yet been done upon the proposed bridge. Another company is also being organized in New York for the purpose of bridging the East River at a point near Sixty-fifth street, New York. These proposed suspension bridges will be enormous structures, from 80 to 100ft. wide erected at least 100ft. above the water level, and having a span of 1,800ft., stretching entirely across East River.

A most destructive fire has almost entirely destroyed the thriving town of Enos. It broke out on the evening of the 23rd ult., and burnt for 15 hours, consuming the whole of the better part of the town, four churches, the mudir's konak, and a vast number of shops and stores. The value of the property sacrificed is estimated at 30,000,000 of piastres, and the distress created amongst the population is necessarily very great.

There is not, in the whole of Switzerland, a toll gate. The Government forbids by law anything which may tend to interrupt or interfere with travel in or between the different cantons. The magnificent public roads which one finds everywhere throughout the country are kept in order at the expense of the cantons through which they run, the federal authorities having each paid, however, at the construction, one half of the expense.

The estimate of Messrs. J. Cresswell and Sons has been accepted for the erection of the new Birmingham and Midland Bank. The work has already been commenced, under the superintendence of Mr. Edward Holmes. The site secured by the directors is, unquestionably, the finest in Birmingham, situate, as it is, opposite the Exchange-buildings in Stephenson-place, immediately adjacent to the Central Railway Station, and occupying, as it does, the central position of New-street. The two principal fronts will be erected in Portland stone, being its first introduction, as a building stone, into Birmingham. The columns and bases of portico will be in polished granite.

A remarkable engineering feat is being performed just now at the antipodes. English engineers have nearly completed a railway tunnel through a volcanic range in New Zealand. The plains of the Canterbury settlement, in the southern of the two great islands of New Zealand, are divided from the port of Lyttleton by almost impracticable hills, and in May, 1861, the local Government accepted an offer to complete a line of railway from Lyttleton to Christchurch in five years, the cost of the tunnel, 2,838 yards long, and called the Moorehouse tunnel, being fixed at £195,000. The works were at first carried on under great disadvantages, on account of the Otago gold fever and other causes. This tunnel affords, it is believed, the first instance where a complete section of an extinct volcano has been opened out. The rock in the tunnel is a series of lava streams and beds of tufa, intersected by vertical dykes of phonolite.

An examination of persons desirous of obtaining a certificate of competency to perform the duties of district surveyors will take place at the rooms of the Institute of Architects, 9, Conduit-street, on Friday, October 25 next, at 10 o'clock.

A Connecticut Yankee has cleared his house of rats by catching one and dipping him in red paint. He then let him loose, and other rats, not liking his looks, left immediately.

A correspondent says:—Mr. Train's tramways, which were so ignominiously driven out of London, have proved a great success in Copenhagen. Their starting point is St. Anna Pladz, near the Kongen's Nytorf, whence they branch off in three different directions, through the principal streets to the neighbouring suburbs. In one direction, that of the Fredericksborg Alee, the tramway extends to a distance of four miles. The whole arrangements are similar to what they were in London. The identical carriages which ran between Westminster and Victoria are indeed now in use in Copenhagen. The fares are very reasonable, and the tramway system is assuredly very convenient. From all that I could learn no accidents had occurred during the four or five years the carriages have been running, whilst the ordinary traffic of the streets was not in the least interfered with. The number of passengers using the tramways increases every year. In 1864 there were 959,890 passengers; in 1865, 1,534,448; in 1866, 2,374,834. This return, which I obtained from an official source, appears very large for a city of only about 160,000 inhabitants, but I believe it to be quite correct. Perhaps we were too hasty in condemning the plan.

The Executive Committee of the National Exhibition of Works of Art, to be held at Leeds in 1868, have been honoured by notifications that the Emperor of the French and the King of Holland will permit their names to be added to that of her Majesty the Queen as patrons of the undertaking. Contributions of a very important character continue to be made to the Executive Committee, not only by the heads of public offices, national institutions, civic corporations, learned societies, and colleges, but by the possessors of some of the finest collections of works of art in the kingdom.

A curious discovery of a mine of amber has been made at Grassey Gully, near Rokewood, Australia. A professional mineralogist, of Ballarat, thus reports on the substance found:—"The resinous substance left with me for examination is undoubtedly amber, and has not, previously, to my knowledge, been found in this colony, making, therefore, another addition to our colonial minerals. The colour of the said substance is brown, streaked yellowish white, transparent, conchoidal fracture, lustre waxy. Specific gravity, 1·1. Acquires resinous electricity by friction; contains empyreumatic oil and succinic acid, and corresponds in all other respects with the brown amber of Europe." Some men are now at work at the mine, and others prospecting for the same material in the vicinity.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

328. D. BARR and J. BLOXHAM. IMPROVED WINDOW AND SHUTTER FASTENINGS. Dated February 6, 1867.

One of these improved fastenings is made of brass or any other metal, and is very similar in shape to the ordinary butt hinge. The lower flap is screwed to the frame of the upper window sash in a vertical position, and the upper flap, which is made thicker at the end, and shaped in the form of a stop, is left free, and fits in a recess or groove, and does not therefore impede the action of the window. Its own weight causes it to fall down on the bottom sash as soon as the window is closed. In this way both sashes are securely fastened until the stop is removed again from its position. *Patent abandoned.*

329. J. FOXLEY. IMPROVEMENTS IN BRICKS. Dated February 6, 1867.

This invention consists, essentially, in forming clay bricks with dovetailed recesses in them, in which recesses pieces of wood are inserted, whereby wood or other work can be readily affixed to structures formed of such bricks by means of nails or screws. *Patent abandoned.*

350. F. C. LEADER. IMPROVEMENTS IN VENETIAN BLINDS. Dated February 7, 1867.

This invention relates to a mode or method of adjusting with ease and certainty the laths of Venetian blinds to any desired angle, and of maintaining them at any angle when so adjusted. In carrying out this invention the patentee causes the top bar of the blind to hang whilst in its normal position at a considerable angle, either by weighing the same on one side, or by hanging it eccentrically, or by attaching a spring to one side which shall always have a tendency to keep it at an angle. In the lower side or edge of this bar or rod a cord is attached, provided with as many notches or loops as there are angles of adjustment desired; or a single notch or loop may be provided in combination with one or more hooks fixed as may be required, the object being to ensure the blind presenting a certain amount of opening or angle, according to the particular notch or hook engaged. *Patent completed.*

383. G. H. KIDD. IMPROVEMENTS IN APPARATUS FOR REGULATING THE SUPPLY OF WATER TO CISTERNS, AND FOR PREVENTING THE BURSTING OF WATER PIPES. Dated February 11, 1867.

This invention has for its object—First, to diminish the pressure in pipes used for the supply of water to cisterns; and, secondly, to prevent the bursting of such pipes by frost. To effect these objects the patentee places a stopcock on the supply pipe, as near the main as possible, and close to it, but further from the main a tap; and he connects this tap and cock with the cistern, so that they are opened and closed as the water in the cistern rises and falls. He proposes to establish this connection in a twofold manner:—First, he makes use of a small regulating tank near the main, and into this tank he conducts the overflow pipe from the cistern, and places in it a float in connection with the stopcock on the supply pipe. By this means the overflow is used to fill the regulating tank and cut off the pressure at a point near the main. To effect the second object—that is to say, prevent the bursting of the pipes by freezing the water allowed to remain therein, he places another float in the same tank connected with the tap on the supply pipe, or a branch of the same, and so arranged that, after the overflow water in the tank has, as above described, cut off the supply from the main, it will open the tap, and so permit all the water lying in the supply pipes to run off, and ensure their being empty, except when in actual use. In order to open the stopcock for a renewed supply to the cistern, the regulating tank may be emptied by means of a valve in the bottom, which may be opened by hand, or rendered self-acting by means of a float placed in the cistern. He further proposes to connect this float with the water-closet valve or other valve in the cistern, so that, if the overflow pipe should become at any time obstructed, the valve will be opened so as to prevent flooding over the sides of the cistern, and the valve thrown on a hook or catch, so that it cannot be used till replaced, and thus notice will be given of the obstruction in the overflow pipe. Secondly, the stopcock and tap on the supply pipe, as above-described, may be connected with a float or floats in the cistern by means of connecting rods, wires or chains, cranks and levers, weights, and counterweights, in such manner that the rising and falling of the water in the cistern will be open, and close them without the intervention of a regulating tank, but with a like effect. *Patent completed.*

423. J. CAPPER. AN IMPROVED CONSTRUCTION OF CHIMNEY TOP OR CAP. Dated February 15, 1867.

The object of this invention is to protect the flues of chimneys at their upper terminations from wind and rain, and to induce an upward current in the said flues at all times. For this purpose the inventor constructs a chimney top in such a manner that the smoke or air from the flue has first to ascend and then to descend in the said chimney top before it can escape into the atmosphere. The part of a chimney pot constructed according to this invention, which serves as a continuation of the flue, and is attached to the chimney, is made of a cylindrical or other shape. Over and downwards around that part a cap open only at its lower end is placed. The said cap is supported by brackets, or otherwise, and being larger in horizontal section than the part to be attached to the chimney, an annular or other space is formed between the two; it is through such space the smoke or air must escape downwards into the atmosphere. A door can be made in the top of the cap to facilitate sweeping or cleaning. *Patent abandoned.*

Trade News.

TENDERS.

BURSLEM.—For the erection of three houses at Bleak Hill, Burslem. Mr. Ralph Dain, Burslem, architect:—Trevor, £2,185 10s.; Whalley, £2,076; Woolridge, £1,998; Blackhurst, £1,960; Bennett and Brindley, £1,920; Matthews (accepted), £1,826 6s.

CLAPHAM PARK.—For house, stables and lodge at Clapham Park. Mr. Notley, architect:—

	House.	Stables.	Lodge.
Colls	£4,700	£620	£220
Macey	4,696	596	291
Turner and Sons	4,424	600	223
M'Laglan	4,319	606	213
Hart	4,310	582	198
Newman and Mann	4,055	578	242
Myers	4,096	579	196
Webb and Sons	4,097	550	200
Browne & Robinson	4,067	534	183

ENFIELD.—For alterations and additions for Mr. B. Mec calf. Mr. F. Cushing, surveyor:—Fairhead, £424; Baye £418; Rivett, £393; Saunders, £338; Gardner (accepted) £330 10s.

HERTFORD.—For building new workhouse at Hertfor F. Peck, 15, Furnival's-inn, London, architect:—M. Chap pel, £10,500; Pattinson and Co., £8,200; J. S. Glasscoc £8,500; Moxon and Mutton, £8,400; Ekins and Son £8,378; W. Smith, £8,155; Savage, £7,868; H. Norris £7,847; J. Perry, jun., £7,777; W. Huddlestone, £7,719 D. Bland, £7,685; W. Henshaw (accepted), £7,320.

ISLE OF WIGHT.—For cottages at Bonchurch, Isle o Wight, for Mrs. May. Messrs. G. Habershon and Pite, a chitects:—Pritchard, Sandown, £1,290; Tharle, Ventno £1,282; Lale, Ventnor, £1,250; Poxon and Smith, Lo don, £1,210; Newnham, Ventnor, £1,200; Beavis and So Ventnor, £1,200; Loe, Ryde, £1,176; Moses and Wallde Ventnor (accepted), £1,150; Parsons and Saunders, Ryd £1,120; Denham, Ryde, £992.

LAMBETH.—For restorations, after fire, to sawing mill Belvedere-road, Lambeth, for Messrs. Meredith Brothers: B. C. Nightingale (accepted).

LONDON.—For additions and alterations at 50, Wes bourne-grove, for Mr. C. Stafford. Messrs. Newman a Mann, architects. Quantities not supplied:—Ware a Jonel, £585; Phillips, £578; Wicke, £545; French (a cepted), £537.

LONDON.—For New Berner's Hall, for the Agricultu Hall Company. Mr. Charles Bird, C.E. Quantities su plied by Mr. Gritten:—Axford and Whellier, £4,54 Perry and Son, £4,515; Patman and Fotheringham, £4,41 Webb and Son, £4,333; Sharman, £4,300; Brass, £4,04 Hill and Keddell, £3,965.

LONDON.—For the New London Pottery, Lambeth, Messrs. J. W. Stiff and Son. Mr. John Taylor, archite Quantities by Messrs. Birdseye and Stoner:—Webst £9,090; Lathey Brothers, £8,224; Killby, £8,223; Holla and Hannen, £8,109; Rider and Son, £7,880; Clemen £7,729; E. B. Gammon and Son, £7,531; W. Hig £7,500; Hill and Keddell (accepted), £7,494.

NOTTS.—For Congregational Church, Eastwood, Not Messrs. Bidlake and Tait, architects:—Thompson, £2,19 Trere and Sons, £1,934; Wright, £1,832; T. and H. Hube £1,823.

TRANMERE.—For the erection of new schools at Tr mere, Cheshire, in connection with the Birkenhead Uni Workhouse. Mr. T. Layland, architect. Quantities su plied by Mr. W. Longson:—Aldis, £9,298; Dobs £9,104; Cameron, £8,887; Burrongbs and Son, £8,7 Kirkham, £8,750; Chuck, £8,600; Harkness and Dempst £8,526; Jones and Co., £8,237; Roberts, £8,181; Car bell, £8,123; Boniface, £8,100; Forde, £8,066; Rob and Robinson, £8,048; Hogarth, £7,987; Callie, £7,9 Ridebalgh, £7,775; Blakely, £7,683; Anderson, £7,6 Mullholland, £7,535; Roberts, £7,438; M'Cormi £7,360; Corris (accepted), £7,360.

VENTNOR.—For schools at Ventnor, for Rev. A. B. Pe Messrs. G. Habershon and Pite, architects:—Pritch £498; Tharle, £454; Lale, £450; Newnham, £450; I sons and Saunders, £424; Poxon and Smith, £420; I £412; Beavis and Son, £375; Moses and Wall (accepted), £365; Denham, £363.

WORPLESDON (SURREY).—For finishing residence at W plesdon, Surrey (from carcase). Mr. Henry Peak, ar tect, Guildford. Quantities not supplied:—Mason, £7. Beagley, £715; Nye, £659; West (accepted), £575.

WEST HAM.—For new receiving wards at the Indust Schools, Forest-lane. Mr. John Hudson, architect Worskett, £4,850; Adams, £4,750; Shawman, £4,8 Sheffield, £4,637; Garrud, £4,617; Smart and Co., £4,4 Knight, £4,283; Hall, £4,369; Shaw, £4,369; Johns. £4,300; Abrahams, £4,295; Tanatt, £4,197; Ri £4,133; Lockeby, £4,077; Langmead, £3,990; Poxon Co., £3,900; Blackmere, £3,952; Nutt and Co., £3,9 Morter, £3,738; Hill and Keddell, £3,694; Hensh. £3,687; Webb and Sons, £3,584; Goshawk, £3,520.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Dep also Cost for Transit to any part of the United Kingd furnished on application to Bath Stone Office, Corsh Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

James Beazley, Little Stanhope-street, Mayfair, buil October 9, at 11—Abraham Hargreaves, Thornton He builder, October 3, at 1—Hebron Haizelden, Lewish bricklayer, October 10, at 12—Hugh Moore, East Wickh Kent, bricklayer, October 10, at 12.

TO SURRENDER IN THE COUNTRY.

James Appleby, Wednesfield, hinge manufacturer, Sept ber 30, at 12—James Coward, Kendal, carpenter, Sept ber 30, at 11—John Dickson, Cadoxton Lodge, near Ne railway contractor, October 2, at 11—William and Ja Allen, Tipton, ironfounders, October 4, at 12—John C ham, Crosshills, Yorkshire, glazier, October 3, at 2— liam Coe, Leeds, joiner, October 10, at 12—William Lic Middlesborough, joiner, October 9, at 11—Enoch Le St. Helen's, painter and paperhanger, October 8, at — John Nelson, Liverpool, joiner, October 4, at 11—Ro Roberts, Tranmere, joiner, October 11, at 2.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

November 22, J. Dallison, Westmoreland-place, road, builder—November 22, J. Joyce, Murray-street, ton, carpenter—November 22, E. Coombs, Greece-st

'HE BUILDING NEWS.

LONDON, FRIDAY, OCTOBER 4, 1867.

ANCHESTER TOWN HALL.—EXHIBITION OF THE REJECTED.

)ERHAPS one of the most unpleasant positions an amiable and withal a ingry man can find himself placed in, is that presenting himself a guest at a country ouse after a long ride from town and a ngthy invitation for *the* dinner of the ason, and, with this double provocation of s appetite, to find he has mistaken the date, d arrived "the day after the *fare*." The ouse is yet in confusion, the host bilious, the ostess weary, and the daughters still furious at "that odious girl" monopolized the prize uire. An air of general dilapidation is sibly impressed on the servants, from the dagrous butler down to the eruptive buttons; and although a *bêchamel* of turhot, gged hare, and a *reechauffé* of sundries, are ry good things in their way, yet the thought the dishes that are gone haunts him like inquo's ghost did another notable banquet, d the semblance of dis-ease is too great to covered decently, even by a dress coat and liteness. This is bad enough, but when he ds that the *contretemps* arises not from his under, but from the greed of the hosts emselves, other feelings beside disappointent rise, and he feels he has a legitimate ason for a growl. It is with some such nsations as these that we find ourselves in anchester, and are ushered in to behold the lics of that feast the mayor and a few of his ends and fellow countrymen have enjoyed themselves, but of which they had not the urtesy to offer us a taste—the twelve best shes are gone—those three hundred guinea its. Bah! we dare say they were greasy d gross, suitable for northern aldermanic urmands, who chiefly prize a dish because is well buttered, and because they know e cook, and so we determine to make the st of what is left; and, dropping all metaor, apply ourselves to the examination of ose ninety-seven designs for the Manchester own Hall which have the honour of ing rejected and exhibited as such. We visedly say honour, for when such names Allom, Audsley, E. W. Godwin, Lamb, E. elby Pugin, Talbert, Roger Smith, and ner good men appear, it is an honour to the st to find themselves for once ranked with em on equal terms. Whether the honour having succeeded against such an array art is greater depends entirely on the anner and the means by which that ctory was won, and of these we have no evince here. That which is concealed is genedly suspected of being unworthy of exposure; d the conduct of the committee is, by their n act, thus called into question. To say e least of it, the motive is cowardly, and ilst the successful competitors are made to pear as men who can neither trust themves or their fellow victors, they, like rbaric conquerors, are licensed to spoil the ctims and bear away their treasures. This is t noble, but Brutus was an honourable man, d so, of course, we can say no less of these; t we think if these gentlemen would merit e palm as well as wear it they would repudiate e stigma thus imprinted on their character their friends, and boldly and fearlessly expit their designs. One hundred and thirty-; designs were submitted; of these twelve ve been abstracted by the committee, and ent. seven removed by their authors in spleen d dudgeon; and we can neither commend e caution of the committee or the cravenartedness of those who thus tacitly acknowlge the justice of their defeat by withdraw-; the result of their labours from the ordeal the public gaze. Of the ninety-seven left us, there are some of remarkable merit, and, of course, a large proportion of very bad ones. Conspicuous among the good ones are the very bright and charming drawings of Mr. Allom, who presents us with some exquisite examples of his able and fertile pencil. The very clerk of the town council, who wrote Mr. Allom's name on them, by a happy slip of the pen, inscribed his sorrow in good German, and instead of dubbing that gentleman "Arch," laments, as we do, "Ach." Admiring visitors have added notes of admiration to his blundering inspiration, and we, too, say —Alas! Surely, such a design as this is worthy to replace one of the duplicate alternating designs selected, and it would be an act of courtesy and grace to award another leaflet from the palm branch to Mr. Allom. Mr. Allom's design is founded on French fourteenth century tradition, and has a Rouenesque air about it, with its richly dormered story and quaint Burgundian forms, which is highly artistic. Perhaps there is too great a similarity between his central composition in Albert-square and that in Princess-street—the same three arches with the same bay window over, the same flanking turrets, and the terminal of the central one only varied. That in Albert-square is capped by an ogee octangular dome, reminding us very much of Oxford; but no words can paint Mr. Allom's beauty, and none but his own pencil give his crisp sparkle. His plan is not so commendable, and presents many crudities and faults more mature consideration would have removed, and we cannot but regret, for the sake of art, that he has been debarred from giving this to it. Great beauty of drawing, in an utterly opposite extreme, is exhibited in the excellent contribution of Messrs. Audsley, of Liverpool. As line drawings, nothing can be more perfect; and their plans are very good—perhaps suffering from want of better means of intercommunication in some of their parts, but still good. Their design wants more wall-space; it is too much cut up into windows, with deeply-splayed and many-columned jambs, and their central tower to the Albert-square front spoiled by over-corbelling of angle turrets, a fault very prevalent at this present day, and one which mars many excellent compositions. Mr. Burges has a good deal of this responsibility on his shoulders; he has made many ugly things look passable, and others think their ingenuity equal to his.

Messrs. Godwin and Crisp, who have almost a *specialité* for town halls, send a very well considered and careful study, good in plan, and dignified in treatment, quite worthy in all respects of being added to that limited liability company who now have the matter in hand. Their central tower is placed in the middle of the Albert-square façade, and is of a truly civic character, apeing neither church nor castle, as do too many of them. The eccentric detached staircases at the angles rather mar this design than otherwise; and, though highly picturesque as "bits," do not in any way aid the general composition; a much more effective manner of masking the acute angles of the site is presented in another design, of which we shall hereafter have to speak. The general composition is of bays of four-light windows, with solid tracery heads, giving square-headed apertures to the actual window lights, having shallow-gabled and crocketted labels or canopies over them, and divided from each other by niches containing statues. Above these is a plain parapet, from which the line of the face sets back, and which would hide much of the superstructure. The top stage has its dormer lights too high for mass, and too detached from the roof for general effect; but these are minor matters, which the great taste displayed by its authors would be sure to have corrected on a revision of their design. The elevation to Cooper-street is a charming little composition, and the design is generally excellent. If the lucky twelve are so much better—that they could be so easily selected—they must, indeed, be good. Mr. Lamb's design is a glorious bit of scene painting—an architectural vision—too good for dull practical reality. It is a mine of invention, and his one drawing of the Albert-square front shows brains and thought enough for a score of the average range of designs. It is a poet's palace rather than the municipal hall of Cottonopolis; and could such a structure be built, that undying one—Macaulay's New Zealander—would trust his spirit to a psychopult, and be propelled from the ruins of London Bridge to where on earth it stood, there to revel amongst the most picturesque remains Old Time has left of all his forefathers' works. Its plan is highly ingenious, and would create a thousand pictures which the spirit of old Prout would haunt, because no where else could it find so congenial a spot. It is decidedly the most artistic design in the whole collection too much so to be grand or dignified, but too good to be merely pretty. Mr. Lamb's exuberant fancy has run somewhat away with him; and, though in a drawing it is marvellously clever and dodgy, in a building it would be too broken up to be effective.

Mr. Pritchard, of Llandaff, sends a design which presents a variety in planning not much worked upon. The town hall itself is here brought to the front, recessed only from Albert-square by an open loggia of four arches, which are flanked by two small towers having entrances in their base. Of course, as may be anticipated, there is much figure sculpture in the spandrils and in the frieze above them. The acute angles formed by the site are here replaced by octagonal pavilions of rather a bold design, and the general composition is marred by eruptive little round turrets, which jut out everywhere with no particular reason and a remarkable want of beauty. His main tower is placed in Princess-street, and is of bold character, square in general plan, but with, of course, the inevitable circular something, and breaking into an octagon at the top, with four more of these pet little excrescences, which, indeed, abound everywhere, and give the design very much the effect of a "set piece" of fireworks before it is lighted. Mr. Pritchard's plan is good, and well worthy the notice of the lucky ones, who may be prowling about seeking what to devour.

Mr. E. Welby Pugin sends a design which belies its motto. It is not "*En avant*;" it is veritably a retrograde movement, turning backwards to a period of which we have heard a good deal lately. Badly drawn, it is unworthy of Mr. Pugin's name and ability, or his father's motto.

One of the very best designs exhibited is by Mr. Robinson, of London, who sends an excellent plan, and a very simple dignified design, most admirably drawn. The central tower is in Albert-square. Square and simple in form, its machicolated parapet not overdone, and its general effect substantial without being heavy, and just sufficiently high to give dignity without crushing the composition; but the chiefest merit in Mr. Robinson's design is his admirable treatment of his angle buildings. These are formed into arcades in their lower story, serving as carriage approaches, and are very skilfully and broadly conceived, and by this treatment the awkwardness of the acute angles of this portion of the site is most admirably hidden. The main body of the building is simply and cleverly treated, and here again we utter the burden of our song—if the twelve chosen were so much better than this as to have been so easily selected, how very good they must be.

Mr. Roger Smith sends two designs, or, rather, two slight modifications of the same design, the variations principally consisting of the necessary changes effected by making the main lines of the side fronts in the one case take the line of the street, and in the other range at right angles to the principal front. His design has much that is good in it, but more that is strange, and the influence of Indian works is very manifest here; indeed, it seems

to be thoroughly based on eastern ideas, partly received through the medium of Spain, and partly through Hindostan. The finest portion of the composition is the circular and domed building at the Cooper-street end, which is thoroughly Indian in its character. The Albert-square front has a lofty plain tower in its centre, having at its base an enriched portico of narrow arches, placed between wider ones, a feature not pleasing in itself, and not made the best of. There is a certain air of dignity about the design which always will result from wall-space, but the design might easily have been made much more of, and has in it greater elements of successful composition than have been drawn out of it.

Mr. Talbert sends one of the cleverest of his very clever sketches. It is a pity he did not more consider his plan, but his tower is by far the best designed one in the whole room, and although his design bears a very great likeness to that he submitted for the Exchange here in the building up of its various parts, it is very welcome. It is full of invention and thought, and is one of the most progressive studies we have seen; quiet, yet quaint, it is thoroughly artistic, yet not extravagant, and married to a well thought-out plan it would be a most successful composition.

Mr. Turner's design is a very excellent one, and worthy of note, especially as regards plan. His tower is rather spoiled by the composition of the base, which lacks dignity. His angle pavilions are well composed of small parts, leaving plenty of wall-space as a foil. The general arrangement of the body of his design is bold and dignified, and the composition of his circular end to Cooper-street, with the ventilating shaft, which forms its centre, is very excellent. Altogether, Mr. Turner's plans please us greatly; and the ingenious manner in which the irregularity of the site has been treated shows Mr. Turner possesses an even greater talent for arrangement than design. These exhaust the eminently good designs. There are in some of the others many good points worthy of commendation. Mr. Lowe, of Manchester, for instance, has one of the best plans in the room, but his elevations are simply horrible; and it is evident, from the position he now finds himself placed in, that he has not such trusty friends in the town council as he had on the Exchange Committee, where he carried off the third premium. In a design marked "Civis," there are many excellent points. The composition of its octagonal angle to Princess and Lloyd-streets is highly artistic, and the bestowal of more time and thought upon it would have rendered this design a good one. His drawings are confessedly "unfinished," and his design is open to the same comment. "Carpere Promtius Quam Imitari" has a very boldly drawn inspiration from the Palazzo Vecchio of Florence, of simple and pleasing character, but too imitative to be worthy of the name of a design. Mr. Atkins, of Cork, sends also an able design, too much troubled with echaguettes, where sentinels would never watch, and battlements none need defend, even in these Fenian days; and Mr. Hibberd one which quite shows his unselfishness in asking that the other designs should be chosen to replace the "alternative designs" of those lucky ones whom the committee have doubly favoured. Of the rest, we can't say much. The insufficiency of such designs as Messrs. Medland and Maberly is too prominent to need much criticism. The same may be said of the designs of Messrs. Blackwell, Son, and Booth. Mr. Empson, of Birmingham, and Mr. Fripp, of Bristol, have done better things than the designs sent in for this competition. They, like Mr. Pugin, have taken a retrograde step. Most, if not all, of these are Gothic designs; of the Italian ones we prefer not to speak. It is curious to note that in this competition it seems to have been a foregone conclusion, whilst the committee made no ostensible sign, that it was to be Gothic. How these "tips" get promulgated is to us a mystery. In the last Manchester competition the office was received that Italian or Classic was to win, and so it did. Then, at least, a respectable opposition was made by the Gothicists, but all our best Italian men are here conspicuous by their absence, and it is only a parody on Renaisance art which here obtrudes itself. And so ends this last *fiasco* for the present. Of the selected ones, we cannot now speak, but we shall anxiously watch the result of the second competition, and trust that the original designs will then be submitted with their elaborated successors. Then we may see what we scarce have hoped for, yet trust to find, that justice has for once been done. Even yet some doubt seems to exist if the second competition will be on the basis of the first, for an ably written letter, to which we shall again advert, reaches us whilst we write, urging, by solid reasons, a change of site, or, rather, an extension of it, removing many of the difficulties which have marred the best, and renders foolish the inferior, designs sent in. In each case we think it would be but fair to allow such of the original competitors who so choose again to send in and show how they can fight when untrammelled by the shackles it has imposed, if, indeed, they are not already too disgusted with the last of its mismanaged race—the Manchester Town Hall competition.

OXFORD, AND THE ART OF THE FUTURE.

If any inquirer into the present state of architecture in the country wishes to see gathered together into one spot all the materials for forming a just estimate of where we stand, he cannot do better than spend a day or two in Oxford. Such a visit could hardly fail also to be of great use to many of our younger architects, if they have the power of learning the lessons which they may read there as in a cyclopædia. In no place, probably, is there such an assemblage of work illustrating the Gothic revival from its beginning to the present time. In reviewing the series, the thoughtful man cannot fail to find much to interest him, much to please him, but also very much to cause him great misgivings as to the future, though the remedies for what annoys or discourages are plainly suggested by what is to be seen in and outside the glorious old city. Outside the city the architects have a rare chance of throwing off their bookish ecclesiasticism, which has so terribly stopped any art progress in most places. There is springing up quite a town in the Gothic style. Such an opportunity has rarely, if ever, been offered to us. It will be an evil sign if the opportunity is thrown away. We have always held that it was to civil and domestic architecture in particular that we were to look as the most probable spur to originality and real life, and, with life and originality, true and healthy progress. If we have been right in this, the experiment which is being tried at Oxford will not be without its fruit—whether bitter or sweet, depends upon the common sense, genius, and powers of the architects. The spread of ritualism in its present phase, as imitative of the Latin church, with its levelling stereotyping character, threatens to endanger still further than has ever been the case in past times, the life and progress of art, if, as has been so much the case, the Gothic architects are to be simply or mainly ecclesiastical. We do not mean that religion has not always supplied the highest motive for the artist, but when one special phase of Christianity, and that the straitest and really most disregardful of art as such, employs the artist to the exclusion of all other forms of thought, the result can only be a cramped, uniform, dull monotony. When added to this we find the most fashionable architects for the extreme school absolutely ignoring all art but that of a particular date and style, and though some of them possessing a desire for originality, but an utter inability to accomplish it, we cannot but feel sure that from ecclesiastical architecture alone, and more especially architecture fitted to the modern ritualistic uniformity, we have nothing to hope in development of style or advancement of art.

This Gothic suburb of Oxford is a great fact, and a great opportunity in many ways. Not the least will be the adaptation of the interiors, in furniture and fittings, to the common sense and comfort of the present day. We hope that in all this cost will be considered. To produce good Gothic furniture, comfortable, handy, and strong, at a reasonable price, is one of the great desiderata of the day. Now, such an opportunity as is offered at Oxford for so large a sale of such things, if they come up to the wants and requirements of the times, should not be lost. It will surely be worth the attention of some of our best architects. If the occasion is lost, if, after all, mere scholastic mediævalism without regard to the altered times and circumstances, is to prevail, as was exhibited in certain instances which we saw when last upon the spot, our hopes will be worse than disappointed. If architects show that they, at any rate, are unable to solve the problem of suiting the old style to modern requirements, the whole thing will help to retard the progress of the art rather than advance it. As in the case of the Houses of Parliament, the eye of the multitudes will be shut to great and undoubted merit, and directed only to the discomforts and inconveniences which force themselves upon the attention. We are glad to see that there is some use of sculpture through the use of which, as much as of any thing else, if properly and truly treated, we look for advance, but we doubt whether the rather commonplace custom of putting up the figure of some saint or celebrity in a niche, as a sign, as it were, of each house, will be of much value.

The same amount of money as is required for such adornment would be far better spent upon the fireplaces, doorways, or other prominent features, where more scope for cleverness of composition and variety would be given. The weakest point in the matter of sculpture in the Law Court drawings was the sort of thing on a large scale—the single figures and groups of figures stuck in and on without any special reference to architectural composition or construction. One successful doorway, staircase, or mantelpiece, is worth a whole race of figures of saints or celebrities, who always look as if they were wondering what they were to do next, or how long they were to stand there in such uncomfortable positions.

Of the ecclesiastical works, of which there are now a very important series, much of which, however, has been already noticed in all the architectural journals, we will pick out two instances which mark most strongly the most advanced architectural art of the present day and bring out in strongest contrast the differences between the schools likely to exert the greatest influence in times to come. The comparison is not quite fair, because in one instance the architect had only to transform a very tasteless and unecclesiastical building into one worthy of its sacred uses and of the learned body to whom it belongs; in the other case, the architect had full scope for his power, the church being entirely new. We refer to Mr. Street's church in St. Giles', and Mr. Burges' decoration of Worcester College Chapel. We may say at starting that there is much that is admirable in both of these works, though, in our opinion, the degree of merit is very different.

The first point that strikes one upon looking at the exterior of the church in St. Giles, is that the lines are good, that there is, at any rate, nothing commonplace or vulgar, though, at the same time, there is a studied severity and stiffness not quite amounting to ugliness, but to most eyes, at least, not altogether pleasing. We cannot, however, help admiring the truth and reality with which the materials are

ed, nor the real dignity of the whole build-g. This is true also, though in a less de-ee, in the interior of the church. There is, so, a good deal of novelty of treatment, ough by no means always satisfactory. We rticularly dislike the inclination of the sternmost walls of the nave, apparently for me ritualistic or symbolical reason. That thing somewhat similar was done at Canter-ry Cathedral we, of course, all know; but hat may be impressive and magnificent in a orious edifice, such as Canterbury, and under ch artists as raised such a structure, may be ite another thing in a plain parish church, d in the hands of an architect whose weak int is want of art knowledge and power. the present instance, we believe that none t a symbolical purpose is satisfied, and feel re that all who care for anything else must ok upon the novelty as a positive eyesore.

If this were an isolated case it would not of much consequence, but Mr. Street has late shown entire impatience of precedent. is by no means an unwholesome sign of the nes; but still we cannot help wishing that s powers in invention and art treatment re equal to his aspirations. We have ready noticed, with great misgivings, his oposed alteration of the details and plan of e nave of Bristol Cathedral, though abun-nt data exists for rebuilding it just as it was iginally projected—all except the west front to make way for the alterations of plan in ich he will have to destroy interesting old rk, for which his western steeple will be a or exchange.

If by novelty of detail anything like some the carving of St. Giles' Church is meant, are quite sure that the so-called servile k-work of restoring the nave, mouldings d all, will be far better for Bristol than such bstitution as is proposed. The ironwork of e doors, &c., in this church is well executed. e patterns are original, but terribly angular d ungraceful. The other metal work we ither like for execution or pattern. Almost e whole appears to be—or certainly might —machine stamped, the only attempt at nament, barring the mere shape and pattern, ing lines, spots, and notches, the file, drill, d machine having taken the place of the mmer, punch, and chisel. In fact, there pears to be no hammered work at all. hen we come to the detail of the stone work, t in the nave and in the chancel is objec-nable, for different reasons. The reredos is infully severe, consisting of little else than aight lines in all directions, resulting in a ffness most unpleasing. The capitals of the llars in the nave are on the vulgarly and arsely profuse. The execution of the . John's eagle in the cap of the north-stern pier, which supports one of the lutes at the corner, is noticeably bad. The ital of the extreme south-eastern pillar is rthy of the most meretricious and coarsest ving of the beginning of last century, and h as one may see in some of the over-deco-ed new buildings in London. Nor when we n to another point of artistic taste are we bet-satisfied. Of all the colouring, one can say hing but that it is severe and rather un-mon: we cannot discover either taste or ver in any of it. From these remarks will be seen that we admire Mr. Street's structive ability and general good taste and ling far more than his art. This we believe be his weak point—the lack of art know-ge—and an especial reason of his not pro-cing far better things than he has hitherto ne. If we wanted one decisive proof of truth of our opinion, we need seek no fur-r than in his treatment of rubble walls. yone who could leave rough unhewn stone lls unplastered and bare has still to learn rudiments of civilized art.

Just when Mr. Street's powers seem to him, those of Mr. Burges come out strongest. No one who enters the Wor-ter College Chapel, however much he may er as to the advisableness of such decora-tion, or its appropriateness to the building which has received it, can doubt that all he sees is the work of a true artist, and one, moreover, who thoroughly knows how to carry into execution all that his mind or taste suggests. To form a fair estimate of what has been accomplished, we ought to recollect the bare walls, and the white staring baldness of the place before it was put into Mr. Burges' hands. We shall then appreciate more fully the real amount of genius which is decoration must have required. Without professing to under-stand or approve of every part, we must acknowledge that the whole undertaking has been a great success. What we like least is the entrance or quasi ante-chapel, which is too directly imitated from the Pompeian wall paintings. We think, too, that the metal work, though right in principle, is not carried out so successfully as much that we have seen from the same hands. We are very glad to see that Mr. Burges is not afraid of *cast* metal, and have no doubt that in future work of the same kind he will teach those who work under his direction the value of real chasing and chiselling, and correct their modern notions as to this essential point. The only valid argument against cast metal is, that it requires first-rate art for its modelling and artistic powers for its finish. These are just the points which, by drawing and dissection, Mr. Burges can supply.

For a wonder, the glass in this chapel is almost wholly satisfactory—a wonderful contrast to that in the church in St. Giles. We think, however, that some points, especially the patterns of certain dresses, are needlessly bold, not to say a little coarse. We should like, too, the faces to be brighter and more translucent, as we find in such glass as was fixed at Little Wickham, and others of a similar character. If we are to point out what strikes us as most successful, we should certainly instance for beautiful pavement *Opus vermiculatum*, and, above all, the most satis-factory stalls. We have never seen wood-work which more entirely pleased us in every way. Mr. Burges is fortunate in having his designs so admirably carried out as has been the case in this instance.

Knowing fully that there is abundant pre-cedent in all ages for the sort of thing, we still cannot bring ourselves to like the imitation inlaid marble all round the chapel above the stalls. Really, in a case of such richness, this inlaying ought to have been real; the small additional expense would surely not have been refused. It can, however, be done at any time, if thought advisable. Upon the whole, we are unable to point to any work in modern time which contains more originality or so much artistic talent as is here exhibited.

J. C. J.

WILLIAM HENRY LEEDS, ARCHITECTURAL CRITIC.

By Hyde Clarke.

WILLIAM HENRY LEEDS, in his own name—and as "Candidus"—filled, in his own time—and that was a long one—some space in the architectural press, but I find that, as yet, no notice of his labours has appeared. I am, therefore, unwillingly driven to make some record of him, although having imperfect means of doing so, but with the hope that, a beginning being made, others may be led to fill up this incomplete sketch. His intimate friend and executor, Mr. E. B. Lamb, contemplates the publication of his miscellaneous works, and of a selection from his manuscript writings; but Mr. Lamb tells me these are so many that the task will take long in execution.

There can, therefore, be no harm in the step now taken. I made Leeds's acquaintance about thirty years ago, when we both joined the *Civil Engineers and Architects' Journal*, in its first volume. Leeds was there a little before me, busy, in those days, with his "Ralph Redivivus," and from that time we were very closely associated until the death of the first proprietor and editor, William Lax-ton, and again on various occasions; and it was about twelve years ago I introduced Leeds to the Building News, to which he was, almost to the time of his death, a contri-butor. The Building News is, therefore, a work with which Leeds's name is connected.

Although I knew him so long, there are many things in his career that I have forgot-ten, or with which I am unable to deal, and I can give but a meagre sketch of his doings; nor can Mr. Lamb help me much. It is not easy now to find men who knew his earlier labours. Loudon, Elmes, Laxton, and most of those who took part in the architectural periodicals of that day, have passed away, for as then Ruskin was not. He gained the Newdigate in the next year after Leeds joined the *Journal*, and Leeds was already a writer of standing. Mr. George Godwin will be found as an occasional contributor to the earlier volumes, and is one of the few survivors.

Leeds, as observed, just preceded me in the architectural department of the *Journal*; but I soon divided it with him, for, notwithstand-ing his greater attainments, his addiction to Italian was so fierce that Classic and Gothic fell to my share, as he could not be restrained from attacking every work that appeared out-side his pale. It not unnaturally followed that I became the architectural editor, and Leeds the contributor; and I find—what I had forgotten—that I also had the greater share with him in the translations from modern languages on architectural subjects.

The pertinacity of Leeds is well known, and his fierce disposition; and it might be supposed that our early acquaintance was not cordial, and never ripened into friendship or esteem, as Leeds was thought not to be the man to bear a rival near his throne. That was not, however, his true disposition, and he was a man thoroughly independent and sincere in his opinions. If we agreed to differ on many points—and he knew I was his adversary on many—he recognized many grounds for sym-pathy. We were both enthusiastically en-gaged in the promotion of art, had studied it in its foreign as well as its home aspects, and were equally ardent in searching its records in ancient and modern languages. He was also a brother linguist and philologist. He greatly contributed, by his intimate know-ledge and learning, to the formation of my opinions—then of very early growth—and I believe that I was not without influence in modifying his on several questions.

There are many readers of this publication who knew Leeds, in his advanced life, as an old bore, and avoided him accordingly. What was the impression made upon me by him, when I first knew him, may be seen from a review of "The Studies and Examples of the Modern School of English Architec-ture," in the *Journal*. Speaking of Mr. Leeds, as the editor of this series, I said:—"We know no man, who, in the merit of his pre-vious works, the soundness and liberality of his judgment, or extent of learning and in-formation, is better qualified for conducting such an arduous work. In the last edition of 'The Public Buildings of London,' Mr. Leeds has earned his qualifications; and equally in translations from foreign languages, and in commentaries on other works, he has proved himself, without pretension, to be one of the best architectural critics of the day." The opinion thus expressed is one yet held by me, and all his subsequent labours tended to strengthen me in it. He had, indeed, great endowments; and in the application of them he exercised a very considerable influence over public opinion in his day. It is under these circumstances that his name is now brought forward.

William Henry Leeds died on the 1st of May last year, but he had so long survived his relations and contemporaries that the place and time of his birth are now somewhat un-

certain. He was a Norfolk man, supposed to have been born in Norwich, and about the year 1784 or '85, being 81 or 82 at the time of his death. Of his early life I can say nothing. Mr. Lamb states that just before we knew him, Leeds had retired from the business of Baldwin and Cradock, the booksellers. He had a limited income, sufficient for his purposes, and he thenceforward devoted himself to architecture; and the small amount he derived from his writings he applied to the maintenance of that considerable library of architecture and philology which was this year sold, and which he had increased to three thousand volumes.

His brother (a clergyman) and a sister died, and Leeds was left pretty much to himself and his favourite pursuit, deriving from their inheritances a small addition to his property. For many years he occupied part of No. 26, Charlotte-street, Portland-place, and his abode was that of a bookworm, with books all around, and in a dusty state, none being allowed to be touched except by himself. His books, however, were read, and he did not pride himself on uncut volumes. In early years he bought many works on languages, but of later years they were chiefly costly books on architecture in whatever tongue published.

He was ever seeking something new in art, or something unknown, and it was to this purpose he turned his attainments as a linguist. I can say nothing of his schooling, but he was a liberal Latinist, keeping up his classical associations. As a linguist he was thoroughly acquainted with the European languages, except that he was not familiar with Dutch, and thereby he lost a source of information as to the seventeenth and eighteenth centuries. He made up for that, however, by an acquaintance with Russian, which he kept up solely for what architectural information he could glean from original sources. Thus it was he drew attention to the progress of the St. Isaac's Church. What little was published in the Scandinavian languages he also read.

It was but seldom, however, he limited himself to a mere technical study of a language, but wherever there was a literature he made himself familiar with it. At one period he had extended his studies to other languages for philological purposes; but, although he had made himself acquainted with the German writers on philology, then not so well known, he did not follow up the subject, and consequently he did not exhibit on this head his usual decision and independence of judgment.

Had he not had the ill-luck to be an Englishman, Leeds' attainments as a linguist would have gained admiration for him; but, in common with many of his countrymen, he got no credit for proficiency, which would have made the literary reputation of a German or favourite foreigner.

Necessarily, his time was chiefly devoted to French, German, and Italian, and he went to great trouble and expense to possess himself of any architectural work or periodical, and, if he could not do better, would borrow it. He was an accomplished German scholar—an endowment, which, in his hands, became of great public service. It is not to be expected that every architect should possess the qualifications of Leeds, or have the leisure to employ them as he did, and he therefore materially helped the profession, by making its members acquainted with every act and thought of the Germans at a time when Berlin and Munich flourished as schools of revival for Classic and Gothic architecture, and when the principles of art and of art criticism were earnestly debated in Germany, nothing having escaped his attention; and he was very happy in giving the salient points, without the tedium of the longwindedness of his authorities. There was scarcely a *fasciculus* of "Candidus" without some contribution of this kind, not merely communicating the observations of the Germans, but illustrating them with his own remarks. Occasionally, it was by way of a review of a German book, which first became known to English readers in this shape. His contributions to the *Foreign Quarterly Review* were of great value in this way. Leeds was fond of the German language, or, rather, it may be suspected, fond of his knowledge of it; but he was discriminating in his adoption of German technology, and was uninfluenced by transcendentalism. There was no dreaminess about him. He hated humbug.

French and Italian periodicals and writings afforded him less material, but he went through a long course of reading each month, the result of which he gave forth in a compressed shape in his communications. His Italian reading was mostly bestowed on the older literature of architecture, with which he had made himself fully familiar.

Indeed, standard authorities, old and new, he constantly perused, never neglecting those of his own country. He was not like some men—and particularly those addicted to High Dutch studies—so fond of their foreign achievements as to hold up foreigners as standards, and to depreciate everything of home growth. His widely-gleaned knowledge made him catholic in his sympathies, without destroying his nationality. Indeed, he laboured for these ends—to instruct his own countrymen in art, and to advance English architects.

He had been at this work of public teaching before my acquaintance with him, and for nearly thirty years more he kept on with it. Hence may be conceived the great benefit which he conferred by increasing our stores of knowledge, altogether apart from his own observations, founded on so solid and so wide a basis. Many a man who has since distinguished himself, and worked out his own independent course of study, was, indeed, influenced by these labours of Leeds, and directed to congenial channels of research.

At a period when humdrum and inanity too much prevailed, and before those newer and more zealous apostles appeared—and I purposely exclude Pugin for the time—Leeds brought to the treatment of his subjects the matured language of a scholar, fortified by a sound knowledge of his own mother tongue, and by all the help of illustration which his knowledge of the literature of Europe could supply. Thus attention was given to his writings even by the adversaries he provoked; nothing passed unnoticed, and more than one controversy followed on a brief paragraph. The professor of architecture, Cockerell, and many another, was driven to defence; and few gained more from the venture than exposure to a running fire, in which the chance shot of the paragraph led to the skirmish of pamphleteering.

Leeds's style, as has been fortokened, was founded on a thorough study of English literature and proficiency in writing, which was exhibited in facility of versification, and in the composition of several dramas still in manuscript. He had the preparation for general literature, and the ambition to engage in it, but circumstances restrained his exercises to one channel. His foreign studies, of course, impressed his style. To a great degree, his style was based on the scholarly or classical style of the last century, but affected by those influences which, in our own time, have so much modified English literature. He had the prevailing tendency towards old English or Anglo-Saxon diction, and to which his High Dutch studies gave him also a bent, but the necessities of his subject drove him into technological exceptions, and he was not without a fondness for illustrative scraps from his copious stores of languages. A word of Latin, High Dutch, French, or Italian, is an alloy by which his anonymous writings can often be known. What was his reason for doing this it is hard to say, as he was thoroughly English. It may have been to draw the attention of the groundlings, an not for his own display.

Everything he wrote was carefully elaborate and polished. He wrote little, but that littl was thoroughly thought over, and wrought ou sometimes rewritten, and, when the proc reached him, a severe restraint on his corre tions would hardly withhold him from amend ment. In all his works, nevertheless, w find a polish, a finish, and a sparkle, whic were freely inspired in his first sketch, an only modified by improvements of the sam character. It was not that his first sketc wanted finish or polish; it was only th whilst still in his hands his ready genir found other means of enhancing it.

From the very course of his labours, h attention was turned to terminology, and h contributed many useful words to our voc bulary, gave currency to the use of some, an suggested others. These were chiefly Greek root, for conformity with existir technology. His contributions to the *Pen Cyclopædia* of tabular statements of buildin led him naturally to such details of classi cation. Such were the qualifications whic William Henry Leeds possessed, and we m bestow a little attention on the way in whi he applied them.

THE DECAY OF STONE—ITS CAUS AND PREVENTION.*

By Mr. John Spiller, F.C.S., Woolwich.

For several years past I have been occupied intervals in studying the causes of the dec of stone, and in experimenting with such chem cal reagents as appeared to offer any p mise of being usefully applied as means prevention. At an early stage of the investi tion I arrived at the conclusion that the corrosi action of sulphurous and sulphuric acid in t atmosphere, resulting from the combustion coal fuel, operates in large towns especially in destructive manner upon dolomite and the nun rous class of limestones commonly employed public buildings. This chemical action, aided doubt by the simultaneous attack of carbo acid and moisture, and in the winter seas further supplemented by the disintegrating effe of frost, must, I conceive, furnish a sufficient planation of all the facts observed. I would h remark that Dr. Angus Smith, Mr. Spence, a others have already directed attention to the i mense scale of production of these sulphur aci and have even quoted statistical data showing t extent or degree of pollution of the air from t cause in the manufacturing districts of Lan shire. When it is known that the best class coal and coke contains usually 1 per cent. sulphur, and that this proportion reaches a tre equivalent when stated in the form of the n oxidised product—hydrated sulphuric acid follows that a ton of coal of this high qual necessarily evolves during its combustion nea 70lb. of oil of vitriol. Here, then, is the ori of the sulphates which we find invariably pres in the loosened crust of decayed stones, whet of calcareous or magnesian character. I h tested numerous samples of dolomite, Caen, Ba and Portland stone fresh from the quarry, and no instance found more than a trace of rea formed sulphate, whereas scrapings taken fr the decayed portions of the stone of the N Palace of Westminster are bitter to the taste consequence of the comparatively large amo of sulphate of magnesia formed during a f years' exposure to the sulphurous gases occur in a metropolitan atmosphere. Caen stone fr several buildings and localities, Portland sto and even old faces of chalk cliff in the neighbo hood of Woolwich, were in like manner found contain appreciable quantities of the sulphate lime, having undoubtedly a similar origin. close examination into the circumstances atte ing the decay of stone at the Houses of Par ment invariably shows an increased liability corrosion under the projecting eaves and mou ings, and at such sheltered parts of the st surfaces as are usually covered with soot a dust, and are in a position to retain for longest period the moisture absorbed durin season of rain. The plain ashlars are through t

* British Association, Section B.

ery much less affected than the buttresses, ables, and other elaborately carved and highly ornamental portions of the work, which appear be more assailable by reason of their relatively reater superficies. In many places the disintegrated stone exhibits white crystals of the sulphate of magnesia, which alternately dissolving and re-crystallizing in the pores of the stone may be conceived to exert a disruptive action sufficient account for the scaling and fracture of the dolomite, which has been so often made the subject of complaint and regret. With the view of overcoming some of these difficulties, I submitted plan to the Royal Commissioners charged with inquiring into the decay of stone at Westminster, May, 1861, which consisted in the application the cleaned surfaces of the stone of an aqueous solution of superphosphate of lime—a salt remarkable for its action in hardening the surfaces chalk. Caen stone, or other calcareous building stone to which it may be applied either by rushing or immersion, and which acts upon the carbonate of lime in the stone, giving rise to the formation of Böleker's salt (crystallized diphosphate of lime—2 CaO, HO PO-5 + 4 Aq.) My suggestion received a practical trial in a competition, to which five other candidates were admitted the right hon. the First Commissioner of Her Majesty's Works in April 1864; and in regard to the work executed on that occasion upon three ces of the Westminster Palace, I fearlessly wait the Government report. In the meanhile, another promising scheme for the treatment of the decayed stone, especially applicable dolomite, has been submitted by me to the ptice of the First Commissioner, but this new oposal has not yet been selected for trial. It nsists in the employment of baryta conjointly ith the hardening salt, so that a base may be prented which is endowed with the power of destroyg the soluble sulphate of magnesia in the pores the stone, forming with it the remarkably inluble sulphate of baryta, and at the same time ngaging the magnesia in one of its most difficult luble combinations. On a recent occasion I ave applied this process on a small scale to some aen stone facings at St. John's Church, Woolich, which were badly decayed. With reference the application of the superphosphate to deyed Caen stone, I am able to refer to several ccessful examples of its use. In the year 1862 applied the process upon some almshouses rming part of Northfleet College, where the ecay has been completely stopped. In 1864 I perated upon a window and buttress of St. ohn's Church, Woolwich; and in the following ea the façade of the Grand Hotel, Brighton, as treated by my process. With respect to ortland stone, the earliest experiments were ade at the Army Clothing Establishment, Woolich, where in 1861 some decayed window sills ere treated, and with perfect success. I have me interesting results to record in connection ith the treatment of Portland stone, which erve to illustrate the increased hardness and rength, and the diminished rate and capacity of ater absorption attending the employment of e superphosphate. Small cubes of Portland one, each 1·3in. dimension, were treated with e phosphate solution, and left to dry in the air; ese were then subjected to gradually increasing ressure, until crushed between plates of lead in e American testing machine at the Royal Gun ctory, and the breaking weights of two presely similar cubes of the native stone were at e same time carefully determined. The results ere as follows:—

	Crushing weight.
I. Stone in original condition	3,650lb.
II. ,, ,,	3,800lb.
Mean	3,725lb.
III. Stone treated with superphosphate	5,375lb.
IV. ,, ,,	5,500lb.
Mean	5,437lb.

hus acquring an increased strength amounting lmost to 50 per cent. The relative hardness of he stone before and after treatment could be eadily ascertained by mutual friction of their urfaces, and also by scratching with a pointed instrument of copper, which metal proved to possess degree of hardness intermediate between the riginal and treated Portland stones.

The porosity of the stone, as indicated by the mount of water absorbed in equal intervals of ime, proved to be greatly diminished in the case f the treated cubes. On this point several experiments were made, the stone being first eighed in the air-dried condition, and then immersed in distilled water at the temperature of 60 deg. Fah. for the several periods named, and the increase of weight in each case noted:—

"WHIT BED," PORTLAND.

	Original stone. Grs.	Treated stone. Grs.
Weight of cube (dry)	1,421	1,420
Water absorbed in 5 min.	70	7
,, ,, 15 min.	91	8
,, ,, 30 min.	91	12
,, ,, 1 hr. 30 min.	92	25

"BASE BED," PORTLAND.

Weight of cube (dry)	1,291	1,355
Water absorbed in 5 min.	120	20
,, ,, 15 min.	122	33
,, ,, 30 min.	124	30
,, ,, 1 hr. 30 min.	126	78

These results have been further controlled by other experiments, in which the same block was used in the original condition, and again after treatment with the superphosphate. It will be noticed that the advantage of the process is most clearly apparent in the case of the denser and more compact variety of Portland known as the "whit bed," which alone is employed for external building purposes; the other, the "base bed," is softer, only fit for internal decoration, and its texture is so porous that in becoming saturated it absorbs 10 per cent. of water. Samples of Mansfield dolomite absorbed an amount of water varying in different specimens from 6 to 8 per cent. After treatment by my process, the degree of absorption was reduced one-half and the results were even more favourable in the case of Caen stone. The cost of materials employed in the treatment of stone according to this plan is very trifling, and bears but a small proportion to the cost of labour necessarily expended upon the cleaning and preliminary preparation of the stone before the solution can be applied. One gallon of solution will cover about 30 ft. superficial, when two coatings are applied upon Caen or Portland stone. The superphosphate employed must not contain any appreciable amount of sulphuric acid and the specific gravity of the solution, when diluted for use, should be about 1,100.

In the discussion which followed, the President said he was sure the section would agree in expressing their best thanks to Mr. Spiller for his interesting communication on a subject of so very great importance, which all of them appreciated, whether they were chemists or not. The destruction of such magnificent buildings as the Houses of Parliament had been naturally looked upon as a most serious question, and they had looked forward with the greatest possible interest to the results of these experiments so as to prevent further decay. Mr. Spiller's account of the results of his process was therefore peculiarly interesting to us, and the observations he had made were of considerable value, inasmuch as they afforded some explanation of the cause of the decay. They could see what was peculiar in the decay, and it showed them how important it was to bear that in mind when they were making arrangements such as those in connection with the Houses of Parliament. At the time when the erection of these buildings was commenced immense care was bestowed in the selection of the stone, and the peculiar magnesian limestone was selected because it was found that all the buildings erected of it in the middle ages were in an entire state of preservation. However, it had been seen that these were not exposed to the atmosphere of large towns and other influences peculiar to such populous places, so that when the same stone was built in London it was found not to serve the same end. He was satisfied that the crystallization of the soluble salt on the pores of the stones subjected to wet and dry weather was a great cause of the disintegration of the stone; but the results obtained by the application of Mr. Spiller's preparation, as illustrated by the several instances shown them that day, were of great importance, and he thought there was little doubt but that the process would meet with general approbation.

Mr. Liveing, in a few remarks, corroborated Mr. Spiller, from his experiments on the stones of his own house, which were of Castleton freestone, whilst the wrought parts were in fine oolite.

Mr. Spence said, as Mr. Spiller had done him the honour of mentioning his name, he would take the opportunity of saying that he thought it was the presence of sulphur amongst smoke that had the influence on the stones. In London they used a larger quantity of coal than in other cities, but then it was of a better quality than in other towns. In Manchester they used coal with 2 per cent. of sulphur, and as they consumed in that city 2,000,000 of tons per year, they put daily 120 tons of sulphurous acid into the atmosphere. This was rather a fearful thing did they see it fully. Then the first shower that came brought down the acid, it lay under the cornices of the buildings, and he had no doubt the acid then commenced to seize on the stone, especially if there were any iron in it, and so began the disintegration. This was done, and the influence spread abroad. In speaking of the emission of sulphuric acid from smoke, he had, it was known, some peculiar opinions, and these he had published. He did not think the acid came mostly from the black smoke which was the subject of the prosecutions. He thought that when the black smoke was cleared away they would have the acid stronger than at present—that the invisible smoke was by far the most mischievous, as there was still as much sulphuric acid, and that, too, in a more concentrated form, for the carbon was all consumed. He hoped they would yet be able—but the time was perhaps distant—to carry off the acid in the town's atmosphere, and he thought they would never be right till they got it carried away so far that it would never come near them.

Dr. Gilbert asked Mr. Spiller whether he had got—or thought it would be difficult to get—rid of all the sulphates in his preparation; and on being answered that he had not got a preparation without them, Dr. Gilbert remarked that a Frenchman had made a discovery which might do away with the difficulty.

Professor Ansted, who had been engaged in another section till nearly this stage of the proceedings, but had ever taken a deep interest in this subject, then made some remarks as to the preservation of stone. He first referred to the different characteristics of stones, even before brought from the quarry, and then spoke as to the manner in which the softer classes were disintegrated by the atmosphere of different places, such as Oxford and London. There should, he held, be a careful selection of stones for building purposes, and his opinion was that, were they to be preserved, the appliance of any material for that purpose would be made when the stones were taken from the quarry, that when decay once got in it could not be removed from a house—though the same means were sufficient on a stone in a laboratory—but that the stones then cracked and broke up time after time, so that perhaps preservation was impossible, and it might be well to give up the attempt, save on the stones of new buildings.

Mr. Spiller replied, and held that the opposite of Professor Ansted's views had been seen from the trial for six years of buildings in London. They had given results which removed from his experiments any appearance of a simple laboratory experiment, and indeed yielded them real practical benefits.

Mr. Ansell suggested that the best mode of getting the preparation put on the stone might be to enclose it in a chamber from which the atmosphere was excluded, and then introduce fluosilicic acid into the stone in a gaseous state.

The President, then, in a few closing remarks, expressed his opinion that the subject was of so very great importance that it could not be too often considered. No doubt many of the methods suggested yet admitted of considerable improvement; but one of the advantages of these discussions was exemplified by the suggestion just made, and there was no doubt that the idea might be turned to some account. A stone might be treated by a preparation in the same way as timber was made impervious to water.

TRADES' UNIONS, AND HOW TO PUT AN END TO STRIKES.

At the recent meeting of the Social Science Congress, Mr. H. Rathbone read a paper on "The Moral to be drawn from Trade Outrages at Sheffield, and the Limits of Personal Freedom." After some introductory remarks, he said he thought a close examination of the evidence would prove that the practice of committing trade outrages was on the decline, and though it was not extinct unhappily in other places than in Sheffield, still the improvement was great and undeniable. What were the reasons that had caused Sheffield to be in this respect far behind most other parts of the country? The Sheffield trades were highly paid, because they required special physical aptitudes, and they had a special

tendency to develop the animal in proportion to the intellectual nature. Another cause might be the extremely exhausting character of some of the labour in Sheffield, which led to an inordinate amount of drinking, and the very unhealthy character of some of the trades, especially those involving dry grinding, which destroyed life at a very early age, and produced great recklessness with regard to life. Another reason might be glanced at—viz., the fact that the peculiar condition of many of the Sheffield trades rendered it not uncommon for a workman to become an employer, and to lapse back into the state of the workman with comparative ease. This caused the existence of a large number of struggling, and therefore squeezable employers, who prevented an effective combination of the masters to resist the tyranny of their workmen. Among the Manchester brickmakers many of the same conditions existed. On the other hand, they found very powerful unions, such as the stonemasons and engineers, where outrages were scarcely ever, if ever, heard of. The real remedy against the tyranny of a union lay, he believed, in the formation of a free labour union, as had been done at Stavely, for in opinions, as in war, an organized army would have the best of it as against a disorganized mob of two or three times its size. They could not expect working men to forego the advantages of uniting in societies, and instead of inveighing against trades' unions themselves, it would be more profitable to induce those unions to take an intelligent view of the interests of those they represented. The great error in arguing about unions was to lump those societies together, as if what was true of one society must be more or less true of all, and this was an injustice which it appeared to him the unionists themselves were not careful enough to protest against, and indeed rather favoured by accepting a solidarity of interests which could not exist. As regarded the building societies, he believed their action was more prejudicial to the interests of the country than that of almost any other trade society. To sum up, the moral he thought to be derived from the Trades' Union Inquiry seemed to him to be that —1st. When trade outrages occur in a trade, the union should be held responsible as the authorized expression of the public feeling of the trade. 2nd. The great object of all should be to clear away all the sentimental cobwebs which obscured the question. It should be understood that labour was only a commodity—that employer and employed stood in relation to each other merely as a buyer and seller of that commodity. He did not doubt that the good sense of the leaders of the working classes would step in to prevent the danger that now threatened them of sinking in the scale of nations as an industrial people.

Mr. David Smith next read a paper "On Trade Societies," in which he held that lock-outs and strikes were evils deplorable in their consequences to the surrounding community, bringing suffering on those not directly connected with the matter under dispute, and if indulged in they ought to be made criminal, and the trade society ordering such ought to be made amenable, and, if possible, be made to indemnify the sufferers. In the second place, he considered that trade societies ought to be incorporated, properly legalized, and a constitution given them by Act of Parliament, and simply registered under it as a trade society, in the same way as some of them were registered as "friendly societies" at the present time. Disputes between employers and the workmen should be referred to arbitration, the award of the arbitrators to be final and binding, and no appeal to be allowed from their decision.

Mr. Rathbone then read a paper contributed by Mr. Tito Pagliardini, on "How to Put an End to Strikes." The writer stated the disastrous extent to which strikes and lock-outs had been and were still being carried, inflicting equal injury on masters and workmen, and on the public, proved that the time had come when it behoved all thinking and practical men to reconsider the mutual relations and duties of capital and labour. Those long and bitter contests, while causing a lamentable stagnation in public and private works, and great misery to the working classes, generally ended like a protracted and disastrous campaign, leaving the field of battle strewn to no purpose with the victims of a useless and ruthless struggle. As long as the workman had no direct interest in the success of the enterprise he was engaged in, he naturally looked upon his employer as a milch cow whom he must turn to the best account; and whilst his employer's aim was to extract from him the maximum of work for a minimum of pay, the workman's aim was to lengthen out his work, that it might last longer, and to strike for an increase of wages, or for its equivalent, a limitation of time. The legality of strikes afforded no room for doubt; and since the strong arm of the law could only interfere when the tyranny of the unions assumed the form of open intimidation or violence, it was decidedly high time to seek for some equitable adjustment of those seemingly opposed interests The writer stated that the regenerating principle he should wish to see introduced into the field of production was that of the association of masters, managers, and men (capital, talent, and labour), so that each might participate in a fair degree in the advantages of any work which was the result of their combined concurrence.

HALF-TIMBERED HOUSES, HOLBORN.

It is only a few days since judgment was passed on Middle-row, Holborn, and all the houses composing it have already passed away. Nothing is to be seen of them at the present moment but a prodigious pile of bricks—so rapidly do transformations take place in London. Very near where Middle-row stood there is a block of antique and picturesque houses, which everybody who ever passed that way must have noticed at one time or another. These old tenements, as represented in one of our lithographic illustrations to-day, are pretty much in the same condition as when they were built (about the year 1600), with the exception of the shops below, which are quite modern. Mr. S. J. Paul, to whom we are indebted for the sketch, has, therefore, in order to maintain the antique appearance of these gable houses, sketched them when the shops were closed and the shutters were up. The artist has aimed more at giving the architectural features of the houses than representing their grimy and blacked colour.

When the great fire of London raged in 1666, these houses had a very narrow escape, the fire coming to the end of Chancery lane, and it was surprising that these half-timbered constructions were not embraced by that vast conflagration. There are not many such houses left in London, and, in all probability, these also will soon perish before the modern desire for "improvement." We have, therefore, given a sketch of them in the Building News.

ECONOMY OF FUEL AND PREVENTION OF SMOKE.

Mr. L. E. FLETCHER, the Chief Engineer of the Manchester Association for the Prevention of Boiler Explosions, in his last monthly report, says that the present high price of fuel, and the amount of public attention now directed towards the abatement of the smoke nuisance, render economy of fuel and smoke prevention matters of considerable interest. I may, therefore, venture to mention to the members of this association that a number of Lancashire and Cheshire coal-owners, who have formed themselves into a society called the South Lancashire and Cheshire Coal Association, have for some time past been carrying on, at considerable expense, a most elaborate series of experiments bearing directly on these subjects, the objects of these experiments being, in the first place, to test the economic efficiency of the coals of this district; and, in the second, to ascertain the most economical form of boiler, the best mode of firing, whether mechanically or by hand, so as to evaporate the greatest amount of water with a given quantity of coal, without the production of smoke These experiments, which have been conducted on a large scale, and have already occupied upwards of eighteen months, have entailed considerable expense, which has been borne by the South Lancashire and Cheshire Coal Association, while they have been conducted under the joint superintendence of the late Dr. Richardson, of Newcastle, and myself, and are not yet completed, but are still in daily progress. I trust at some future time, by the permission of the Coal Association, to be permitted to publish some of the details of the trials in this association's monthly reports for the benefit of our members, while I may venture to state, in the meantime, that, as far as these trials have hitherto progressed, they have clearly shown that the formation of smoke may be entirely prevented without any diminution of the evaporative efficiency of the coal, by careful firing alone; while it has been found, in addition, that the coals raised in this district will realize as high an economy and efficiency as the best north country and Welsh coals, and that without the production of smoke. I hope to refer to this subject again on a future occasion. Economy of fuel, as well as smoke prevention, is becoming of daily increasing importance, and is a matter on which I am most desirous of rendering our members every assistance.

NEW CATHEDRAL CHURCH, ST. ANDREW.

We have already given a description of the new Cathedral Church at St. Andrew's Scotland, which forms one of our illustrations this week. The foundation stone was laid two months since with full masonic honours, by Mr. J. Whyte Melville, Grand Master Mason of Scotland. Mr. R Anderson, Edinburgh, is the architect, and the following are the principal features of the building:—Total length, 122ft.; nave, 176ft. long and 25ft. broad; aisles, 10ft. broad; choir and sanctuary, 35ft. long and 22ft. broad; height to eaves of nave walls, 31ft.; and to ridge of roof 57ft.; the tower is 10ft. square at the base, exclusive of the buttresses, and the height to the top of the spire is 160ft. The style of architecture adopted is that of the thirteenth century Internally, the nave is divided from the aisles by a row of five arches on each side, and from the chancel by a lofty moulded arch springing from corbel shafts. The roofs of the nave and chancel have inside ceilings of wood, their transverse section being a pointed arch; the ties and king posts are the only constructional parts seen longitudinally. The ceilings are divided into panels from ridge to eaves, which will be filled with appropriate coloured decorations. The whole of the nave and aisles will be seated with open deal benches for a congregation of 600, and the choir will be furnished with a throne for the bishop and stalls for the clergy and choir.

WATER SUPPLY AND SANITARY MATTERS.

Plans and specifications, as prepared by Messrs Gotto and Beesley, of the proposed new drainage works at Chatham, the estimated cost of which is £3,000, and £10 per annum to keep them in repair, have been adopted, and the local board meet to receive tenders on the 18th inst.

A special meeting of the Town Council and Local Board of Health, Warwick, was held last week. A report was received on the sewage question from the sewage sub-committee, stating that a tender had been sent in by Mr. J. H. Clarke to execute the work on No. 5 contract for the sum of £2,353. The contract includes engine-house chimney, &c. Mr. Clarke's tender was accepted.

Bridgewater.—A meeting of ratepayers was held week finally to determine the long-vexed question of the water supply. The mayor presided. The meeting, says a local report, lasted three hours, and was of an uproarious character Alderman Smith moved and Mr. Hayward seconded —"That, in the opinion of this meeting, it is not desirable that the corporation should be the promoters of waterworks for Bridgewater." Mr. F. J Thompson moved, and Mr J. Hurman seconded an amendment—"That the report of the council which has now been read (recommending the adoption of Mr. Hawkesley's plan) be approved, and that the council be directed forthwith to apply for the requisite powers to procure the supply of water for Bridgewater." The Mayor declared the original motion carried, and thus the whole scheme will be upset.

The *London Review* learns that a number of influential gentlemen, having formed themselves into a company, intend to apply to Parliament early next session for powers to enable them to purchase land in and around the Seven Dials, with a view to pull down the wretched hovels, which by their ill drainage and ill-ventilation, endanger the health of that part of the metropolis, and to replace them with lodging-houses built on a new principle. Leicester-square is also to be the scene of an improvement. The mutilated effigy, which is now so conspicuous, is to be removed, and fountains erected on its site, while a light elegant railing is to fence a series of prettily-arranged flower beds and grass-plots. We are very much afraid all this is too good to be true.

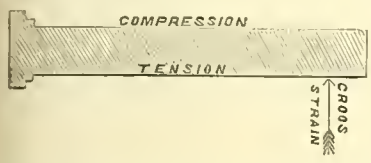
View of Old Houses - Middle Row - Holborn - London.

H A L Lith.

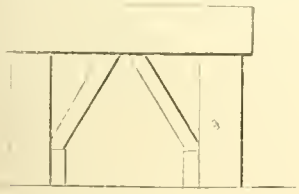
Cathedral Church of St. Andrew. — St. Andrews, Scotland. — ROBERT ANDERSON, ARCHT

CONSTRUCTIVE AND ÆSTHETIC DESIGN.—No. V.

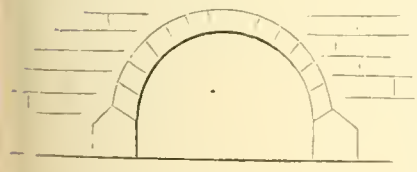
We have seen that the wall is subjected to two pressnres—vertical and transverse. To the first belongs its condition under the primitive beam construction, while the consideration of both pressures is needed to its present performance in building. It may here be remarked, that some writers have thoughtlessly put cross-strain before vertical pressure, as the progressive order of constructive design, not considering that the earliest system, while combining both these effects of gravitation, still virtually indicated only simple repose or vertical compression, particularly if we consider the megalithic beams thrown across comparatively small intercolumns and openings, making the proportion of the bearing to the supports hardly perceptible. In respect to horizontal coverings, indeed, cross-strain preceded compression, but in respect of walls and supports, the contrary is the case. The arch and abutments constituted a combination of compression and cross-strain; a modern suspension bridge or a well trussed roof, a combination of both these with tension—the third and last force to which materials are subject in statical and dynamical design. The application of this last force to construction has already been made, and on it—in logical and æsthetic correlation to the others—will depend the architecture of the future. It may be as well to bear in mind that whenever we load a beam, or push a wall, we bring these three forces into simultaneous operation, irrespectively of the material—a fact valuable, inasmuch as it dictates weight and thickness for our walls, lightness and stiffness for our roofs of stone, timber, and iron. Hence the lintel, arch, and



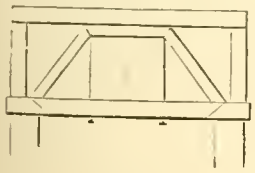
tie constitute three proximate principles of constructive design, capable of separate use and combination, and, curiously to mark, in confirmation of a great law of progress, each successive one being suggested by its predecessor, as evidenced in following diagrams:—



LINTEL.



ARCH.



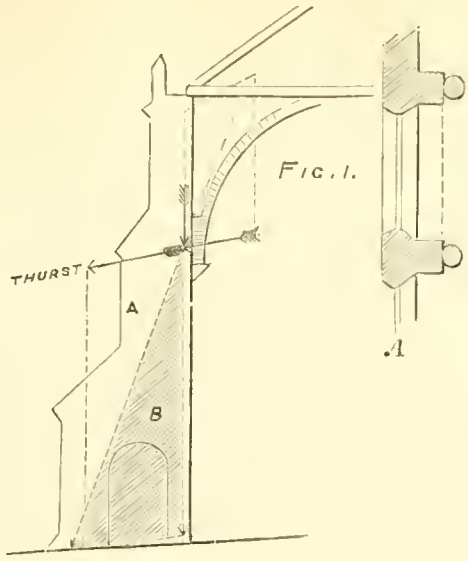
TRUSS.

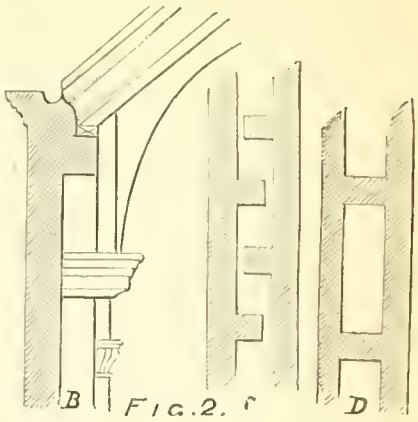
It is more than probable, I think, that the wide-span lintel, by weakness or fracture, soon suggested the raking struts which the Peruvian and Mexican constructions confirm, and many wooden originals indicate; that this, in turn, gave the idea of the arch, while the arch requiring abutment or tie suggested and developed the perfect truss in which the peculiarities of all three modes are combined. At any rate, there is such a natural sequence of cause and effect in them that no one will dispute the steps of the transformation being consequential. The economy of material in the truss is self-evident, and when we imagine the substitution of an indirect for a direct tie, the mechanical effort of a continuous arched rib or an arrangement of ties and braces in a curvilinear form, as we occasionally see in some of our churches large single span roofs, we arrive at the most perfect example of constructive design possible—the *summum bonum* of æsthetic excellence—in short, the combination of arch and truss. But more of this in a future article.

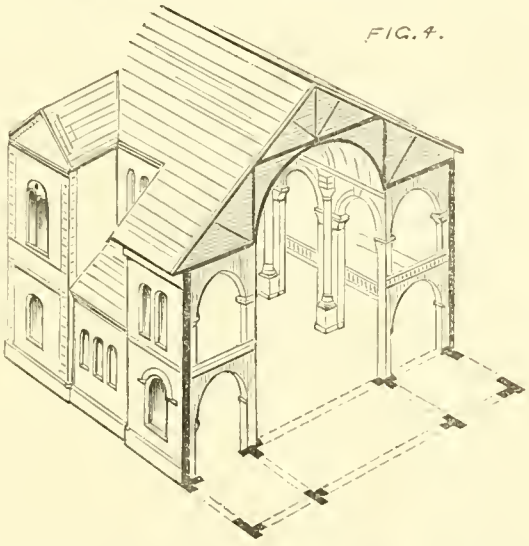
We have remarked on the importance of lateral base to the wall, obtained in the manner of buttresses; or by a cellular arrangement where mere thickness is expensive or unattainable; and that the external buttress, in some localities, at least, is obstructive, and the intermediate spaces inutile to a fault. The deep solid buttresses commonly seem round continental churches, as those at Avignon, to the Lady Chapel of Rouen Cathedral, and elsewhere, frequently, indeed, become the restlings of shops and tenements whose picturesqueness atones for the otherwise lost spaces under the windows; and in other cases, these spaces have been enclosed and utilized as an afterthought, by being converted into lateral chapels, as at Amiens. In apsidal terminations, I admit there is a depth and grandeur in these masses of projecting masonry; but even this does not sanction their entire protrusion externally when they could have fulfilled their office equally as well within. It is true the lower stages could be perforated with arched apertures, but the effect of this detracts from the solidity necessary to an external base; and whatever be done to diminish, the visible buttress should never dwindle into a mere narrow strip or flat pier, as are often seen in some starved imitations of Gothic, being far better to omit these adjuncts altogether. A buttress, like every other feature, should look exactly what it is meant to be, and nothing else or less—a truth which our Classic and Gothic revivalists lost sight of when they made their features only just large enough—the unreal and apparent substitutes of what they once were.

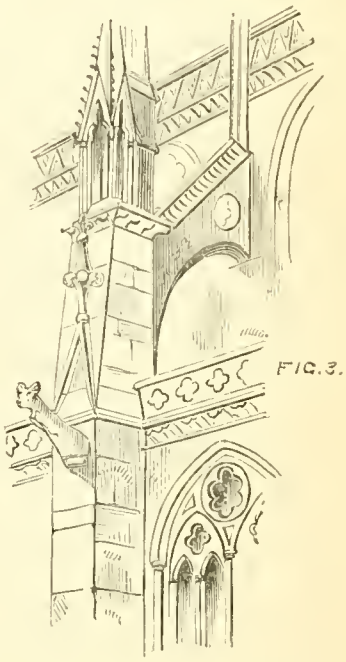
The lower projecting portions of buttresses, with sloped set-offs, suggest the aisle roof, and in cases where a continuous passage-way cannot be made from a deficiency of buttress depth, the cells might—in our churches—be devoted to monumental purposes, or simply become accessory to internal relief, for excessive lateral abutment, as I have said, is not needed for our modern roof systems. The *multum in parvo* principle is, as a rule, the primary consideration in churches and public buildings, and I will here indicate a few ways of accomplishing this in respect to our sustaining walls and abutments. In designing our walls and roofs it is well to bear in mind that well-known, though practically neglected, theorem, the "composition and resolution of forces," for by the aid of a simple parallelogram, the proportions of the forces to be dealt with can be sectionally laid down and adjusted The weight and thrust of wall and roof conjointly determine the inclination of the diagonal resultant, as well as the magnitudes of the component forces; and it is easy to see that the inner or base triangle

CONSTRUCTIVE AND ÆSTHETIC DESIGNS.









B primarily determines the economy of material, comprising, as it does, the most effective portion of the abutment, *i.e.*, the base; while that portion within the triangle A is comparatively of little direct use except as an assistant weight, for we can imagine it removed without materially lessening the stability of the buttress. It may be also easily perceived how a weight applied as a pinnacle or parapet, and acting by its gravity, can further assist in changing the resultant of the forces by reducing its obliquity more and more to the perpendicular within the body of the buttress, an expedient well understood by the mediæval architect, and by that consummate master of static design, Wren, who, by the external peristyle above the foot of the supporting cone of St. Paul's dome, lessened the outward thrust by gravitating the mass, and added at the same time a beautiful feature to his noble design. Perhaps the arched and pinnacled buttresses of Strasbourg Cathedral (fig. 3) present one of the finest and most artistically managed instances of this dynamic principle—in some cases too adroitly handled.

The above means of proportioning the magnitudes of masses intended to counteract forces, if properly studied, will lead us so to adapt our material to the best advantage, always allowing, however, a margin for static rest and æsthetic repose, for, if we did not, the slightest disturbing cause would tend to unbalance the composition. Limiting our attention to the practical methods of obtaining transverse strength, the walls and counterforts for our churches and large rooms can be constructed on any of the plans sketched (fig. 2), where it will be seen how easily and effectively they apply to both the Pointed and Classical styles. In either case, the weight of roof could be thrown upon the inner side of wall, and thereby materially help to perpendicularize the pressure. In *c* and *d* the same result could be obtained, but without the effect, at a saving of about one-third of the ordinary solid built wall.

The buttress principle, valuable in economizing material, is applicable in a variety of ways, and is capable of a far wider treatment than generally bestowed upon it. In wide buildings, where a single span roof is objectionable internally, it suggests the basilican arrangement of central vista and side aisles with or without the clerestory and triple roof externally—a plan infinitely more satisfying and artistic for churches and chapel interiors than wide spans and lowness of height. Although the three divisions are embraced under one covering, three distinct trusses can be adopted, thereby obviating a straight tie at level of eaves, simplifying and economizing construction and height. Although the tendency of modern construction is towards the development of mechanical ingenuity and wide spans, by the employment of scientific combination of arch and tie, yet I believe this tendency will correct itself.

STREETS AND THOROUGHFARES.*

THE wear and tear of an ordinary macadamized road and, consequently, its cost of maintenance, are very great. The explanation appears from experiments which show that a cubic yard of macadamized stone, when well pressed down in a box with a capacity of 27 cubic feet, contains 11 cubic feet of vacuities; and that a roadway covered with 12in. of metal, before it is consolidated into a smooth and useful surface, has a large portion of its stones crushed into small particles, and that more than one-third of its dimensions consists of mud and sand. When heavy rains occur, combined with heavy traffic, disintegration of the stones in such a roadway takes place, and quantities of mud are generated in proportion to the amount of traffic. In the new mode of constructing a roadway which I propose, the vacuities in the metal are filled with cement grout, which, when hardened, forms a concrete, binding together the macadamized stones into a mass impervious to water, and, unlike asphalte, unaffected by heat, while at the same time it preserves entire the original size and dimensions of the stone.

Again, every one must have noticed the tear and wear of the causeway stones in an ordinary street pavement, and the irregularities of the surface of the streets, after six or twelve months' traffic. Granite and other stones of the hardest quality appear to give way under the weight of the traffic. The explanation of this waste may be found in the ordinary mode of constructing street pavement. The stones are laid on a bed of loose sand some 2in. or 3in. deep above the soil, and are then beaten down into an approximately even, but really irregular, surface. They are laid three-fourths of an inch to one and a half inch apart, and the intervals between them are filled up with sand, which is soon reduced to mud. Thus, each stone is insulated, and made to rest on a yielding surface. In a street so constructed, the ends of the causeway stones are found, after twelve months' traffic, to be worn down from one-half to three-quarters of an inch. This arises from the percussion of the wheels of carts and carriages falling from the centre of one stone on to the joint of the two adjoining, which, being on a yielding surface, and the wheels striking on the ends, sink a little from the pressure. When a stone has sunk bodily from half an inch to an inch, or when a little hollow occurs in the pavement of the street, it will commonly be found that the adjoining stones are much worn, the hollow on the surface increasing the force and effect of the percussion of the wheels. The greater the hollow the greater is the tear and wear from the strokes of the wheels. The source of waste is seen to be the yielding surface on which the stones are laid To prevent their tear and wear, what was wanted seemed to be a rigid and perfectly regular surface, by which also the traction might be greatly improved.

These defects in the construction of causeway have long been noticed, and the only remedy hitherto used, and which has been in very general use, but which has always failed, has been to lay a body of lime concrete 6in. deep below the stones, and to fill with lime grout the joints or intervals between them. The lime, it has been found, has never consolidated, owing to the stones being beaten down when it is half set, and to the tremor subsequently caused by the traffic. Thus, on the best paved streets, after heavy rain or watering, much mud is generated from the wet unconsolidated lime and sand. Where there is much traffic this mud on the surface, in drying, proves slippery and dangerous, and many serious accidents occur in consequence. The irregularities of the surface, and consequent mud, are increased by 2in. of sand being placed between the bed of lime concrete and the bottom of the paving stones. In the new mode of constructing street pavement which I have proposed there is first laid down a bed of cement concrete 3in. deep (gravel may be used instead of macadamized stone where abundant and cheaper), and to the requisite convexity in the cross section. This concrete quickly consolidates and entirely excludes moisture or water from below. On this foundation the paving stones, 5in. deep and 3in. wide (a width of 3in gives a better hold to the horses' feet than a width of 4in. or 4½in., which are the common sizes), are built, and, when brought to a perfect form, the joints are filled with cement grout. When the whole is consolidated it forms a surface perfectly immovable by traffic and impervious to moisture. The wear and tear of the stone arises from the attrition of the traffic only. If the causeway be well made there should be no irregularities on the surface. Where such irregularities exist they are due to defective workmanship.

Three experiments have been made to test the merits of the new or concrete road, and two to test the merits of the new form of causeway. The first trial road and pavement were laid down in Inverness early in 1865. They have been under traffic for upwards of two years, being passed over by the whole goods traffic of the Highland Railway. The road is now perfectly sound, and it has required no repairs; whereas the macadamized roadway adjoining it has constantly required repairs, and is now full of irregularities and ruts. The second trial new road was laid in London. As it was important that this plan of road-making should be subjected to the test of severe traffic on some of the London thoroughfares, I applied to, and obtained permission from, the Right Hon. Wm. Cowper, Chief Commissioner of Works, to lay down 100 yards of it in length by 35ft. in width, on the Mall in St. James's Park, at the foot of the Green Park. The whole traffic between the district of Regent-street, Piccadilly, Pall Mall, Buckingham Gate, and the Victoria station passes along this route, which is, apparently, subjected to as heavy traffic as any thoroughfare in London. Subsequently this road proved a failure, the surface breaking up under the traffic. My explanation of the failure, which was very puzzling at first, is as follows:—The roadway at each end of the experiment was macadamized at the time the experiment was made, and the contractor's men, who were crushing the macadamized road with a heavy roller of three to four tons weight, were inadvertently permitted by the person in charge to pass their heavy roller from end to end continuously over the experimental road before it had properly consolidated. The crystalline structure of the cement was injured by this, and, in consequence, the surface yielded to the incessant cab traffic and the mouth of continuous rain to which it was immediately thereafter exposed. The surface was repaired by the trustees by a coating of 2in. of macadamised stone, which was rapidly ground down on the hard concrete by passing vehicles. As the bottom was entire and consolidated, had a coating of 2in. or 3in of new concrete been laid down, with the required time to consolidate, it would have answered all the purposes contemplated; but the surveyor deemed it his duty to remove the concrete surface entirely, which was only done at great trouble by means of levers and iron crowbars. The experiment was certainly a failure; but, in attempts of realizing new conceptions, it is in the nature of things that there must be repeated failures before success is reached.

The third experiment was made in Edinburgh, and has in my opinion proved very satisfactory and successful. A length of 150ft. of concrete road by 45ft in breadth, and a similar extent of street pavement, were laid down last summer at George IV. Bridge, where the traffic is heavy and continuous. One half the street was laid down with concrete at a time, and the traffic was rigidly kept off that portion for a month. The other half was then laid down. The whole roadway has since been under traffic for twelve months, and has proved perfectly sound and immovable, not a stone turning up all that time. After the road had consolidated, and had been under traffic during the winter, it was observed that some small hollows had shown themselves at the joinings along the centre of the roadway, and arose from our inexperience in laying down the concrete, and will in future be avoided. These hollows were cut out, and made up with new concrete, and opened for traffic in a week. The result has been that the surface is now perfectly smooth and regular. The street pavement on the south end of the concrete road was then laid down on a bed of cement concrete 3in. deep. The cement concrete was permitted to consolidate for about ten days, and thereafter the pavement was built on it with cement mortar; and when the stones were regularly set the joints were filled up with cement grout. This pavement has also been perfectly successful, the water running off it as from a foot pavement, leaving no mud; and the only wearing of the surface is from the attrition of the traffic. It has been stated that the noise of vehicles on the pavement is greater than on the ordinary pavement. I do not consider it greater the blows arising from the irregularities on the ordinary pavement are noisy, as well as destructive to the road and to carriages; but the noise on the concrete pavement, though not greater, is different it having more of a ringing sound, like that on a street bound up with frost. In point of wear and tear, and freedom from mud and dust, this street pavement has many undoubted advantages over that now in common use, particularly where there is heavy traffic; but I anticipate that a road consisting of a good body of concrete should supersede even this species of street pavement.

The following is an extract from a report made by me to Mr. William Duncan, secretary to the Edinburgh road trustees:—

The concrete road cost 6s. 8d., and the paved road 17s per square yard. A sum of 1s. 8d. per square yard was incurred for excavating and removing the materials of the old road, and for watching; but I calculate that the value of the old material would go to meet these outlays. The small experiment that has been made, however, is not a good criterion of the cost. In a work on a large scale the cost ought to be less. The advantages offered by this mode of construction on a road under heavy traffic, as far as our experience has gone are, first, diminished tear and wear the general surface is apparently not worn in twelve months more than one-eighth of an inch; secondly, sup

* By Joseph Mitchell, F.R.S.E., F.G.S., C.E. Read before the British Association. Section G.

rior cleanliness—the road is almost wholly free from mud and dust; thirdly, diminished cost and annoyance from repairs. The road has required little or no repairs for twelve months. It requires no scraping or watering, and its maintenance is almost nominal, while the coatings, scrapings, and waterings of a macadamized road under similar traffic in Edinburgh cannot be done under 1s. to 1s. 6d. per square yard, besides the great inconvenience and discomfort they cause to the public. The original cost of a macadamized road, 9in. deep, which, before it is consolidated, is crushed into 6in. of available material, is about 2s. per square yard, or say somewhat less than one-third of the concrete road. In London, where the metal is 20s. the cubic yard, instead of 6s., as in Edinburgh, and where the cement is cheaper, the cost of a road of 9in. of metal will nearly amount to the cost of a concrete road. It thus appears that the cost of a concrete road will be proportionally less, and its advantages proportionally greater, in London and towns similarly situated, than in Edinburgh. The cost of the concrete, which is 17s. per square yard, is higher than it should be, as the stone was procured from Aberdeen instead of the neighbourhood of Edinburgh, and gravel would have served for the concrete bottom quite as well as the more expensive macadamized stone. In conclusion, I consider that the experiment which, through the liberality and public spirit of the road trustees, I have been permitted to make on this important subject, has been successful—the road having sustained the traffic on George IV. bridge without a stone being moved for twelve months, and that it only requires further experience in the manipulation and laying down of the concrete to accomplish all that I anticipated from this new mode of road-making.

Since the date of this report, Messrs. Wylie and Slight, engineers in Edinburgh, have been good enough to make experiments, which show that the new road possesses another advantage over the old. It was natural to anticipate that, from the superior evenness and solidity of the new road, the traction would be less upon it than on common roads, and these gentlemen have found that the traction on the concrete road of a waggon 2 tons in weight, against a gradient of 1 in 80, was 70lb.; while, on a common macadamized road of the same grade, wet and muddy, was 140lb., or double that on the concrete road. On a road with wheel tracks through new metal it was 340lb., and on a road newly covered with metal 560lb. The gradients of these several roads were 1 in 80.

The experiments are to be further prosecuted, as the dynamometer got injured, and I have every confidence that they will establish the very great superiority of the new road as regards traction—a circumstance affecting the preservation of horses and carriages and the comfort of travelling. Many experiments will yet have to be made before the merits of the new road and pavement can be held to have been conclusively tested. In particular, it will be necessary to have an experiment on a large scale before the cost of construction and maintenance of the new road can fairly be put in comparison with the cost of construction and maintenance of the roads now in use. But, in the meantime, as far as my experience has gone, I feel entitled to sum up the advantage of the new roadway over the old in the four following propositions, viz.:—First, the tear and wear are less on the new road than on the old; second, the cost and annoyance of repairs are less; third, the mud and dust are a minimum quantity, and there is superior cleanliness; fourth, the traction is less, as has already been proved.

It must be observed, however, that the entire efficiency of this mode of roadmaking depends on the quality of cement, which should be the best Portland cement, tested to bear a tensile strain of 500lb. to 600lb. on a bar 1½in. square. Time, after the road is made, is a great element of efficiency, as the hardness of the concrete gradually doubles in the course of twelve months; but further experiments are necessary to determine the precise time the road should be left for consolidation before it is opened for traffic; a month I found quite sufficient in Edinburgh.

SANITARY LEGISLATION.

A SUGGESTIVE paper on the important subject of health legislation was read the other day at one of the sections of the Social Science Congress. The writer, Mr. W. H. Mitchell, assumed 1st, that a uniform system of health legislation should apply to all parts of England and Wales; 2nd, that this system should be compulsory; 3rd, that a central body (Ministry of Public Health) should be established in all cases to direct local action, and to act as a court of appeal; 4th, that all local power should be vested in one local authority; 5th, that the whole of the kingdom should be divided into districts, each district under the control of one local authority; 6th, that each local authority should have attached to it a medical officer of health. The objects of health legislation should comprise the prevention and removal of nuisances, the regulation and supervision of dwelling-houses, making and keeping in repair of roads and streets, effecting public improvements and directing private improvements, water supply, public and, where necessary, private lighting, establishment and superintendence of markets, supervision of food, providing baths and wash houses, and public recreation grounds and burial grounds. To accomplish these objects, an entire reconstruction and consolidation of existing statutes was essential, and all powers regarding public health intrusted to boards of guardians, &c., should be abrogated. A general system was required, under which it would be impossible that defects should be unrecognized, and no steps taken to provide a remedy. A Ministry of Health, the chief having a seat in Parliament, to which he would be responsible, and a Board (engineering and medical), directing local works, and to which every medical officer of health would be responsible, acting also as a court of appeal in the cases to be hereafter noted would give intelligent action to sanitary legislation throughout all the districts of the kingdom. Medical officers of health whose whole time should be devoted to the duties of their office, nominated by the Health Ministry, but with salaries paid by the districts to which they were respectively appointed—would form part of the Ministry of Public Health, furnish reports to it of the sanitary condition of their districts, and thus secure the objects contemplated by the Sanitary Act, 1866. There were other matters connected with medical jurisprudence which would be taken cognizance of by the Health Ministry, the officers of health being the recognized authority to examine into and give evidence respecting any case of death which demanded medical inquiry. The pressing difficulty was to reconcile effective, vigorous, and coercive central action with local independence. What was at present required in order to secure efficiency and uniformity in the working of the sanitary law throughout the kingdom, was their consolidation and the adoption of means to enforce them.

Building Intelligence.

CHURCHES AND CHAPELS.

The parish church of Heytesbury, in Wiltshire, has been restored at an expense of £6 000. In restoring it, many architectural beauties have been brought to light; the church is a cruciform in structure, chiefly of Early English architecture.

On the 14th ult., the church of All Saints, Baden-Baden, was solemnly opened by the Archbishop of Armagh. Towards the erection of the church the Prince of Wales has given 1,000f.; M. Benazet, keeper of the "hell," 2,000f.; the King of Holland, 100f. The Queen of Prussia has also contributed liberally; and the Crown Princess presented a fount. A stained glass window, from the designs of Lady Loftus, has been given by her husband. The site was the gift of the town, and also a sum of 2,000 florins.

A new Wesleyan chapel is being built at Blyth. The Classical style has been adopted, and the building will be 65ft. long by 51ft. wide, with a central projection of 9ft. at either end. The contract for the whole of the works has been let to Mr. Wm. Middleton, of Blyth; and Mr. F. R. N. Haswell, of North Shields, is the architect.

A new Independent chapel has just been erected at Holyhead. It is one of the neatest in the principality. It measures 46ft. by 37½ft. Mr. Thomas, of Glandor, is the architect.

The foundation stone of a New Primitive Methodist chapel was laid in Clifford-street, Hereford, last week. The architect is Mr. T. Davies, of Hereford; and the contractor, Mr. Colley, also of Hereford.

The Roman Catholic church, South Parade, Bath, was completed on Tuesday with the exception of fixing the cross on the spire. The height of the tower and spire to the summit of the cross will be 230ft., making it the most lofty edifice in the city.

Camberwell.—The land on which Christ Church stands being required by the South Metropolitan Gas Company, the site and building have been purchased for the sum of £6,000. The foundation stone of a new church to be erected in the Old Kent-road was laid last week. It will be a brick structure, with dressings of yellow and blue Bath stone, the style being Early French Gothic. Mr. Bassett Keeling, of Gray's Inn, is the architect.

Edinburgh. Hope Park United Presbyterian Church was opened last week. Messrs. Peddie and Kinnear are the architects, and the style they have adopted for the structure may be described as the Lombardo-Venetian. Internally the church consists of a nave about 73ft. in length and 36ft. wide. On either side is a transept about 52ft. in width, divided into three portions by iron columns which rise from the floor to the roof, and supporting the roof through the intervention of an arched timber frame resting upon the columns, the space between the columns corresponding with the three gables outside. There is accommodation for 1,050 sitters, and the whole cost is estimated at about £6,500. Messrs. W. and D. M'Gregor, masons, were the contractors.

Ireland.—A new Catholic church is to be erected at Monkstown, Co. Cork. The expense will be about £2,500. The designs have been supplied by Messrs. Pugin and Ashlin.—A new Presbyterian church at Magherafelt, Co. Londonderry, was opened for service on the 22nd. ult. The building will accommodate about 400. The cost will be £1,600.—The Wesleyan Methodist chapel for some time in course of erection between Passage and Glenbrook, Cork, has been opened. It is in the Gothic style, and is built of brown stone, with limestone dressings. Mr. R. Walker, jun., was the architect and contractor.

Lincoln Cathedral.—The Dean and Chapter of Lincoln, says the *Times*, have undertaken the restoration of the beautiful woodwork of the choir of their cathedral, considered by Pugin to be unrivalled both for variety of design and for accuracy of workmanship. One portion on the south side is completed, and the change effected by the removal of the ugly high pew fronts that had been added to the old stalls and benches is marvellous, and makes one anxious to see the improvement carried on through the whole choir. The work has been entrusted to Messrs. Rattee and Kett, of Cambridge, who have done their part so well that it requires a most practised eye to distinguish the new carving from the old. The present Chapter has entirely suspended the scraping of the exterior stonework, which caused such severe animadversion sometime since, and has employed the funds at his disposal in a more legitimate manner, in the careful rebuilding of the pinnacles of the western towers, which had become so decayed as to be in danger of falling. The tessellated Roman pavement, discovered some years since in the cloister, and which had been almost destroyed by damp, is being removed to a place of greater safety, and the hideous red brick shed which covered it is about to be pulled down.

Sparkbrook.—Christ Church was consecrated on Tuesday by the Bishop of Worcester. It is constructed of Hampstead stone, with Bath stone dressings, and in the Early English Decorated style. The dimensions of the nave are 104ft. by 56ft., and of the chancel 28ft. by 20ft., and there are north and south aisles. The capitals of the pillars of the nave have been richly carved. The roof is of open timber, and the distance from the floor is about 50ft. Open benches have been erected on the floor, and provision has been made for the erection of a west gallery in the event of further accommodation being required for the congregation, and the church will at present accommodate about 890 persons. The architects were Messrs. Medland, Maberly and Medland, of London and Gloucester; and the work was executed by Messrs. Briggs and Son, of Birmingham. The estimated cost of the building is about £8,000.

BUILDINGS.

It is announced that a gentleman well known in the commercial circles has recently invested, in the names of trustees, the princely sum of £250,000, for the purpose of founding a convalescent hospital in the metropolis. The plans for the building have been entrusted to Mr. Dale, of New Inn.

The opening of the new national schools at Newnham, Gloucestershire, was celebrated last week. The schools were designed by Messrs. Medland and Maberly, of Gloucester; and built by Mr. James Coleman, of Chaxhill.

The new Theatre Royal, Leeds, which has been designed by Messrs. Thomas More and Sons, architects, Sunderland, was opened on Monday. The front of the building is in the Italian style, and the house will accommodate about 2,500 persons, and has cost from £15,000 to £20,000. The new theatre at Doncaster, mentioned by us a fortnight ago, is by the same architects.

A building of six storeys has been erected at 127, Aldersgate-street, partly on the site of the old candle factory. The owners of the building are Messrs. Tubbs and Lewis, and the occupiers will be a firm of wholesale druggists of long standing, The architect was Mr. W. Smith, Copthall-court, and the builder Mr. Henshaw. The premises, No. 125, Aldersgate-street, belonging to the same landlords, have been adapted so as to give additional accommodation to the same firm. This work has been carried out by Messrs. Sewell and Son. A six-storey warehouse has been erected on the site of three old houses at the back, by the same architect, and for the same owners (Messrs. Tubbs and Lewis).

A grammar school, at Brewood, eight miles from Wolverhampton, was opened on Friday last. The plans were prepared by the late Mr. Edward Banks, architect, but were carried out under the direction of Mr Bedlake, his successor. Neither the first architect nor the builder, the late Mr. J. P. Palmer, lived to see the building completed.

Birmingham.—The town council intend enlarging the lunatic asylum to admit ninety patients of each sex, making the total accommodation for 810 patients. The estimated cost of the proposed extension is about £10,000, or £56 per patient. The asylum was built about seventeen years ago, at a cost of £74,000, including land for the accommodation of 300 patients.

Bradford.—The suggestion as to the placing of the new town hall on the Bowling-green site, finds increasing favour with the people of Bradford, and a lithographed plan has been prepared and extensively circulated, showing the advantages of the site over that advocated by the committee of the town council.

Fairwater.—On Tuesday, the Rev. David Thomas, of Highbury Chapel, Bristol, laid the foundation stone of a new college at Fairwater, about a mile from Taunton. The new college will accommodate 200 pupils, although dormitories will be arranged in the first instance for 150 only. The style of the new building will be Tudor Gothic, and it is estimated to cost £10,500. The cost of the land, £6,000; fittings and extras (including the alteration of Fairwater House, as a residence for the master), will make the total expenditure nearly £20,000. The college front will extend 220ft., with a tower in the centre 106ft. in height. The principal school-room and dining-hall, each 60ft. by 20ft., will occupy nearly the whole space on the ground floor on each side. There will be extensive playgrounds, a bathing place, and all the modern appliances for warming, ventilation, &c. The architect is Mr. Joseph James, of London; the builder, Mr. H. Davis, Taunton.

Ireland.—The erection of new premises in College-green, Dublin, at corner of Foster-place, for the London and Liverpool and Globe Insurance Companies has been commenced by the contractors Messrs. Cockburn and Sons. The cost will be £6,300.—New offices and residences are being built at Valentia, Co. Kerry, for the Atlantic Telegraph Company, at a cost of £4,700. Messrs. Ryan and Son, of Limerick, are the contractors.—The restoration and new chauntry at Fore, Co. Westmeath, for Lady Rosa Greville, are nearing completion. The architects are the Messrs. Pugin and Ashlin; and Messrs Sibthorpe and Son, of Great Brunswick-street, are executing the contract.

Wolverhampton.—New infectious wards have been erected at the Union workhouse for the accommodation of two classes of patients. The building consists of two males and two female wards, each 30ft. by 20ft., and 12ft. high, providing accommodation for seven beds in each ward, with an allowance of 1,030 cubic feet for each bed. A separate stone staircase is provided for each pair of wards, and on the ground floor is a kitchen, with nurses' room above. The wards are lighted and ventilated by sash windows on each side, and also by air bricks in the lower and upper parts of the walls, covered with perforated zinc, and each having a sliding shutter. In each ward is fixed one of Galton's patent ventilating warm air grates, provided by Messrs. Keunard, of Upper Thames-street, London Proper lavatories, baths, and waterclosets are attached to each ward, and on the outside are four airing yards having the access to each arranged so that no communication takes place betwixt the different classes of patients The whole of the works have been carried out by Mr. S. Thompson, builder, at an expense of £780, from plans and under the superintendence of Mr. J. R. Veall, architect.

TO CORRESPONDENTS.

Notice.—On and after the 11th October next, the "BUILDING NEWS" will be Published at the New Offices, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the Editor, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty four Words.

Received.—G. T.—R. S., New Zealand.—D. R. W.—G. A. C.—W. O. C.—C. L.—T. M.—E. W. P.—J. A. M.—G. W. H.—T. R. S.—G. G. S.—E. W. P.—J. N.—W. R. H., send the sketch —G. B.—G. H. G.—J. L.—W. D. G.—T. M.—A. C.—T. G.—W. O. L.—J. C.—S. M.

Correspondence.

PUGIN *v.* BARRY.

To the Editor of the Building News.

Sir,—As both yourself and the *Times* have permitted a third Barry to enter the lists against me, I trust to your impartiality to allow me a few final words in answer to his extraordinary statement and challenge.

He asks, in a tone unbefitting his cloth, on the authority of an anonymous writer, if I do not know that his father's letters to mine belong by law as much to Sir Charles Barry as to my father or me; and implies—nay, asserts—that he did quite right to get them from me under any pretext, as also to break his promise to return them.

I answer that I know nothing of the kind. On the contrary, I am assured by those who have much more legal experience than either I or Dr. Alfred Barry, that the receiver of letters has the entire right to keep them, and has never been restrained by injunction from making any *bona fide* use of them, either to defend a claim, or to vindicate his reputation, as is done every day, though he has not such a "literary ownership" as will enable him to publish them if the sender or his executors refuse to allow it, which in this instance would only be equivalent to the Barrys admitting that they are fatal to their case.

But suppose they are joint property; does the Rev. Alfred Barry, D.D., mean to teach his pupils and the world the doctrine that one joint owner may lawfully or honestly—not to say honourably—and with any chance of ever being believed again, borrow the joint property, under a solemn and repeated promise to restore it immediately, and then either destroy or keep it for his own exclusive use?

He says I did not venture to make this claim during his father's lifetime. It suits him to forget that I showed the direct contrary in my first letter in the *Times* of the 7th. I have said elsewhere that I do not claim for my father the making of the ground plan of the building, and therefore it is to no purpose to offer to dispute that.

Notwithstanding his ostentatious demand that every document should be referred to a committee of architects, and saying that he writes because he has his father's diaries, &c., Dr. Alfred Barry, like his brothers, carefully avoids either confessing or denying whether the "&c." includes the 76 letters in question. And then he accuses me of wanting to garble the evidence—a pretty accusation, truly, from the son of the man who has undoubtedly destroyed one half of the correspondence between Sir Charles Barry and my father (which, according to the law of the Barrys, was as much my father's property as his), and of whom it is not yet denied that he destroyed the other half, but quite certain that he broke his promise to restore it, and that his sons mean to do likewise if they can.

If the Barrys were unable to defend their case by fair argument, drawn from facts, they surely could have given their instructions of "no case for the defendant; blacken the plaintiff's and his witness's characters;" and have had the part of the Old Bailey lawyer played with greater decency, if not so effectively, by another than their rev. brother. But in the midst of all this uncertainty one thing is evident—viz., that if my father's letters have been destroyed, the promised life of Sir Charles Barry—should it contain any other correspondence whatsoever—cannot be produced without admitting that the correspondence with my father regarding the Houses of Parliament, which extended over a period of seventeen years, has been destroyed, and that for the purpose of concealing the actual facts.—I am, &c., E. Welby Pugin.

The Grange, Ramsgate, September 30.

SIR CHARLES BARRY'S WORKS.

Sir,—In reply to Mr. C. Barnett, I believe the Gothic works of Sir C. Barry, in addition to those mentioned in my letter of September 20, were these:—St. Peter's, River-lane, Islington; Hurstpierpoint, Sussex—the latter in the Middle Pointed style; a Unitarian chapel at Manchester, First Pointed, completed 1840; the parish church of Stoke Newington; a church at Highgate, the name of which I forget; and King Edward's Grammar School, Birmingham, in the Perpendicular style, commenced 1832, completed 1837. It is worth while carefully to note a passage in the paper read before the Institute, by Mr. M. Digby Wyatt, May, 1860, to this effect:—"The study bestowed by Barry upon the working out of this building (the schools), and consequently on the Tudor style generally, be found of the greatest possible service to him, when subsequently (?) called upon for the Houses of Parliament competition. It was about the period of the completion of the Birmingham Schools that Barry became acquainted with Welby Pugin, whose talents he greatly admired." It was in 1835 that Pugin was employed by Sir Charles on the competition, and anyone who examines the Gothic works above named will perceive the source whence the supposed architect of the Houses drew his inspiration. If positive proof is absent we must fall back upon analogous reasoning.—I am, &c., J. A. H.

HAYLING COMPETITION.

Sir,—In the article on the Hayling competition, in your paper of the 27th ult., you say—"We may here ask, in reference to the selection, why the plan of allowing every competitor to vote for those designs he thought entitled to be premiated was set aside? and we ask this, not from any desire to undervalue the decision arrived at, but simply from our inability to discover the abandonment of a mode of selection approved of generally as faultless."

The objections raised at the meeting of the competitors, and in consequence of which it was unanimously voted that the decision should be left to Mr. Longcroft, were as follows:—

1st. That there were, in some cases, two or more designs sent in under different mottoes, but evidently prepared by the same competitor, in which case to give him a vote for each would be unfair to the others.

2nd. That there was no possible means to prevent collusion among the competitors so that a few, by combining together, could divide the premiums among themselves.

3rd. Each competitor being entitled to vote, however rough or absurd his plans might be, there could be no restriction to the manufacture of votes by sending a number of designs and having nominees to represent them.

4th. As a competitor could not vote for himself, every vote he gave to a good design would damage the chance of his own, and it would therefore be for his interest to vote for those which he might consider the most unlikely to be voted for by others.

I think you will agree with the decision of the meeting that these reasons were sufficient to prove that the scheme, though evidently proposed in the most impartial spirit, was bad in principle, as opening so many ways to unfairness, and that it could not be depended on to secure the award to the best designs.—I am, &c.,

A. G. Hennell.

22, Southampton-buildings, Chancery-lane, W.C., September 30.

THE MANCHESTER NEW TOWN HALL COMPETITION.

Sir,—Some three weeks ago you gave insertion to a letter of mine containing an analysis of the published reports of the Manchester New Town Hall Competition. Having this week visited the exhibition of the designs, it has occurred to me that some further information on the subject may prove interesting to many of your readers. I may repeat that eleven sets of designs were selected by a sub-committee of the council on the 14th of August, and that four

sets were added to the list on the 20th of August. I give the numbers of the fifteen, as follows, distinguishing those premiated, exhibited, and not exhibited, viz. :—

SELECTED AUGUST 14.

14. Not exhibited.
46. Premiated.
67. Ditto.
74. Ditto.
90. Messrs. Hayley and Dawes, Manchester (Exhibited).
98. Premiated.
115. Messrs. Blackwell, Son, and Booth, Manchester (Exhibited).
120. Premiated.
129. Not exhibited.
131. Ditto.
143. Ditto.

ADDED AUGUST 20.

26. J. Hibbert, Preston (Exhibited).
42. Thos. Allom, Surrey (Exhibited).
55. Premiated.
89. Ditto.

The design recommended by Mr. Godwin, but found to be disqualified, is also exhibited, viz, No. 82, by Mr. John Robinson, of London. It will thus be seen that four sets of drawings, the selection of the sub-committee, and one set selected by Mr. Godwin, are amongst the designs exhibited. It is much to be regretted that Mr. Robinson's very defective plans caused his exclusion from the final competition; his most artistic and beautiful drawings are not surpassed by any in the exhibition. Another fact learned from the exhibition is that of the fifteen sets of designs selected by the sub-committee, six at least were by Manchester architects. I say "at least," for as four sets of the eight rejected are not exhibited, it is just possible that more than six may have been by Manchester men.

It was fondly hoped by many that the Manchester Town Hall competition would have opened a new era in these affairs; but, alas! "Hope told a flattering tale!" It seems to be impossible for an architectural competition to be anything but a "delusion and a snare;" and *Punch's* advice to people about to marry may be judiciously given to architects about to compete —"Don't!"—I am, &c., R. R.

SIR,—I observe that some of the additional provisoes of the "final instructions" are identical with certain specific features of my plan *inter alia*. "The spacious staircase at the Cooper-street end," important externally and internally in my design, "convenient means of approach for hand carts to the basement," "cart entrance in Lloyd-street," "separate staircases to parts of basement in connection with offices above," and even to the provisions of "housemaids' rooms," and "lifts for coal."—I am, &c.,

JAMES HIBBERT.

19, Fishergate, Preston, September 28.

[We have, as it might have been supposed, received a great many letters on this competition, and they all join in a general chorus of condemnation of the local council and the London referee. We recollect no instance wherein so much ill-feeling—we may say, exasperation—has been produced. The letters we have received come from competitors and disinterested lookers-on. All the letters agree on two points, viz., that *all* the designs should have been exhibited, or *none*; and that the referee committed an unpardonable blunder in not selecting twelve competitors for the first competition, as originally arranged by the town council. We have seen copies of indignant protests sent into the council, which ought, by right, to be made public. If they were published, town councils would, no doubt, be more cautious in future in the selection of referees in such matters.—ED. B. N.]

SOUND.

SIR,—In the article on "Sound," in your issue of August 23, you refer to the whispering galleries, and repeat the explanation—to be found in many of the older books on physical science—of their phenomena by the supposed reflection of the sound. It may interest your readers, however, if you permit me space in your columns, to remind them that a second solution has been suggested by Mr. Scott Russell and others, and one which seems in several particulars better to fit with the phenomena observed. He considers that in the whispering gallery of St. Paul's, for example, the wave of sound is conducted along the wall, and that the louder sound heard at a point exactly opposite the speaker is due to the coincidence at that point of two streams of sound which have travelled along the wall in opposite directions Consult, for a further account, Weales' rudimentary treatise on "Acoustics," page 27, and Mr. Scott Russell's lecture reported in BUILDING NEWS of November and December, 1858.—I am, &c., T. ROGER SMITH.

DARTON CHURCH RESTORATION.

SIR,—Being personally referred to by "P. Q. P. V.," in your last week's publication, as the architect in charge of the above restoration, I trust to your indulgence for a word in reply, and to assert, as I am happy in being able to do, the most unqualified contradiction of the unfounded censures contained in your correspondent's communication. It is scarcely possible that "P. Q. P. V." can have seen for himself the work of restoration now in progress at Darton, or that from personal observation he can be at all acquainted with the structure.

The exterior walls, which originally presented a face of sandstone ashlar, have subsequently received successive coatings of lime and colour-wash, and at a later period have been further covered with a thick plaster of lime and hair. This excrescence is now being removed as far as the resources will admit; but every care is taken, not only to assimilate the random chisel marks to the earlier type, but also, in repairing the mouldings —occasionally found to be mutilated—to follow as closely as possible the outlines of the original. What, then, can have inspired the gratuitous imputations of "P. Q. P. V." it is not easy to imagine. In his appreciation of the purity and beauty of the church, I am happy in agreeing with your correspondent; and I can assure him that, whether the restoration can be effected as completely as could be desired or not, the work will be directed by a scrupulous regard for the preservation of the primary style and character of the church.—I am, &c., WILLIAM PERKIN, F.R.I.B.A.

Leeds, October 1.

ZINC ROOFING.

SIR,—In consequence of absence from England, the letter of "C. H.," in your journal of the 13th, escaped my observation till now. There is no mistake in the statements published by you as to the cost of zinc roofs of a plain character. At £26 per ton, the price assumed, one ton of No. 14 Vieille Montagne zinc will cover about 1,300ft. of finished work; and this, at 7d. per foot, without taking into account special discounts, allows 2s. 4d. per foot for labour and profit. Flashings and gutters must not be included in the surface measurement at this price If the work is small or difficult, cutting the metal to waste, or if the carpentery is not arranged to allow the 8ft. sheets to drop properly into place, the cost is, of course, increased, and the roof probably spoilt as well. There is no difficulty in getting a good fall, but "C. H." must not suppose that this can be done where the joists of the flat or roof are made to do duty as ceiling joists as well. To arrange the roof otherwise is quite easy and costs no more. Twenty per cent. is sufficient to allow for loss of zinc in rolls and laps, in taking the surface measurement of a properly formed zinc roof, but ill-considered carpentery may make it as much as "C. H." thinks it should be. —I am, &c., J. E.

October 1.

A SUGGESTION!

SIR,—I remember riding past the north side of Hyde Park about six months ago, and seeing a hoarding a hundred yards west of the Marble Arch. The answer I had to my inquiries was that this was to be another statue of the Prince Consort. This, of course, did not surprise me; but I certainly was astonished this morning at the wonderful work of art that I find has been erected there. Why, Mr. Editor, this small drinking fountain (for such it turns out to be) in the space of 6ft. base and 30ft. in height, contains all the resources of modern Gothic art! You can there see flying buttresses, diapers, circles with heads looking out of them, crockets, columned shafts, and I know not what besides; and the awful thought occurred to me that if the mischievous urchins who were so energetically pelting the trees hard by, to bring down the horse chesnuts and acorns, were only to take it into their heads to do the same by this beautiful rection, the only relief left for its industrious carving would be the nearest policeman. Five minutes' carronade, such as I saw against the trees, would leave it—though not, alas! without a shaft—crocket-less and finial-less. Pursued by this dire foreboding, I walked on into Oxford-street, but upon reaching ————'s, the famous confectioners, a bright idea seized me. These astute tradesmen protect their perishable goods with a glass shade; and, if so, why can't this be done to the valuable erection in Hyde Park? This valuable idea I hasten to present to the Government through you, that there may be no excuse for delay upon this point. Let them do this, and at the same time insure in the Plate Glass Assurance Company, and we shall be safe; the shade will prevent our getting to the water, but that was evidently such a minor consideration in the design that it can't matter much.—I am, &c.,

H. P. RAILING.

CIRCLE-SQUARING AGAIN.

SIR,—The method copied by "E. W. T." is, of course, far more accurate than Mr. Guillaume's first, as I showed, and nearly as true as is second, which would give us the straightened quadrant by joining AB, dividing this line into three and three, and prolonging it one-ninth. But, surely, the demon of quadrature is like that one in the Gospel. After leaving Mr. Guillaume, and walking through dry places in that gentleman's second letter, he returns and makes his last state far worse than the first! Does he suppose an error of only "a thousandth part" (an eighth of an inch in 10ft.) "near enough for all practical purposes?" Why, it will not be so with even this correction, which he says is "for strict accuracy!" Call his diameter unity—

A side of his triangle =	·866025
A side of his square =	·707107
Their sum	1·573132
	2
Doubled.....	3·146264
A thousandth deducted	3146
	3·143118

This is much further from 3·14159 than either the Archimedian 3 142857 or his first attempt!

As for Mr. William Butler's arithmetical puzzle, we need not attempt to understand a method which, as soon as he gets beyond the well-known 113:355, leads him to entirely wrong results. If the two numbers he gives us, of seven and eight digits, yield a quotient no truer than 3·1415926535 89, as he states, they are wrong; because their product would have 14 figures, and the best pair of numbers whose product has but 14 figures are bound to give a quotient correct to at least 14, including the integer. Thus, 7 and 22, whose product has three figures, give a quotient with three figures correct. But the 113 and 355 of Metius are remarkable for this, that though their product has but 5 figures, their quotient is true to seven. Mr. Butler will find that the following seven and seven figures, 1725033 : 5419351, are about 40 times nearer than he states his seven and eight figures to be!

Again, he gives us two rows of 21 figures apiece, whose product would be 41, and only says their quotient is true to 37 figures; whereas they are a false approximation unless giving at least 41 figures correct.

The following approximations, nearer than 113 : 355, he skips over undiscovered—

33102 : 103993 = ...	3·141,592,653,01
or too little by	·000,000,000,58
33215 : 104348 = ...	3·141,592,653,92
or too much by	·000,000,000,33
66317 : 208341 = ...	3·141,592,653,467
or too little by	·000,000,000,123
99532 : 312689 = ...	3·141,592,653,619
too much by	·000,000,000,029
265381 : 833719 = ...	3·141,592,653,581
too little by	·000,000,000,008
364913 : 1146408 = ...	3·141,592,653,591,4
too much by	·000,000,000,001,6
1360120 : 4272943 = ...	3·141,592,653,589,39
too little by	·000,000,000,000,40
1725033 : 5419351 = ...	3·141,592,653,589,815
too much by	000,000,000,000,022

The method of obtaining these is treated in most works on algebra, under the head of "Continued Fractions."—I am, &c., E. L. G.

September 30.

P.S.—Mr. Butler will find each successive pair of the above numbers consist of the previous pair (or some multiple of it) plus the last pair but one. Thus, the first pair being 1 : 3, and the next being 7 : 22, the third is the former pair plus 15 times the latter, making 106 : 333. The fourth is the second and only once this third, making 113 : 355. The fifth is the third added to 292 times this fourth—so greatly does the fourth exceed the third in accuracy. Thus the multipliers for these three steps are 15, 1, 292; and those for the succeeding steps are 1, 1, 1, 2, 1, 3, 1. Thus it is probable that there may be millions of steps before so large a multiplier as 292 occurs again.

MEETING FOR THE WEEK.

MON.—Society of Engineers.—Adjourned discussion on Mr. Pendred's paper on "Water Tube Boilers;" and, should time permit, a paper will be read by Ewing Matheson, on "The Quality of Iron as at Present Used." 7.30.

Intercommunication.

QUESTIONS.

[594.]—POULTRY FARM.—I am about establishing a poultry farm. Can any of your correspondents inform me where one is to be seen in working, of the best books on the subject, and what is the proper number of fowls to calculate for per acre?—ROOSTER.

[595.]—AQUARIUM.—I have an order for an aquarium 24ft. long, 12ft. wide, and 8ft. deep. I propose to enclose the glass in an iron frame and bars (with india-rubber to make watertight), making the squares of glass 6ft. by 8ft. Will you or any of your correspondents inform me what the greatest pressure will be on the glass when filled with water, and what thickness of glass will be required to withstand that pressure?—PIKE.

[596.]—BATH AND HEATING FURNACE.—Will any of your readers oblige by naming the manufacturer's name of a certain bath which combines both bath and heating furnace in one and the same article; and not, as generally, the heating part of the apparatus separate and detached from the bath.—H. R. S.

[597.]—FISH POND.—Will you kindly inform me in your "Intercommunication" the best way of making a lake or fish pond in a flower garden? Thirty yards and twenty yards is about the size of the pond required. What I want to know most is, how to make it hold the water.—R. H., for F. B. C.

[598.]—DESCENDING STOVE.—Being about to have a descending stove placed in a shop, I should be glad if you or any of your readers would inform me of the best plan for suspending the iron flue from wood joist and floor, not ceiled, giving about 12in. clearance from top of flue to bottom of joist, suspended so as to cause the least danger from fire at any time through overheating, or any of the ironwork coming in contact with the wood. Also the means to be adopted for making the stove draw well at the time of kindling the fire.—W. N.

[599.]—RETAINING WALLS.—I shall be glad to receive information on the strength of brickwork to resist horizontal pressure, as in retaining walls, and the result of experiments with the face of the wall vertical, and with an assumed batter; whether the work was set in mortar or cement, and, in the latter case, the result of the tests for tenacity per square inch of the cements used.—F. HOPE.

REPLIES.

[516.]—REMOVAL OF OLD PAINT FROM STONE.—I would inform "R. L. B." that I have at the present moment a very richly and elaborately-carved stone screen of the Decorative period, which was taken down in the restoration of Yatton Keynell Church, and am now cleaning the old paint off. It has been painted many times, so many, indeed, that the finest portions of the tracery are completely buried or smothered with the old paint. It must have been painted for ages.

My method is as follows, and I have proved its efficacy by 20 years' experience:—Have a wooden trough made large enough to take the portions you wish to clean, so that you can get in three or four pieces at once, say 6ft. × 2ft. 6in. × 6in. deep (the size I now have in work). Make a strong solution of American potash, which can be purchased from any respectable wholesale drysalter (ask for the very strongest), which is about four times stronger than the common American potash of commerce. Fill your trough, and immerse your stones; let them lay 24 hours, take them out and put more stones in; then with fine wire brush and small scratch brush the whole of the paint will come off like dead putty or paste. Scratch and wash it as you want. The removal of the paint is very rapid, and it leaves the stone perfectly clean and of its pure natural colour. The whole of the carving is as pure and fresh as if newly carved.

The stone in this screen is Bath, and size about 12ft. × 9ft. The price of the potash which I have had from Chippenham is about 10s. per cwt., and I have only required about ½ cwt. Trusting this will set "R. L. B." and all other similar inquirers all right, and if they wish any further particulars I shall be happy to supply it, if in my power.—I am, &c., EDW. HONEY, Clerk of Works for G. E. Street, A.R.A., restoration of Yatton Keynell Church, near Chippenham, Wilts, Sept. 25.

[566.]—CENTROLINEAD.—Whoever attempts to set one by the directions of "W. G. E." will find his lines radiate not from VP, but from the centre of the circle that passes through VP, P1, and P2. To make them radiate from VP, the stock must have its parts, as I said last week, only half as much inclined. If one arm be set, as in his figure, to the line VP, P², the other must be set to the dotted horizontal line; and on his supposition of the "first angle" being 20 deg., that of the centrolinead must be 170, not "160 deg."—See Euclid iij. 22. I do not venture to give a corrected copy of his inexcusably careless figure, because the engraver altered my previous one. It is essential, as I said, for the two arms to be equally inclined to the blade. If they are not so, but as the engraver drew them, the lines will not radiate from any single point, but be like the steps of a winding stair.*—E. L. G.

* But the two pins need never be equidistant from the horizon, as in "W. J. E.'s" figure. That would be highly inconvenient in most drawings.

[572.]—QUEEN ELEANOR'S CROSS, WALTHAM.—I beg to refer "W. R. G." to "Mrs. Markham's History of England," page 130.—ALFRED D. PEARY, Argyle-chambers, Colmore-row, Birmingham, September 28.

[574.]—THE "LIMNER."—By the aid of the "Limner" I am enabled to copy perspectives accurately, and for copying any large drawings I find it invaluable. "E. W." will find it a cheap and very useful instrument, and he cannot do better than try it.—EXCELSIOR.

[586.]—ARCS OF DIFFERENT RADII.—No arc of a circle can be formed by the bending of a rod as described. Its curvature will vary at every point, forming what is called the elastic curve, whose formulæ are very difficult, and have exercised the highest skill of Bernouilli and other first-rate mathematicians.—E. L. G.

[586.]—Assuming the length of the rod $a\ b$ to be equal to the length of the required arc, then the chord $x\ y$ and versin z may be found in the following way:—Let L = the length of the arc, R = the radius, and c = the angle contained by half the arc, then, as ½L is to c, so is the circumference to 360 deg. $\therefore C = \frac{180\ L}{2R\ (3{\cdot}1416)}$

Chord $x\ y = 2R.\ \sin.\ c$; versin $z = R - R.\ \cos.\ c$.

For an example, take L = 10in., R = 5in., then

$c = \frac{1800}{31\ 416} = 57$ deg. 17 min. 44 sec.

The chord $x\ y = 10\ \sin.\ c = 8{\cdot}4147$ inches.

Versin $z = 5 - 5\cos.\ c = 2{\cdot}2985$ inches.

F. HOPE.

[588.]—BOX GIRDERS.—The calculation for the sectional area is as follows:—Let W = the weight 50 tons, L = the span 13ft., D = the depth of girder 1ft.; then,

the strain in centre $= \frac{WL}{8\ D} = \frac{50 \times 13}{8} = 81{\cdot}2$ tons.

Straining the iron at 5 tons per square inch, we have the

section $= \frac{81{\cdot}2}{5} = 16{\cdot}24$ sq. in. effective.

Add for rivets 3·00

19·24 sq. in.

A pair of angle irons 3½in., by 3½in., by 7-16in. = 5·74 sq. in.

Two plates 13in. wide by ⅜in. thick..... = 13·50 sq. in.

The required section = 19·24 sq. in.

This is the section of each member or boom, top and bottom, in the centre, the second ⅜in. plate need only extend 4ft. on each side of the centre, thus reducing the section to the pair of angle irons and one ⅜in. plate, at each end of the girder. The web plates should be ⅜in. thick.—F HOPE.

[589.]—PENCIL DRAWINGS.—1oz. of gum arabic to a quart of water, and some prepared ox gall dissolved with it to ensure its laying equally. A few drops of otto of roses, or some essential oil, or a small quantity of musk, will effectually prevent the mixture from growing mouldy or becoming offensive. It should be spread over the drawing, rather than washed, with a flat camel's hair brush in tin, preventing, as far as possible, the brush from touching the drawing, but allowing the solution to float before it over the whole surface of the paper, which should be laid inclined on a desk during the process.—EXCELSIOR.

[589.]—Among other means of keeping pencil drawing from injury I think "blue milk" should not be lost sight of, for though it dulls the gloss (giving the drawings more the appearance of lithographic prints), yet it is an excellent preservative. I have a small pencil drawing so treated (the trial plan of Stockton New Wesleyan Chapel, drawn to the scale of 1-16in. with a very fine pointed H.B. pencil in September, 1865, in view of which the committee determined choice of style, &c.), and which has borne knocking about since then among other books and papers, and is as good as new. One done at the same time and not coated with anything was soon nearly obliterated. I pour the blue milk over, as this method does not disturb the marks. "Gum water," or gum arabic dissolved in hot water and left to cool, is used where it is desirable to leave more brightness or "shine." This may be carefully laid on with a broad flat brush.—G. M.

[589.]—If isinglass is used, put ¼ oz. into cold water, let it steep one minute; pour off the cold water, and pour on an old wine gill (about thirteen tablespoonfuls) of boiling water. Stir the whole, when the isinglass will immediately melt, and use while the solution is yet limpid. Lay on with a flat camel hair brush of suitable size, carefully avoiding air bubbles in the manipulation. It may be necessary to strain the liquid through fine clean muslin while hot. The water used—also the vessels—should be quite clean. A few experiments should be made, as to time of using, &c., before trying to coat anything of importance.—S. M.

[591.]—WATER COLOURS.—A thin solution of gum arabic laid on where depth is required in a wash. "Seeker" will do well to read "A System of Water Colour Painting," by Aaron Penley, published by Winsor and Newton, of Rathbone-place. The price of this work is one shilling.—EXCELSIOR.

[592.]—OX GALL.—I have for years prepared my own ox gall by placing a little fresh gall from the butcher, in an old bear's grease pot (clean) in the kitchen oven, and allowing it to remain until it becomes dry and crisp. I then put a few drops of water into it, just sufficient to cause the dried gall to soften; I then again put it into the oven for a minute or so to slightly evaporate, when it is ready for use, and quite equal to that sold at the shops, and will keep good for years. The preparation by me was, in the first instance, compulsory, being unable to obtain any in the town, and so pleased was I with the result of my experiment that I have not purchased any since.—LINCOLN.

STAINED GLASS.

This week the handsome stained glass window, which was recently subscribed for by the inhabitants as a memorial of the rector, has been inserted in the parish church of Newbury. The stained glass windows liberally presented by the people of the town and neighbourhood as a testimonial to their late rural dean, the present vicar of Speen (Rev. H. W. Majendie), and W. Chatteris, Esq., are also fixed, and they add greatly to the appearance of the western extremity of the church.

STATUES, MEMORIALS, ETC.

The first of the statues to be placed in the vacant niches in the west front of Salisbury Cathedral has been fixed. It is the statue of Christ holding a globe, and is 7ft. high.

The pedestal for the statue of Edmund Burke, in front of Old Trinity, Dublin, still remains vacant. It is said that want of funds to pay its cost keeps the statue itself in London.

A group of sculpture executed in Paris, from designs by Rosa Bonheur, representing a tigress bringing food to her cubs, and presented to the city of Glasgow by M. Kennedy, of New York, was formally inaugurated last week. The site is in the lower level of the West-end park.

The pinnacle or cope stone has, at last, been placed on the national Wallace Monument, near Stirling. A great deal remains yet, however, to be done in the shape of turretting and other details. The warden's house has yet to be built, and will not be commenced this season.

At a recent meeting of the committee entrusted with the erection of the monument to the late William Smith O'Brien, it was resolved that the friends and admirers of that gentleman should be earnestly called on to provide a sum of £400, which is still required to pay for the statue which has been finished for some time in the studio of Mr. Thomas Farrel, R.H.A., Dublin. The statue is executed in Carrara marble, and is considered a very perfect likeness.

General Items.

We regret to observe the death of Mr. Charles Fowler, J.P., Fellow of the Royal Institute of British Architects. Mr. Fowler died at his residence, Western House, Great Marlow, on the 26th ult., of chronic bronchitis. He was 75 years of age.

We have just seen a very fine photograph of the Victoria Tower, as taken by Mr. Stephen Ayling, of 483, Oxford-street. It is the largest photograph we ever saw, and reflects great credit on the photographer.

Mr. Lemon, the author of the plan bearing the motto "Experience," which has obtained the premium of £150, attended the meeting of the General Purposes Committee on Tuesday. The result will be made known at the next monthly sitting of the Local Board.

We learn that for the future the monthly meetings, on the first Saturday evening in each month, of the London Association of Foremen Engineers, are to take place at the George Hotel, Aldermanbury, London. The first meeting of the session will be held to-morrow (Saturday), at 8 p.m., Mr. Joseph Newton, in the chair.

The tin mines in Cornwall have been worked for about 3,000 years. They are now yielding 3,500 tons per annum. The Spanish tin mines have been known nearly as long as the Cornish ones.

Mr. Gascoyne, builder, of Leamington, was last week invited by a number of his friends to a complimentary dinner at the Crown Hotel, on the occasion of his retirement from the chairmanship of the Local Board of Health.

Messrs. Longman announce that they will shortly publish a pamphlet entitled "Who was the Art Architect of the Houses of Parliament," by E. Welby Pugin.

Artizans visiting the Paris Exhibition should be cautioned against accepting the invitations of touters for lodgings, who haunt the railway stations and other places to offer their services to unwary Britons, many of whom have been thus victimized. If a workman going to Paris has not already made in London his arrangement for lodgings, by correspondence with Mr. Hodgson Pratt, Vice-President of Mr. Layard's committee, 265, Strand, London, or through Mr. Cook, the well-known excursion manager he should immediately, when he arrives in Paris, proceed by a cab, which costs 2 francs to the workman's lodging-house, in Avenue Rapp, close to the Exhibition. If this house be full, then let him go to the British Workman's Hall in the Exhibition, and ask for M. Houssoulier, and he will escape all fleecing.

On Tuesday week a meeting of the Durham workhouse committee was held to consider the best means of obtaining plans for certain proposed alterations and additions to the Durham union workhouse. It was resolved to advertise for plans, and to give two premiums of £40 and £20 for the two best.

A new public park in Brechin was opened by Earl Dalhousie, on Saturday last. The movement was started about two years ago by Mr. Gardner Mitchell leaving £200 of a legacy for some ornamental purpose; then the town council got a feu of 8½ acres of the Coldhame feus on the Brechin Castle estate. Lord Dalhousie gave the ground at a low rent and feu, besides contributing £100 to the fund for ornamentation; and subscriptions were got at home and abroad to the amount of nearly £1,300. Curators were then appointed and the park was beautifully laid out with flowers and shrubs, and furnished with a nice lodge and pavilion.

Blowing down the chimney is a very poor way of extinguishing a lamp. It requires a good degree of dexterity and a considerable amount of breath. It should never be resorted to except the object be to blow up the lamp. The easiest way of extinguishing a lamp happens to be the safest; turn the wick down pretty low and give a slight puff at the bottom of the chimney.

The Commissioners of Works has given instructions that the whole of the footpaths on Primrose-hill shall be lighted with gas, and men are now busy in laying down the pipes. On the top of the hill there will be a large ornamental column surmounted by four lamps.

A new fashionable watering place is about to be formed at Bolduor, at the south-west corner of the Isle of Wight. About 100 men will shortly be set to work making roads and laying out the grounds for the erection of villas. It is proposed to form an esplanade and pier.

Messrs Mitchell Brothers, of Manchester-road, Bradford, have just erected a mill chimney of the height of 100 yards from the ground line, and 110 from the foundation. It is the highest chimney in Yorkshire, and from the top of it, when the atmosphere is clear, the town of Leeds can be distinctly seen.

The new railing now being placed round Hyde Park is considerably thicker than the old one. It is fitted into very solid blocks of stone. It is intended to move the gates further back into the park, which will considerably widen Park-lane, and other improvements for the public convenience are also being carried out.

A subterranean chapel in the cathedral of Milan, to which the visitor is admitted by the payment of a few francs, reveals some of the hidden treasures of the church. It contains the tomb of St. Charles, one of their archbishops, whose memory they perpetuate in silver and gold and precious stones. The chapel is entirely lined with silver, which is finished in various bas reliefs, illustrative of events in the life of the saint. The body is embalmed and inclosed in a silver coffin, which was the gift of Phillip IV. of Spain. As we stood in front of this shrine, the priest in attendance touched some secret spring, by which the outer coffin gradually descended, and revealed through a case of rock crystal the wasted face and the pontifical robes of him who had for years slept in that gorgeous but gloomy state. A cross of emeralds, diamonds, and rubies was suspended in the coffin, and precious jewels glittered amid the folds of the rich embroidered robes. Mass is said for this saint every morning at 9 o'clock, although he died in 1584.

At a meeting of the Darlington Board of Guardians held last week, the question of the purchase of land, for a site for the new workhouse was discussed. The committee appointed to inquire into the subject recommended that 3½ acres of land, at a cost of £1,050, should be purchased of the Ecclesiastical Commissioners, at the east part of Darlington, in the neighbourhood of Bank Top. This recommendation of the committee was confirmed. It was also agreed after some discussion that the building should be constructed to accommodate 250 inmates, as recommended by the committee. A proposition that the number should be 300 was lost. The present number of inmates was about 100. It was also agreed that premiums of £40, £30, and £20 should be offered for the best plan of a new workhouse, if the architect of the premium plan be selected to carry out the work; in that case he is to forego the premium, only having his commission.

Some time ago there was a town's meeting in Brierly Hill to protest against the price of gas supplied by the local company. The townspeople wished a reduction from 4s. 7d. to 3s. 9d. per 1,000, and urged as an argument in favour of such reduction, the prices paid by towns adjoining, and in the district, but the directors of the company refused to yield to such a reduction. At the last moment, arbitration was offered by a gentleman well known in the district, and accepted on the one part by the gas company. The inhabitants, however, declined the proffered mediation, and the consequence is that nearly the whole of the houses in Brierley Hill, Quarry Bank, Brockmoor and Hart's Hill are lit up without the aid of gas. Shopkeepers use lamps, which they say are satisfactory and cost less than gas, whilst ordinary houses use candles or lamps, according to taste. The movement has been very complete. The directors of the company have intimated that as the demand for gas becomes less the price must advance, but the inhabitants intend keeping up the opposition throughout the winter unless their wishes are attended to.

A grand tumulus, on a piece of original wold untouched by the plough, has been opened by the Rev. Canon Greenwell, of Durham. It proved to contain about twenty-four burials, of which the remarkable deposition of seventeen has been traced. The bodies, many of them, had been disturbed, but a sort of rude order had regulated their re-interment, the bones having been placed in position, but in many cases wrong end first, causing a most heterogeneous mixture. A large number of peculiar features, as regards pottery, implements, and burial were found, and several of the bodies were associated with the remains of the red deer, the ox, and other animals—the animal bones split for the marrow. Some of the articles were as fresh as on the day of interment, 3000 years ago.

Few persons know the origin and history of the once famous but now defunct Hungerford Market. It took its origin from the following incident, which we find in an interesting paper on Hungerford, read by Mr. W. L. Barker, at a recent meeting of archæologists in Wiltshire:—The greatness of the Hungerford family ceased with Sir Edward Hungerford, who, by his excessive extravagance, squandered a princely fortune, and died a poor Knight of Windsor, in the year 1711, at the advanced age of 115. He is said, on one occasion, to have given 500 guineas for a wig in which to figure at a Court ball. The town house of the Hungerford family was destroyed by fire during his life, and on its site lately stood Hungerford Market, with a bust of Sir Edward under a niche in the wall. The circumstance is mentioned in Pepy's Diary: "April 26, 1669. A great fire happened in Durham-yard last night, burning the house of one Lady Hungerford, who was to come to town to it this night; and so the house is burned, new furnished, by carelessness of the girl, sent to take off a candle from a bunch of candles, which she did by burning it off, and left the rest, as is supposed, on fire. The King and Court were here, it seems, and stopped the fire by blowing up the next house." Sir Edward obtained permission to hold a market three days a week on the site of his former mansion, and this was the origin of the Hungerford Market.

In a sensible article on the dangers of the streets, the *Lancet* remarks:—The authorities of Paris are said to have under consideration a project for throwing foot bridges over the most crowded thoroughfares of that city, in consequence of the great risk attending a passage across the streams of vehicles, of which a great number are in the charge of careless or incompetent drivers. The *Figaro* says that every day from 8 to 15 persons are knocked down or run over by vehicles in Paris; what proportion of these are killed is not stated. In London the "dangers of the streets" are patent to everybody, and the loss of life by accidents from vehicles amounts in a year to a very startling total. Looking through the Registrar-General's weekly returns, we find that since last February 111 deaths have been registered as caused by horses or carriages in the streets, giving for the last thirty weeks an average of nearly 4 deaths per week. In one week 10 deaths were recorded, and of these 6 were of persons over fifty five years of age, and 2 were of children under ten years of age. The numbers receiving anything short of fatal injury are not recorded. To childhood and feeble age the passage of our overcrowded streets is full of peril, and it is not creditable to the humanity or the public spirit of the metropolitan authorities that suggestions which have often been made for erecting light footbridges at the most difficult crossings have not been adopted long ago. Are the Boulevards Montmartre, Capucines, and Italiens more thronged with vehicles going in all sorts of distracting directions than the Oxford-street Circus, the junction of Fleet-street and Ludgate-hill, the open space hard by the Bank and the Mansion House, the confluence of Cannon-street, King William-street, Gracechurch-street, and London-bridge, or other well-known places of excessive traffic? One of these days some peer, perhaps Sydney Smith's bishop, or other person of high station, may get knocked down and killed by a dashing "Hansom," or one of those terrible Pickford's vans, and then possibly the authorities will be so shocked that something will be done. But a hundred or two of children and old people,—mere nobodies! It is their lot to die, and what does it matter to metropolitan or local "boards" whether they are crushed beneath the Juggernaut of the streets or not?

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

432. J. CARTER. IMPROVEMENTS IN OPENING, CLOSING, AND SECURING WINDOWS, DOORS, AND SHUTTERS, ETC. Dated February 16, 1867.

This invention has reference to a former patent, dated 11th June, 1866 (No. 1616), and consists in employing a shaft, the upper part of which is screwed or has a screw formed on it, for raising, and lowering the upper sash, shutter, door, or port shutter, the lower part of the shaft being plain, and which passes down through a trouser or tube screwed on the outside for raising and lowering the under sash, shutters, door, or port shutter, the trouser or tube being only half the length or thereabouts of the solid screwed shaft; its length being sufficient to raise the under sash, shutter, door, or port shutter. By this arrangement, either of the said shutters, doors, or port shutters may be raised or lowered, or secured in any position of their motion, the ends of the screwed shaft and the trouser passing down through the framing into a wall box, their lower ends being provided with bevil wheels which are actuated by a handle as in the invention referred to above. It is to be understood that the screwed part of the shaft and the trouser or tube passes through or into corresponding screwed lugs attached to the framing of the sash, shutter, door, or port shutter, so that, according as the screws are revolved the sash, shutter, door, or port shutter moves upwards and downwards. *Patent completed.*

436. E. STEVENS. IMPROVEMENTS IN MEANS OR APPARATUS EMPLOYED TO SECURE COAL PLATES, TRAP DOORS, AND OTHER SIMILAR ARTICLES. Dated February 16, 1867.

In performing this invention, a fixed ear, lug, or bolt, and a sliding bolt, are employed; the sliding bolt is guided in suitable guide, cast on or affixed to the article to be secured. On this sliding bolt one or more lugs, pins, or teeth are formed or fixed, which are acted upon by a weighted lever, or by a lever acted on by a spring. *Patent completed.*

444. C. WENNER. CERTAIN IMPROVEMENTS IN APPARATUS FOR PREVENTING DOWN DRAUGHT IN CHIMNEYS, ETC. Dated February 19, 1867.

This invention consists in the use and application of a curved "hood" or "cowl," into which the upper portion of the chimney pot or funnel is made to project, such hood or cowl being open at the exit end, and turning with the wind on a vertical shaft, and has an opening in the back or long curve of a smaller sectional area than the area of the exit end of the cowl, and into this back opening a horizontal funnel or conical tube is fitted in order to catch the wind. By this arrangement the air passed from the small opening in the back of the hood or cowl over the top of, and at right angles to the chimney or air shaft through the said hood or cowl of larger sectional area, expanding at the same time, and causing a great upward draught in the chimney or ventilating shaft. To prevent any back current, the hood or cowl is made of sufficient length to allow the current of air which issues from the small opening in the shape of a cone to touch the sides of the cowl before passing into the open air, so that no air current can enter through the front opening. *Patent completed.*

Trade News.

TENDERS.

BRIXTON.—For house and shop in the Brixton-road, for Mr. F. Hutchinson. Mr. Charles H. D Driver, architect. Quantities supplied by Mr. T. Nixon:—Thompson, £1,635; Nixon, £1,550; Manley and Rogers, £1,422; Perry, £1,320; Taylor, £1,243; Nutt and Co. (accepted), £1,105.

CROYDON.—For carcassing only, two houses at Thornton Heath. Mr. J. Berney, architect:—Hall, £1,483; Nightingale, £1,232; Crabb and Vaughan, £1,190; Lose, £1,162; Brett and Bradbury, £1,148; George, £1,127.

CITY.—For pulling down and rebuilding the court and offices of the Coopers' Company, Basinghall-street. Mr. Geo. Barnes Williams, architect to the company:—Coleman, £4,888; Myers, £4,867; Ashby and Son, £4,824; Brass, £4,778; Ashby and Horner, £4,750; Rider, £4,660; Browne and Robinson (accepted), £4,627.

KENSINGTON.—For a terrace of ten houses at Kensington for Mr. S. Ullman. Mr. John Dale, architect. Quantities supplied by Mr. Shrubsole:—Macey, £16,490; Johnson, £14,990; Carter and Sons, £14,176; Cowland, £13,240; Butt and Son, £13,075; Parsons, £12,986; Nightingale, £12,742; Wilcox, £12,696; Nutt and Co., £12,613; Munday and Hutchinson, £12,400; Thorne and Co., £11,945; Grover, £11,660 3s.; Cockrell, £11,575; Pearse, £11,500; Baxter, £9,678.

NEWCASTLE-UPON-TYNE.—For the Albert Memorial Orphanage. Messrs. Austin and Johnson, architects:—

	Main Building.	Boundary Walls, Gates, and Drains.	Total.
H Hudspeth	£4,805 15 0	£771 2 0	£5,576 17 0
Thos. Howard	4,790 10 0	769 15 0	5,560 5 0
T. Forsyth	4,678 0 0	...	...
J. Gibson	4,643 0 0	706 14 0	5,350 9 0
R. Yeaman	4,500 0 0	780 0 0	5,280 0 0
Edward Brewis	4,566 0 0	624 0 0	5,190 0 0
Robert Whichello	4,494 0 0	648 0 0	5,142 0 0
William Gibson	4,334 5 1	760 13 0	5,004 18 1
W. Scott (accepted)	3,030 0 3	634 11 7	3,664 11 10

TOTTENHAM.—For Congregational church and schools. Messrs. Smith and Son, architects, Quantities by Mr. Shrubsole and Mr. Paice:—

	Entire Works.	Church only.
Adams	£4,189	£6,365
Gordon and Co.	4,085	3,087
Barker	3,928	3,378
Nightingale	3,657	3,125
Blackmore and Morley	3,583	2,800
Crabb and Vaughan	3,400	2,550
Munday and Hutchinson	3,153	2,403
Palmer (accepted),	2,820	2,179

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

F. Barlow, Strand, dealer in building materials, October 16, at 12—Frederick William Etheridge, Brighton, builder, October 16, at 12—Henry Gent, East Croydon, builder, October 17, at 11—James Hicks, Lower Norwood, builder, October 16, at 12—C. Rowe, Heacham, Norfolk, jobbing carpenter, October 16, at 12—Thomas Baird Steven, St. John's-place, Notting-hill, contractor for buildings, October 16, at 1—Joseph Hopping, Barnes, gasfitter, October 22, at 12 Samuel Penfold, Great Dover-street, Borough, builder, October 15, at 11.

TO SURRENDER IN THE COUNTRY.

W. Brown, Maryport, Cumberland, joiner, October 7—Henry Ellwood, Whitehaven, painter, October 9—Jabez H. Forshaw, Barrow-in-Furness, joiner, October 10—John Greenfield, South Stockton, Yorkshire, brick manufacturer, October 9—Henry Stevens, Eastbourne, builder, October 9—F. G. Taylor, Manchester, master painter, October 8—Edward Whiteside, Kirkham, Lancashire, joiner, October 10—John Beddoe, Westbromich, builder, October 11, at 12—David Connell, Bradford, plumber, October 14, at 11—Thomas Davies, Birmingham, carpenter, October 11, at 10—Richard Pawley, St. Mary Church, Devon, mason, October 12, at 11—Edward Eggleston Wordsworth, Hull, paper and paperhanger, October 14, at 11.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

November 8, G. Norman, Leeds, joiner—November 1, R. M. Robson, Liverpool, ironmonger—October 11, C Moyse, Fornham All Saints, Suffolk, carpenter—October 16, R. Ross, Sunderland, painter—October 23, W. Cooper, Leicester, joiner—October 23, W. Broughton, Leicester, bricklayer.

PARTNERSHIPS DISSOLVED.

Taylor and Wilkinson Leeds, architects—Raybould, Gell, and Winmill, Bristol, window glass merchants—Hobbs, Hart, and Co, Cheapside, and Arlington street, Islington, lock manufacturers—Jones and Pollard, Manchester, joiners—Dalrymple and Finlay, Tackley and Kirthington, Oxfordshire, builders—Tomlin and Leander, Manchester, engineers—F. Boetius and J. Eichhorn, Delahay-street, Westminster, civil engineers—A. and F. Parkes and Co., Birmingham, edge tool manufacturers.

DIVIDEND.

October 18, S. Proctor, Chesterton, builder.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9	0	£10	10	Archangel, yellow ..	£11	10	£13	0
Quebec, red pine	3	0	4	10	St. Petersburg, yel...	10	10	11	0
,, yellow pine..	2	15	4	0	Finland	8	0	9	0
St. John N.B. yellow	0	0	0	0	Memel.....	0	0	0	0
Quebec Oak, white ..	5	5	5	10	Gothenburg, yellow	8	10	10	10
,, birch.....	3	10	4	10	,, white	8	0	9	0
,, elm	3	10	5	0	Gefle, yellow.....	9	0	11	0
Dantzic oak	3	10	6	0	Soderham	9	0	10	10
,, fir	2	0	3	0	Christiania, per C., 12 ft. by 3 by 9 in. yellow	16	0	22	0
Memel fir	3	0	3	10	Deck Plank, Dantzic, per 40 ft. 3 in.	0	15	1	4
Riga.....	3	0	3	5	PUMICE STONE pr ton	6	0	8	0
Swedish	2	0	2	5	OILS, &c.				
Masts, Quebec red pine	6	0	7	0	Seal, pale....per tun	41	0	0	0
,, yellow pine..	5	0	6	0	Sperm body .....tun	108	0	0	0
Lathwood, Dantzic, fm	4	10	5	0	Cod	38	10	0	0
,, St. Petersburg	8	10	7	10	Whale, Sth. Sea, pale	38	10	39	0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Olive, Gallipoli.....	68	0	0	0
Quebec, white spruce	13	0	19	0	Cocoanut, Cochin, ton	56	10	57	10
St. John, white spruce	13	10	16	10	Palm, fine	42	0	42	10
Yellow pine, per reduced C.					Linseed	38	0	0	0
Canada, 1st quality.	17	0	18	10	Rapeseed, Eng. pale..	40	0	40	10
2nd do.....	11	10	12	10	Cottonseed.....	34	0	40	0

METALS.

IRON :—								
Welsh Bars in London .. ..per ton	6	7	8	6	10	0	3	
Nail Rod ..... do	7	10	0	7	15	0	2½	
Hoops ..... do	8	10	0	9	0	0		
Sheets, Single ..... do	9	15	0	10	0	0		
Staffordshire Bars ..... do	7	10	0	7	15	0		
Bars, in Wales ..... do	6	15	0	6	0	0	3	
Rails ..... do	6	5	0	0	0	0	nett	
Foundry Pigs, at Glasg. No 1 .. do	2	15	0	3	5	6	2½	
Swedish Bars ..... do	10	5	0	10	10	0	nett	
STEEL :—								
Swedish Keg, hammered .....per ton	15	0	0	15	10	0	2	
Swedish Faggot ..... do	10	10	0	12	10	0	2	
COPPER :—								
Sheet & Sheathing, & Bolts ....per ton	84	0	0	0	0	0	3	
Hammered Bottoms ..... do	93	0	0	0	0	0		
Flat Bottoms, not Hammered .. do	88	0	0	0	0	0		
Cake and Tough Ingot ..... do	74	0	0	75	0	0		
Best Selected ..... do	81	0	0	83	0	0		
Australian ..... do	84	0	0	89	0	0		
Y. L. Metal Sheathing & Rods ....per lb	0	0	7	0	0	0		
TIN :—								
English Block .....per ton	96	0	0	0	0	0	2½	
do Bar ..... do	97	0	0	0	0	0		
do Refined ..... do	99	0	0	0	0	0		
Banca ..... do	94	0	0	95	0	0		
Straits ..... do	89	10	0	90	0	0	nett	
LEAD :—								
Pig, English .....per ton	21	15	0	0	0	0	2½	
,, Spanish Soft ..... do	19	15	0	19	10	0		
Shot, Patent ..... do	23	0	0	0	0	0		
Sheet ..... do	20	15	0	0	0	0		
White ..... do	30	0	0	31	10	0	5	
SPELTER :—								
On the Spot .....per ton	21	0	0	21	2	6	net	
ZINC :—								
English Sheet .....per ton	26	10	0	27	0	0	2	
Devaux's V. M. Roofing Zinc .... do	26	10	0	0	0	0		

* And 5 per cent. discount if laid upon the new system.

QUICKSILVER .....per btl	8	17	0	0	0	0	
BEGULUS OF ANTIMONY							
French .....per ton	28	0	0	0	0	0	2

In the Press,

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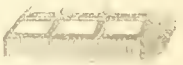
ESTABLISHED  1833.
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THE BUILDING NEWS.

LONDON, FRIDAY, OCTOBER 11, 1867.

MANCHESTER TOWN HALL.

IN our last week's comment on the designs submitted for the New Town Hall at Manchester we very briefly adverted to a letter addressed to the mayor and corporation, urging the reconsideration of the site. This letter is addressed to them by a member of the town council, Mr. John King, and contains such very sensible suggestions, that we are surprised to find this is not the first time they have been made to them. Their purport is not only to enlarge the site for the building, but to give it a more regular shape than it at present possesses, and by thus opening open out important thoroughfares and afford increased means of access to that which is intended to be the central point of the city—Albert-square. We should have hardly thought that a mayor and corporation could be so blind as not to see the advantage of such an extension, if the painful fact were not daily intruded upon us that the first step into a corporate body is veritably "a leap in the dark," and from which it requires almost superhuman energy to escape with daylight. Knowing this, we are not surprised to find that the Corporation of Manchester have deliberately chosen an irregular three-cornered bit of land, incapable of extension as the growing exigencies of the city require, and are presenting themselves, like their Venian prisoners, "manacled and ironed," to architects with the earnest request that they will give them that freedom of space, light, and air they have thus wilfully excluded themselves from. Mr. King's suggestion is to dissolve Lloyd-street, and substitute a new line from Oxford-street into the square, obtaining by this means a thoroughfare of immense value, and avoiding much serpentine progress now necessary to get at what is meant to be the heart of the city. He enters into an elaborate—and, seemingly, a very fair—estimate of the cost, but not being sufficiently acquainted with the price of land in Cottonopolis, we cannot follow him into this part of the subject; but this we can say, that any price which may be paid now will be much less than in that by no means distant period, when the proposed Town Hall will, like the present one, be found too small for its requirements. A mere cursory glance at the plans will show how many difficulties architects have found in endeavouring to make the best of a bad job the town council have thought good to give them. Long flights of steps lead to rooms of daily use, office has to be piled on office, or dug down deep into the earth, and their occupants need be angels or troglodytes to use them with comfort; and yet we learn, from Mr. King's letter, that even in last autumn he urged the question of the reconsideration of the site, not only personally, but by the presentation of a memorial signed by so numerous and important a portion of the community that it represented an assessment of £120,000, being one-tenth of the total assessment of the entire city. This pamphlet also lets us behind the scenes a little, and shows how from time to time the city surveyor clipped a bit of first one street and then another, and destroyed now this courtyard, and then that, to squeeze out the area and squeeze in the accommodation to suit the existing demands; and even when all is done, not one of the plans exhibited show anything like sufficient areas for light and air in so gloomy a climate, and none that can give any hope for future extension or modification. The town council even now have to decide on plans submitted in a "close" competition for new Police Courts elsewhere; and we would, in the name of architecture and common sense, urge them to read Mr. King's letter, and well consider it, and comply with his demand. Then, all the municipal buildings may be united in one mass, a fine building be obtained, suited not for the present only, but the future of the city; and in such case we would urge that the competition which has so far been a failure may be again re-opened and conducted on a better basis. We are told, in Mr. King's letter, that Mr. Walters, a local architect of much ability, was called in by the city surveyor to show how the best might be made of the land before the designs were advertized for; and rumours have reached us that these plans have been seen by some of the successful competitors. How far this may be the case we do not know, but we trust that should the competition be continued on as at present arranged, Mr. Walter's plan will be exhibited, not only with the final drawings, but also with those selected from amongst the present competitors. We shall then see how much some of them are indebted to this private plan, of which we now hear officially for the first time, and how much they have culled from the plans of their successful brethren now exhibited for their behoof. We would, however, earnestly beg the council to pause. It is not too late to rectify an error and do a wise work which would gloriously distinguish the Manchester Corporation from too many of their municipal brethren.

WILLIAM HENRY LEEDS, ARCHITECTURAL CRITIC.*

By Hyde Clarke.

IT will have been already, to some degree, understood what were the leanings of Leeds. He was a decided votary of Italian, and in so far indisposed towards the Classical and the Gothic styles. It was commonly thought that he was utterly prejudiced against the latter two, but this was by no means so. He, together with many of the advanced men of his day, had arrived at the conviction that the imperfect copying of classical temples was unsuited to modern days and to modern purposes; and he thought that Italian, being an architecture of habitations, whether for palaces or small buildings, was that which we could best adapt. Italian has everything in it which we require, even to windows and chimney pots, which Greek and Roman temples do not yield us. As to Gothic, he did not deny its possession of some characteristics, but his school held that Gothic had been surpassed in these by Italian; therefore, he thought he was following the tendencies of the age in promoting the development of Italian—not the copying of Italian, but its legitimate development in adaptation to the wants of the present time, without presenting purely national Italian details or allusions. An Anglo-Italian school was looked forward to which should be a modification of Italian as strictly as Palladian. This is a result which will probably be attained, but the error of too many men of the past—or, rather, their want of judgment—lay in their objections of the mediæval styles as incapable of formative action; or it may be that some, as Leeds himself reprobated, considered it desirable to check the sprouting and new growth of Gothic as likely to choke the coming up of Italian. Gothic was to be weeded up as an opposition crop, as stools of the older harvest not wanted now. This, with our present knowledge, is an open error, because, firstly, Italian is not enough of itself to awaken the needful strength of feeling for art, while Gothic has shown itself most efficient for this end, and we owe much more to the progress of Gothic than to the progress of Italian in furnishing us with the elements of art. How far, having these elements restored to us, we shall succeed in breathing into them a new spirit, and giving birth to a new style of art, remains to be seen. We want the beauties of Classic, Gothic, Italian, Indian, and Oriental, so applied in subservience to our wants—so adapted to iron, glass, and gas, and so impressed with the character of being English, as to furnish forth a style which shall be a record of our day.

As yet we have been rather mustering the materials and getting together our stores than doing anything effective in the construction of monuments, and our progress in art, small as it may look in the latter aspect, is really great. We are getting together the materials for a campaign in art, and that is our success. Those of us who laboured a generation ago were too eager; like doctrinaires, who upset a government, we expected a new one was to be carried out before the men and means had been created. When Leeds and those of his day had shown the inanity of Ionic temples in post-offices and banks, and raised the hopes of the young and rising men of the day, they thought they should have an early harvest, but everything had to be fresh created from utter destruction. In the decline of art whole trades had perished, and had to be restored. It was no longer possible, without great expense, to produce the lower decorations of the decline of the last century. Free plasterer's work, carving, and panelling, had become almost extinct. It has taken a generation to raise fresh men, but we can now with satisfaction review the array. It is enough to name the decorators, wood-carvers, stone-carvers, glass painters, plasterers, who contribute to the better finish of the buildings of this day. There is hardly a provincial city which is not better supplied with architectural aid than the metropolis itself a generation ago. Leeds, Pugin, Ruskin, Fergusson, Layard, Beresford Hope, each in his way, thought he had only to demand art; and, because he met a ready response, believed he had secured it, but he had only engaged in a great labour, needing the sedulous exertions of years. If any man has been disappointed it is because he has asked too much, because he undervalued our decline in art, and because he did not sufficiently estimate time, in its relation to the production of lasting effects in art, as well as in all that is human. So far as we have creative power, what we create with a breath dies with a breath, and though our power to produce what is lasting is limited to narrow bounds, still it is only by long labour we can establish anything which shall for its short span be permanent. If volition is the possession of taste—could of itself give us monuments—we should have had them; but how many a man is there of the past day, who, having laboured conscientiously, now feels that his architectural productions have not answered to his own aspirations. Brilliant as was the career of Barry, it may be doubted whether he was satisfied in reviewing its results, compared with the ambitious dreams of his early manhood.

Leeds expected much from Italian, and was ever disappointed in the end. When Pall Mall had risen, to show a line of imitative palazzi, he believed that Italian was safe; yet he found that he did not get beyond the imitations of Palladio or Scamozzi, and that the wings of the fledglings never reached a higher flight. If architecture had been left to the Italian style, it may be questioned whether the present progress of that style would have been attained, and whether that progress is not greatly owing to the concurrent study of the mediæval examples. It was neither from illiberality or want of power of adequate appreciation of the other styles that Leeds was an Italianist. He bestowed a great deal of attention on the monuments of antiquity and their classification, as may be seen in the "Penny Cyclopædia;" and as he had adequate knowledge of their construction and their merits, he never depreciated them. What he denied was that it was right to copy them for other distinct purposes, or to adapt them to modern uses with incompatible adjuncts.

* Continued from page 682.

As to Gothic, he denied none of the artistic beauties of its great monuments, but he thought for domestic purposes it was surpassed by Italian. Leeds believed and affirmed that Gothic architecture possessed more forms and rules of art than Grecian. He said Grecian, because, with him, the true model of classic art was Grecian. The assertion here given as to the superiority of Gothic comes out in the *Civil Engineers and Architects' Journal*, vol. iii., p. 373, but it was not a solitary expression. He had been quoting an article from the *British Critic*, No. 52—an essay on modern churches—and where the writer affirmed "there cannot be a greater mistake than the idea that Grecian architecture required greater attention to study and rules than Gothic. Gothic architecture appears less formal and less regular than its ancient rival only because it embraces more elements of calculation—because it has more forms and rules of art." "This dictum," says Leeds, is "True, most true;" and he goes on to declare that a person may go through the whole of Grecian architecture—may learn all the five orders, *secundum artem*—in less time than he can make himself acquainted with the varieties of Gothic doors or windows, or any other single feature belonging to that style. He carefully distinguishes, however, as to what he means by Gothic, for he says carpenters' Gothic, or even the Jemmy Wyatt Gothic, is a different matter; that, says he, is regular enough—all done by rule, without any study, and therefore regularly bad, or, at least, insipid.

To those who remember Leeds's passages of arms with Pugin it will appear still more strange to find Leeds in the character of a defender of Gothic architecture; and yet it is thoroughly genuine. It was provoked by some remarks of Professor Cockerell at the Royal Academy, when delivering his academic course on architecture. A sharp remark of Leeds's (as "Candidus") brought out a champion under the signature of "S. L." and the inspiration of the Professor. "Candidus," in defending and enlarging his original observations, first of all vindicated the right of criticizing public men and their works, and particularly the propriety of criticizing the productions of living architects. "Candidus" says his impression of the Professor's lecture was that Professor Cockerell was so far unfavourable to Gothic architecture as to discourage it most decidedly in his day. He had expressed a decent, "for-good-manners'-sake" admiration of it, and no more, as he might have done for any other bygone and worn out school of art, as for Egyptian or Byzantine architecture. He accused Cockerell of being an enthusiastic devotee in his rapturous reverence for the sublime Sir Christopher Wren, who, "Candidus" affirmed, had been guilty of Temple Bar and sundry other pieces of veritable architectural bathos. He held Cockerell to be evidently ill-disposed towards the practical application or adoption of Gothic in his day.

Leeds considered the chair of architecture at the Royal Academy—then the only one in England—ought not to be confined to the advocacy of one style of art and the suppression of another; and he boldly challenged Cockerell and his squire in vindication of the catholicity of art and the claims of Gothic, not only to past glory, but to living adaptability. This argument, in the *Civil Engineers and Architects' Journal*, vol. iv., p. 155, will show not only Leeds's views, but what was necessary, in 1841, to be said to a public authority on a matter in which, in a quarter of a century, no one could be found who would dare to raise a contest. The Professor's representative had said that mullioned windows do not accord very well with plate glass, but are more suitable for casements with small panes than for the large squares now in use. To this Leeds responds that small panes do not at all disfigure Gothic windows, and do not produce the same mean and paltry effect they would do in others, but he says they are by no means indispensable to propriety of character, and that, if well designed in other respects, the windows lose nothing by each compartment being filled with single plates of glass. He vindicates the use of plates as giving more light, and this, he declares, is in keeping with what is equally beautiful in the same style—viz., an open screen with unglazed compartments.

Not contented with thus exposing pharisaism in its denouncement of Gothic as being inapplicable because of so slight a difference as the windows being glazed with large plates instead of diminutive panes, he declares that it is not possible for us to reconcile ourselves to the infinitely greater departure from the genius of Grecian architecture, by introducing, as we most freely do, into that style, features not only unknown to it, but absolutely at variance with it. He instances not only windows, chimneys, balustrades, attics, but succesive tiers of windows, and windows throughout; windows also within porticos. He calls the Professor's attention to the semi-Gothic or Gothicly glazed windows of St. Paul's Cathedral. The representative of Cockerell, blatant in the superciliousness of classicism, had proclaimed that when modern architects design in the Gothic style their object is imitation, but when they employ Grecian or Roman their aim is invention. This aroused all Leeds's ire, and he affirms that it is most palpable and notorious that all our Anglo-Grecian architecture betrays utter want of invention. "Invention, forsooth!" was his indignant exclamation; "then invention must consist in making facsimiles of Grecian columns, and poking plenty of sashwindows between them, or in showing ugly chimneys, garret windows, and skylights over Grecian entablatures." Leeds severely stigmatized the course of Cockerell as calculated to revive the prejudices of the last and previous century. His own objections were chiefly against the overstrained claims put forward on behalf of Gothic—or, as it then began to be called, Christian—architecture. While unwilling to allow Gothic architecture to be decried or suppressed, he resisted, on the principles of the catholicity of art, all attempts to place it on the throne of absolute supremacy, in place of its deposed classical rival. This was the motive of a warfare carried on by him, not against Gothic architecture as believed, but against those who wished to suppress other styles for Gothic, and particularly against those who attempted to set up an idol of the past by imposing on us as all-sufficient stereotype copies of the works of the thirteenth century. In this respect, he set himself against copying in Gothic, as he did against the copyist in other styles; or he demanded in the same degree inventions in Gothic, and applauded it. He maintained the appropriateness of Gothic at Windsor, and also in the new Houses of Parliament. Consistency would not necessarily drive him to countenance monkery in our streets and to reproduce the crudities and oddities of olden days.

PROPOSED EXTENSION OF THE HARBOUR OF ST. HELIER, JERSEY.

(From our Special Correspondent.)

JUST as I prepared the readers of the Building News to expect* so it has happened. The Committee for Piers and Harbours of the Free States of Jersey are enveloped in a mental fog, as dense as those material ones which occasionally make the approach to the island extremely difficult and dangerous, if not wholly impossible. They cannot see their way to a decision as to the merits of the plans sent in for the new harbour. Many weeks have now elapsed since the designs and models of the thirty-seven competitors were first displayed for inspection, in the rooms of the Working Men's Association at St. Helier, and the premiums offered for the three best are not awarded, nor apparently likely to be so for some time to come. Indeed, it will, as I think, become a necessity for some independent juror or jurors to step in and cut the knot the Committee can't untie. It is true, that the difficulties of this body are considerably enhanced by the fact that the estimates which accompany the plans are one and all larger in amount than was originally expected, or than the present financial position of the island would warrant them in accepting. It is the old story in regard to architectural and engineering works, repeated—the old problem to be solved, namely, "how to get the best thing at the least cost." For my own part, I am not quite certain that the whole cost of the proposed improvements should fall upon the inhabitants of Jersey alone. In the year 1846-'47-'48 and '49, the British Government purchased in the beautiful bay of St. Catherine, situated some five miles north-east of St. Helier, landed property to the extent of 280 acres, and at a cost of about £70,000. This was preparatory to the formation there of a harbour of refuge and fortifications, as it was said. Afterwards, half a million of money was granted from the English Exchequer, for the realization of the plan, and this amount was actually expended in constructing the first instalment of the harbour, a stone pier of great length. It was then discovered that the site chosen was in every way ineligible for the purpose, and the whole thing was abandoned. Thus it may be said £500,000 were literally cast into the sea.

There is no chance of any sum of money expended judiciously upon the harbour of St Helier being thus wasted; and if so much was spent uselessly at St. Catherine's Bay why not expend a little usefully on the Bay of St. Aubin? A subsidy of £100,000 from England would marvellously assist the authorities of Jersey in deciding as to whose design should be adopted for extending the harbour of St. Helier, and in putting the favoured scheme into execution. I advance this suggestion on my own responsibility, and am not at all aware whether a similar idea may have crossed the minds of the members of the committee. By the way, as I have before furnished you with a list of the civil engineers and others who have entered into competition for the works in question, it may not be improper to give you also the names or titles of the gentlemen who form the Piers and Harbours Committee, and who sit in judgment on the plans. They are as follows:—Jurats L. Gallais, Bisson, De Quetteville, Le Bailly, the Dean of Jersey, and the Rector of St. Mary's; the Constables of St. Helier's, St. Martin's, and St. Brelade's; and Deputies Hemery, Godfrey, sen., and Godfrey, jun. No doubt these are all honorable men, but as to their fitness for their present task it is not for me to say more than that none of them are civil engineers or architects. It is, at any rate, highly essential that their deliberations should not be much longer protracted. It may not be possible for much to be done in regard to the actual construction of the new harbour this side of the spring of 1868, but preparations for an active campaign after then could be far advanced during the coming winter. Every year witnesses increased intercommunication between Jersey and England, and hence the urgency of increased facilities for its accommodation. The number of visitors who disembarked at St. Helier's this year from the 1st of May to the 30th of September was not less than 22,000. As arrangements are at present, a large proportion of this number both on their arrival and departure, were compelled to submit themselves to the annoyance and the danger of transits from the steamer to the harbour, and *vice versa*, in small boats. The importance of completing with all speed a low-water landing-place, and a breakwater for its protection from the heavy seas which sometimes sweep the bay of St. Aubin, is manifest. This, indeed, would not only be advantageous in respect of what may be termed the pleasure traffic of the island, but would

* See Building News, No. 664.

ctainly tend to increase its trade and com-
erce. Vessels of all kinds might then ride
perfect security off the town, whilst the
ipowners of all nations would use the port
more frequently than they do at present.
Having effected the primary works just re-
red to, the interior arrangements might be
tered upon with all due deliberation and
re. These, of course, should include wet
d graving docks for the reception and
pair of vessels, if not of a patent slipway as
ll. It is only reasonable to suppose that, if
ch accommodation existed, it would be
gely used—by English shipowners, at least.
ey are well aware, at present, that labour—
d that, too, of an excellent quality, so
as shipbuilding is concerned—is one-half
eaper in Jersey than at home; but, un-
tunately for them, it is not available. The
ving of at least 50 per cent. in the item of
bour alone (to say nothing of materials,
hich also—and especially this is true of tim-
r—are very much cheaper than in England),
uld amply repay the cost of either sailing
towing their vessels to St. Helier.
Perhaps some time may elapse before a
rer illustration presents itself of the incon-
nience of the existing harbour of St. Helier
the shipbuilders of Jersey than exists
this moment. There are lying within
two very excellent specimens of what those
ntlemen can accomplish in the shape of
ober-built vessels. They are both of the
ss known as barques, and were launched, or
empted to be launched, in the Bay of
Aubin, on the same day—August 31 last.
e of these is named the "Cœur de Lion;"
r lines are admirable, and her tonnage
847 register. She was built for the Jersey
ipbuilding Company, by Mr. Daniel Le
sconte. The other is the "William
ning," owned and built by Mr. William
ning. She has a tonnage equal to 788
gister, but is far less symmetrical than her
ter ship. Both vessels are being masted
d rigged alongside the harbour jetties. As
ere is no such thing as a wet or float-
g dock to receive them, they are both
t high and dry at every low tide. The
aining to which they are thus subjected has
t, apparently, done either any injury; but
question much if twelve months' voyaging
all weathers would test their strength and
urability more than the cruel ordeal to
hich they are, twice every twenty-four
urs, submitted.
A plan for the inclosure of the Bay of St.
bin, the reclamation of three thousand
res of valuable land, the formation of a har-
ur and railroad connecting the towns of
Helier and St. Aubin, and the profitable
plication of the sewage of both towns,
hich was some years since proposed by Mr.
homas Hayley, of Jersey, is again attracting
me attention.

BRISTOL CATHEDRAL, ETC.

To the Editor of the Building News.

Sir,—The Rev. J. C. Jackson, who writes
you with his views about Oxford and the
ture of art, may just as well—if he ever
s time between sermons and criticisms—
arn something about his facts before he
tacks me again. He is so good as to say,
at "we have noticed with great mis-
vings" the works at Bristol Cathedral.
hese misgivings arise from the fact that
have, so he asserts, made a plan in order
execute which I shall have "to de-
roy interesting old work for which" my
western steeples will be a poor exchange."
ny one who is well acquainted with Bristol
thedral must know how absurd this state-
ent is; but, as Mr. Jackson's object is to
mage me with people who are ignorant of
e facts, it is necessary that I should correct
m.
There was formerly a small chapel or
atory attached to a house at the south-
est angle of the old (Norman) cathedral
nave. In the fourteenth century this chapel was half destroyed by the erection of a small portion of a new nave, which occupies the northern half of the chapel area; and, if the works of this nave had ever been carried on, the whole chapel would, no doubt, have been destroyed, inasmuch as the south-west angle buttresses would have occupied the western half of its area, whilst the first buttress from the west would have come just in front of the east window of this oratory, and would have effectually blocked it up; so that, whether I try to build exactly what the fourteenth century architects intended to build, or whether I build two western steeples, the only interesting feature in this chapel must equally be destroyed or removed.

The only old features besides this east window are two recesses in the south wall, one of them a piscina, and one probably a sedilia. They are very rude, and I much doubt whether their arches are original. Really, conservative as I am, and always have been, of old work, there is something so grotesquely absurd in the assertion that we may not build western steeples to a cathedral, because in so doing we shall have to disturb the small remains of this old oratory, that one hardly knows what to think of the man who makes it! And most people will join with me in wondering how Mr. Jackson can know that my steeples will be a "poor exchange" for this old fragment, without having ever seen my design for them! Surely, a clergyman might know better than to write in this unscrupulous style, when his ignorance of what I am going to build is only equalled by his ignorance of the "interesting" old building he pretends to be anxious to preserve.

The truth is, that Mr. Jackson's letter shows great recklessness as to the truth of the assertion he makes, and a complete ignorance of art. Is it possible to conceive a more hopeless state of muddle than that of his brain when he says that "anyone who could have rough unhewn stone walls, unplastered and bare, has still to learn the rudiments of civilized art?" His first instructions to a beginner would evidently be, "Pray plaster your walls," because if you do so, you will probably design your windows, doorways, mouldings, and everything else in a "civilized" way. In fact, from Mr. Jackson's point of view, the love of uncoloured plaster is the real test of the possession of artistic power. And those men who, like the mediæval architects in England, as well as everywhere else, first of all build their walls, and trust to see them plastered afterwards, only when and where they are to be decorated with paintings of real value and interest, are mere charlatans, entirely lacking in "art knowledge." Mr. Jackson's criticisms are, in fact, only the expressions of his own likes and dislikes, and such as depend entirely for their value on the artistic knowledge of the man who makes them. He is welcome, as far as I am concerned, if he can find the opportunity to indulge himself in making them; and the thing that strikes one most forcibly is the possible and probable weakness of the cause which requires so much unscrupulous writing for its support.

I cannot conclude without saying how much I admire Mr. Jackson's skill in the discovery of a ritualistic meaning in the planning of the eastern bay of the nave of SS. Philip and James, Oxford. It places him almost on a level with Dr. Cumming and other critics, who see deep into mill-stones. Humbler mortals, who understand something about such small matters as the construction of groining, and the thrust of arches, might have told Mr. Jackson that I had planned my nave so as to make the nave, arcade, and the central tower support each other. But what a prosaic explanation this would be; and how much more fresh and far-seeing is it not for this committee-man, of what used once to be the ritualizing and high church Ecclesiological Society, to detect in this able manner—and, having detected, to expose—the Popish character of my work. The committee of the society will doubtless feel grateful to him for the acumen he so unexpectedly (no doubt) displays in this new branch of artistic criticism!—I am, &c.

George Edmund Street.

51, Russell-square, London, Oct. 7.

THE STRATFORD NEW TOWN HALL COMPETITION.

We had fully expected to have given this week a notice of this competition, but the designs were, to all appearances, no sooner exhibited than they were disposed. We sent a special correspondent on Tuesday last to see the designs, with a view to noticing them, but they had vanished. They were exhibited for a short time at the board-room of the West Ham Gas Works. Out of thirty-two designs, only twelve were exhibited, the others, we suppose, not being deemed worthy of exhibition. Of this, however, we cannot speak. No doubt their authors consider themselves slighted; and, as a rule, it is much better to exhibit all, if there be sufficient room for the purpose, as dissatisfaction is sure to be produced if there be the appearance of partiality.

The site of the proposed building is at the corner of High-street and West Ham-lane, Broadway, Stratford, and the amount proposed to be expended on the building is £12,000. The premiums offered for the best design were £100, £50, and £25; the first design to merge into the commission, and the premiated designs to become the property of the Board. Not being able to see the designs, we are obliged, in this instance, to quote from the *Stratford and West Ham Reformer*. That paper says:—As the time for the selection drew near it really appeared that the Board had determined to premiate the best designs, irrespective of any extraneous considerations. Remembering the disgraceful favouritism of the Poplar Board, in awarding the first premium to their own servant, one almost admired Mr. Meeson, the chairman of the Board, when he recounted the labour which had been expended in keeping the names of the competitors from the unwilling ears of the members. The competitors, however, must have been sadly disappointed when they learned that the surveyor of the Board—by whom the conditions of the competition had been drawn up—had been allowed to send in designs; and we opine that each and every one of them will register a vow never to enter another parish competition, if the rumour is correct that the committee have recommended that the first premium should be awarded to the surveyor of the Board. It is likewise stated that the third premium has been awarded to a gentleman who held that office but a few weeks since.

This fact being admitted, those unacquainted with parochial boards will be surprised to hear that such a proceeding should be perpetrated; and even those having no confidence in the conscience of corporations may well be startled to find that a public board, not satisfied with obtaining gratuitously the services of a number of gentlemen, have put aside a number of talented designs, and conferred the first premiums (subscribed by the competitors themselves) on an officer of the Board.

We are far from declaring, however, that, putting aside the question of cost, the first premiated design is the worst in the collection we have viewed. The plans have been well studied, and prepared with considerable care. One point, however, in the first-floor plan, goes far to convince us of the correctness of the rumour before alluded to. We refer to the fact that a magistrate's court room has been provided, and in the basement we notice the necessary prisoners' cells. We find no mention of this in the instructions to architects, although we are aware the matter has been talked of amongst the members of the Board since the instructions were issued. The ground plan shows an entrance to a large hall in High-street, and another at the end of the building. A corridor connects these two halls, and a staircase leads from each to the first floor. Both the board-rooms are placed on the ground floor, and the offices of the Local Board occupy the whole of the frontage, thrusting the vestry-room and offices to the inferior parts of the building. A roadway, 10ft. in width, is shown at

the side of the building in West Ham-lane, as directed by the instructions, but the staircase from the adjoining hall running across the front of it at a height of 7ft. would render it useless. The interior of the grand hall is shown with red granite columns, supporting a circular roof. The whole of the room is profusely decorated; statuary is shown in niches betwixt the windows, and the panels of the ceiling, &c., are frescoed. The elevation and perspective view do not claim our admiration as being good practical working drawings. Every manner of ornament is freely used without any very satisfactory result. A square tower is placed over the hall in High-street, and on the parapet of each face a group of statuary is placed. Similar groups are also freely distributed over all the prominent angles of the building. Red granite shafts, with stone caps, and useless balconies are amongst the prominent features of the elevations. The row of vases or urns on the parapet next West Ham-lane do not improve its appearance. In our opinion, the building will cost at least £20,000, if it is carried out as shown in the drawings.

"Adsum" has placed both the board-rooms upstairs, and has given much better entrance to the large hall than some of the competitors. The decorations of the large hall and board-room are sufficient, and not too elaborate. This architect also has fallen into the error of decorating the front of the building with statuary.

"Industria" (3rd premiated design) shows a very respectable ground plan, and the architect appears to have had good grasp of the subject. Thoroughly understanding the proposed uses of the building, he has arranged the different offices in a very clear and simple manner. The style of the exterior design is about the worst exhibited, and has become familiarized to us in the form of main drainage pumping stations. The alternative design, with the extra portico, is also very commonplace. The ground plan, with the motto "Proportion," is the very reverse of the one last commented in the straight flight of stairs to the first-floor, which would be very objectionable and dangerous. The style of the building is Italian, and the materials brick and stone or terra cotta, the roof being covered with Italian tiles. The design has a workable look, but would be more suited to a warehouse than a town hall.

"Immunis Mali."—The plans of this design are very mediocre and the elevations plain, not to say ugly. The style is Italian, and the square tower reminds us of an unfinished Catholic church. We pass over the bad drawing and design of "Nil Desperandum," and come to "Circle," and here we stay for a long look, and wonder why on earth the architect has not obtained a premium. The plans are good, and the interior views are well drawn and designed. Two elevations are submitted—one Gothic and one Italian; both represent a brick and stone building, with variegated bands of the same material. The design has been most artistically treated, and the whole has a real and tasteful appearance, which is altogether apart from the effect obtained by the over-colouring. "Spero" and "Emulation" send sensible designs, though the elevation of "Spero" is capable of improvement. The drawings marked with a Crest are very inferior. If it were worth while to say anything about them, we should commence by advising the architect to select a more pronounceable motto. "Des Volente," sends a carefully prepared set of drawings, showing an Italian building, of free design. The architect evidently understands what he draws, but the arrangement of some of the ground-floor offices is not to be commended. The remainder of the plans call for no particular comment; and, whilst anxiously waiting for the report of the committee, we can excuse them giving an honest (?) opinion in favour of the plans bearing the mottoes "Civis" and "Adsum," but what claim "Industria" has to be ranked with them we fail to discover.

HOUSES, HEALTH AND LONGEVITY.

One of the most important addresses called forth by the recent Social Science Congress was one on health, delivered by Sir James Y. Simpson, Bart., the celebrated physician and discoverer of chloroform. Sir James began by remarking that public health might be defined as public wealth. It was important to attend to because, in relation to disease, prevention was much better than cure. At the outset he referred in some detail to the great evils which arise from the overcrowding of dwellings in great cities and towns. Nature has everywhere provided a bountiful supply of that most essential requisite for healthy life—pure air. Man everywhere endeavoured to contract this supply, and to putrify and corrupt it by the internal arrangement of his dwellings. Outside his dwellings also there was an entire disregard of the laws of health in the manner in which manure and sewage is allowed to collect in rural and other districts. He humorously referred to the way in which foul matter is allowed to collect in the inferior class of Irish hovels, in consequence of pigs and other animals being allowed to occupy them with the immates. Some years ago a doctor visiting an Irish family located in the upper storey of a large house in Edinburgh noticed an immense pig, and asked a man in the room how it had been got upstairs. "Faith, your honour," the man replied, "she never was below." In the country districts worst off in these respects the people were better off than in the towns, and human life more prolonged in the former than in the latter. In cities, besides the confinement of the smaller streets, lanes, and alleys, there was an enormous evil influence arising from the foul and pestilential exhalation of refuse matter, gaslights, manufactures, &c., &c. Pigs and other such animals had, however, long since been banished from human habitations in Edinburgh, as he maintained they ought to be from the abodes of men everywhere else. Cow byres, and even stables for horses, ought to be banished out of every town. In Westminster there are 1,000 houses vitiating the air required for 30,000 human beings. In Edinburgh still they had splendid house fronts and confined squares and spaces behind them, in which the air was poisoned by offensive exhalations. A splendid problem for modern science to solve, and statesmen to carry out was, what was to be done with the vast amount of their sewage matter. For it, as for everything else, there was a natural use, and he believed the time was coming when we shall not toss so much of it into the sea as we do. The true use to make of it is to return it to the soil. The value of each human being was calculated at 10s. a-year, which gave £70,000 worth of sewage wasted every year in Belfast. Every year we have an amount of deaths produced by bad sewage and other such causes equal to the whole population. We have various kinds of hospitals, medical, surgical, obstetrical, &c. There are as yet, unfortunately, no means of making a general comparison of the comparative efficacy and cost of hospital and home treatment. Materials of the kind have been provided with respect to the obstetrical hospitals. In the great Rotunda Hospital in Dublin, than which there was not a better in the world, the cost of each patient was about 30s. It was found that the cost of treating the same class at home was about 10s. Now the pecuniary loss in hospital treatment was a matter of small moment. The French Government issued a commission of inquiry which collected statistics on this subject of nearly a million cases from all the hospitals of Russia, Prussia, Sweden, Denmark, Great Britain, Germany, Switzerland, and 900,000 cases of poor patients confined in their miserable hovels. Now the hospitals afforded by far the greater advantage in respect of medical advice, &c. Yet the conclusion afforded was most startling. The report stated that of women delivered in hospitals one in thirty die, whilst of the same class of poor women confined in their miserable homes only one in 212 die. It had been found the same all over Europe. With respect to surgical and medical hospitals, the collection of patients and the exhalations proceeding from them and their wounds and diseases into comparatively small spaces could not but be pernicious. One patient labouring under a contagious disease often caused the spread of it through the hospital. In the hospital with which he was connected, after a case of cancer had come in, it was often found necessary to stop operating for a week or ten days, because it was found that after the arrival of and partial treatment of such cases, all the other cuts and dressing, the sores began to go wrong. The man treated in a surgical hospital was exposed to more chances of death than the soldier on the field of battle. In cases of amputation, the mortality had been found far higher than any one thought a few years ago, different statistics giving it at one in three and one in two. Was it the same in private and in country practice? We have no *data* as to this, and Government or some other power should provide them. But the impression of medical men was, that the private practitioner found no such mortality after his operations. An old medical friend of his in London, who highly approved of bleeding, used to say that the way in which op rations were bungled in the country was th means of saving the lives of the patients by th blood-letting that was caused. The great objec in hospitals was to increase the amount of pu air for each patient. The Surgeon-General of th United States Army reported that during th war he had found hospitals of planking far bett than permanent buildings, and tents the be of all for the treatment of wounded men. I medical hospitals the diseases treated were fat to an extreme degree. In consumption, which w not benefited by hospital treatment, one patie died out of every six or eight. The learned ge tleman gave statistics of the yearly mortality inflammation of the lungs, bronchitis, and vario other diseases. In Edinburgh, in 1848, whe from the crowded state of the hospitals, tents ha to be erected, the mortality in the tents was onl one-half of that in the hospitals. Any one wh went into an empty room which had been shut u for a few days would find it smelling must in consequence of the decomposition of sma material particles. Everything, in fact, w secondary to pure air. Mr. Hepworth Dixon, an account of the settlement of the sect call Shakers, at Mount Lebanon, in America, me tioned some interesting facts. The marri women there lived as nuns, and the men as monk They had no doctors among them, and took clo and scientific care of their ventilation. Eve building was provided with shafts, fans, flapper and vents. Stoves were so delicately adjusted to keep the temperature in winter within one d gree of warmth. The elderess or queen of t community told him that they had had only o case of fever during thirty-six years. The he elder said good food and sweet air were their on medicines, and said to him "Is it not strange th you wise people of the world keep a set of me called doctors, who lie in wait for you unt by some mistake of habit, you fall sick, and th come in and poison you with drugs?" How we our hospitals to be improved? They should given up, or greatly altered. It was now an in portant point of dispute how many cubic feet air were required by each individual per day. had often thought that if their hospitals, fro being crowded palaces, with a layer of sick each flat, were changed into villages or cottage with one, or, at least, two patients in each room, great saving of human life would be effected. T village should be so constructed of iron or wo as to be movable, so that it could be placed whe required, and, in case of epidemics, the accomm dation could be easily increased. He would pa to another subject—namely, the dreadful m tality amongst children. Having given statisti of this mortality, he attributed it to the ignoranc on the part of mothers and nurses, of hygien laws. One great requisite for infant childr was pure air, but it was essential that the a should be warm. Cold air was most destructiv Nurses would insist on shutting windo and other apertures which ought to be le open. In Belgium, where children had to brought out for baptism when a fortnig old, one half more died in winter than in summ Want of clothing of the head and arms of t child was also mischievous. Like all other you animals, the heat-producing power of the chi was much less than that of the adult. For b own part, passing from the children to t mothers, he would be much disposed, sometim to cut off a portion of the ladies' skirts in ord to clothe their necks and arms. Children shou never be allowed to sleep in the cold. He w sorry to say that he had often known lady mothe to carry dirty dogs in their arms, and yet not willing to carry the children that God had giv them. What a shame, too, to put childr into cold baths—little creatures that shou be always warm. In a Highland regiment which that practice prevailed amongst the wiv of the men—hardening, it was called—enou of the children did not live to make pipers for t regiment. The mother's milk, which God mad was better for the infant than any human comp sition. He then alluded to the mortality caus by the criminal starving by mothers of the illegitimate children. It was recorded of t foundling hospitals which formerly existed Ireland that, from 1791 to 1796, the numb of children admitted into them was 12,686, a that of these 135 walked alive out of the hospital and the rest were carried out in the dead car The learned gentleman referred to the greater mo tality amongst unmarried than amongst marri men. He did not know how to cure this; but

ıose desolate, deserted adult foundlings did not arn that it was better to perpetrate matrimony ıan suicide, they would find themselves figuring the next Act of Parliament for the protection public life. He then referred to the famous ·nner's invaluable discovery of cowpock. It ved 80,000 lives every year. Government ought be able to stamp out the smallpox as well as ttle plague; but improved regularity was still ·eded for this. In Scotland the infected were ·evented from going into public vehicles. Having ferred to some of the absurd prejudices which ıd been entertained against cowpock, and to the ıtagonism which it even still encounters from me, he said that Jenner's discovery was the eans of saving a number of lives equal to the ıole population of the United Kingdom every ·enty-five years. He received £30,000. Had slain a hundred thousand men in battle he ıuld probably have got much more, and been ıde a duke. The French erected a statue to m at Boulogne. A few years since one was ·cted, by subscription, in Trafalgar-square; it d been since removed, with the sanction of the ɔuse of Commons, to make room for some those fighting Napiers. He trusted that the formed Parliament would have better judgment.

ɔQUIESCENCE IN BREACH OF COVE-NANT IN RESTRAINT OF BUILDING.

estern *v.* Macdermot, L. C., 15 W. R., 265; 2 L. R. Ch. 72; Peek *v.* Matthews, V. C. W., 15 W. R., 689, 3 L. R. Eq. 515.

T will be useful to compare the effect of these two decisions on the above point, which to ɔprietors of houses on a building estate may be some practical importance. In Western *v.* ıcdermot the plaintiff and defendant held the uses occupied by them under conveyances made ɔut one hundred years ago, by which their re-·ctive predecessors in title became the owners adjoining plots of some ground which had been l out for building purposes, according to a plan ɔject to perpetual rentcharges, and to covenants th the grantor, his heirs and assigns, and there-e in effect with each other, so far as the ·enants could run with the land, or, if this ɔuld not be the case, so far as the respective assigns l notice of the same that there should be no es nor buildings in the gardens, as shown in the n, above 8ft. in height. The defendant had ently commenced the erection of a bow of the ne height as his house, and about 8ft. deep, and, answer to the plaintiff's suit to restrain such a lation of the covenant, relied among other de-ıces on some trees above the specified height ng in the plaintiff's own garden, and on his ·ing acquiesced in some breaches of covenant of similar nature, entered into by the former ner of the fee in the above conveyances with pect to some land opposite the row of houses question.

In Peek *v.* Matthews the plaintiff and defend-, also owners of adjoining houses, had at the pective times of their purchasing the sites—being ·tions of some ground laid out for building, ·cated a deed of covenant, in which they ·enanted with all the persons executing the d, being the present or future purchasers of ıer plots on the same building estate, not to ild upon certain portions of the plots purchased them, which were to be enclosed with a dwarf ll. It appeared that before the defendant pur-ised his plot and executed the deed, breaches of ·enants, by the erection of a wall and some ·ds for gardening, had been committed by other ·ties to the deed, and the defendant, who had ilt a similar wall, and against whom the plaintiff ɔught a mandatory injunction, relied on this defence to the suit. The well-known case of Duke of Bedford *v.* the Trustees of the British ıseum, 2 My. & K. 552, was of course cited by counsel for the defendants in both suits, the ·intiff in that case having in vain attempted to ce a covenant entered into by the builder of ɔntague House in 1675, the object of which had ·en to secure an open space in the vicinity of uthampton House, the then residence of the dford family, after the house itself had been lled down, and his predecessors in title had owed the adjoining land to be covered with ildings, Montague House having been converted o the British Museum, and the whole character the neighbourhood having been changed. Lord elmsford, however, thought this inapplicable to case before him, on account of the consent by Dukes of Bedford to the alteration in the state of the property which it was the sole object of the covenant to prevent, and that passive acquiescence in one breach of covenant would not be considered as a waiver of the right for all future time to complain of any other breach, even supposing, which was a matter for consideration, that it was not necessary to show "substantial injury" in order to require the interposition of the Court. In Peek *v.* Matthews, on the other hand, the Vice-Chancellor, considering the object of the covenant to be simply to secure to the neighbourhood the benefit of uniformity in the appearance of the houses in question, held that anyone seeking to enforce such a covenant must himself be vigilant in his efforts to secure its observance. When once the common scheme had been broken up without resistance, the power to enforce it, as was held in the Duke of Bedford's case, was gone, and therefore it became immaterial that the defendant had entered into the covenants after the other breaches had been committed, such covenants by him being, under the circumstances, as all parties must be taken to have known, nugatory.

Read in connection with this case the *dicta* of Lord Chelmsford seem to require some explanation, but in estimating their force the following circumstances present in Western *v.* Macdermot must be remembered—1. The object of the covenant was to secure light and air to, as well as uniformity in, the houses. 2. The breaches acquiesced in did not affect either in any appreciable degree. 3. The breach of covenant complained of caused a substantial injury to the plaintiff. Such being the facts of the case, the Lord Chancellor held that the plaintiff might sue alone, and that he was not estopped by reason of breaches of the covenant, which he was seeking to enforce, having been permitted by himself and other persons entitled to the benefit of the covenant. If, however, the only ground of complaint had been that the defendant was destroying the uniformity of the terrace, it seems to us that all the persons who could enforce the covenant would be equally affected and have an equal right to sue, and Eastwood *v.* Lever, 12 W. R. 195, may in that case be applicable, so that all would be necessary parties to the suit. On the same hypothesis Peek *v.* Matthews may be looked upon as an authority that acquiescence in a breach of one covenant would prevent the enforcement of another, if both covenants were only intended to secure uniformity, and the breach of the one had destroyed this effectually.—*Solicitors' Journal.*

ARE OUR FEET PROPERLY CLOTHED?

It is somewhat surprising that, says the *Scientific American*, with all our boasted improvements, we have not as yet produced a proper covering for the feet. Barbarous people, if their climate admits, go with bare feet, or wear sandals covering only the sole, or slippers with just enough of upper to retain the sole on the feet. We, however, encase the whole foot, and a portion of the leg, in a material almost impervious to air and moisture, and generally uncomfortably hard and rigid. The colour and polish of our boots are directly calculated to attract the sun's rays; and the enamel on patent leather, and the blacking on ordinary calf skin, tends to harden and solidify the substance, closing the pores and making air-tight cases for a portion of the body, which exudes more perspiration than any other, and is subjected to greater strain. Our boots in summer parboil our feet in a warm bath, and in winter freeze them in an icy envelope. It is doubtful if wet feet are, in themselves, very conducive to disease, some medical men to the contrary notwithstanding; but cramped confinement of the feet, in an icy cold envelope, generated by perspiration and chilled by the external atmosphere, thus shutting the prisoned feet up almost air-tight, is as unhealthy as it is uncomfortable. For hot weather there is hardly any shoe so agreeable as that introduced within the past three or four years, known as the army shoe, and extensively used by base-ball players. It is of heavy canvas and unblacked leather. It is cool and remarkably easy to the feet. The texture of the canvas allows the escape of the perspiration, and the colour of the shoe does not attract the heat of the sun. It would seem that the plan of covering other portions of our bodies with material pervious to air might advantageously be extended to our feet. There is no natural reason why our feet should be so much less sensitive than our hands. They become indurated and deprived of their natural activity by long, close confinement. The people of warm climates, who use their toes as we do our fingers, and the bare-footed school-boy, who picks up and throws pebbles with his feet, show that the foot of the civilized adult in our climate is a much abused member. A more flexible and porous material for our boots and shoes might save us from many of those terrible annoyances, which, in the form of corns and bunions, make our pilgrimage one of pain.

WATER SUPPLY AND SANITARY MATTERS.

The drain at the eastern end of the Esplanade, Exeter, which is to relieve the town of its sewage, is almost completed by the local contractors, Messrs. Turner and Lawrence. Its effect will be to carry the contents of the drains below low-water mark. Of course it would be premature to express any opinion on what may be the result of this proceeding, whether the sea will immediately absorb the sewage, or will wash it back to the infinite annoyance of the promenaders on the Esplanade. Time, which "tries all," will show.

Alloa.—The construction of new waterworks, at a cost of £3,000, has just been brought to a successful completion. Messrs. Chalmers and Mackenzie, Dunfermline, were the contractors, and they have done their work expeditiously and well, considering the unfavourable weather they had long to contend with.

Jedburgh.—A short time ago the waterworks a the distributing reservoir at the top of the town was suspended, owing to an action of interdict having been raised. The magistrates, however, determined to make the delay as short as possible seeing that winter was near at hand, and they resolved that, instead of cutting any further down for a foundation on the side next the property of the party who had commenced the action, a foundation should be made by laying down concrete. This has been done very successfully. The concrete was laid down to the depth of 5ft, and a capital foundation has been got, so that the work is being carried on now without interruption.

Sanitary Facts.—Some results of the works of drainage, sewerage, water supply, and cleansing, which within the last few years have been accomplished in various towns in England may be stated in figures that cannot be too well known. In Cardiff the monstrous mortality of 33·2 per 1,000 per annum has been brought down to 22·6, and in Newport the ratio of 31·8 per 1,000 has given place to 21·6—reductions of 32 per cent., or, allowing for cholera and dysentery, 23 per cent. In Salisbury, Croydon, Macclesfield, and Merthyr, the mortality has been reduced by a fifth. In Ely the reduction—the saving of life—has amounted to 14 per cent. per annum; in Badbury to nearly as much. Dover has only saved 7 per cent., but its death rate was previously moderate for an unreformed town. In Leicester, the total reduction is but 4½ per cent., but the fatality of typhoid fever is little more than half what it was. So also the reduction of the general rate of mortality is not strikingly great at Cheltenham, but its former rate, 19·4 per 1,000, was not high; and its death rate by typhoid fever, only 8 per 10,000 before, has been reduced below 5 per 10,000. In Bristol the full completion of the works has been too recent for an estimate of their results, but typhoid fever has lost about a third of its fatality, and in so large a town important savings of life result from even small percental reductions of mortality. The death rate by typhoid fever has fallen in Salisbury to a fourth of what it was; in Croydon and Stratford-on-Avon to about a third; in Banbury, Warwick, Ely, Penrith, Macclesfield, Ashby-de-la-Zouch, about half. The improvement in the cholera rate at each successive epidemic in the towns reported by Dr. Buchanan, from whose report to the medical officer of the Privy Council these statements are compiled, is equally striking. It is also shown that the drying of the soil, which has in most cases accompanied the laying of main sewers in the improved towns, appears to have led to the diminution of the mortality from consumption—a diminution approaching 50 per cent. in Salisbury and Ely; exceeding 40 per cent. in Rugby and Banbury; amounting to about a third in Worthing, Leicester, Newport, and Macclesfield, a fourth in Cheltenham, a fifth at Dover and Warwick, a sixth at Bristol, Cardiff, and Croydon, a tenth at Merthyr. Only one-fifth of the towns here reported on have appointed a medical officer o

health, and Bristol, with apparent timidity, only recognizes him as a "medical inspector;" but in various towns the medical practitioners have given their fellow-townsmen valuable unpaid services in the work of stopping the waste of life. Mr. Simon in presenting in his report of this year these and similar statements relating to 25 English towns, with an aggregate population exceeding 600,000, observes that medical science could not from the first regard these great popular experiments in the management of the public health as of doubtful promise, but to the popular mind they had to be judged by their actual fruits. The splendid results which have already been secured may serve not only to confute persons who have despaired of any great preventability of disease, but also to justify in the public eye, and to encourage in their noble labour, those who for years have been spending their powers in this good work.

ILLUSTRATIONS OF COMPETITIONS.

No. I.

COMPETITIONS have recently been sufficiently dragged through the mud; in fact, we can call to mind only a few that have given anything like satisfaction. Considering that they leave so much discontent and indignation behind them, it is marvellous that men will enter into competitions at all. But some how or other, every competition that is advertised brings up a fresh crop of candidates. With the hope of impressing corporations and committees with a sense of duty, and bringing about, if possible, an improved state of things, we intend to give, occasionally, specimens of compositions, by presenting illustrations of successful designs by the side of one of the unsuccessful ones, and so leave our readers to judge of the taste and wisdom displayed by deciding bodies. We give this week lithographic illustrations of the Retford town hall competition. The accepted design we have reproduced from the *Illustrated London News*, which was engraved after the building was erected. On the same sheet we give an engraving of a rejected design for the same work. No doubt the corporate authorities of Retford are satisfied with their selection, but we scarcely think that public opinion will endorse their decision. The contrast is so striking between these two designs that there is no necessity for us to point out their characteristic qualities to professional men. The two buildings could be erected for about the same cost. If the corporation of Retford acted conscientiously, we can only say that it is a very great pity that they did not call in some professional man of undoubted ability and honour to advise them in the matter, and then the responsibility would have rested on him. They had an opportunity of having a hall erected which would have reflected credit on their town, and, no doubt, would have been admired by ten or twelve generations of its population; for we cannot suppose that in the good time that is said to be coming, that the people will be so indifferent to beauty, and be so absorbed in money getting as the majority of those who now live. Let us hope, at all events, that this step of publishing rejected by the side of accepted designs will evoke a spirit of caution, if it does not assist to put the system of competition on a much sounder basis than the one on which it now rests.

STABLES FOR THE EARL OF ZETLAND.

AN example of what may be achieved by good judgment and an impartial selection of modern improvements to render buildings both appropriate and ornamental, which have hitherto been regarded by architects as unworthy of much attention, has recently been set down by the erection of some handsome stables for the Earl of Zetland, in Swallow-street, Regent-street. The internal arrangements are adapted to ensure comfort, security, light, ventilation, freedom from damp, and possess, indeed, all possible desiderata. The floors are covered with Pyrimont Seyssel asphalte, which gives a hard, level, and durable surface, unbroken by a single crevice capable of lodging dirt or moisture. The stalls are all fitted by Mr. James Barton with his revolving water troughs, and other strong yet neat and tasteful appointments. The building itself, which is a specimen of excellent workmanship, has been erected by Messrs. Lucas Brothers.

PLASTER AND WALL PAINTING.

THE last number of the *Ecclesiologist* has a suggestive article on "Church Restoration and Wall Painting" which will repay perusal, as may be seen from the following observations. The writer says:—In no single point has the strange want of art exhibited in most of the works of our present architects been more unhappily shown than in their treatment of walls. Where ornament has been tried, it has more frequently than otherwise been almost worse than nothing, but usually nothing has been done but leaving the stone dressing bare and plastering the rubble. Any one in his common senses must know that that sort of thing would not last. In a domestic building we should, as a matter of plain civilization, cover up the bare plaster with paper or paint it; and of course in churches too, if *we* do not whitewash or colourwash, our successors will as soon as the plaster gets dingy. We may be as certain of this as if we saw it done, and architects are beginning to see it; and how do they propose to remedy it? Certain fashionable, but sadly inartistic architects, have now voted plaster a bore altogether. Now, there never was a time since architecture was really an art of civilized beings that the roughness of walls was not disguised by some sort of gesso or plaster. To leave rough-hewn stone inside a building of the plainest character without any covering is a simple barbarism worthy of savages. But there seems to be growing up a school that looks upon this unfeelingness for, one might say, the mere proprieties of life as a godly severity,—as a sort of matter of faith. Make your houses look pleasant and human, but beware of anything like a comfortable look about your churches. Use the choicest of materials, porphyry, polished granite, serpentine, and alabaster, put rich colour here and there, and enrich with much gold, and then finish up by a common brick wall and rough rubble. It is so honest, we are told.

Nothing to us shows a greater deficiency of art power than such a stupid adherence to the letter of a good text. This perpetual preaching about truth wearies us. Real artists of all times have been careful observers of the truth, they have not deceived us, but they have not always been talking about it. If anything offended their sight, they have never scrupled to disguise it, not, indeed, in such a way as to make you suppose it something else, but to keep it out of one's sight. It would be just as good sense to find fault with our skin for covering up the muscles and veins which would shock and pain us, as it is to object to plaster rough walls. There cannot be a question that plaster in such cases is the right thing. The mediæval architects put a slight gesso coating even over the stone work. But then what are we to do with the plaster? There is the rub, a question which these would-be artists have not been able to answer. And we must admit that a good and satisfactory treatment of it is one of the most difficult problems the architect has to solve. But most will not look at the question from this point of view—they prefer the easier method of cutting it altogether. It is for this reason that we deplore the astonishing neglect with which so-called restorers have treated the walls of old buildings. With the colour bursting through the successive coats of whitewash, sometimes, as in the case of Conisborough and many other churches, where pictures and decorations have been actually and successfully laid bare, the only result has been for these people to sneer at them and have them covered up. "They are unmeaning lines," or they are bad art, or they are so much faded. Now, *prima facie* one would expect as good, or nearly as good, art in the painting and decoration as in the sculpture and architecture—and when we know, from the illuminated books which we possess of English execution, not only that the English could paint and draw, but also that they could do these things far better than almost any of their contemporaries, it must require a great amount of credulity to believe that though they invariably coloured their walls, and, in fact, their whole architecture, woodwork and all, they usually made a mess of it, and, in fact, that, though we have made little or no progress in such matters ourselves, and are driven to all sorts of unworthy shifts to cover our inability, it is of little use our taking pains to see what these great men did. We happen to know what they could do in their choicest work; for a few specimens, such as the splendid paintings in the chapter-house at Westminster, and a few fragments of wall decorations of St. Stephen's Chapel, still remain—having never been defaced or covered with whitewash. Though there is little likelihood of getting such fine art in most country churches, we are quite certain that there is none, be it never so homely and out of the way, but will be highly instructive to the patient and intelligent observer. It is not always in the first coat of colour and best preserved that we get the best work; as the buildings underwent alteration according to the fashion of the day and the taste of the neighbourhood, so did the coloured work. It is not an unfrequent thing to find three or four different coats of wall painting done one over the other: and, as we might expect, the lowest and earliest by far the best: and not only so, not only is it good of its kind, but really, if we were not so ambitious, the very thing for our time; just the sort of thing to suit an ordinary church, and to give hints to an artist to improve thereon. Some of the ordinary patterns of the thirteenth and fourteenth centuries would be especially applicable to our wants.

CONSTRUCTION OF ICE HOUSES.

A CORRESPONDENT in an American paper says:—In the year 1819 I became acquainted with two modes of keeping ice on an estate in Baltimore County, which I consider the two extremes. A description of each, I think, with a little reflection, will show any of your readers what is wanted to keep ice from year to year. No. 1 was built about the time of the revolutionary war, and was said to be the first in the state. It was constructed on the principle of keeping ice as warm as possible, or, in other words, excluding all atmospheric air. The entrance to it was through a passage 20ft. or 25ft. long, heavy stone wall, arched over, with doors at each end. The house was circular, in shape of a lime kiln, 14ft. diameter, tapering some little to the bottom. In the centre was a stationary ladder reaching to the door to pass up and down in getting out the ice. This ladder had sixteen steps and door 6ft.; the arch commenced from the top of the door. In filling the house, rye straw was placed round the sides, and the ice broke fine. Larger pieces were placed in the doorway as they filled it, to keep the ice broken up until the house was filled to the crown. The inner door was then closed and the passage filled, the front well closed with straw. The passage and house were covered with soil 3ft. or 4ft. thick. This made a large mound covered with grass, with nothing to be seen but the door.

No 2 was a simple hole or pit dug in the ground, the soil from which formed the sides, tapering to the bottom. At the surface it was 15ft. square. As to depth we could not tell, as it had never been known to be without ice since it was made. The covering was a shed roof, composed of straw at least 1ft. thick, which was supported by a post at each corner 2ft from the ground, extending over the sides of the soil, and down as low as the surface of the pit. This space of 2ft. was always kept open, and being 4ft. or 5ft. outside of the ice, it excluded all influence of the rays of the sun. On filling the house, straw was laid on the sides, the ice broken as in No. 1, the ice rounded up as much as possible, and then covered with rye straw to the thickness of 2ft.

The sequel of these two modes: No. 1 never was known to keep ice after the month of July—No. 2 never was known to be empty. I have not been particular in giving the exact dimensions of each, but sufficiently so, I think, to give to the common understanding what is wanted in a structure or house for keeping ice. The soil where No 1 was located was limestone, stiff red clay, elevated position. No. 2, location elevated; soil limestone and stiff red clay, containing a large quantity of small gravel from ½in. to 2in. or 3in. diameter. To keep ice well, there are four things wanted. First perfect drainage; second, a thick covering of a non conductor, such as rye straw, on the surface of the ice, at least 2ft. thick; third, perfect circulation of air; fourth, perfect shade. As to the shape or mode of structure, the owner can please his own fancy.

One of the most discouraging signs of the times is, that land in Ireland is gradually going out of cultivation, whatever the *Times* and the Lord Lieutenant may say notwithstanding. The recent returns of the Registrar-General sufficiently prove this. Something, therefore, must be done besides a sweeping condemnation of Fenianism and punishment of Fenians if a new era of prosperity is to be opened up for that country.

Loches

The Porch du Corderie

Cap in Sacristy

Cap in Nave

St Ours Loches

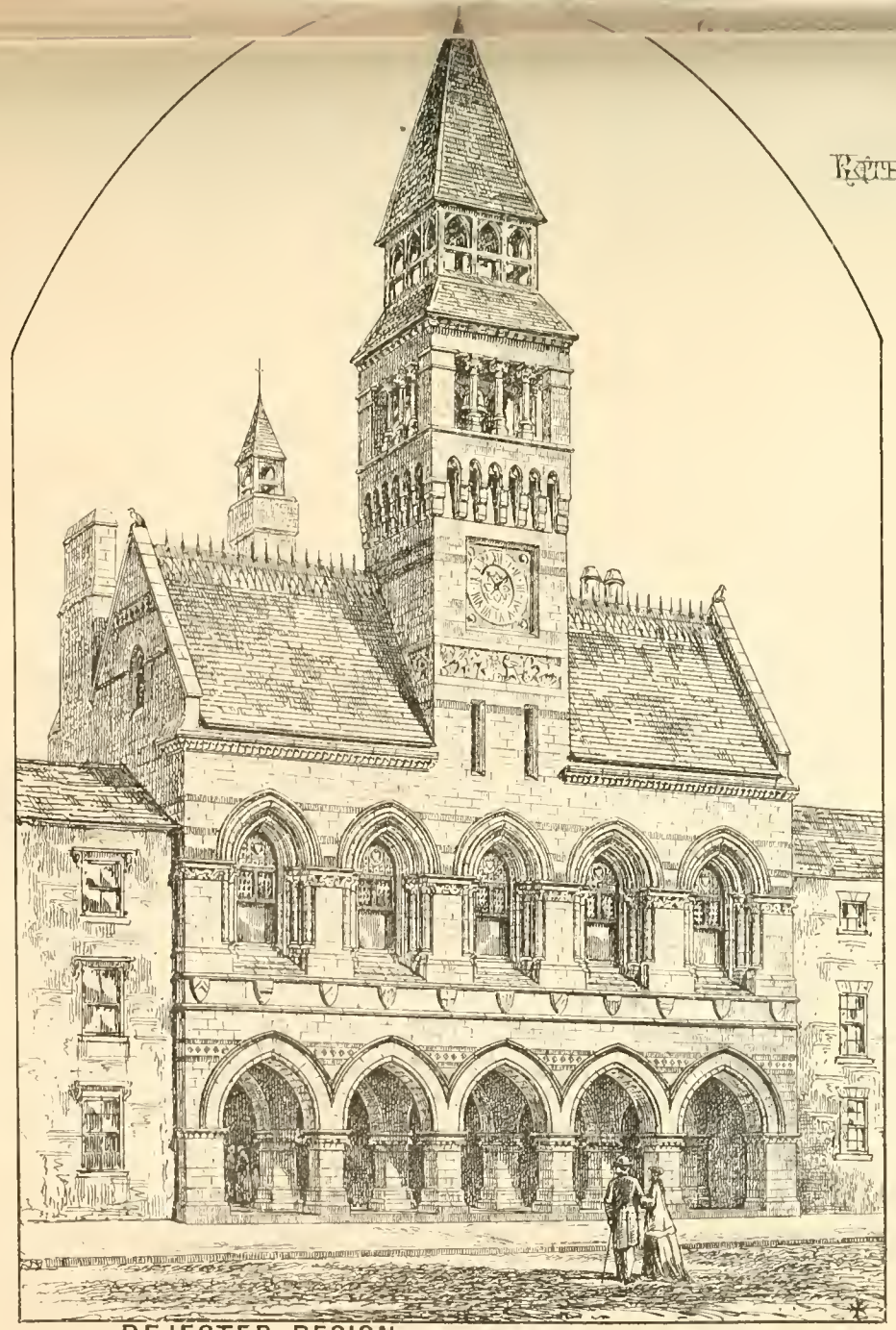
This is a very fine but remarkable edifice: it being built entirely of stone without any wood construction: It consists of Nave semi-transepts and circular East end with side Aisles terminating in semicircular Chapels:
It has been well restored: The west doorway is very fine:
The west porch is square and groined in stone with flat stone roof over:
The Nave is covered by the two towers (terminating in octagonal roofs) and two octagonal shaped domes - a most peculiar arrangement making the interior look somewhat like a mosque:
There is a very fine chateau here having a very well constructed oak roof.
The tomb of Agnes Sorel is also in the chateau - the chateau is now used as a sous-prefecture:
Loches is a very fine old mediaeval town. the castle (once belonging to the cruel and ill fained Louis XIth) has several bold towers corbelled parapets and grated windows and the remains of a bold Donjon Tower:
There is a very fine old tower (the only remaining part of a magnificent church) at Bailleau about a mile north of Loches and also one of the 12th century adjoining:
An interesting chateau will be passed on the right hand side of the road going from Loches to Bailleau:

Printed by Whiteman & Bass

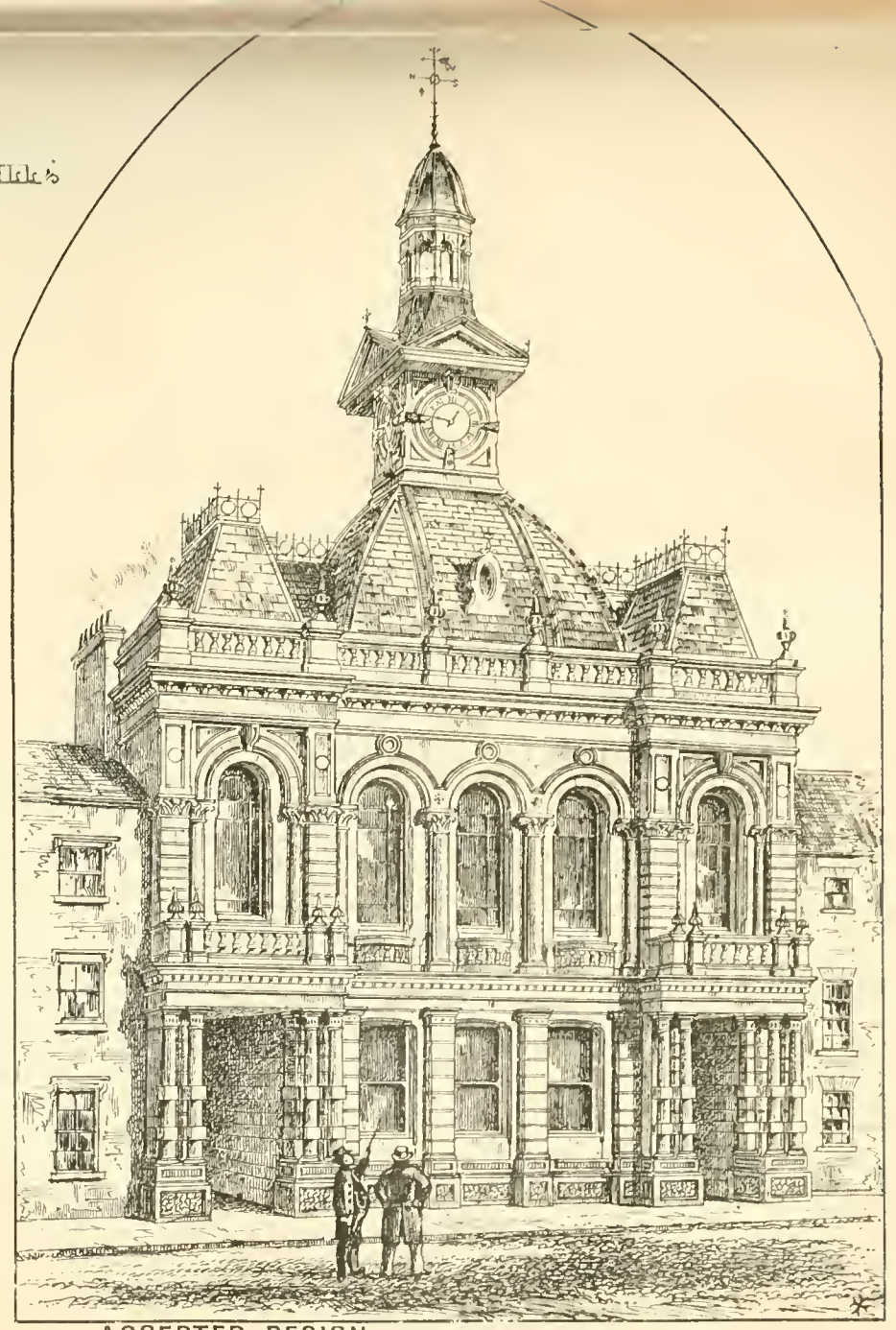
E. Wimbridge del.

No. I.

Rathord Town Hall's



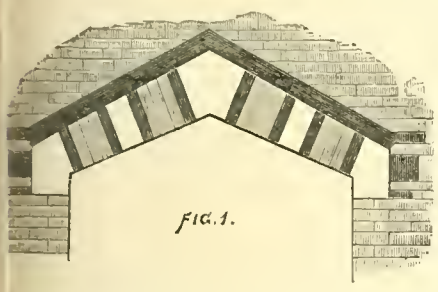
REJECTED DESIGN BY MESSRS GODWIN & CRISP.



ACCEPTED DESIGN BY MESSRS PEARSON & BELLAMY.

SAUNTERINGS IN SOUTHWARK-STREET.

An impartial observer, a "looker-on in Vienna," if called on to choose a field for the display of collective architectural talent, would unhesitatingly select Southwark-street. The *tabula rasa* produced by the demolition of obsolete buildings, and the construction of the noble thoroughfare from Blackfriars Bridge to the Borough has offered a "fair occasion" for various architects to show their metal. That the metal should have, in all cases, the genuine ring is scarcely to be expected. There is alloy in all of the specimens, and pure pinchbeck, if the term be allowable, in too many. Asmodeus did not accompany us; nothing beyond the general appearance of the elevations can therefore be described in these notes. Crossing Blackfriars, and passing under the railway bridge, leaving the quaint old almshouses of good Charles Hopton on the left, the first building encountered is the immense store of Messrs. Tait and Co., army contractors. This building was illustrated in the Building News, No. 589, and will therefore be but cursorily noticed at present. The architect was Mr. R. P. Pope. It is distinguished by a liberal use of colour, and even gilding, but the effect is peculiar. Over the ground and first-floor windows are about eight courses of pseudo-reticulated glazed red and green bricks, and it is needless to say that the contrast is too violent for a building of otherwise sober



colour. Again, the use of black—or, rather, artificially blackened—brick in the form of labels to windows and doors is most objectionable. In the present instance it makes the building appear as if in mourning, and the too free introduction of black tiles in the frieze of the cornice heightens the indications of woe. What connection there can be be-

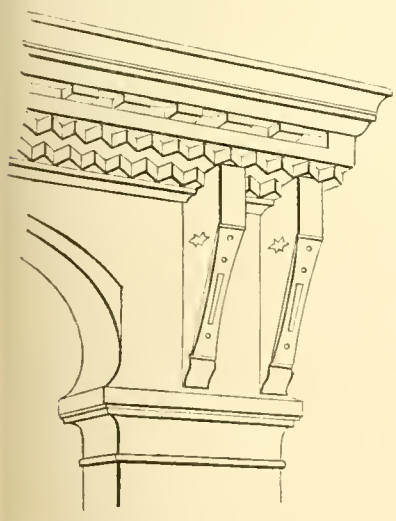
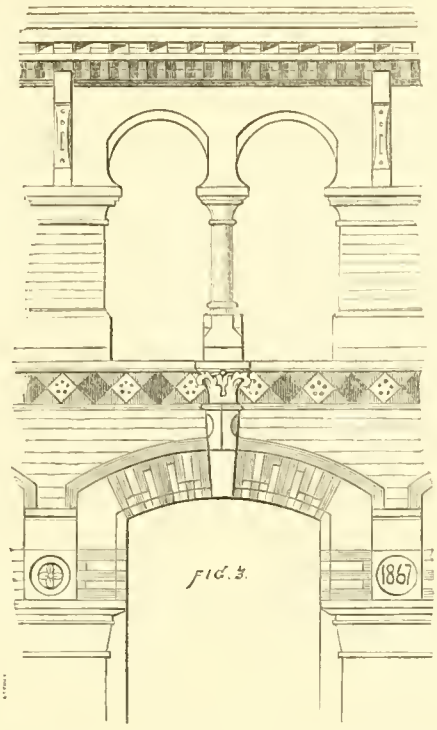


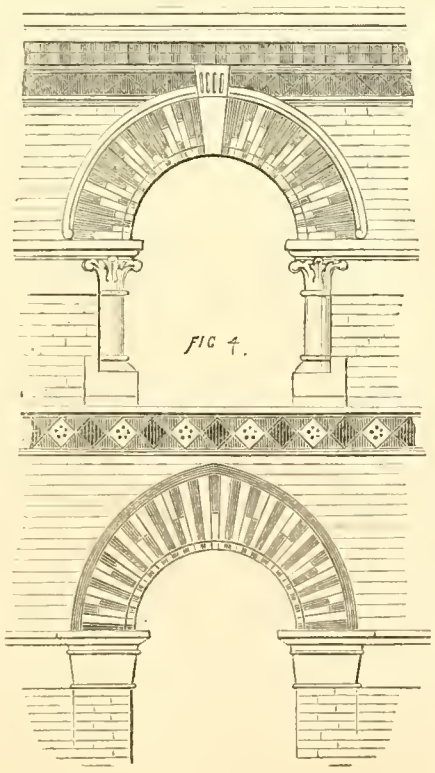
Fig. 2.

ween an army contractor's establishment and a family mourning depôt we cannot see. It is true that a pursuit of reputation in the career of arms may occasionally be effectively wrecked, but from the time when the Venetians furnished supplies to the Crusaders in the days of Cloncurry—or, for that matter, in this year of grace—army contractors have had little occasion to make a moan. Why, then, this "suit of sables?" From the south-east a good view is obtained of the tower over the staircase, and from this point the building is seen to the greatest advantage, the management of the tower being really artistic. The material is, for the most part, yellow brick, with a little red Mansfield stone in the form

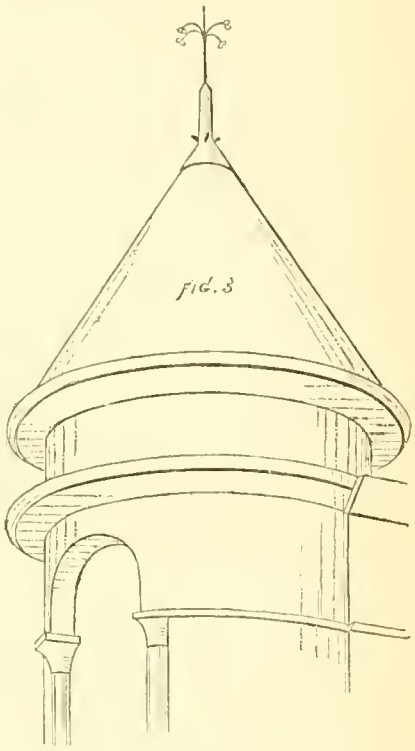


of dressing. There is, however, an unreasonable mixture of noble with mean material. Common yellow bricks, Mansfield stone, glazed bricks, gilding, white stone—either Portland, white Mansfield, or some similar stone—encaustic tiles, polished granite shafts, elaborately carved caps, and a dismal bordering of black brick, a bordering such as the well-dowered widow orders to be put on her writing paper (see fig. 1), which shows one of the window heads.

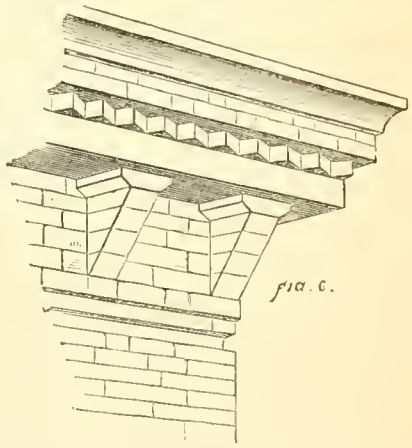
The next building on the same side of the



street is the warehouse of Messrs. Causton and Sons, stationers. The utilitarian character of this building is so plainly indicated by its external appearance that criticism would be disarmed were it not that a display of festivity, in the guise of carving, has been attempted over the first-floor windows. Carving, if attempted, should be good of its kind. This is bad of its kind. Ill-designed and coarsely executed, it disfigures a building which should



certainly not court attention. The jointing of the basement window heads is what we have ever protested against. A joint in the centre of a segmental or circular arch is neither conformable to recondite theory nor rule of thumb practice. The balcony over the entrance door, not yet fixed, may do something for the building, but the



trusses already in place are of very uncouth form. The frontage is about 108 feet. Mr. Saunders, Finsbury Pavement, is the architect. On the same side of the way a warehouse is in course of erection for Messrs. Lawson and Co., seed merchants; Mr. J. Wimble, No. 2, Walbrook, being architect. So little progress has been made that beyond recording the fact that the first-floor joists are laid, nothing need be said at present. Immediately opposite, and in an unfinished state, is a warehouse for Messrs. Waite, Barnett, and Co., also seed merchants; Mr. Edis, architect. It is of yellow brick, and very plain in its present state, as the ornamentation is to be in stucco. The third-floor joists are not yet laid, so that it is not easy to say what will be its appearance when finished. It has a frontage of about 65ft., and a height of 50ft., enough for the display of a good deal of architectural skill. The contractors are Messrs. Sandon

Brothers. Separated from this building by a vacant lot is a row of five warehouses, the architect being Mr. Edis. We illustrate portions of this building in detail. Fig. 2 is part of the main cornice; figs. 3 and 4 the second and third-floor windows. The material is yellow brick, with slight mixture of red: no black brick whatever is introduced. Coloured tiles are used in the cornice and elsewhere, but neither profusely nor injudiciously. In many of the buildings in this street coloured and glazed tiles are used without knowledge or discretion; and when protest is made against them it must not be understood that Mr. Edis's treatment comes within our anathema.

These warehouses are built upon a piece of ground which runs to a point at the eastern extremity, as a narrow street joins the main thoroughfare at an acute angle. This splendid opportunity for making the end of the building circular, and surmounting it with a tower, was not to be neglected. The main cornice is, however, carried round the tower in its entirety, which is always a mistake, and in this instance a most egregious one. The very small height given to the tower, nine or ten courses of brick, and the exigencies of its own cornice, reduce the tower *pur et simple* almost to zero. This portion of the building is also open to the more serious objection of using arched openings on a circular plan. Unless of very small span it is impossible that arches can stand on a circular plan without artificial aid. They may, indeed, stick together by means of good cement and good luck, but the principle is wrong, and sooner or later the fatal error in construction will show its results. Fig. 5 will give some idea of the tower. The caps to the pilasters on the ground-floor bear a striking resemblance to fiddle heads, and are singularly destitute of grace or invention. The arrangement of the coloured brickwork, on the other hand, exhibits much judgment. The colours of the tiles in the frieze of the main cornice are admirable. One great point seems to have been over-looked—namely, the junction of the external woodwork with the brick or stonework. Anything worse than the way in which the brick and stonework is connected with—or, rather, separated from the door frames and window sills—can scarcely be described. Nearly opposite, on the north side, is a very large building, 111ft. frontage, occupied by Messrs. Millington and Hutton, Mr. Josephs, Bucklersbury, being the architect. With the exception of the ground-floor the whole is of yellow brick. It is perfectly plain, the dressings to windows being in simple moulded brick of the same colour as the rest. Immediately opposite is the establishment of Messrs. Easton, Amos, and Co., built about 1865, by Mr. D. Wyatt. This is a very pleasing work. The conditions were no doubt favourable; its great length, 120ft., and low elevation, with the comparatively few windows required, rendered its treatment an easy task. It has breadth, and consequently repose. The material is red brick, the basement is of black brick, not artificially blackened, and contrasts well with the rest. Almost adjoining is the gigantic hop warehouse of Messrs. Wigans and Cosiers. This extraordinary building, more quaint than handsome, is by Mr. R. P. Pope, and was illustrated in the Building News, No. 520. It is of yellow brick, with stone sills, lintels, and springing stones, relieved here and there by a little black and red brick. The cornice, which is entirely of brick, has little projection. It is, however, adorned with coloured tiles of strongly contrasting hues—a great mistake in a cornice. The best feature in the building, a window in the eastern portion, was illustrated in the Building News, No. 534. As in Mr. Tait's warehouse, there is in this too free a use of black brick, in the form of bordering. Spots of black can be introduced with advantage, but a black binding never. The next building that is arrived at is a block of warehouses occupied by Messrs. Levy Brothers, and Messrs. Brocksopp, Sons, and Co. It fills the entire space between Bridge-street and Southwark-square, thus presenting three sides to the view. It is of yellow brick, with red and black bricks in the window heads, and is of no particular character or merit. There is some variety given by the use of red and white Mansfield stone, and there are some gay tiles in the cornice, where they look out of place. The profuse use of black bricks may be observed. Mr. Josephs was the architect. Immediately opposite, on the north side of the street, will be seen two substantial warehouses, with scarcely a particle of mere ornament. The lintels and sills are stone, as is also the lower storey; all the rest is yellow brick. With the exception of the lower storey, there is nothing in this building that the most captious could find fault with. Segmental headed openings, with architrave turned down on the cap, may be of common use, but they are not architecture. An architrave, in connection with pilasters or columns, is a horizontal feature simply, as much as a skirting or plinth can possibly be. The details of this building are worthy of all praise. Sufficient, but not excessive openings, are provided. Strength of construction is manifest, and, above all, there is no ornament. Anyone may see at a glance that it is a warehouse and nothing else; Messrs. Tillot and Chamberlain, architects. Fig. 6 shows part of the main cornice. The adjoining houses on the north side do not call for any particular notice. They are rather pretentious, and deal in festoons, swear by a lofty gilded cresting, and, in spite of the example of Victoria-street, Westminster, put much faith in little balls on the balconies, or, rather, window sills. All this is so much rubbish. Next these highly decorated edifices, and close to the railway bridge, is a very peculiar structure. It purports to be a couple of warehouses, built so as to resemble a single one. This is the worst thing in the whole street. It has loops and a crane as a warehouse must have, but it will scarcely be credited that the fitness of things has been so violated that the crane positively interferes with the Corinthian cap of the pilasters. The crane or derrick necessary for the purposes of commerce in juxtaposition with a Corinthian cap and "swags" of fruit and flowers! The cornice, where some fancy might have been displayed, is very plain and very ugly. Nothing calls for notice until Calvert's buildings, on the south side of the street, are reached. These premises are, we believe, occupied by the Hop Planters' Company, and were erected by Mr. E. I'Anson.. That portion which is purely a warehouse is remarkable. The lower storey is of stone, all the rest being of red brick, with the exception of bands of stone corresponding with the heads and sills of the windows. The lower storey is perfectly plain, being neither chamfered, moulded, notched, nor incised. The window and door openings are of an elegant elliptic form. Above this are four storeys, the two lower being of very small height. The sills do not project from the face of the building. The cornice is the least satisfactory portion of the work. Of the adjoining building—an older work, by the same architect—it will be sufficient to say that it is an ordinary Italian design, neither particularly good nor specially bad, but entirely without originality. We now come to the great work which sheds lustre over the entire Borough—the Hop Exchange. This work, a portion of which only has been undertaken, is not yet complete, but it is so far advanced as to show that no amount of finishing can redeem it from the charge of absolute hideousness. We have, in our time, seen some rare specimens of architecture. Chicago, St. Louis, and New York are not unknown to us, but they contain nothing that can compare with the Hop Exchange. Conceive a huge building, 170ft. or 180ft. in length, and nearly 100ft. in height, nine storeys above ground, without a break of any kind, unless the half-brick projection of the centre can be called a break, with *three tiers* of monotonous circular-headed windows, each so lofty—and, consequently, attenuated—as to light two floors. Add to this that these windows have no dressing whatever, and a faint idea may be formed of the ugliness of this building. It is almost useless to attempt a description. The principal entrance is a part of the segmental-headed arcade that forms the lower storey, or, rather, the two lower storeys. This is enriched with elaborately carved caps and keystones, the hop plant being freely introduced, and with good effect. This entrance is remarkably ill-conceived. It is not a portico, as it does not project; and it is not a vestibule nor a lobby, as it is open to the weather. It is adorned with columns and pilasters of red Devonshire marble, and is profusely enriched with carving. Indeed, in this portion of the building no money seems to have been spared. It is, however, a great mistake to concentrate decoration which should be evenly distributed. The cornice is coarse beyond description, and the shelf-like balcony, supported by the frailest of iron brackets, will not improve the appearance of the front. The great hall, 80ft. long, 50ft. wide, and 75ft. high, is formed by piling four arcades one on the other; the effect, therefore, is monotonous. Three tiers of balconies, of precisely the same pattern, do not show much inventive power. The only good word to be said for the building is that the caps of the iron columns to lower storeys are of good design. This building was estimated to cost about £80,000, Mr. Moore, of Walbrook, being the architect. This finishes Southwark-street.

No allusion has been made to a very elegant little work by Mr. Ernest Bates, because we intend to give an illustration of it in a week or two. In Southwark-street the student will see much both to admire and avoid. He will not fall in love with the parti-coloured reticulated brickwork which he will see on all hands, nor will he fail to perceive the incongruity of luxurious carved caps in connection with the loops and cranes of commerce and the swinging bales of trade. He will appreciate at their full worth the works of Messrs. Tillot and Chamberlain, Mr. Ernest Bates, Mr. I'Anson, Mr. Edis, and Mr. D. Wyatt. He will see that a warehouse which fulfils its purposes, so far from being an ugly building, is about as good a building as can be seen. Here he will judge of the effect of incised and delicate work generally. The influence of colour and gilding can be estimated, and, in presence of these examples, are not likely to be over-rated. A few hours spent in this street, while it will not give a very high notion of the talent of the profession, will correct many errors, and afford food for profitable meditation.

COMPETITIONS.

At the monthly meeting of the Winchester Local Board, held on the 3rd inst., Mr. Newman, the surveyor, instructed by the General Purposes Committee, tendered his report, recommending that the premiums offered for designs for the main drainage of the city be awarded as follows, viz.:—the first premium of £150 to plan No. 7, by Mr. James Lemon; the second premium of £100 to plan No. 3, by Mr. Whitaker, of Parliament-street, London; and the third of £50 to plan No. 11, by Mr. W. Russ, formerly of Winchester. After some discussion the report was adopted by the Board.

The West Ham (Stratford) Town Hall Competition.—The West Ham local board have awarded the first premium of £100 to the plans marked "Civis," the joint design of Mr. Lewis Angell and Mr. John Giles, of Craven-street. The second premium of £50 is awarded to Mr. G. A. Wilson, of Leadenhall-street, for design marked "Adsum." The third premium of £25 is awarded to Mr. H. S. Legg, of Bedford row, for the design "Industria."

The construction of the Thames Embankment has necessitated the demolition of Buckingham Watergate, one of the finest pieces of architecture designed by Inigo Jones.

Building Intelligence.

CHURCHES AND CHAPELS.

Another chapel has been built in Wrexham, and local report says it is a very fine one. It is in the Romanesque style, and built from the designs and under the superintendence of Messrs. W. and G. Audsley, architects, Liverpool, by Messrs. Thomas and Son, builders, Menai Bridge. The glass was manufactured by Messrs. Edmundson and Son, of Manchester, and the carving was done by Mr. Stirling, of Liverpool.

The foundation stone of St. Luke's Church, Leicester, which is in course of erection, was laid under the auspices of the Leicester Church Extension Association, by W. Perry Herrick, Esq., on the 27th ult. The church is to be built of brick and stone in the Late Pointed style, and will contain upwards of 800 sittings, which will be placed on the free and open system. The architects of the building are Messrs. Hardy and Bellamy, of Lincoln; the contractor is Mr. J. Firn, and the whole of the works are being carried out under the superintendence of Mr. S. Davies, the clerk of the works.

It is proposed at once to build two new churches at Coventry, for which plans have been obtained, to contain about 650 sittings each, at an estimated cost of about £7,000—one to be in the neighbourhood of Gosford and Far Gosford-street, having attached to it a district taken from St. Michael's and St. Peter's parishes; the other near the Stoney Stanton-road, with a district taken from the parishes of Holy Trinity and St. Peter, including also Red-lane, now in the parish of St. Michael, to be called All Saints. Subscriptions to the amount of £5,200 have already been promised. Measures have been taken for the erection of a new church at Landport, Portsmouth. A committee has been formed, and subscriptions promised.

The church of Auffray, France, has just been partly destroyed by lightning, which struck the spire and set fire to the woodwork of the belfry. The entire clock tower and roof were burnt, and the two bells, one of which weighed 2½ tons, entirely melted. The church is one of the oldest in Normandy.

The Bishop of Oxford on Tuesday took a prominent part in the services associated with the reopening of the parish church of St. Nicholas, at Newbury, the building having been closed for more than eighteen months for entire restoration, carried out at a cost of between £8,000 and £9,000, under the superintendence of Mr. H. Woodyer, architect, of Grafham, Guildford.

The foundation stone of a new Wesleyan chapel has just been laid at Waterloo, Blyth, near Newcastle-on-Tyne. It will be in the Classical style; and Mr. F. R. N. Haswell, of North Shields, is the architect, and Mr. Myddleton, of Blyth, the contractor.

The church at Egloshayle, Cornwall, has just been restored at a cost of £1,400, and in a few days will be completed the restoration of Phillcigh church, at a cost of £1,040. Two other churches in the county are undergoing great alterations and repairs.

BROMLEY, KENT.—The foundation stone of a new church dedicated to St. Mary the Virgin, was laid on the 5th inst., by Miss Wilkinson, of Shortlands. The site is one of great beauty, and the church will be a conspicuous object for many miles round. The land has been given, and the building will be erected at the sole cost of the Wilkinson family. The style of architecture is Gothic of the thirteenth century, and the church will comprise a nave, side aisle, transepts, chancel, and organ chamber, together with a lofty tower and spire at the north-west angle. The material employed is Kentish rag stone, with dressings of Bath stone; the roof is framed with open timbers covered with boarding, and the seatings will accommodate 600 worshippers. The design has been prepared by Mr. Whichcord, F.S.A., architect, under whose superintendence the works are being carried out. Messrs. Dove, brothers, are the builders.

ST. SILAS, NEAR BRISTOL.—The newly erected church of St. Silas, in St. Philip's, near Bristol, was consecrated a few days since by the bishop of the diocese. The church contains 780 sittings, of which 551 are free and unappropriated for ever. It cost about £5,000; its style is Gothic. The walls are of Pennant stone, with liberal dressings of freestone, which have been inserted at rather short distances from each other in the form of bands, and which run in parallel lines round the church. The interior does not present the neat appearance that could be desired, for on account of the lack of funds it has not been found possible even to "point" the stonework. It certainly does not accord with the popular idea of comfort to be obliged, whilst in church, if seated next the wall, to bring one's broadcloth in contact with rough undressed Pennant stonework, with the probability of rubbing off sundry bits of mortar at every movement, and, for the sake of decency, it is desirable that something be done to remedy this thing without delay. The present idea is to plaster the walls as far up as the window sills, as soon as the means are forthcoming, and afterwards to "point" the upper portion of the stonework. The exterior of the building is already pointed. The church has been erected from designs by Messrs. Popes and Bindon, architects, of Broad-street. The mason's work was executed by Mr. Thorn, of Clifton; the carpenter's work, by Mr. G. Humphries, of Stapleton-road; the plastering, by Mr. Bevan, of Bedminster; the smith's work, by Mr. Williams, of St. Michael's-hill, and Mr. Leman, of Frogmore-street; the plumber's work, by Mr. Tuckey, of Milk-street; the gasfitter's work, by Messrs. Hale and Son, of Narrow Wine-street; and the glazier's work, by Messrs. Gay, of Stapleton-road. The heating apparatus was supplied by Messrs. Hayden, of Trowbridge.

SYDENHAM.—The Grove Congregational church, which has recently been opened, has a nave, side aisles, and chancel, the extreme length being 101ft., and the width 51ft. The walls are built chiefly of Bath stone, with grey Reigate, red Mansfield, and Peterhead granite, used sparingly for relief, in shafts, string courses and arches. The nave and chancel arches are also of Bath stone. The church will seat about 650 persons. Dissenters, as we have lately had occasion to remark, have a weakness for Flamboyant and Perpendicular excesses—the Gothic run-to-seed types; but the architect in this instance, Mr. James Hine, F.R.I.B.A., of Plymouth, has studied simplicity rather than complexity of outline and detail. The church is excellent for its acoustics. Over the west porch is a figure, lifesize, of the good Shepherd, an unusual feature in Nonconformist churches. The chancel windows are filled with stained glass by Heaton, Butler, and Bayne.

THE NEW ROMAN CATHOLIC CATHEDRAL.—Shortly after the death of the late Cardinal Wiseman, many of the leading Catholic noblemen and gentlemen in the metropolis met together to devise a fitting memorial to the memory of the deceased prelate. On that occasion it was almost unanimously determined that, as the diocese over which the Cardinal had presided did not possess a church worthy of the Roman Catholic diocese of England, it would be a fitting monument to his memory to erect a large and substantial cathedral. Since that time subscriptions have come in from all parts of the world, and a handsome sum is now understood to be in hand or promised. A site has just been obtained, which is in every respect most eligible. It is close to the Victoria Railway Station, not far from Westminster Abbey, and bordering on that new quarter which is springing into existence round Buckingham Palace. The whole architectural profession will be called upon, it is thought, to compete for the designs; but it is just possible that the competition will be restricted to Roman Catholic architects alone. It is intended to make the new cathedral by far the most imposing Roman Catholic edifice in England; and should the original design be carried out, clergymen speaking most of the European languages, will be stationed there for the purpose of hearing confessions and preaching to foreigners in their native tongue.

BUILDINGS.

The London Orphan Asylum committee have purchased land at Watford, whereon to build a new asylum. The total cost will be £65,000.

The north Surrey district school authorities have commenced their new infirmary, at Anerley, near the Crystal Palace. The building will be of brick, with a little Portland stone relief.

The Trinity House authorities of London have resolved to erect a lighthouse on the Durham coast, at Whitburn, near Sunderland. The requisite plans and sections are in course of preparation, and the erection of the lighthouse will be commenced early in the spring.

The Preston new town hall was opened amid public rejoicings on Thursday last week. The architecture is Gothic of the early part of the fourteenth century. The ground-floor contains a fine exchange room 50ft. by 40ft. Over the exchange room there is a great hall for the holding of public meetings, &c. All the windows are filled in with richly stained quarry glass. The entire cost of the town hall will be about £70,000. Mr. G. G. Scott was the architect.

On the 30th ult., the foundation stone was laid of the new national schools at Fownhope, Herefordshire. They will be built with stone of the district, random ranged, with freestone dressings, and the roofs will be covered with green Pembroke slates. The elevations will be handsome and effective. The architecture employed will be Gothic. The design has been prepared by T. Nicholson, the diocesan architect, and the buildings will be erected by Mr. Ford, of Fownhope, under the architect's superintendence.

On the 1st inst., P. B. Hall, Esq., of Lombard-street and Ellisker House, Richmond, laid the memorial stone of a new Wesleyan school and chapel, which has just been commenced in the Kew-road. The building consists of a school-room 48ft. by 30ft., which is entered by a porch in the centre of one side, and has two large class-rooms attached, over which a gallery is formed. The roof will be open stained and varnished, and slated with slates of two colours in diamond works and bands. The exterior is of picked stocks with Bath stone dressings and tracery. These buildings are Early Gothic in style, and when completed will be used as a chapel. Space is left in front of the site for a large chapel, and when this is added the buildings just described will be used as a school on the Government model. Mr. E. Hook, of Craven-street, is the architect, and Mr. Hookham, of Kentish-town, the builder. The building contract sum amounts to £1,120.

NEW DOCK.—A special general meeting of the Maryport board of trustees has been held to receive the report and plans of Mr. Hawkshaw, the civil engineer engaged to advise the trustees on the subject of increased dock accommodation. Mr. Hawkshaw, C.E., visited Maryport, and made a professional investigation. There were, he reported, three modes which presented themselves for increasing the dock accommodation at Maryport, viz.:—First, the enlargement of the present Elizabeth dock, by extending it in a south-westerly direction; second, the construction of a new dock on the northern side of the harbour, northward of the present north pier; third, the construction of a new dock on the southern side of the harbour, to the north-west of the Elizabeth dock and basin. As regarded these three schemes, Mr. Hawkshaw speaks most favourably of the new dock on the southern side of the present harbour, to the north-west of the Elizabeth dock and basin. He was of opinion that the dock and basin, and works connected therewith, could be constructed for £85,000. As this estimate, however, does not include parliamentary expenses, Mr. Hawkshaw thinks it desirable to fix the capital for the new undertaking at £100,000. Another meeting of the Board will be held to resume the consideration of the matter.

NEWNHAM, GLOUCESTERSHIRE.—The Seven Bank Hotel, Newnham, Gloucestershire, is nearly complete. It is situated on the bank of the Severn, and commands some most beautiful views of the river and surrounding hills. The works were commenced in the autumn of last year, and though retarded by the inclemency of the winter, will not be much after the appointed time of completion. The hotel consists of good entrance hall, bar, porters' rooms, coffee room 40ft. by 20ft., smoking room, commercial room, sitting rooms, and a very spacious billiard room. The upper storeys are appropriated as bed-rooms. The kitchen arrangements are very complete, as are the baths. The corridors will be laid with encaustic tiles on brick arches. The works are executed by Mr. Coleman, of Chaxhill, Gloucestershire, and the architects are Messrs. Medland, Maberly, and Medland, of Gloucester.

On Thursday evening last, a meeting of the friends of Dr. Gray, Bishop of Capetown, was held at St. John's School-room, under the presidency of Mr. J. G. Talbot, when a beautiful crozier, designed by Butterfield, and executed by Messrs. Peard and Jackson, of High Holborn, was presented to the Bishop on the occasion of his attaining his fifty-ninth year.

TO CORRESPONDENTS.

NOTICE.—On and after this day, OCTOBER 11, the "BUILDING NEWS" will be Published at the New Offices, 31, TAVISTOCK STREET, COVENT GARDEN W.C.

To Our Readers.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the Editor, 166, Fleet-street. Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

Notice.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

Received.—T. M. and Son.—C. J. M.—J. A. H.—J. W.—T. Bros. and H.—S. W. and S.—S. A.—J. A. H.—T. H. and Co.—O. N. S.—W. F. P. M—H. and C.—B. B.—E. W. P.—W. B. and Co.—M. H. and Co.—G. P.—R. and B.—J. N.—W. W., We will enquire.—W. B.—L. M.

Foreign Tiling.—"Apprentice" cannot do better than visit the department of the South Kensington Museum where building contrivances are exhibited. He will there find a very large and important collection of tiles. The tile Courtois (so named after its inventor) is very simple, and differs from the lozenge tile, in that the latter gives more scope for ornament, is strengthened by a slight rib along its centre, and is much lighter.

Correspondence.

CLOYNE NEW CATHOLIC CATHEDRAL.

To the Editor of the Building News.

Sir,—An announcement has been very generally made through the press, that the designing of the new Catholic Cathedral for the diocese of Cloyne, about to be erected at a large cost, and on a proportionally large scale, in the city of Queenstown, Ireland, has been entrusted to Messrs. Pugin and Ashlin, of Dublin. As many members of the profession are aware that it was originally intended there should be a competition for this important work, we think it necessary to inform them and those interested in the question of architectural competitions, how it has occurred that Messrs. Pugin and Ashlin have now acquired the work without the test of a competition. Early in this year we received a circular from the Reverend Dr. Rice, the secretary of the Building Committee, inviting a competition for the proposed new cathedral between Messrs. Pugin and Ashlin, Mr. J. J. McCarthy, and Mr. George Goldie. This circular contained the terms of the competition, and also requested the intending competitors to visit Queenstown for the purpose of receiving further instructions. We accordingly visited Queenstown in a few days, and saw the Right Rev. Dr. Keane, the bishop of the diocese, and the Very Rev. Dr. Rice. We expressed our satisfaction with the general fairness of the conditions for the competition proposed by the committee, but as one of these conditions was that the successful competitor should give security that his design could be executed for the stipulated sum of £25,000, we thought that on the other hand the other competing architects should have some guarantee that the committee would not, as has too frequently occurred, select a design, the execution of which would ultimately far exceed the proposed outlay. Furthermore, being aware that Messrs. Pugin and Ashlin had powerful family connections and other influences over the general committee, we considered that a perfectly impartial sub-committee of selection should be formed in the way to which we shall hereafter refer. We mentioned all this in conversation to the Bishop and Dr. Rice, and they highly approved of our proposals. His lordship said, moreover, that what we advised would ensure not only fair play for the competing architects, but would secure the committee from being involved in a scheme which would far exceed their resources, and he mentioned a case of the kind which occurred some time ago in the city of Cork. Finally, the Bishop and Dr. Rice suggested that we should put our terms in writing, and invite Messrs. Pugin and Ashlin to join us in requesting their adoption on the part of the committee. The Bishop said further that if Messrs. Pugin and Ashlin refused to join us in asking such reasonable conditions, it would produce a very bad impression on his lordship, and also on the committee, in their regard; but in such case he might say for certain that the request of two out of the three proposed competitors would be quite sufficient to secure the adoption by the committee of the conditions we proposed. We accordingly drew up the conditions of competition, a copy of which we enclose, and having signed them ourselves, forwarded them to Messrs. Pugin and Ashlin, requesting their signature. This, however, they declined to append, and as the bishops and Dr. Rice advised, we forwarded the conditions to the committee, requesting their adoption. The committee declined to adopt them, but drew up a new set of conditions, substantially the same as the first, except that it was provided that each of the unsuccessful competitors should be paid £200 instead of £75 as originally provided. After mature consideration, we decided, under the circumstances mentioned above, that our safest course was to adhere to our original conditions, and to ask Messrs. Pugin and Ashlin again to join us in requesting their adoption by the committee. Messrs. Pugin and Ashlin again declined, adding that they had addressed their reasons for so acting several months previously to the committee. We then once more requested the committee to adopt our conditions, urging that we saw no other course by which fair play in judging of the merits of the designs could be ensured. The only assurance we could get on that point was that the committee had passed a resolution that fair play should be shown. The fact, however, of their refusing to accede to conditions which the Bishop and Dr. Rice (and, we think, all impartial people) consider fair and reasonable, joined with the persistent refusal of Messrs. Pugin and Ashlin to associate themselves with us in our endeavours on behalf of fair play, left us far from satisfied that a simple resolution on the part of the committee was a sufficient guarantee that justice would be done in the matter. In reply to our second application, the committee, through their honorary secretary, invited us either to accept their conditions or to decline the competition. In reply, we expressed our unwillingness to decline so important a competition, and repeated our hope that the committee would, after all, adopt our terms. With this the correspondence ended, for the newspapers very shortly announced that Messrs. Pugin and Ashlin were appointed the architects of the new cathedral. From this simple statement of facts, we think our professional brethren and those who take an interest in such subjects, will be enabled to appreciate the exact value of the chances of fair play that existed in the Cloyne Cathedral Competition as proposed by the committee.—We are, &c. J. J. McCarthy, R.H.A., M.I.I.A.
Geo. Goldie, M.R.I.B.A.

The following are the conditions of competition referred to:—

We, two of the architects competing for the new Catholic Cathedral of Cloyne, to be erected in Queenstown, request that the following conditions be added to those stated in the Rev. Dr. Rice's circular of January 21, 1867:—

1. That a committee of seven for examining the plans and deciding on their merits be constituted and appointed in the following manner:—The bishop and administrator of Queenstown parish to be ex-officio members; three members to be appointed by the competing architects one by each, and two architects of eminence not connected with the competition to be appointed by the general committee.

2. That the committee so constituted shall examine the plans and specifications and arrange them in their order of merit as to their beauty, commodiousness, and cheapness.

3. That all the plans and specifications shall remain in the hands of the bishop and administrator of Queenstown parish till the expiration of twelve calendar months after the actual commencement of the building, and that they are not to be returned to the architects on any pretext whatever until the expiration of the time named.

4. That the architects' securities required by the resolution No. 1 be obtained in the following manner:—The architect whose competition, plans, and specification are deemed by the committee of selection first in order of merit, shall furnish all supplemental drawings and specifications that may be necessary to enable builders to prepare tenders. Such supplemental drawings and specifications not to introduce any alterations or deviations from the original plans, but are to be merely illustrative of them.

5. That a sub-committee of selection be appointed, to consist of the Bishop of Cloyne the Administrator of Queenstown parish, three gentlemen not belonging to the architectural profession (one to be named by each competitor), and two architects of eminence, to be selected by the five foregoing members. That the successful competitor shall be the gentleman whose plans shall, in the opinion of the foregoing sub-committee of selection, guarantee the most beautiful, commodious, and cheapest building.

6. That the plans and specifications so prepared be advertised for tenders from competent builders; and if no respectable builders (with two solvent and approved securities for the amount of £5,000) will undertake to build the cathedral according to said plans and specifications for the sum of £25,000, the said plans and specifications are to be entirely rejected and the architect of them to be dismissed from all further share in the competition, or in the erection of the cathedral, and is to receive no compensation whatever, and is to have no share of the sum of £150 mentioned in the fifth resolution of the committee meeting of the 20th January, 1867.

7. That in the event of the plans considered first in order of merit being rejected as above described, the architect of the second plan in order of merit shall be directed to proceed as mentioned in condition 4. And in the event of such second plan being rejected for the same cause as the first, then the plan considered third in order of merit shall be advertised for tenders in the same way as the two others, and if it be found impossible to have the cathedral built according to it for £25,000, said plan and its architect shall be rejected without compensation, as in the two preceding cases.

8. That each of the competing architects shall furnish with his plans a map and section of the site to the same scale as the plans, sections, and elevations, showing the position of the cathedral by a block plan.

9. That the part of resolution 5, of the committee meeting of January 20, 1867, beginning with the word "less" and ending with the word "candidates" be omitted, and the following substituted for it, "less the sum of £200, which £200, with £200 more, will be divided as follows:—£50 to the unsuccessful competitors, £50 each to the two architects of the sub-committee of selection," who shall be required to report to the general committee and to the sub-committee of selection whether the supplemental drawings and specifications required by clause 4 are in strict accordance with, and are merely illustrative of, the original designs.

10. That the architect who shall be deemed by the sub-committee of selection the successful competitor shall prepare working plans and specifications upon which estimates can be made. That these plans and specifications shall be advertised for tenders, and that if no competent builder (who will give solvent security to the amount of £10,000) can be found to undertake the work for £25,000, then the plans of the so-called successful competitor are to be rejected, and their author is to receive no compensation whatever; and the bishop and building committee do further guarantee that they will not engage under any circumstances whatever aforesaid architect in the designing or erecting of Cloyne Cathedral.

11. That the competition plans and specification be lodged in the hands of the Rev. Dr. Rice before the 1st day of January, 1868, and that the award of the committee of selection be communicated to the competitors before the expiration of six weeks from that date.

12. That the committee will furnish the three competing architects with a map and levels of the site of the proposed cathedral at as early a date as possible.

13. That the architect's plans, sections, and elevations be drawn to an uniform scale of 8ft. to 1in., and that Indian ink only shall be used for the drawings of plans, elevations, and sections. The perspectives only may be coloured.

14. That the specification referred to by the first resolution of January 20, 1867, be only general, stating the qualities of the several materials to be used in the different parts of the work, and descriptive of the arrangement of the plan and the general method of construction to be adopted in carrying it into effect.

MR. WELBY PUGIN AND THE MANCHESTER TOWN HALL COMPETITION.

Sir,—If your estimate of my design for the Manchester Town Hall can scarcely be considered flattering, it is, in one respect, perfectly true. The motto "*En avant*" is scarcely misapplied, as, although I fully intended to make a veritable "retrograde movement," it was in order to advance in a right direction, from a starting point of fifteen years back. I have, on several occasions, stated my belief that from that period our public buildings have been degenerating. Extraneous importations, crotchets, and eccentricities have been long taking the place of a natural, legitimate development of true principles. Where we formerly worked out with care a building, expressive of its purpose and satisfying its requirements we now go out of our way to produce something that will mainly set people wondering. All truth is sacrificed for a sensation. Simplicity has departed, and nothing now goes down that is not manipulated into fantastic forms and covered with useless features. This depraved taste is not confined to architecture, but is as painfully marked in other false developments of art, as *e. g.*, in the meretricious Mexico-Chinese fashion of modern female costume. Nor is it confined to England. What is, at present, only budding in this country, has long blossomed and is now running to seed in France. In that country architecture is positively rioting in every kind of monstrosity. Look at the Grand Opera, Chamber of Commerce, and modern churches—their halting distorted forms, and distracting ornamentation. Can they, for a moment, be set against the simple lines of the Madeleine, or even the debased style of St. Eustache, or the buildings of twenty years back? The Grand Opera, whose every line, as it were, *screams* at the beholder, the Chamber of Commerce, with its hideous many-eyed cupola; the Haussman churches, like gigantic skeletons festooned with flowers, or bodies broken out all over into blotches. What a degradation of intellect and art! Or, again, take any of the modern Gothic churches, and set them side by side with the grave simplicity of Notre Dame. The same false taste and perverse development is evident in all. To a less glaring extent, but rapidly tending to the same goal, follows the architecture of the day with ourselves. Compare Newgate with Reading Gaol and many others

of our modern prisons. The latter are German toys. Newgate speaks for itself. It is grand in its gloom and its aspect of despair. Or take the churches of some fifteen or twenty years back, at Camberwell, Millbank, and Oakley-square, without naming many examples of civil architecture. They contrast strikingly with similar works of the present hour. Therefore it is that I revert to a period when the revival held out such glorious hopes, and nature guided where now caprice dictates. All beauty rests on the laws of nature, and simplicity is its greatest charm. Nature is the basis of true art. The human form is her highest work. Man, amidst all the varieties of race, remains true to his original type. Nature never departs from her model, except to produce a malformation or a monster. A man with a third eye or a sixth finger, or any other additional feature, is simply regarded with aversion. What we abhor in nature we are just now rampantly generating in art, with conceited self-gratulations on our own ingenuity. Our buildings are rapidly developing into monsters. We are mistaking our vocation. Instead of developing principles we are only multiplying features and patronizing abortions; and it appears we have to learn afresh the value of a straight line or an unbroken curve. We would be more creative than nature herself. We are being trained down instead of trained up. Just as a whole nation, both in mind and body may either sink or rise, according to the culture it receives, so may the whole range of the various arts be degraded or ennobled, according to our treatment of the principles on which they are founded. If we seek to add to what was in the beginning, instead of legitimately developing it, we only succeed in producing a monster in the end. We must revert, then, to nature and its principles, and develope them from the point to which we had arrived some fifteen years back, for at present we are only vitiating public taste, increasing the demand for monstrosities, and wasting alike both good material and vast sums of money. It was in hopes of crushing this *ver rougeur*, which is now tapping the architecture of the day in every style, that I ventured to speak without reserve on the designs for the Law Courts, in which I traced its insidious advances: but I by no means plead guilty to a desire of "turning backward to a period of architecture of which we have heard a good deal lately." These words would seem to imply that you are under an impression that my design for the Manchester Town Hall approaches the style of the Houses of Parliament, of which, however, with all their faults, it cannot be predicted that they betray any trace of the dry rot of unnaturalness. That building is one *sui generis*. It stands alone, and has no rival of its kind. But much as I value the principles of which, by the unity of its conception, and the perfection of its details, it is the exponent, I am very far from considering it a type or model of the style we require. I will not dispute, although I dissent from, what you say about my design being "badly drawn." Allow me to remind you that a drawing is not necessarily bad because it is slight and sketchy; and to ask the favour of its admission amongst your illustrations at an early date, when, more fully to set forth what I intended, I will add a detail of one of the compartments.—I am, &c., E. Welby Pugin.

PUGIN *v.* BARRY.

Sir,—The tone of Mr. E. W. Pugin's letter is such as to preclude my taking any notice of it in detail. I cannot regret its appearance, for it shows clearly the character of my antagonist, and it shows, moreover, how uneasy he is in his present position. As your readers may (in consequence of Mr. E. Pugin's peculiar method of controversy), be imperfectly acquainted with the real position of the question, I will place it before them in few words. Mr. E. Pugin has asserted over and over again in his published letters that he can prove his case from materials and witnesses now forthcoming. We have challenged him to do so before any tribunal, where his statements and evidences can be fairly tested. If he refuses, the world will understand his refusal. He evades the challenge now by requiring certain letters, which he states that he lent to Sir Charles Barry in 1860, and which he also asserts that Sir Charles promised to return. It will be time to comment on the conduct of both parties when the facts are established. At present the whole story rests on the unsupported assertion of Mr. E. Pugin, in regard to a private interview—an assertion made seven years after my father's death, when any statements on the subject are beyond the reach of direct contradiction. Let him bring this point, also, before the same tribunal. We will state then what documents we have, and will produce any paper or answer any question which the court of arbitration may think fit. There, and there only, are we called upon to meet him.—I am, &c., Alfred Barry.

MANCHESTER TOWN HALL COMPETITION.

Sir,—As one of the unselected, but non-exhibiting competitors, permit me to say that my drawings were removed—not "in spleen or dudgeon," or from "craveuheartedness" — but simply because the selected designs were to be withheld. In objecting to an exhibition of the unselected designs by themselves, I suggested to the mayor, "that when the complete drawings of the selected competitors are being exhibited, that those of the unselected, so many of them at least as their author may choose to return for that purpose, should be exhibited at the same time." I thiuk you will agree with me that this would have been the better course. Being led to trespass on your space so far, I am tempted to refer to a peculiarity of treatment to which my drawings were subjected. Competitors being restricted to a certain size for their stretching frames (34in. long and 24½in. high), I concluded that the limitation was adopted merely with a view to economize hanging space, so arranged the whole of my drawings on three boards of the required size; the greater dimeusions, however, being the height. In this way the two plans were mounted on the outside boards, the unoccupied corners on the upper part being filled by a small block plan on one, and Cooper-street elevation on the other; while on one side, and the lower part of each, was pasted down, in slips, a printed explanation of the design. The principal entrance—or Albert-square side of the building—formed the base of the plan, and the whole read in this way. On the centre board were placed the two principal elevations, the one over the other; and the three boards were hinged together, so as to prevent separation as much as possible, and for convenience in hanging, &c.

On opening my drawings I find (though returned to me as described above), that my arrangement of them has been anything but appreciated, the boards having been unhinged and each hung separately. But how? Not as the drawing, writing, and printing would suggest, nor upside down exactly, but sideways, the lesser dimension of the board being made the height, and the elevation reading the opposite way from the plans. The plans, in fact, might just as well have been turned upside down, and the elevations would have been quite as intelligible with their face to the wall. As there could not have been much difficulty, if any, in placing these drawings at the end by themselves, if they would not fit in with others in military order, I suppose their disarrangement must be attributed to the red tapeism, or ignorance, or something else, of the official entrusted with the hanging.

Being anxious to learn in what particulars I had failed to comply with the instructions of the committee, and whether my arrangement of the drawings was looked upon as an important violation, sufficient to place them "out of court" intentionally—as they were practically by the way they were hung—I wrote in succession to the mayor, the town clerk, and the city surveyor, requesting to be furnished with "a copy of that portion of the report referring to my design, if considered worthy of notice at all." At last I received a reply stating "that the committee decline to give their reasons why any particular design has been excluded."

The accompanying photographs are taken from the stretching frames as returned. The position on each board of the distinguishing number in itself indicates the mode of hanging adopted, not to mention the new screw holes for rings on the corresponding long side of each board where none were before.—I am, &c., No. XVI.

THE STRATFORD COMPETITION.

Sir,—Will you permit me to say a few words on this subject, as it is, I fear, only another added to the long catalogue of the genus "hanky panky," which will require to be dealt with by your powerful pen. Being a competitor, I went on the 1st inst. to Stratford to ask to be allowed to see the drawings. I was informed that thirty-two designs had been received, and that they were hung up in the large room at the office of the Gas Works, there not being a room of sufficient size for the purpose at the present vestry hall, for the inspection of the ratepayers of the district. Quite right and satisfactory. I obtained permission to view them. But what was my surprise on entering the room to see only twelve designs on the walls. Were there not thirty-two received? Where then are the twenty? Echo answered, "Where." It appeared, however, on inquiry, that the committee had made a preliminary selection of these twelve. Quite proper, and according to the recognised course of proceeding. And equally, of course, these twelve were selected for their superior merit. It is not for me, an interested party, to offer an opinion on this question. You, Sir, will very shortly tell us all about that. But, though I say nothing, this I will say: Are the ratepayers all men of business? Are they all men of judgment? Are they all honourable men? Of course they are. And the members of the vestry board, they are also honourable men, and sure to be the best judges of what they want, and to select it, too, without partiality, and quite regardless of any personal feelings. But, Sir, do suggest to the ratepayers the desirableness of just giving a cursory glance at the other twenty. It might be satisfactory to them; and, I am sure, would be felt as an act of graceful condescension by the twenty gentlemen who have devoted six weeks of their time, and I know not how much of their money, to the preparation of those twenty designs. —I am, &c., Vigilans.

Sir,—I am induced to trouble you with a few words with reference to the above competition, as I understand that the surveyor to the local board is a competitor. As a general rule, it is considered, to a certain extent, unfair for a surveyor paid by a board to compete for works proposed by them, as the great amount of interest he posseses among the members gives very great advantages over other competitors; a few hints have only to be throwu out as to his motto, and the result can be guessed. In the recent farce of a competition for new offices, at Poplar, the board of works there selected a most hideous design, only because they believed it was by their late surveyor; so ugly is it that the Building News has hoped it will not be perpetrated. Competitions are nearly always swindles, but if the members of the board of health will only act with the same amount of impartiality as their chairman appears determined to do, merit alone will win, the race, and in the architectural profession the Stratford town hall competition will be considered a model one. Having had great experience in these matters, I beg to offer one or two suggestions. The designs should be publicly exhibited both before and after the award, professional assistance should be obtained in selecting designs and the report, stating the reason of selection published, so that the competitors can be satisfied there has been no jobbery. As the majority of the competing architects have spent a great amount of time and money in preparing their drawings they hope to obtain Fairplay.

[Since the above letter was written the award has been made, and is recorded in another column. Ed. B. N.]

THE IMPROVEMENTS IN WEST LONDON.

Sir,—Your issue of this date notices an announcement in the *London Review* of a project for "reforming" the musty and degrading vicinity of Seven Dials, by the removal of a large number of the old houses therein, and replacing them "by lodging houses, to be built on a new principle." Thirty-three years ago I suggested in one of the journals of that date (the *Weekly Chronicle*) a considerable improvement of a paying kind that could be made—by running a new line of street—commencing at the north-east corner of Newport-street, and thence directly through to Crown-street, removing all the houses on the east side of that street, and constructing throughout, from St. Martin's-lane to Oxford-street, a suitable style of buildings for business purposes. By this means a good wide street leading direct from Charing-cross to Tottenham-court-road (even to Hampstead), would be opened, a vast improvement in the carriage and foot-way be effected, the property on both sides of the whole line of New-street become much more valuable, the entire neighbourhood be greatly benefited, while the present difficulty to pedestrians and carriages of all kinds, of getting from the east end of Oxford street to West Strand, would be obviated, and the public would hail with satisfaction so im-

portant an addition to the improvements in West London. And I venture to predict that this project would be well worth being taken up by a "Limited Company," as the whole of the property throughout the line designated is now most certainly of very inferior value.

I beg to enclose my card.—I am, &c.,
October 4. Civis.

THE SEWAGE OF TOWNS.

Sir,—Permit me to occupy a small space in your valuable columns with a few remarks on this important subject. First, I beg leave to introduce two new distinctive words which are more euphonious than the terms now used, and will be convenient in discussions—aquine, signifying the liquid portion; and cloacine, the solid portion of the refuse of towns. Secondly, I submit, as the result of much thought and observation, that in dealing with the refuse of towns, aquine should be disposed of separately as valueless, and even deleterious. Thirdly, I hold that without an admixture of decayed vegetable matter, cloacine and sand or clay will not make good earth. For what is earth? Is not the best earth or mould a compound, with a large proportion of decayed vegetable matter? As I write, leaves are falling, and will in due time become incorporated with the soil on which they fall. It seems to me that in consistency earth is a disinfectant; this point has often been overlooked, and should be remembered. On a future occasion I shall have the honour of submitting a simple and effective mode of dealing with aquine and cloacine respectively.—I am, &c.,
September, 2. A. J.

DARTON CHURCH RESTORATION.

Sir,—I was in hopes Mr. Perkin would have been able to say say the gross vandalism now being perpetrated at Darton Church was all done without his knowledge or consent. As he has thought fit to write a letter in which he both indignantly denies and then in substance admits the accuracy of my statements, perhaps you will kindly allow me to say a few more words ere the subject is closed. He says "The greatest care is taken to assimilate the random chisel marks to the earliest type." Was more absurd nonsense ever penned. I repeat that the whole of the interior stonework has been very rudely recut, and not even one original tool mark can be found. Mr. Perkin's letter serves to show how little architects in general know about church restoration, and I wish to Heaven such men would let our grand old churches alone. Darton Church is a peculiarly fine one, and now it is irretrievably ruined. No amount of letter writing can restore its olden beauty; but what need is there for other churches to be sacrificed too? Allow me also to inform Mr. Perkin that all my statements were written after a most careful personal inspection, and their truth will be evident to all who can pay the church a visit.—I am, &c., P. Q. P. V.

RATIO OF THE DIAMETER TO THE CIRCUMFERENCE OF A CIRCLE.

Sir,—It was my intention this week to reply to the remarks of "E. L. G.," respecting my last geometrical diagram, but finding that an able letter, treating on the above subject, has lately appeared in the *Mechanics' Magazine*, upsetting the existing theory and rather supporting my position, I will defer my reply for the present. The author of the letter alluded to (Mr. Harvey) appears to have devoted great study and research to this subject, and proposes to write a series of letters in confirmation of his views. Although I cannot go so far as he does in his preliminary assertion, yet from my own investigations I believe the Archimedian ratio of 7 to 22 is rather below the truth and not in excess of it, as most modern mathematicians insist; and, I may add, one mathematical writer of authority has hinted the probability that, although the exact numerical ratio cannot be obtained, a geometrical quadrature is possible.—I am, &c., Geo. Guillaume.

MR. PRICHARD'S DESIGN FOR THE MANCHESTER TOWN HALL COMPETITION.

Sir,—I have been struck by the obviously partial spirit in which your reviewer has criticized some of the rejected designs for the Manchester Town Hall. As a friend of Mr. Prichard's, and as being familiar with his design, which greatly interested me, I could not but observe the ungenerous spirit in which it was reviewed in comparison with those that preceded it. Although it unavoidably holds a prominent position among the "eminently good" designs, yet the faint praise bestowed upon it is entirely marred by sarcastic allusions to such minor details as the "eruptive little round turrets." Had I not seen the drawings, I should certainly have depicted to myself, from the reviewer's description, a building bristling with these objectionable features

Now, the facts are these. In the Albert-square front, 328ft. long, there are two of these turrets, each containing a private staircase for the housemaids, and therefore not without their use. In the Princess-street front, 393ft. long, there are also two—one for the use of the porter, the other giving workmen access to the roofs, &c.—all being thus strictly consistent with Mr. Prichard's avowed principle of making exteriors suggestive of interiors. From these facts your readers may judge for themselves whether in such frontages a feature so common in French architecture has been too frequently introduced. As to the "circular somethings" in the Princess-street tower, I, amateur as I am, was at no loss to understand its meaning, and have already disposed of it as the porter's staircase. Neither could I see the relationship between the pinnacles which reconcile the square of the tower with the octagon, and the turrets whose number is so much exaggerated by the writer. As a friend of Mr. Prichard and a lover of art, I cannot but regret that a notice of this kind was not written in a more fair and impartial spirit. Nothing is more calculated to mislead public taste than a criticism influenced even in the least degree by prejudice. The moment a critic ceases to regard all his subjects from the same point of view, or, whilst smoothing over faults in one case, endeavours in another to make the most of them, his work becomes not only valueless, but positively mischievous.—I am, Sir, &c., A Law Student.
Inner Temple, Oct. 9.

ZINC ROOFING.

Sir,—In reference to my letter in this week's issue of your journal, allow me to point out that "2s. 4d. profit" should have been 2¼d. It is, I suppose, a misprint.—I am, &c., Jas. Edmeston.
October 5.

Intercommunication.

QUESTIONS.

[600.]—FLOW OF WATER.—Will any reader kindly inform me, through the medium of the "Intercommunication" column, the best formulæ for calculating the discharge of water in gallons of a stream whose dimensions are 4ft. 6in. wide, 9in. deep, and flows at the rate 95ft. in 47 seconds?—Querist.

[601.]—THE STAINING OF STONE BY CEMENT.—Having been much vexed by finding some beautiful blue sandstone steps stained by the contact of cement both in the beds and joints, and also where tiles had been laid touching them, I should be glad to know the cause, and means of avoiding such for the future, and the method of removing the stains already made, which extend some inches along the surface of the steps.—J. S.

[602.]—COMMISSION FOR SPECIAL MATERIALS.—Can an architect claim his commission on the cost of special materials or apparatus (say a system of warming and ventilation) he may with the consent of the building committee have introduced in a building, that may not, when in use, carry out the expectations formed of it, provided, that before introducing it, he made inquiry and obtained numerous testimonials as to its use and efficiency in other similar buildings? As the committee in question refuse to pay, an answer to this will oblige.—A Young Architect.

[603.]—CHICHESTER CATHEDRAL.—I shall be obliged if you will inform me how it was that the spire of Chichester Cathedral fell down; was the stone placed bedway?—R. W.

[It is believed that the spire would have been preserved had care been taken by underpinning—a principle which has admirably succeeded in many cases in France. The stone was a shelly limestone from the Isle of Wight, nearly a pure carbonate of lime, but of a very light, porous, and absorbent character, the specific gravity of the stone being only 1·815. Mr. Thompsom some years ago made experiments as to the crushing weight of this stone, and found that, when laid in its bed, it crushed with a weight varying from 466lb. to 566lb. per square inch; but, when placed vertically to the bed, it sustained a weight of 860lb. to 1,070lb. per square inch before it crushed. In the first instance the stone crumbled into powder, but when placed vertically it split diagonally. Mr. Thompson thus accounted for the increased strength of the stone, when placed vertically:—The layers of shells formed long, flat, and thin arches on its bed; but when reversed the layers became either laminated columns or narrow lancet arches. We believe the piers were only cased with the stone laid in its bed, and the interior was found to be a mass of rubble stone, filled in with mortar in large lumps, some of it in a crumbling state. Hence the catastrophe. We need hardly say how many lessons it taught architects and builders. The stone was placed bedway, but in the very weakest way.]

[604.]—WARMING ROOMS.—Can you inform me whether there is any other way by which a room may be warmed, besides the iron piping usually used. We have a stove rather more than half down the room (rather a long one), and the smoke is conveyed back again to the chimney by the iron piping. I would like to know whether there is anything more durable and cheaper than the piping.—Pinto.

[605.]—AN ARCHITECTS' CLUB.—Could not a kind of club or institute be formed among the architects' assistants and pupils, where they could meet for mutual improvement and instruction? Architects themselves have an institute and association, and I do not see why one cannot be formed among their staff. It would have to be formed in such a way that the pupil who has no salary might become a member as well as the head draughtsman in an office. If it succeeded (as I feel sure it would), a kind of museum might be formed consisting of all building appliances, and the different modes of construction. A company might be formed similar to that of the Institute. I think we (the assistants and pupils) ought to make a move and try what we can do; it is for our own benefit, and if we help ourselves others will help us. I would suggest that a committee be formed at once, and if you, sir, will allow those willing to form that committee to address themselves to you, and then announce them, we might get in a good working condition. I do not think the subscription should be more than 5s. a year, as it would then place it within the reach of all. As Crosby Hall, Bishopsgate-street, is now advertised to let, we might secure it.—Alpha.

[Does not the Architectural Association at 9, Conduit-street, answer the contemplated purpose? And why form another museum, when South Kensington Museum contains so many valuable facilities for young architects?]

[606.]—STAINING OAK.—Can any of your readers inform me of a liquid that will stain oak dark, almost black, to match some very old panels?—A Joiner.

[607.]—GUM, &c.—Can any kind reader inform me how the gum, used on postage stamps and envelopes, is made, as I require the use of a gum similar in effect? Can any reader also oblige with a description of Delcommanie.—Woolwich.

REPLIES.

[574.]—THE "LIMNER."—In answer to "E. W.," I may say that the price is two shillings for the "Limner," and another two shillings for the stand and wires to complete the instrument. The stand and wires are used for still-life pictures, landscapes, &c. They are very roughly made; at least, mine are.—Woolwich.

[586.]—ARCS OF DIFFERENT RADII.—As the elastic curve can only rudely approximate to a circular arc (and that only when of slight curvature, and made by a rod well tapered to the ends, like an archer's bow), "F. Hope's" elaborate use of trigonometrical tables (to minutes and seconds!) is a perfectly useless refinement. The question can only be understood as applying to the relation between the depth of curve z, and the radius of a circular arc that might have the same chord and depth. The two curves can only be confounded when z is so small that the difference between $a\ b$ and $x\ y$ would be inappreciable; and the practical rule is then simply this—As twice the radius is to half $a\ b$ or $x\ y$, so is the said half-length to z. Or if z is given to find the radius, as z is to a quarter xy, so is half xy to the radius. See Euclid III. 31, and VI. 8.—E. L. G.

[588.]—BOX GIRDERS.]—I am much obliged to "F. Hope" for kindly answering my question on box girders. I had worked out the girder, but by a different formula from that which "F. Hope" employs, and did not make the sectional area come to quite so much. The formula I used is as follows:—Let W = breaking weight in centre in tons, C = a constant for wrought iron, A = sectional area, D = depth of girder in inches, L = span, also in inches. Then we have the equation $W = \frac{CAD}{L}$ from which we deduce the following equation, $A = \frac{WL}{CD}$. In this case W will = 100 tons breaking weight in centre, L = span, 156in., C = 75, being a constant for wrought iron, D = depth 12in., $A = \frac{100 \times 156}{75 \times 12} = 14$ square inches sectional area.

In the sectional area thus arrived at and the sectional area "F. Hope" obtains (which he calls effective) there is only a difference of 2·24 square inches, but then he adds 3·00 square inches for rivets, and this is what I do not quite understand.

You, in article No 4 on Plate Girders, given in the Building News of June 21, obtain your sectional area by the same formula as that which "F. Hope" employs, but you do not add for rivets.

It is only in the building up of the girder that you make any difference for rivets, and then you make the plates of such a thickness as to give sufficient sectional area in order that you may deduct the strength lost by the use of rivets, and still be able to leave the sectional area after such deduction as nearly as possible equal to that which you had obtained by the formula. If "F. Hope," or any of your correspondents, could answer my queries I should feel obliged, and also if they could point out any errors (if any) in the formula I have used, which is that given in your journal of January 22, 1858.—E. E. C.

[591.]—WATER COLOURS.—In reply to "Seeker," he can make coloured drawings look like oil paintings by the following method:—1 oz. of Canada balsam and 2 oz. of spirits of turpentine. Mix. Before the composition is applied the drawing should be sized with a solution of isinglass; wash, and, when dry, apply with a camel hair or sable brush. "Seeker" had better try it on a small drawing first to see if it will answer his purpose.—Woolwich.

[594.]—POULTRY FARM.—In reply to "Rooster," I would advise him to see the one at Bromley, Kent, the property of a company, whose manager, Mr. Geo. Kennedy Geyelin, has published a work entitled, "Poultry Breeding in a Commercial Point of View;" which may be had through any stationer for 2s. 6d.—E. H.

[595.]—AQUARIUM.—Every one ought to know, in his national weights and measures, the average pressure of the atmosphere, and what depth of water it takes to equal that pressure—33 English feet to press 15 of our lbs. per square inch. At 8ft. deep, therefore, we have not 3¾lb. per square inch, nor at the plates' centre of pressure—a third of their height—quite 2¼lb. Load a strip of your glass, above 6ft. long, with 2¼lb. per square inch, and separate the bearings till it breaks, and you will learn the necessary proximity of mullions at the weakest horizontal line, 2ft. 8in. from the bottom, whether they may be 6, 4, 3, or only 2ft. apart. But whatever their number, as several adjoining panes, when separate, require to be about half as thick again as if they were all one piece, to resist the same pressure, the constructor will certainly save quantity of glass (if not cost) by having the plates 12ft. by 8ft., and strengthening their lower half by some external tracery, crowded most at the height of 2ft. 8in., while only the bars dividing the plates need rise to their top. Two or three external transoms, at intervals increasing upwards, would be the simplest treatment.—E. L. G.

WAGES MOVEMENT.

The building trade strike at Barnsley, which commenced on May 1 last, and has, therefore, lasted for five months, has at length come to an end, the masters and men having met and mutually agreed upon the terms of compromise.

Trade is slackening in Dundee, and the wages of masons are being reduced in that town. Some employers are paying off hands by the score.

STAINED GLASS.

A stained glass window, in memory of Mr. Richard Freeman, a builder who executed a great deal of the work lately carried on there, has been placed in Ely Cathedral. The subject represented in the window is the purchase of the Cave of Machpelah.

W. Holland, of Warwick, has recently designed and executed in St. Giles's Church, Willenhall, Staffordshire, two armorial windows containing the arms of the Duke of Sutherland, the Earl of Lichfield, — Giffard, Esq., and the Rev. C. Lane, with grisaille groundwork. The north transept window is filled in with arms of Richard Wilkes, Esq., M.D., with wreaths and motto in tracery, an angel bearing a scroll and inscription at foot. The north side chancel window contains the subject of Christ Blessing Little Children, with ornamental groundwork, and an angel in tracery bearing the arms of the vicar.

Aston Old Church, Birmingham.—Mr. Holland has just executed for this church a memorial window containing subjects of Our Saviour Visiting the Sick, and Our Saviour Healing all Diseases, under rich canopies, with angel in tracery.

Haseley Church, near Warwick.—The chancel of this church has recently been partly restored and enlarged by rebuilding up the east wall. Mr. Kibler, of Wellesbourne, was the contractor, and the new stonework has been filled in with stained glass, executed by Mr. Holland, in memory of the late rector, containing three openings, and a subject in medallions in each, of the Annunciation, Nativity, and Crucifixion, angels and ornament filling up the other portions of the work. New commandment tablets have been placed on either side.

Nidd Church, near Harrogate.—This church has been rebuilt, and will be opened on the 15th inst. The stained glass has been executed by W. Holland, consisting of east window, containing three openings, two medallions in each, containing the Angel Appearing to the Shepherds, the Nativity, Christ Disputing with the Doctors, the Baptism, Crucifixion, and Ascension, upon rich groundwork of the vine and passion flower; and in tracery, the lamb, pelican, &c., with rich ornaments. The west window is composed of geometrical grisaille glass with emblems of the Evangelists.

STATUES, MEMORIALS, ETC.

A memorial of the late Lord Feversham is to be erected in the market-place of Helmsley. The memorial will take the form of a cross, from designs by Messrs. Banks and Barry, of Westminster. About £600 has been subscribed towards the necessary expenditure.

On the proposition of the Prefect of the Tarn, the Council-General of that department has decided that a statue shall be erected at Castres to the memory of Marshal Soult, and has voted a sum of 12,000f. towards its execution.

The long talked of monument to the famous navigator, Captain Cook, who perished at Kealakekua Bay, is about being erected. The plan has been drawn, the contract signed, and Mr. Holland is on his way to Hawaii to execute the work.

The statue of Andrew Marvell, at the Hull Town Hall, presented to the town by Mr. Councillor Winship, has been placed on its pedestal, at the head of the staircase, in the new Town Hall, and is now the most attractive ornament in the building.

A "Smith O'Brien Memorial Committee" have addressed a letter to the Dublin corporation, asking for permission to erect a statue in marble, which has been executed by Mr. Thomas Farrell, on a site in the city, and suggesting that a spot on the south side of Carlisle Bridge, corresponding with that on the north already allotted for the statue to Daniel O'Connell, would be the most appropriate. The corporation take time to consider the matter.

On Friday a bronze statue of the late Prince Consort was placed on a pedestal of rude mason work, consisting of huge blocks of granite, about 50 yards west from the obelisk erected by the tenantry, and a quarter of a mile east from Balmoral. The statue, which is by Theed, is a striking likeness of the lamented Prince, and as a work of art is thought to possess great merit. He is represented with the right hand on the head of a large shaggy staghound by his side, with a rifle in the left, and with the face towards Balmoral.

LEGAL INTELLIGENCE.

A Case under the Building Act.—On Wednesday last, Mr. Jarvis, district surveyor of Camberwell, took out two summonses against a Mr. John Barrington, the proprietor and builder of a "circus," erected at Peckham. The one summons was for not having given him the two days notice required previous to commencing the work; the other for having the enclosure of wood and the roof of canvas. It was urged by the defendant that as the erection complained of was simply a large gallery for 1,600 people, lined at the back with wood, and sheltered at the top by a covering of canvas, it was no more than a large booth, and, therefore, he considered it was exempt from the operation of the Building Act. After having heard the case, the magistrate decided that the circus was a building, and fined the defendant £10 penalty, remarking that if the defendant was dissatisfied he could appeal to a superior court. No order was made upon the summons for irregular construction, as it was ascertained by the surveyor that the defendant had made application to the Metropolitan Board for their approval of the plan and construction of the building, and that they would consider it on Friday next.

General Items.

The *Saturday Review*, a week or two since, had an article on Bristol Cathedral, in which Mr. E. W. Godwin was pulled over the coals for his letter on the subject in the Building News. "Of Mr. E. W. Godwin's capacities as an architect," says the reviewer, "we know nothing, but he is well known as a careful and well-informed local antiquary." It so happens that on several occasions the *Saturday Review* has spoken well of some of Mr. Godwin's works. It did so in 1861, when speaking of the Northampton Town Hall; and in 1863 it stated that it was an example which might advantageously be followed. In 1865 it noticed, in an equally favourable spirit, Mr. Godwin's Congleton Town Hall, and it has on several other occasions spoken of the same architect. The forgetfulness or the ignorance of the reviewer on a recent occasion is, therefore, a little surprising. The same writer says that Mr. Godwin attacked Mr. Street with "merciless bitterness." This is not true; but even if it were so, when the *Saturday Review* condemns such a style of writing, it reminds one of Satan rebuking Sin.

We have to notice this week the death of Mr. H. M. Wood, architect, of Nottingham, at the age of 82 years. The greater portion of his life was spent in the town as a trade surveyor. Mr. M. O. Tarbottom succeeded him in that office.

The Highways Committee of the parish of St. Mary, Islington, after fully considering the respective testimonials of about 40 candidates for the appointment of an extra assistant highway surveyor, have recommended to the vestry Mr. John A. Clements, C.E., which appointment the vestry in full approved of last Friday evening, the 4th inst. The parish is divided into two districts, the Upper-street and the Holloway-road forming the division, Mr. Cormack, the present assistant, taking the eastern, and Mr. Clements the western. Mr. George Pratt is the chief surveyor.

A correspondent in *Notes and Queries* gives a list of the following churches in which leaden fonts are to be found:—Brundall, near Norwich; Long Whellington and Clewer, Berks; Wareham, Dorset; Brookland, Kent; Great Plumstead, Norfolk; Pitcombe, Somerset; Climbridge and Siston, Gloucestershire; Clifton, near Dorchester; Walton-on-the-Hill, Surrey; and Barnetby-le Wold, Lincoln. That at Brundall has figures outside, and is painted over in imitation of oak. One would have supposed that a stone colour would have suggested itself as more appropriate. That at Barnetby-le-Wold is a circular leaden font of the Late Norman period, and was brought to light by the Rev. B. Street, who found it in an obscure corner of the church, where it had long been used for the purpose of containing lime washes, &c. It is adorned externally with three bands of scroll work cast in relief. Its height is 1ft. 7¾in., and its internal diameter a little more than 2ft. A list of fonts of other materials than stone is to be found in the "Handbook of English Ecclesiology" for 1847.

His Majesty the King of Italy, in order to signalize the formal opening of the Victor Emmanuel Gallery, which has been erected at Milan by an English company, has graciously conferred the order of St. Maurice and St. Lazarus on the undermentioned gentlemen:—Commanders—Mr. Albert Grant, M.P., Chairman of the city of Milan Improvements Company; and Mr. William Drake. Officers:—Colonel Neville, director; Signor M. Monteechi, director; Mr. M. Digby Wyatt, director; Mr. Alfred Lowe, representative of Mr. A. Grant, M.P., at the inauguration of the gallery, has received the grade of Chevalier.

On Tuesday morning, about twelve o'clock, a frightful accident (similar to the late Blackfriars-bridge accident) occurred at Messrs. Fabricotti's Carrara marble wharf, Grosvenor-wharf, Pimlico, which, unfortunately, has resulted in the death of two men, and serious injury to another. It appeared that James Lambert, James Bright, and another, were at work on a traveller shifting a block of marble of an immense weight, when the framework suddenly gave way, and the ponderous traveller, with the unfortunate men, were precipitated to the ground, a depth of about 28ft., Bright and Lambert falling beneath the *debris*.

Some mural paintings have been discovered in St. Thomas' Church, Salisbury. The part of the church where the paintings have been discovered was built in the reign of Edward IV.

A great effort is being made in Ireland to preserve the Dublin Exhibition Palace building for the benefit of the public. The latest proposal is that it be purchased by the Government, or, at least, that a grant be given for the purpose of establishing in the building a museum such as that at South Kensington, where the best specimens of art manufacture may be exhibited at the Imperial expense.

A new town hall and two public parks have been opened at Leeds.

The Coventry Exhibition will close on the 21st inst., when the prizes will be distributed. The exhibition has been most successful, and has been visited by nearly 100,000 persons. It was opened on the 19th of June last.

Mr. John Piggot, in the *East Anglian*, draws the attention of church architects to the fact that the tower of All Saints' Church, Malden, Essex, is triangular; he asks if it is unique, and whether any other examples of triangular towers now destroyed are known to have existed formerly.

A terrible calamity has befallen the village of Lozzo, in the Alps of the Tyrol. A week back a fire broke out in the main street of that town, and the houses, built of wood, lent fuel to the flames. In the space of three hours the greater part of the village was reduced to ruins—the parish church and bell-tower, and the communal hall being among the buildings burnt down. An elderly couple and a young woman fell victims to the fire. A hundred and sixty houses have been destroyed, and 130 families deprived of the means of shelter. The loss of property is estimated at 1,500,000f.

The coining of guineas has certainly not ceased in this country. Since the wearing of them as ornaments has become fashionable, thousands have sprung into existence. In passing a jeweller's shop in the city of London two or three days since, we counted about two dozen guineas, all of which were stated to be in "a good state of preservation." And so they were, as they all appeared as if they were coined the day before. If there be a demand for flint hatchets some "Jack Flint" manufactures them after the ancient stamp, and sells them to credulous purchasers. If guineas are wanted, there is an unlimited supply at the rate of £1 8s. 6d. each, or half-guineas at 15s. each. Query, is it lawful to mint guineas to sell as ornaments.

It was stated on Saturday last, at a meeting of the central committee for the erection of a statue to Mr. Peabody, that more than £3,000 was subscribed. It was decided by the unanimous vote of the meeting to entrust the work to Mr. Story, the American sculptor. Mr. Peabody will give sittings in Rome, and it is hoped that the statue, which is to be made of bronze, may be ready within eighteen months. The Corporation have been memorialized to grant a site near the Royal Exchange.

It appears that Irishmen are determined to rely more and more on the Government. Almost simultaneously with the demand for the purchase of the railways of Ireland comes a desire that the Government should buy the Winter Palace, Dublin, which has proved a financial failure. The Directors of the Palace ask the Government to purchase their building and gardens for the purpose of concentrating there a variety of public institutions and objects—a permanent exhibition of the manufactures of Ireland and her raw materials, a permanent exhibition of agricultural and horticultural implements, and a museum of "practical education." They also suggest that the building for the Queen's University might be erected on the same site, and all the scientific institutions, exhibitions, and collections brought into proximity with it. The Duke of Leinster is chairman of the committee by whom this project is preferred, and Lord Talbot de Malahide, Sir Benjamin Lee Guinness, M.P., and Mr. Jonathan Pim, M.P., support it.

A short time ago a farmer, in removing a fence upon the lands of Drumlohan, county of Waterford, came upon an artificially constructed chamber. The earth was removed from the top and interior of the cave, when a number of Ogham monuments were revealed, in fine preservation. The chamber is constructed of upright pillar stones, filled between with rubble masonry, and the roof is formed of lintels of stone. Upon these pillars and lintels the inscriptions are found, some of the stones having as many as three lines of characters.

We have received a long letter from Mr. J. C. Timmins, of 50, Albany-street, Regent's-park, and also a copy of a letter which Mr. Timmins addressed to the *Builder*, complaining of misstatements which had been made in that journal in reference to the employment of a surveyor to estimate the quantities for Hertford Union Workhouse. This letter was not inserted. We, also, must decline to insert it, as we are not responsible for the misstatements. To all appearances, Mr. Timmins has met with unjust treatment, and has a good cause of complaint. We can only say, that had this journal in any way misrepresented him, we should have embraced the first opportunity to undo any wrong we had unintentionally done him.

Sir Thomas Winnington, writing in *Notes and Queries*, mentions that in St. Patrick's Cathedral, Dublin, and in the new collegiate Church of St. Michael, Tenbury, are wells of pure cold water. Another correspondent mentions that a similar well is to be found under one of the central pillars in Carlisle Cathedral, but that he has heard that the present Dean "has had it covered over, for fear of it or the water affecting the music."

Land and Water gives the following instructions on how to send flowers by post:—Get a tin canister (those used for mustard by the dealers will do nicely), then cut the bottom off, for it must be open at both ends. Tie your flowers firmly together, and place a layer of damp moss all round them; put them in the body of the canister, let them be firmly fixed in by means of the moss, and they will travel very nicely. They can be sent by post this way if you get a case or canister made with two removable ends, and have a small cylinder fixed in one of them to hold the stem of the bouquet. Cover the canister with paper, seal, address, and post it.

A correspondent of the *Manchester Guardian* pertinently asks what has been done by the Manchester municipal authorities to prevent or provide in any measure against the recurrence of another flood, such as occurred last year, which caused so much loss of property and suffering to thousands living in Lower Broughton, parts of Salford and Manchester? The only answer to repeated enquiries is that the Corporation of Manchester and Salford are waiting for some gentleman's report upon the subject. There is surely engineering skill in this country to devise a practicable and efficient plan to prevent the recurrence of such disastrous inundations. The expense to be incurred is only a secondary question. If the municipal authorities of Manchester are justified in offering large premiums to architects for the best designs for a new town hall, to complete which over £250,000 of public money will be spent, it is also within their province to call for plans, &c., for the best scheme to prevent the rivers Irwell, Medlock, and Irk from overflowing their banks, and spending, say, as much money as a town hall is to cost. He suggests the formation of an association with the view of bringing the matter more immediately before the notice of the Corporation, and taking such further steps as may be deemed necessary.

The *Deseret News* has an account of the dedication of a Mormon meeting house in one of the towns of Utah. The proceedings were under the auspices of Brigham Young, but the "dedicatory prayer" was delivered by Elder Taylor. This prayer was a very remarkable production. It began at the base of the building and went to the top of the steeple, mentioning every item between these points, and calling for blessings upon each separately:—"Bless, we pray Thee, the house, in all its parts, that is built or rests upon this ground; bless the foundation stones thereof, and all of the stone wall that composes the foundation; together with the lime, the sand, and clay of which the mortar is composed that bind it together; bless also the columns, and their bases and caps, that are placed in the foundation, or basement, to support the building. Bless also the beams, the joists, the columns, the flooring, the lintels, and all the woodwork pertaining thereto; including the beams and binders that compose or sustain the tower. Bless also the plates, the raiters, and beams that sustain the roof, and all the ties and fastenings thereof; together with the sheeting and the shingles; the tin, zinc, or other material used upon the roof or tower: the ball and vane that rests upon the top of the tower; the bell and its fastenings, and everything pertaining thereto. Bless also the door frames and their casings, and the doors thereof, together with the hinges, locks, and fastenings. We ask Thee also to bless the windows, and their frames and casings; and the sash, the glass, and the putty wherewith they are fastened." These are only about half the things specified by Elder Taylor.

A correspondent of the *Hampshire Advertiser* states that in the recent removal of one of the screens of the chancel arches of the Abbey Church of Romsey, two stone lamps of curious form were discovered, which have given rise to much speculation as to their origin and use. That they are of very ancient date is certain, inasmuch as the rubble-work in which they are imbedded was built against some of the original and very earliest painting upon the stonework of the piers, still visible on the first arch of the south side. One of the lamps resembles a rather large brick, 10in. long, 5in. wide, and 4½in. deep, with a thick handle like half a ring on one edge. In the upper side are two round cavities, 3½in. in width and 2in. in depth, and at the bottom of each is a small hole big enough to insert one's thumb. The other is more elegant, and consists of four such cylindrical cavities arranged not in a square but a lozenge form, and the exterior so cut as to conform to the outline of the sockets. In all these cup-like indentations are fragments of charred wicks, and a carbonized substance that burns with a brilliant flame, evidently tallow 700 years old.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

452. H. Y. D. SCOTT. Improvements in Constructing the Floors and Roofs of Houses and other Buildings. Dated February 19, 1867.

The object of this invention is to construct fireproof floors and roofs of houses and other buildings in concrete in a more economical manner than has heretofore been accomplished. The patentee proposes to dispense with the use of the ordinary joists, and to make use of wrought iron tie rods extending from wall to wall (or, when the space to be covered is of large extent or span, from girder to girder) placed at intervals of ten or twenty feet apart to assist in carrying the weight of the concrete, the thickness of which will increase with the increase in width of the span to be covered. These girders will form part of the main supports of the floor for large spans, while the tie rods will hold together the mass of concrete between the girders. *Patent completed.*

459. R. MORELAND, Jun. Improvements in the Construction of Floors for Buildings. Dated February 20, 1867.

For the purposes of this invention a number of curved or bow and string wrought-iron lattice girder joists are laid at distances apart upon wrought-iron girders, supported upon the walls of the building, or otherwise. A number of laths of wood or other material are then laid on the upper or curved surface of the lattice joists, passing from joist to joist. These laths are not laid close together, but with spaces between them of about one-half the thickness of the laths; concrete or brickwork, or other material, is then laid on these laths, and brought to a flat surface, and the floor joists are then laid on or embedded in the concrete, and then boarded in the usual way. The ceiling joists are secured to the lower or horizontal bars of the lattice joists, and the laths secured and plastered in the usual way. The lattice joists are conveniently constructed as follows:—A bar of angle iron of the required length is bent to the curve of the top of the joist, and is rivetted at its end to two straight angle irons; vertical bars are rivetted at intervals to connect the curved and the straight angle irons. A bar or bars of flat iron is or are employed to connect diagonally the several vertical bars. The formation of the girders may be varied by rivetting a curved piece of angle iron on either side of an ordinary joist or girder. The advantages secured by this construction are the air space between the ceiling and the underside of the concrete, whereby the floor is rendered more impervious to sound, and the retention of air in the space hinders fire from rapidly penetrating the construction. The lattice joists form a permanent centreing to the arches above them, and the arches have no thrust while they are supported. *Patent abandoned.*

618. E. WELLS and W. PRYOR. Improvements in Rising or Adjustable Brackets for Supporting Shelves. Dated March 5, 1867.

This invention consists in making the said brackets in the manner hereinafter described, whereby the bracket arm is made to fix itself at the angle to which it has been raised, and, when required, the said bracket arm can be raised or lowered into any of the angles contained in a semicircle. For constructing rising or adjustable brackets according to this invention, the inventors make the jointed end of the bracket arm of a circular form, and they make on the periphery or edge of the said jointed end a series of ratchet teeth. At the top of the knuckle plate a stationary portion of the bracket a small plate or click is jointed, the said pall or click being so arranged that, when in its normal position, its lower end drops into or engages with ratchet teeth on the jointed end of the bracket arm, and fixes the said arm. On lifting the arm, the pall or click works over the said teeth without obstructing the motion of the arm, but in loosing the said arm the pall or click drops into the ratchet teeth brought under it, and thus fixes the bracket arm. When it is wished to lower the bracket arm, the projecting end of the pall or click is passed so as to liberate its lower end from the ratchet teeth. Having adjusted the bracket arm, the pall or click is permitted to re-engage with the ratchet teeth, and fix the bracket arm in its adjusted position by raising the bracket arm or pressing the pall or click from the ratchet teeth, the bracket arm can be raised or depressed respectively into a vertical or nearly vertical plane, or into any angle between these positions. By this means the bracket arm offers no obstruction to the cleaning or arranging of the window in which the brackets are fixed. *Patent abandoned.*

553. T. HYATT. An Improved Mode or Manner of Securing Door and other Knobs to their Spindles. Dated February 28, 1867.

This invention consists in providing a metal collar which, instead of being circular in shape, is square-shaped, and which, therefore, fits the square-shaped spindle upon which it slides with such exactness that it cannot be turned round. Attached to the said collar is a circular neck, which, when the spindle is properly adjusted, is caused to go over the neck of the adjustable knob employed, and a pin or screw being passed through both, the knob is securely attached to its spindle. *Patent abandoned.*

Trade News.

TENDERS.

Brighton.—For erecting a public-house at North-road, Brighton. Messrs. Goulty and Gibbins, architects:—Hall, £667; Lockyer (accepted), £567.

Bagshot (Surrey.)—For residence for the Rev. J. C Lacera. Messrs. Walford and Donkin, architects:—Robert (accepted), £1,580.

Colney Hatch.—For erecting a new school at Cromwell-road, for the Rev. Robert Morris. Messrs. E. Habershon Brock, and Webb, architects:—Woodhall (accepted), £531

Denmark Hill.—For rebuilding two houses and shops Mr. Rawlings, architect:—McLacklan, £2,722; Cooper and Cullum, £2,448; Taylor, £2,193.

East Sheen (Surrey.)—For a villa residence for Mr. F Walford. Messrs. Lee Brothers and Pain, architects:—Adamson and Sons, £1,915; Aviss and Sons, £1,897; Bowling, £1,866.

London.—For gas fittings at St. Matthew's Church New Kent-road. Mr. Henry Jarvis, architect:—Bassingham, £190; Lawson, £186 14s.; Comyn, Ching, and Co. £179; Stevens and Son, £173 15s.; South, £156; Biggs £153 10s.

London.—For rebuilding No. 79, Cheapside. Mr. J. T Marsh, architect:—Beeton, £1,636; Ashby and Horner £1,556; Kiddle, £1,550; King and Sons, £1,497; Brass £1,470; Wood and Munn, £1,468; Saunders, £1,454; Hershaw, £1,425.

London.—For a pair of villa residences in Hornsey-lane Messrs Lander and Beddells, architects. Quantities supplied:—Carter and Sons, £2,277; Manley and Rogers £2,235; Axford, £2,204; Williams and Son, £2,193; Mann £2,100; Hawks, £2,080; Sale, £1,960; Grover, £1,925.

Muswell Hill.—For a pair of villa residences. Messrs Lander and Beddells, architects. Quantities supplied:—Read and Son, £2,098; Lemon, £2,045; Manley and Rogers, £1,988; Axford, £1,976; Williams and Son, £1,970 Outhwaite, £1,895; Earle, £1,835; Palmer, £1,817; Mann £1,745; Grover, £1,737; Sale, £1,540.

Newcastle-on-Tyne.—Messrs. Austin and Johnson say—Please allow us to draw your attention to two errors in the statement of tenders for the Abbot Memorial Orphanage:—1. "Albert" is printed instead of "Abbot." 2. Lowes tender (W. Scott's) is £4,030, not £3,030.

Portsmouth.—For constructing, erecting, completing and setting to work two steam engines, with boiler pumps, and all other apparatus requisite for the purpose of lifting sewage at the proposed works at Eastney, for the Plymouth Local Government Board. Mr. J. T Greatorex, C.E., engineer:—Simpson and Co., London £6,757; G. Wailes and Co., Stroud, £5,830; R. Morelan and Son, London, £5,600; Hamilton, Woods, and Co Manchester, £5,000; A. Grant, Landport, £4,556 (Easton and Amos would make the most complicated portions of the machinery); Burrell, Rotheror, and Co., London £4,492; Routledge and Ommaney, Manchester, £4,150 Middleton and Co., Southwark, £3,850; Watt and Co London, £3,850; Smyth and Co., Dover, £3,760; Silvester and Hopkins, Newcastle-under-Lyne, £3,750; T. Horn Westminster, £3,500; Claridge, North, and Co., Bilston £3,230; Onnerod, Brierson, and Co., Manchester, £3,140 Grinson and Co., Leicester, £3,095; Coupe, Wigan, £2,940 J. Clayton, Preston (accepted), £2,823; The Abbey-street Millwright Company, Leeds, £2,440; Jackson and Watkins, London, £2,400.

Sussex.—For erecting a villa residence, Keynes, Sussex for Mr. W. J. Smith. Messrs. Goulty and Gibbins, architects:—Hall, £1,165; Lockyer, £1,048 10s.; Simmis and Marten, £996 12s. 6d.; Nightingale (accepted), £973.

Swinton (Lancashire).—For church, Swinton, near Manchester. Mr. G. E. Street, architect:—

	Church.	Upper part of Tower.	Total.
Higham	£17,417	£3,350 0 0	£20,767 0
Ellis & Hinchliffe	16,705	2,615 10 0	19,321 15
Southern	16,250	2,710 0 0	18,960 0
Clay	15,995	2,629 0 0	18,624 0
Neill and Sons	15,077	2,700 0 0	17,777 0
Bowden, Edwards, and Co.	13,430	2,510 0 0	15,940 0
Horsman	13,086	2,568 6 6	15,654 6

Tunstall.—For making roads, paths, draining, and laying out ground for the new cemetery at Tunstall Mr Ralph Dain, Burslem, architect:—Frayne, Birmingham £802 3s. 8d.; Smith, Newcastle (accepted), £943; Pierce Hanley, £1,227 9s. 1½d.; Miller, Milton, £1,242 12s. 8d. Lee, Stafford, £1,533.

BATH STONE OF BEST QUALITY.

Randell and Saunders, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots also Cost for Transit to any part of the United Kingdom furnished on application to Bath Stone Office, Corsham Wilts.—[Advt.]

THE BUILDING NEWS.

LONDON, FRIDAY, OCTOBER 18, 1867.

BRITISH INSTITUTION.

THERE are few persons, who are lovers of the fine arts, that are not sorry that there seems every probability of the British Institution dying out. That it required some alteration and amendment, so as to keep pace with the times, few will deny, but even as it has been in past years its loss will be much felt. In these days of impatience of real study, which is exhibited in so much that is connected with art, music and kindred subjects, we shall be sorry that so prevailing an opportunity of seeing the masterpieces of ancient painting, and of studying the more schooled and disciplined labours of those who have gone before us, should be lost to our students and amateurs. There never was a time when it was more necessary to the progress of fine art, to study attentively the best works of times gone by. Nothing is so likely to correct the license and refusal of all control which is seriously threatening our future advancement in every healthy sense of the word. From this it will be seen that we consider the real value of this Institution of late years consisted in its exhibition of the paintings of the old masters. Since the Royal Academy has advanced to its present importance, there can be no particular advantage in holding a similar exhibition upon a scale so small as to bear no comparison with its more successful rival. What we want is to enlarge the scope of the Institution. The addition of engravings and etchings would be of immense value and interest, as Mr. C. S. Robinson has suggested; and better still would be his exhibition of original drawings. The taste for which he complains has been of late years going out of fashion, though, upon rather questionable grounds. It is seldom that a collection, such as was formed by Mr. Woodburn, realizes its full value. There were too many drawings to come into the market at the same time, and besides there was a very considerable proportion of undesirable drawings, either being copies or poor specimens: occasionally, similar collections of the most popular description fail for the same reason. However this may be, an annual exhibition of fine specimens of the drawings of the deceased masters would do more than anything to revive and keep alive the interest of the public in these most useful works—by which we read so much of the history of the way the great painters reached their pre-eminence. It appears that there has been a private exhibition of such things among the members of the Burlington Arts Club; but, necessarily, only a few privileged persons could see them, and then they had not the advantage of comparing them with the paintings by the same hands. Mr. Robinson suggests that a junction should take place between this society and the British Institution, and that jointly they should hire or buy some building, either the old rooms at Pall Mall, where they could build additional rooms for the enlarged exhibition, or some other convenient building, which could probably be done, if the two societies can see their way to amalgamation. There is no doubt that if the thing can be done, the public will be great gainers, and one would think that the new blood and fresh interests would help to enliven the older society. We should be very sorry to hear of the removal of the Institution from London, as was suggested by Mr. Waring, but wisely, as we think, declined by the committee. If such an institute cannot be kept up in London there is little hope for its permanence in any other place; and, after all, in no other place is it likely to be visited by so many who will really profit by the lessons to be derived from it. We doubt the advantage of mixing up other art subjects, except perhaps sculpture and illuminated MSS, it would vastly increase the expenses, if anything like a loan collection of articles of *vertu* were added to that of the paintings and drawings. There is every reason to fear in such a case that the exhibition would interfere seriously with the loan collection at South Kensington. There is scarcely room for two collections of this kind in London. One would be sure to suffer. Probably, in point of number of visitors, the South Kensington collection, though it is most likely that it might command the better specimens. If, without making the aims of the united society too heterogeneous, their amalgamation could be accomplished, we have little doubt that the result would be successful. We doubt, too, if any harm would be done by the governing body becoming a little less exclusively aristocratic. Art collecting is now much more common than it was when the original society was founded, and if the revived Institution is to hope for permanence, it should, by its members, properly represent the art-collecting body in its altered state. To do this the number of members must, one would think, be considerably increased. The united societies must, in fact, appeal to the public.

As a comprehensive art institution, taking in a large proportion of the wealthier lovers of art, it could scarcely fail of success. It is very difficult to believe that the metropolis is unable to support so valuable and so interesting an object. The interest that is taken in the matter is shown by the continued correspondence upon the subject, and the many valuable suggestions which the discussion has produced. The only danger of enlarging the extent of the societies would be in the lowering of its aims—but this is by no means a necessary consequence. Unless the acknowledged connoisseurs and wealthy collectors desert the societies altogether, the admixture of a new element will be advantageous. The main difficulty will be in providing funds for the erection or procuring of a building of sufficient size, and in a fitting place for the exhibition of such collections as the joint societies can put together. There is no doubt that this will be a matter of some difficulty. Neither the Burlington Fine Art Club nor the British Institution are at present over-rich. The former is quite small, and the funds at the disposal of the latter are said to be low, so that extension seems the only possible solution of the difficulty, and we do not despair that under proper and energetic management such extension will be accomplished. Anything short of the entire collapse which is threatened would be considerable gain; and we will not believe that there is so little energy in those who are the leaders in such matters that they will allow this Institution, which is of such immense advantage to art, and which has always afforded so much pleasure to all art lovers, to die away without leaving no stone unturned to prevent so disastrous a conclusion.

Everything that so accomplished an artist and so clever a man as Mr. George Scharf says or writes is well worth considering; but we should far prefer continuing the Exhibition of Old Masters as a private undertaking to making it, as he recommends, a new department of the National Gallery. Although the New National Gallery will be immensely larger than the present, we do not imagine that it would be at all wise to devote any part of it to any but the national pictures. It will not be many years before all vacant space will be filled—we shall in the course of years be no better able to afford room for a loan collection of pictures by the old masters than we are now for the exhibition of the Royal Academy. Perhaps, however, we misunderstand Mr. Scharf's meaning. If he thinks that a mere loan collection of pictures, seldom if ever changed, and not opened at special times with a fresh selection, will be in any degree an equivalent to the exhibition of the old society, we do not agree with him. That such a permanent loan collection of masterpieces, if on a very limited scale, might be a good thing in its way, as connected with the national pictures, there is no doubt, but it would not supply the place of the British Institution. Some of those lower motives which he deprecates, such as the pride of possessors, and even to some extent their interest cannot safely be ignored, art never has lived, and most probably never will, upon its own merits alone. If we waited for collectors who amassed their art treasures simply for the love of art, without reference to fashion, personal glorification, or plain money value, there would be few collectors; nor can it be doubted for a moment that any art society which ignored all these natural things, disagreeable as they are to the generous minds, would have a short life. We are quite sure, also, that to be successful the exhibitions must be as heretofore periodical; when people know that they can go to a place when they will, a large proportion do not go at all. If a far more attractive collection of modern pictures than is now shown at the Royal Academy were open through the year, the number of visitors would be far less than at present. The exhibitions must be fresh each year, and only open for a limited period. Mr. Scharf's suggestion is well worth the consideration of the trustees of the National Gallery; but its adoption would not concern the other institution. We have no doubt that with an extended basis and more interesting—because more various—exhibitions, the renewed society might, if properly managed, still stand upon its own ground without connection with the State.

PAINTED DECORATIONS.—No. XI.

IN fulfilment of the promise with which I concluded my last article, I propose to cite a few cases of modern wall painting, valuable mainly as illustrations of what is *not* the duty of the painter. We have close at hand some very notable examples of the struggles of the nineteenth century in this particular branch of art. The Houses of Parliament contain a very sad record of how-not-to-do-it; the east end of All Saints' Church, Margaret-street, has a warning for us; the South Kensington Museum is amusing as usual; and our last new theatre is distinguishable from all other theatres by an attempt to reconcile the painter and the architect, in the persons of Mr. Albert Moore and Mr. C. J. Phipps—an attempt which, owing to causes I shall hereafter mention, has unfortunately been in vain. Of the Houses of Parliament, it is almost enough to say that as the artists employed were men who had passed their days in working primarily for a living, or, to use other words, in painting easel pictures, no sane person could expect that their wall decorations would be other than easel pictures magnified. That men like Messrs. Ward, Herbert, &c., should be suddenly changed by a Royal Commission was not in the nature of things. They had always painted pictures which were, so to speak, independent objects, isolated by their frames from everything on the earth—separate existences having nothing whatever to do with the building in which they might chance to hang—having no local habitation, and not even a name, except to the very limited world of the sale room. When men's lives are spent upon such narrow work, it is not surprising that their grasp of art should fail to be large and monumental; nor can we wonder that they should be blind to the inter-dependence of the arts, and thus fail to see that the primary object of all wall painting is not the exhibition of paintings—for that we go to the Royal Academy and Pall Mall—but the decoration of a wall and the addition of the glory of colour to the glory of architectural form. But, apart

from all this, the spaces devoted to the paintings are totally unfitted for such expensive decoration; gloomy recesses in gloomy corridors, with a gloomy climate, and gloomy costume bustling to and fro are scarcely the conditions required for the development of wall painting. The fact is the "Palace at Westminster," whoever designed it—Barry or Pugin, or both—is eminently unsuited, as is all panelled perpendicular architecture for high class painted decoration. Noble painting can only be suited to noble architecture. The architecture of the Westminster Palace, like the architecture from which it is copied, is anything but noble. The seeds of art estrangement were sown when architects began to interfere with what had been the province of the painter, and to substitute for the broad wall masses of earlier days narrow weak reiterations of mullioned and transomed panel. We see in the glass paintings how certain of the artists were not to be controlled, for though deprived of wall space they spread their pictures regardless of interruption by mullion or architectural framework all across the window. This contrariness met with its reward; yet, strange to say, the warning hand was not seen, and our leading Gothic revivalist literally revelled in the littlenesses of architecture, ignorant to the end of the largeness of his art, or, at any rate, incapable of grasping the wideness of its scope.

The east end of All Saints' Church, Margaret-street, is another instance of a union of the arts without affinity. Mr. Butterfield stands pretty much in the same relation with fourteenth century Gothic as the late Mr. Pugin did with fifteenth century. But the hardworking student, the good archæologist, the devout churchman, is not necessarily the artist. The architectural composition of the east wall above-mentioned was purposely designed to receive paintings. I wonder whether there would have been any difference if it had been designed to receive sculpture? Were the subjects of the paintings settled before these arcades were executed? If so, was it by the mutual consent of architect and painter? If not, to whom do we owe the awkward posing of the chief figure? Whoever is to blame for this it was certainly *not* the duty of the painter to adopt a system of colouring which makes the panels of the arcade look like dim recesses. The office of the painter is certainly not to exaggerate features in the architecture which by exaggeration would bear the appearance of false construction. I know that this sort of thing is done every day, but that is no justification; rather the contrary, considering the condition of art knowledge amongst us. But even had the scale of colour been much lighter than it is, and had all cavernous effect been avoided, the rounded and somewhat squat figures swathed in innumerable yards of Academy drapery, would still have been out of all harmony with the building. We had no style of our own: the artist had to seek or select one, and had he cared for the architect or the architecture, as one artist should care for another, he would have directed his attention neither to Giotto nor to Raffaelle, but to such MSS. as the Arundel Psalter, and that now so well known by its official title of 2 B VII.

At South Kensington Museum the artist's work is executed in mosaic by Salviati, Rust, Minton, and others. Of the mosaics, as works of inlay, I do not propose to say anything, nor of the choice of subject. Indeed, it is a question whether we have any right to regard them as wall decoration in any sense, for the first impression produced upon my mind was that the mosaics were part of the museum, and not decorations of the museum *building*. If they were to be taken merely as specimens of the work of different manufacturers fitted into the arcade of the building like so many specimens of paper hangings, then of course I should have nothing to say. But they go further; the artists who have undertaken to supply the cartoons have thus shown us what they would do, and how they would treat the figure, were they called on to decorate our walls with figures in mosaic; and although it would be manifestly unfair to treat these several works as one decoration, it is quite open to architects to judge how far their art would suffer, or how far it would be enhanced by union with the work of any one of the gentlemen here represented. In all we see a fond clinging to the model rather than to the colour. A gold background, beyond which conventionalism can no further go, is not enough to restrain the painter from aiming at a realism which is utterly destructive of his work as architectural decoration. Some, too, are not content with making the figure as realistic as possible, but must needs add accessories. Thus, in the Hogarth panel, we have the inevitable dog and a piece of furniture; with Phidias a distant view of the Parthenon; with M. Angelo a dome and some steps; with Raffaelle a scaffold and the cast-iron ribs of a railway station roof; and with Ghiberti a furnace and a few other tiny kickshaws. Giorgione, N. Pisano, and Cimabue are the best of the series; but the best of these, wherever it might be placed, would fail to unite itself with the architecture. Why? Because it is, so to speak, *cut out from the wall* by the over dexterous use of what is called chiaroscuro, and has all the appearance of a painted statue *in suspensura*. Whereas, if this was what was to be desired, the sculptor, not the painter, would have been the best servant. Before leaving the subject, I would ask how it is that Cimabue, who lived in the second half of the thirteenth century, is represented wearing the *cote-hardie* and the rest of the foppish costume of the middle of the fourteenth century? Fancy Sir Joshua Reynolds or Dr. Johnson in the height of the Parisian costume of 1867! This would be taking a license which is certainly not the duty of the painter.

I approach now a somewhat delicate question. It is clear something has gone wrong at the Queen's Theatre. When I first heard that Mr. Albert Moore had been commissioned to execute the chief decoration—a subject over the proscenium, containing fifteen figures rather larger than life-size—I, in common with many others, rejoiced that such an opportunity had at last occurred to one who seemed so eminently qualified for the task, and I looked forward to the opening of this theatre full of hopeful expectancy that here, at last, we should see a fair result of the union of architecture and painting; but, unfortunately, we see nothing of the kind. So far as the form and construction of the house are concerned, we have little ground of complaint. Two of the great problems which all theatre architects are called on to work out—viz., that everyone should both see and hear well—are admirably solved. The shape of the house and its proportions are also equally praiseworthy. So far, the architect has done *his* duty. It is only when we come to consider the point where the constructive work ends and the fine art begins that we become conscious of lack of duty somewhere. As it is no secret that I advised Mr. Phipps to give Mr. Moore the commission for the space over the proscenium, I may, perhaps, be allowed to add that I also advised him to consult the painter generally as to the rest of the colour and decorations throughout the house. The first half of my advice was taken and followed—the second half was taken tentatively but not followed. To be plain, the architect recognized at once the strong desirability of doing nothing which should be in any way out of harmony with the chief art work, and obtained from Mr. Moore such complete suggestions and sketches as enabled him to produce a large drawing showing the house with all its decorations. This not only fully satisfied the painter, but met with the approval of certain architects and painters to whom it was shown, *and even*, as Mr. Phipps told me, *of the proprietor himself*. So far, all seemed prosperous. Mr. Moore had made his design for his figure subject before the design for the general decorations was begun; he was now engaged working it out, whilst the scheme for the general decorations stood for some time in abeyance. Here, I take it, is the first dereliction of duty on the part of the painter. He should have had sufficient interest in the theatre *as a whole* to have seen that the *entire scheme* of decoration was settled and signed before he accepted the commission to paint its leading feature. But this, perhaps, is not so much the fault of the individual as of the class, and is to be traced to the miserable isolation of painters caused by the pernicious custom of easel painting. Mr. Moore's sin was a sin of omission—of forgetfulness of the maxim that self-preservation is the first law of nature. The sins of everybody else connected with the matter are direct sins of commission. A new element in the case now appears, in the shape of the management. I need scarcely go on. We all know what must happen when theatrical managers, &c., have a voice on questions of art. Of course such a scheme for the general decoration of a theatre as would be produced by Mr. Moore, or any other artist worthy of the name, could neither be appreciated nor even apprehended. The tenant of the theatre, like the tenant of the private house, says, I must have a voice in the paperhangings, colour of paint, &c. (not a parallel case, I know, but the lessee thinks it is); and so he has his voice, and he might have painted it, as is the fashion in some place, sky-blue or pea-green, with perfect impunity—I presume without any interference from the owner or the architect, for I cannot suppose that it would be other than an injustice to Mr. Phipps to saddle him with either the design or the approval of the design of these "decorations." And yet the architect must either have approved or disapproved. If, as I would fain hope, he disapproved, how do they exist? What sort of authority and what sort of contracts are we drifting to if a building can be ruined whilst it is in the hands of the architect? If he approved, then his best friends will trust that Mr. Phipps may not have another opportunity of approving. But then, some of my readers may ask, "Is the building ruined? Are not the general decorations quite appropriate," &c., &c., and "Is not Mr. Moore's work unsuited, inappropriate, &c., &c. Is not Mr. Moore's scale of colour too weak for a picture in such a position, and are not his outlines too delicate for *any* general scheme?" To all this, unhesitatingly and decidedly, No. That people may think so is quite possible, because now, unfortunately, Mr. Moore's work appears, *by contrast with its surroundings*, both pale and weak; but whose fault is this? Certainly not the painter's, except so far as I have already noted. Had the painter's scheme been adhered to by the architect, in default of the architect not having a scheme of his own, the Queen's Theatre would have been a success. No one would have felt want of colour or strength of line in the chief decoration, simply because all the rest of the house would have been in right subordination to the principal feature. Tender tones of grey and white and red would have occupied the place of violent blues and scarlets, and delicate pencillings and pleasing patterns would have made the house look light and spacious, and classic, where now coarse imitation Renaissance scrolls, and offensive over-*prononcé* patterns swamp, with their barbarism, the exquisite Greek refinement of the only work of art our theatres possess. To Mr. Moore we must, I am sure, be thankful for this his latest and noblest achievement. In delicacy of colour (which can now only properly be seen with the glass), in loveliness of composition, in power of drawing, and in its thorough grasp of the spirit of a wall decoration, this painting stands alone amongst all modern wall paintings. It is archaic, yet neither formal nor stiff; graceful, *yet in subjection*; monumental, yet animated and natural. It shows

a most masterly knowledge of naked forms and drapery, and witnesses to its author's spirit of invention and his sense of the beautiful and the fit. All this only makes me deplore more deeply than ever the miscarriage of a scheme of decoration which, however much it might have been criticized, and however much unappreciated at present, would have held its own, and would eventually have done good service to the art progress of the nineteenth century, by refining some of that lump called the English mind, fast approaching that state when even "the concord of sweet sounds" produces no effect. The question whether Mr. Moore is right in adhering so rigidly to the Greek method is one which is far too important to be discussed in the final paragraph of an article; but this much we may be quite sure of—that until the nineteenth century can produce some distinctive art of its own, the single artist, be he architect, painter, or sculptor, who seeks a foundation for his work, either in Greek purity or thirteenth century common sense, is doing more for us than a whole army of artists who seek to immortalize the swallow-tail coat and all the other elegancies of drawing-room life, be their technical skill what it may.

Edward W. Godwin.

WILLIAM HENRY LEEDS, ARCHITECTURAL CRITIC.*

By Hyde Clarke.

HAVING so far given a short sketch of what may be called the architectural politics of Mr. Leeds, we may now turn to some personal details; and, first, as to his publications and writings. About 1838 he edited the second edition of Pugin and Britton's "Public Buildings of London," and in which he found scope for considerable improvements and additions, and for applying his own standards of architectural criticisms. The elder—or, as ought now to be said, when three of the family have distinguished themselves in the career of art, the eldest—Pugin, was the artistic originator, and it was John Britton who had charge of the text. Old, honest, zealous John Britton, was likewise more of an artist than a critic. His day had then passed, but he was not pleased with such a successor to his labours as Leeds.

Leeds had the opportunity of dealing with Buckingham Palace, the Post Office, the Corn Exchange, and the Travellers' Club. He recast the whole work, removing extraneous digressions, and bits of bookmaking, and supplying matter of professional interest. His introduction to the section on theatres gives much information on that subject, with tables of comparisons of the continental theatres. This was a favourite subject with Leeds, and he was always anxious to have a chance of sharing in the plan of a theatre. The work was well received, and sold; but gradually, and the encouragement not being so prompt, Leeds lost the opportunity he had desired of continuing the work and producing another series on Provincial Architecture. Although he was much confined to London he never looked at architecture as a simply metropolitan attribute, but devoted attention particularly to provincial buildings, regarding the works in the provinces of provincial architects and of London architects as affording important examples of progress. In the present day it is still more to be regretted that we have no work on our provincial buildings. Churches of course offer themselves for such a series, but our baronial mansions and chief examples of villas would form part of it; the town halls, now becoming important, constitute a class, and the same may be said of markets. The metropolis is not self-sufficing with us, even if for the ordinary classes of city buildings, we had not schools of architects in Dublin, Liverpool, Manchester, Edinburgh, Glasgow, and so many of our great cities. Then, too, there are places like Oxford and Cambridge, and the watering places, which are the common exercising ground for architectural aspirations.

A plan of Mr. Weale's and Mr. Leeds's, arising out of the new edition of London, was a series of architectural monographs, to be called "Studies and Examples of the Modern School of English Architecture." This was one of Weale's grand plans, but which, though so well devised, from the apathy of architects, was allowed to expire. The opportunity was an admirable one. Weale was a man of enterprize and public spirit, and Leeds, as an editor, one of great attainments and sterling industry. They started well, too, for they succeeded in getting Sir Charles Barry to give the first example and to appear as the author. The subject was the "Travellers' Club," published in 1839, and in the end the high-sounding title is lost in a small volume, which depicts that club. Leeds accompanied it by an "Essay on the Present State of our Architectural Study, and the Revival of the Italian Style." This was the frontispiece to the great project, and it is to be feared it gave a reason to the architects of that day not to support the work, though it is by no means certain that they would have displayed any liberality. Leeds' observations in the style of reproof became those of prophecy as to the fate of his own work. He advocated the then detestable heresy that the laity—the public—should not only be allowed but invited to take an interest in architectural matters, and to express their opinions upon them. It is true there were lay writers upon art, and patrons who were tolerated in publishing expensive books on architecture, but the papal authorities of architecture never abandoned the dogma that architecture was a mystery far beyond the vulgar kin. This Leeds denied, and many respectable men looked upon him with horror, as scarcely less impious than Benjamin Hayden, or George Pioggo, who had sacreligiously made game of the cocked hat of the president of the Royal Academy. As yet there was not that band of ardent votaries, choice scholars, and able writers, who have made art a thing of the day, as the theatre was, and as politics are. In those times there was a great love of tufthunting, and it seemed natural a mild earl should preside over the Institute, for it dignified it; but it was not conceived that Beresford Hope should sit in that chair, as a real president, and expound the mysteries.

Leeds told a great deal too much truth in defending the necessity of calling in the public. He said naturally that the profession being narrow, architects did not take that enlightened view that they ought, but that another disadvantage was, for their judges they could scarcely look to any but their professional brethren, perhaps rivals, whose praises would hardly ever be very enthusiastic, and who would seldom be disposed to approve individually of what was either contrary to their own practice, or calculated to render manifest their own inferiority. Certain it is, said he, that the most promising talent in a young aspirant is seldom cordially hailed, or in any way assisted by those around him in the profession; neither does that of the more advanced architect receive their applause until he has terminated, or is about to terminate his career, his contemporaries punctiliously waiting till he shall first have said his *valete*. It is consolatory to think that much of this belongs to the past, and there is a higher professional standard among architects, and a better appreciation of art by the public; still there wants more zeal and liberality in the field of architects, for the architectural press may still be looked upon rather as leaders of professional opinion than as its exponents, and many admirable efforts fail, as of old, for want of timely professional support. No other architect could be got to follow Barry in these "Studies," nor did the public come forward otherwise than slowly, and in their own good time, causing a lock-up of capital, which but generally rendered architectural publications one of the heaviest enterprizes of the day. This was why Mr. Weale, who began with architecture, devoted more and more of his energies to engineering.

There is no independent work of Leeds from 1839 for some years. In 1846, his friend, Mr. E. B. Lamb, having published "Studies of Ancient Domestic Architecture," Leeds contributed to it "Observations on the Application of Ancient Architecture to the Pictorial Composition of Modern Edifices." This is another instance of Leeds' co-operation in the application of the mediæval styles. On the foundation of Weale's "Rudimentary Series," another of Weale's large projects, Leeds contributed to it "The Orders of Architecture in 1850." It was in the same year that he contributed to another enterprize of the publisher, "Weale's London," in preparation for the Great Exhibition. This was one of Weale's mishaps. His idea was a good one—a scientific guide for the visitor to London during the Exhibition year—and he chose able contributors; but, as he was confident in his plan, and would edit it himself, he produced a strange work. It contains most valuable matter, some parts repeated, some essentials left out, and was everything but a guidebook for the visitor, Weale finding at the end that he had overrun his space without accomplishing its object. As it is easy of reference, it is still as a work in "Bohn's Series," one of the most useful books in London. Leeds' contributions to other works were very numerous. In the "Penny Cyclopædia," Mr. Knight and Mr. Ramsay inform me that he wrote only the biographies of architects, with perhaps one or two of engineers, but I am confident Leeds told me he gave to Professor Long all the architectural details and tables of the geographical portion, which are evidently from his hand.

The same authorities say he commenced writing the account of the Public Improvements in the "Companion to the Almanac" in 1838, and continued to do so until 1850. This was a most useful annual register of architecture, in which Leeds took great interest; and, though it was on a small scale, it gave valuable details on the progress of architecture in London and the country. The few sketches afforded useful records, and Leeds's observations maintained the literary character of the publication.

Leeds was a contributor to that useful periodical *London's Architectural Magazine* until it was discontinued, and so in succession to architectural periodical literature. He wrote in *Fraser's Magazine* from time to time, but a more acceptable channel was the *British and Foreign Quarterly Review*, to which, besides articles, he communicated notices of foreign books on architecture, in all languages. He was, also, an occasional contributor to the *Athenæum*. Mr. Lamb thinks he wrote for the *Westminster Review*. Of that I have no knowledge, and the present editor can give me no information. In the later years of his career the establishment of the Building News afforded him the opportunity of giving to a newer generation of architects the benefits of an experience, strengthened by his intimate knowledge of the labours of their predecessors and contemporaries. The architectural room of the Royal Academy, and afterwards the architectural exhibitions, gave him periodical occasions for the exercise of his knowledge. He continually strove against the neglect of architecture by the authorities of the Royal Academy, and was one of the first advocates of a distinct architectural exhibition. The various great and minor competitions necessarily engaged his pen, and he wrote much on the evils of competitions. In 1841, he advocated select competition as one remedy for the then abuses, abuses which have multiplied instead of diminished.

Although Leeds naturally looked to a reward for his labours, his contributions were

* Continued from page 698.

not limited by that consideration, and whenever he was of opinion there was a call for his exertions, he was ever ready to take up the public cause. His literary remuneration was not very considerable, and came back as a contribution to the cause of learning in the accumulation of his library. The library, as sold this year, extended to 3,000 volumes, and its catalogue is to some degree a catalogue of Leeds' mind and his attainments. The sale lasted for four days. This library occupied much of his time and attention, and it afforded him a solace for the amusements of society, which had little attraction for him. An impediment in his speech deprived him of the eloquent utterance of his ready command of language, and made him shy before strangers. This gave him a reserve, and threw him back more on the independence of his own character. In early life he had been something of a dandy, but in older years having less care for appearance, and an inveterate habit of snuff-taking, he had, with his older fashions, an air of oddity, which repelled rather than attracted new acquaintances. As he cared more for the cause of art than for personal popularity, this comparative isolation produced little effect upon him. If his censures were sometimes bitter, he had a ready admiration for all that was new, young, and aspiring. His censures fell more heavily on the old and intractable: his praises were bestowed most encouragingly on the young and promising. Whether he ever practised as an architect his surviving friends do not know, but he occasionally contributed to the Royal Academy and exhibitions. One of these subjects was 1076 in the Royal Academy Exhibition for 1838, "Study for the Façade of a Public Building, by W. H. Leeds." It was an Ionic tetrastyle in antis, between two open screen wings of the same order. The drawing was small, but there were several novelties in the details.

His chief works are :—"Illustrations of the Public Buildings of London, with Historical and Descriptive Accounts of each Edifice," by Pugin and Britton. Second edition, greatly enlarged by W. H. Leeds. In 2 vols. London: Weale, 1838. "Studies and Examples of the Modern School of English Architecture. The Travellers' Club," by Charles Barry, architect. Accompanied by "An Essay on the Present State of Architectural Study, and the Revival of the Italian Style," by W. H. Leeds. London: Weale, 1839. "Studies of Ancient Domestic Architecture," by E. B. Lamb; with "Observations on the Application of Ancient Architecture to the Pictorial Composition of Modern Edifices," by W. H. Leeds. London: Weale, 1846. "The Orders of Architecture." London: Weale, 1850.

Hyde Clarke.

BUILDERS' CONTRACTS.

Mr. T. J. Kilpin, the president of the Liverpool Architectural Society, delivered his annual address on Wednesday week. He touched on a variety of topics, including the advantages of holidays to architects, labourers' dwellings in Liverpool, and what had recently been done there to improve them, and builders' contracts. On the last-mentioned question he said:—the great majority of contractors are reasonable and fair-dealing men, anxious to keep on good terms with the architect and to co-operate with him in bringing any business they may be engaged in together to a just settlement and amicable conclusion. But a general feeling is gaining ground amongst respectable contractors that they are hardly and unfairly dealt with; that, though there may be a few fraudulent contractors, there is a much greater number of unreasonable and arbitrary architects; that the bills of quantities supplied from the architects' office are very often erroneous and defective, and that in consequence they are often obliged to supply a greater amount of materials and labour than they had estimated for; that, being bound to execute the work within a given and often a short space of time, they are sometimes obliged to wait for detail drawings, without which the work cannot be executed at all; and that, notwithstanding this and many other unforeseen obstacles, the penalties for a non completion of the work in time are often unjustly exacted, and the chance of redress prevented by an arbitrary clause in the contract, that all matters of dispute that may arise are to be left to the architect's sole decision. In addition to all this, they have often to contend, when the contract and price are fixed, with the demands of the men for higher wages and diminished hours of work, and, like the flying fish who escapes from his pursuers in the waters beneath only to be seized on by the sea-gull hovering above, so, if they emerge for a moment from the troubled waters of strife, agitated by the demands of trades' unions, they are pounced upon by some albatross of an architect, who does his best to complete the work of persecution and plunder. To prevent or remedy these evils, the Master Builders' Association has been formed, with a committee appointed, from which a deputation from this society has had during the recess several interviews with a view to draw up, if possible, a form of contract which shall be just, equitable, and binding on the employer, the architect, and the contractor. There has been no great difference of opinion between us as to the propriety of extension of time from unforeseen circumstances, the necessity and justice of furnishing correct quantities or ample detail drawings, the duty of granting proper certificates, and the legal obligation of the employer immediately to pay them, and various other points; but the main difficulty has been to devise how the arbitrary power of the architect can be limited without impairing his efficiency. The builders wish that an umpire should be appointed and named in the contract, to whom all matters of disagreement that may arise during the progress of the works shall be referred. But this we consider to be quite inadmissable, and that it is a matter of absolute necessity that the architect must have full authority while buildings are being carried on, and that with regard to an arbitrator, the utmost that we could venture to suggest to the society was, that if the builder or employer should be dissatisfied with the final certificate of the architect, the matter might be referred to a third party. This, we consider, would afford ample security to the contractor against any injustice that he might think he met with from the architect, who, with the prospect before him of having all his "faults observed, set in a note book, conned, and learned by heart," and, finally, inquired into, would be very cautious not to lower his dignity, or have his final decision reversed by any abuse of his authority, or requiring anything to be done that either contractor or employer could reasonably object to. We are to have another interview on the subject, which I hope will result in an amicable arrangement.

NORTHERN ARCHITECTURAL ASSOCIATION.

The quarterly meeting of the members of this association was held on the 8th inst., at the Old Castle, Newcastle-on-Tyne, Mr. John Green in the chair. The election of officers was by ballot, with the result following :—President, Mr. John Green; vice-president, Mr. Matthew Thompson; honorary treasurer, Mr. R. J. Johnson; honorary secretary, Mr. Thomas Oliver; honorary solicitor, Mr. G. W. Hodge; committee, Messrs. M. Greener, A. M. Dunn, John Johnston, F. Charlton, and William Peachy.

The secretary brought under notice a recommendation of the committee to the effect that the Association present a respectful memorial to the Board of Guardians of the Durham Union with reference to the extension of the workhouse, and suggesting that it should be a condition of competition that whoever should obtain the first premium (the guardians having advertised for designs) should be the architect to carry out the work. He (the secretary) had written an unofficial letter to the clerk to the guardians, asking if the usual condition, as mentioned in the memorial, was to be adopted; and he had received a reply to the effect that the guardians had come to no such resolution. It would (added the secretary) be a great waste of time for a person to compete, and only get the premium for his trouble.

Mr. Thompson thought the Association should take some steps, as architects did not compete for a mere premium, but for the sake of the commission, and the honour of carrying out the building. The secretary suggested the advisability of the guardians agreeing to a condition that the architect who obtained the premium should have charge of the erection of the building, provided, as was suggested by Messrs. Peachey and Thompson, that the architect did not object. The secretary then read the competition advertisement. Mr. Green thought it a very honourable advertisement, while Mr. Thompson saw nothing very objectionable in it. He would not compete himself for the mere premium were it six times its amount. The secretary had seen fairer advertisements—those in which it was stated that the successful competing architect would be employed. Mr. Green observed that, however unreasonable the conditions, competitions always attracted a number of architects, and among them good names.

PHOTO-SCULPTURE.

The small figures of General Grant, Admiral Farragut, Peter Cooper, and others, which have been exhibited in the Broadway windows for a few weeks past, are the first experiments in the new and wonderful art of photo-sculpture. This invention has lately been introduced in New York, and it marks a new era in the art of photography. It was a natural step from the daguerreotype of twenty years ago to the ambrotype, and the transition from the ambrotype to the photograph was equally easy; but photography has made more rapid advances than any style of sun-picture which preceded it, and now it assumes a new phase. Photo-sculpture is the product of the photograph and the pantagraph, reproducing the exact forms of natural objects in all their fulness and completeness of proportion. The impression printed upon the sensitive plate in the camera is transferred in all its details to plastic clay, and may then be re-cast and reduplicated in plaster, parian, or bronze. The process is described as follows:—The operating room differs from others of its kind in the fact that it is circular, with an arched glass roof overhead. In the centre of this rotunda there is a raised circular platform, upon which the sitter is placed. His seat is in the exact centre of the room, which is ascertained and assured by a plumb line falling from the centre of the cupola above. If this line could descend to the surface of the platform, it would touch a point from which radiate twenty-four lines marked in black, pointing to the centres of twenty-four cameras, set at equadistances from each other in the circular wall. In an instant, twenty-four little doors are opened, and in a few moments the figure of the subject is printed upon as many plates. The doors then are closed simultaneously, and the sitter descends from his perch. So far as he is concerned, there is nothing more to be done. But twenty-four pictures of his figure have been taken, and each of these gives a profile view of one part of the entire circumference of his body, each differing from the other. The work of the pantagraph now begins. There are twenty-four different profiles of the subject, all of small dimensions, and it is desired to have a statue the full size of life. At once the little pictures, by means common in photography, are increased to the required dimensions. Each of these is fastened to the wall, and numbered from one to twenty-four. On a table near them is a mass of soft clay, which is fashioned somewhat in the shape of the statue to be made. Holding in his hand one end of the pantagraph, the operator begins to follow the outlines of the profile of the picture number one, by means of the machinery of the instrument, so that precisely the same outline is marked, or rather cut, in the soft clay; and as the operator goes on from one to twenty-four, following the outline of the profile in each, he makes the circuit of the entire mass of clay, and produces an exact *fac simile* of the model. It is impossible to imagine the limits to the use of this art, for it may be applied to every form of architectural and monumental ornament and mechanical design, as well as to the modelling of the human figure. It has been contended that it will be an injury to art, and that the sculptor may close his studio or seek another channel for his genius; but what proved true of the daguerreotype, the ambrotype, and the photograph in their relation to portrait painting, will be doubly true of photo-sculpture in its relation to the plastic art. It may spoil the market for bad artists, but it will be an invaluable assistance to men of real genius.—*The American.*

A twenty minutes' sand glass has been attached to the pulpit of the Chapel Royal in the Savoy for the guidance of the preachers, an example very worthy of imitation in many London churches.

‹TIQUARIAN DISCOVERIES AT GUIS, BOROUGH ABBEY.

DURING the past month, Captain Chaloner, R.N., the proprietor of the Guisborough ‹ate, in Yorkshire, and of the remains of this ‹autiful abbey, has been employing a number of ‹rkmen in clearing away the accumulation of ‹bbish that covers the foundations and floors of ‹ese interesting remains, and the discoveries ‹t have already been made in the choir of the ‹urch, which since the dissolution in 1540 had ‹en entirely buried, are of great historical in‹est. Tesselated pavements, heraldic tiles, ‹inted glass, monuments, sepulchral slabs, ‹nldings, coins, and other relics, have been dis‹rered about 3ft. beneath the present sward, ‹ich did not correspond with the original floor the abbey church. At the time of the Re‹mation, Guisborough was one of the wealthiest, ‹st magnificent, and extensive monastic institu‹as in the kingdom. Walter de Hemmingford, ‹o was a canon of this monastery, and one of choicest historians of the fourteenth century, ‹s us, that in 1289 this monastery, with all its ‹ks, plate, and vestments, was destroyed by . A new church was erected shortly after by princely grants and donations of the neigh‹ring nobility; and it is among the ruins that ‹v remain that the excavations have just been ‹le. At the Reformation, the work of destruc‹n commenced, and the recent discoveries show ‹ea of the fierce passion, religious rancour, and ‹ton destruction which then took place. ‹erally, little more than the timbers and lead ‹he roofs, the glass in the windows, and in‹al fittings, were removed; but at Guis‹ough it would appear that the tower and other ‹ldings, with the exception of the east end, im‹liately after the expulsi on of the monks, were ‹wn down, and falling with great force on the ‹ement, in many places crushed the monu‹ntal slabs and shrine work of the tombs. ‹wanton destruction that took place at this ‹ey may be accounted for, from the fact that ‹g Henry VIII., in 1541, granted a lease to Thomas Leigh "of the buildings, with the ‹ and precincts of the priory, as the King ‹uld henceforth command, to be then de‹lished and carried away." Six years after‹ds, King Edward VI. granted the site to Sir ‹mas Chaloner, ambassador to Charles V., and ‹rwards to King Ferdinand of Spain. For ‹y years after the Reformation these monastic ‹ldings were converted into a stone quarry, for use of the adjacent town and country, and second Sir Thomas Chaloner used some of the ‹terials to build his mansion. The choir of ‹ abbey was larger than any other monastic in‹ution in Yorkshire, as appears by the plans in ‹rp's and Paley's "Parallels." The present ‹avations were commenced by cutting a trench ‹ss the church at about 200ft. from the east ‹dow, in a line with the outer wall, and a large ‹rway, with the remains of Early English ‹ars in Purbeck marble, were discovered.

‹he heraldic tiles discovered in this portion of church were of great beauty. On some were arms of England and France—the latter *semé* ‹s; others had two chevrons. A lion rampant ‹wned the figure of a bell, appearing above and each side of the shield; a fess between six ‹ss crosslets or, or three cross crosslets on a ‹ef; on a shield two bars embattled; on a shield ‹ bars in chief, three roundlets—a lion rampant. one fragment, which had apparently borne ‹r shields of very exquisite design, can be ‹ed a shield cheque, and on the other a bird. ‹merous other tiles of beautiful design, some ‹ly English, others of a later date, were disco‹ed. About 170ft. from the east window the ‹rkmen came upon what appeared to be portions the central tower, just in the state in which it ‹l fallen. Under the solid masonry, which had ‹n thrown down in great masses, there were ‹ee large monumental slabs 6in. thick and 9ft. ‹ long, and 4ft. 5in. broad; at a depth of 5ft. ‹m the surface the skeleton of a man was found the remains of an oak coffin. This skeleton ‹s measured by Dr. Merrywether, of Guisbo‹gh, and was 6ft. 8in. Two circular bronze ‹ckles, like those displayed in the heraldry of the ‹rteenth century, were found. Apparently, they ‹l been used to fasten the materials in which the ‹ly had been swathed. On the centre slab was ‹s inscription, in fine black letters, deeply cut, about the middle of the fifteenth century:—‹it. Pax Eterna Tecum Victore Superna." Under ‹s slab was a stone coffin much broken by the fall of the masonry from above. In this coffin was a bronze buckle similar to the one just described, but of a stouter material. In the same coffin, on the feet of the skeleton, were a pair of sandals, which may have belonged to a canon who had been buried in his vestments, of which there were also some remains. The third slab had had a brass plate, the studs of which alone remained. In the *debris* above were found portions of a shrine, carved in fine white Caen stone, the finials and tracery, much of which was painted in bright colours and in gold, and all of exquisite workmanship. In the spandrels of an arch forming part of this shrine was the figure of an angel drawing a man out of fire with a chain. Other remains of considerable interest have been found, consisting of coins, portions of the lead, silver, and iron fused together in the great fire of 1289; at which time, Hemmingford tells us, all the chalices, images, books, and plate were destroyed, and in a soluble state had made their way through the more ancient floor. Among other interesting antiquities that have been discovered are the remains of a figure in chain mail, part of a figure in plate armour of the early part of the fifteenth century, and, from the arms on the breast, appears to be one of the Latimer family; bosses from the roof, rich in gold and colour; large quantities of coloured glass, pottery, remains of alabaster tombs, &c.

LEICESTERSHIRE ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.

AMONG other specimens, &c., exhibited at the meeting of this society on the 30th ult., was a very fine example of modern glass mosaic by Salviati, of London and Venice, the artist and maker of the beautiful reredos lately erected in Westminster. Mr. North communicated some remarks to the meeting, through the chairman, upon the curious and interesting vessel lately found in Peckleton churchyard, and exhibited by the Rev. E. Tower, before this society, at the meeting in July last. The vessel had been described to Mr. Tower as a chrismatory, which had formerly divisions in it for the several sacred oils used in the Roman ritual. Mr. North's opinion, which was also confirmed by that of the Very Rev. Canon Rock, one of the most learned ecclesiologists in the country, was that the vessel was not what is usually styled a chrismatory—*i.e.*, a receptacle for the three bottles of oils which each church in pre-Reformation times was required to possess, but was made as a receptacle for a large quantity of the oil after consecration on Maunday Thursday, and from which the smaller chrismatory in frequent use would be supplied; one, for instance, which a rural dean would keep, that he might be able to distribute its contents to the parish priests of his district. Mr. Wing, Melton Mowbray, read a paper on the restoration of Melton Church, which was a candid critique upon the proceedings of the committee.

THE NEW QUEEN'S THEATRE, LONG ACRE.

THE large building in Long Acre, nearly facing Bow-street, so long known to choral societies and the public as St. Martin's Hall, will be re-opened on the 24th as an elegant and commodious theatre, under the experienced lesseeship of Mr. Alfred Wigan. The building has been completely gutted, from basement to roof, only the outside walls and covering remaining, so that it is, *de facto*, a new theatre, and one which will in every way sustain the reputation of the architect, Mr. C. J. Phipps, F.S.A., who has already erected theatres at the following provincial towns—Bath, Nottingham, South Shields, Brighton, Swansea, and Bristol.

The entrances of the new theatre are numerous, and conveniently situated separate streets. The principal entrance, leading to the stalls and two tiers of boxes, is in Long Acre, through a loggia, opening by swing doors into a grand vestibule (part of the original hall), 42ft. by 22ft., immediately facing which is the grand staircase, which is one of the finest in London—a double flight of stairs, 6ft. wide, leading to the boxes. The stalls have a separate approach by a few steps, and an incline under the pit, without ascending the stair case. The entrances to pit and gallery are in Wilson-street; where, also, at some distance apart, is the royal entrance, opening immediately upon a private staircase to the royal box on the grand tier, and forming, also, on ordinary occasions, an exit way from the stalls, level with the street. This feature requires especial notice, as Wilson-street, being out of the traffic of the main streets adjoining, will be admirably adapted for carriages taking up, and greatly facilitate the speedy exit of a large audience. The entrance to the stage is in Charles-street.

The plan of the auditorium is original. Each tier recedes, so that two balconies are formed. The plan of the front of the dress circle tier may be described as three parts of an egg; the upper box tier similar, but larger in radius; while the gallery tier resolves itself into a complete circle, carried round over the proscenium, and forming, as it were, a cornice. The two front rows of this tier are appropriated to amphitheatre stalls, while the gallery ranges behind them. The audience in the amphitheatre do not occupy more than to the half circle, the remaining part, where it would, of course, be difficult to see, is occupied by a handsome circular frieze, taking the same line as the circle of the gallery, crowned with a cornice. Upon this frieze is a wall painting, which deserves an extended notice hereafter.

The better to judge of the size of the new house, we append a table giving the dimensions of some of the principal London theatres:—

	Length from curtain to front of centre box	Width between boxes.	Width of proscenium.	Height of proscenium.	Height from pit to centre of ceiling.	Depth of stage from curtain line	Width of stage between walls.
	ft. in.	ft in	ft in	ft in	ft in	ft in	ft in
Her Majesty's	88 0	59 0	37 0	—	51 0	35 0	—
Covent Garden	81 0	63 0	50 0	43 0	65 0	60 0	90 0
Drury-lane	48 0	51 0	32 0	—	60 0	48 0	—
Lyceum	—	38 5	32 0	35 0	—	—	—
Haymarket	46 0	35 0	32 0	28 0	—	48 0	58 0
Olympic	—	33 0	27 0	29 0	—	—	—
Princess's	—	—	26 0	30 0	—	—	62 0
Britannia	58 0	56 0	35 0	37 0	47 9	60 0	—
Adelphi	* 46 0	31 0	35 0	38 0	44 9	55 0	67 0
	† 40 0	44 0	—	—	—	—	—
New Surrey	68 0	62 0	—	—	—	60 0	70 0
The Queen's, Long Acre	* 44 6	38 0	30 0	29 6	50 0	50 0	55 0
	† 47 6	43 0	—	—	—	—	—
	‡ 50 0	48 0	—	—	—	—	—

The computation of the seating accommodation is as follows:—

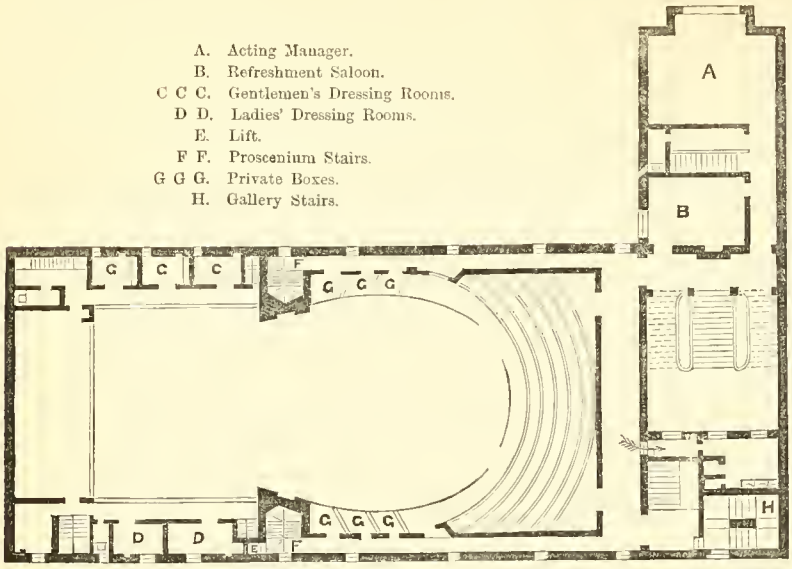
Place.	No. of Rows.	Distance front to back.	Width of seat.	No.
		ft. in.	in.	
The stalls	6	3 0	22½ (armchairs)	110
Dress circle	7	2 9	21 do.	230
18 private boxes	—	—	—	64
Upper boxes	6	2 8	21	230
Amphitheatre	2	2 2	20	100
Pit	19	2 0	18	640
Gallery	14	1 10½	16	610
			Seating	1984
			Standing	236
			Total	2220

In the decorations the absence is noticeable of all raised plaster ornaments, which have hitherto only served as a harbour for dirt in our theatres, except the constructional mouldings, which present on the box fronts a singularly subtle and delicate contour, leaving a flat space between, for painted decoration, as at Her Majesty's Theatre. The main feature of the ornamentation, however, is a painting on the frieze above the proscenium, 30ft. long and 7ft. deep, by Mr. Albert Moore, whose delicate representations of Greek figures and colouring in this and last year's exhibitions of the Royal Academy were so much admired and sought after. This painting, which is in a flat medium, like fresco, represents a group of life-size Greek figures, in various attitudes, listening to, and watching, with delight and rapture, the representation of a play which is being enacted.

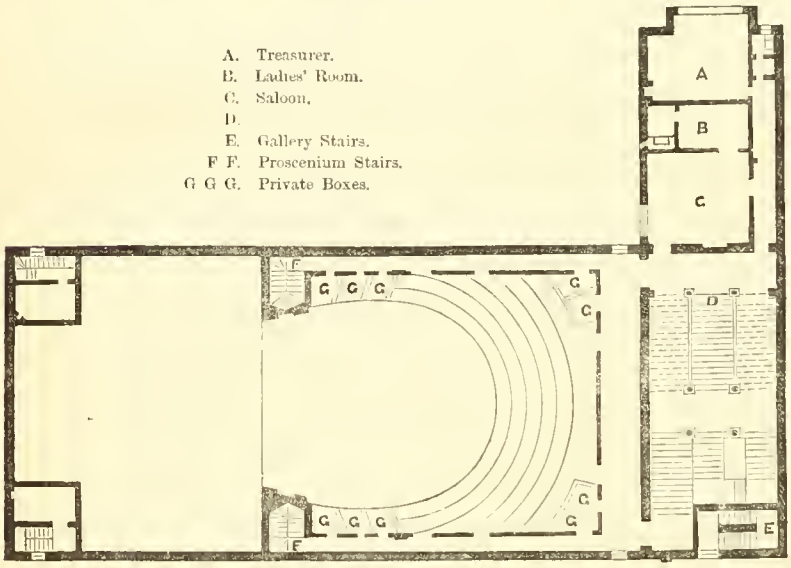
The decorations have been executed by Messrs. Green and King, of Baker-street, Portman-square. The ceiling consists of a semicircle, prolonged horizontally over the greater part of the auditorium, and beyond this a flat portion raking up over the gallery. The latter is panelled out into squares, lozenges, and circles, which are treated in such a manner as to enhance the brilliancy of the former, which is divided by radiating ornaments into ten compartments, enriched with brilliant arbesques, and with medallions, containing musical instruments and other devices, upon a soft neutral ground. Beneath the semicircle, and above the proscenium, is a deep frieze, on which is

* To grand tier box front. † To upper box front.
‡ Gallery tier

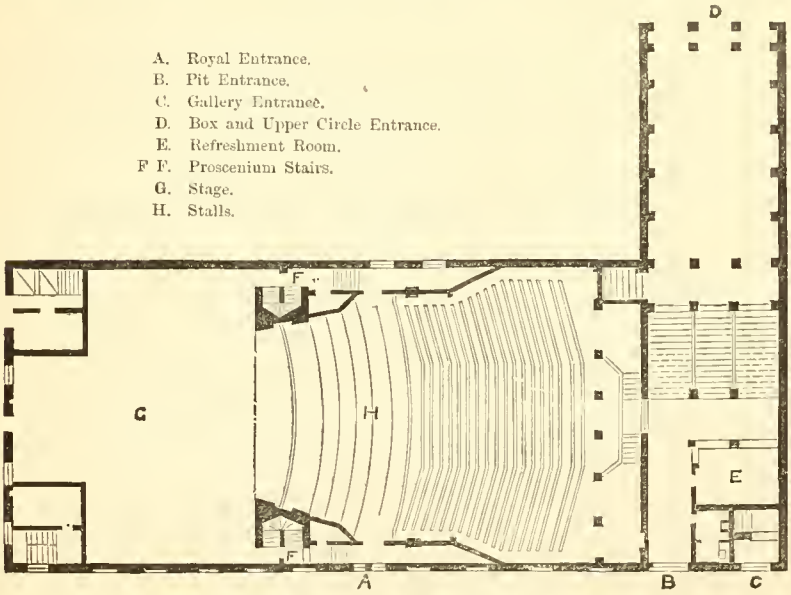
PLANS OF THE NEW QUEEN'S THEATRE, LONG ACRE.



UPPER CIRCLE PLAN.



DRESS CIRCLE PLAN.



PIT AND LEVEL OF STAGE PLAN.

painted the figure subject before alluded to, and below this again an entablature, which, continued in a circle round the whole house, forms the gallery front, and is enriched with a bold anthemion and other ornaments. The lower box fronts are painted with brilliant arbesques and borders, and are further embellished with gold mouldings and delicate amber satin curtains, resters, and Vandyke valances, which contrast admirably both with the pale sage green and gold box-linings, and with the ebony seats and cerise-coloured cushions. The proscenium is richly decorated with gold and colours to harmonize with the other portion.

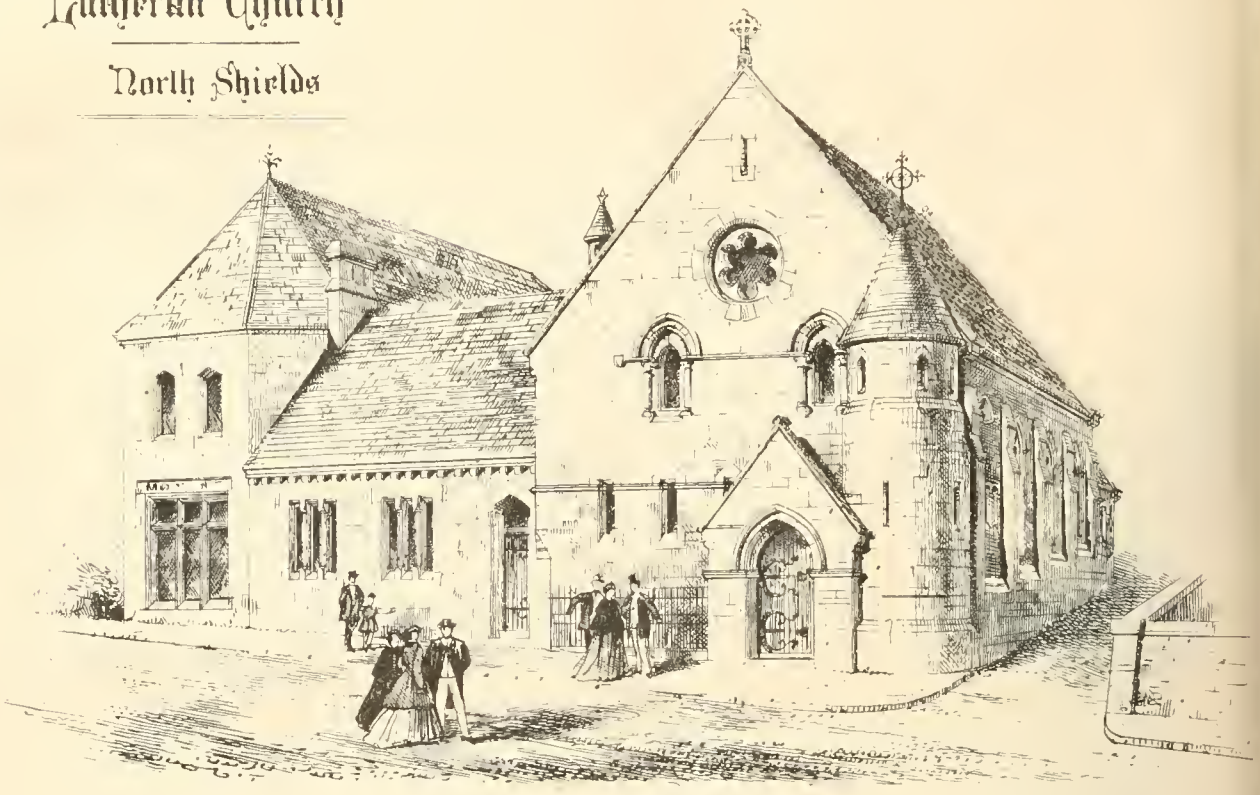
The lighting is effected by a powerful sun burner, manufactured by the patentees, Messrs. Strode and Co., of London, placed in the centre of the ceiling, but not hanging more than 18in. below it. There is a large ventilating shaft, 6ft. in diameter, immediately above the sun burner, carried through the roof, in the centre of which is another flue, specially to take off the combustion from the gas. By the management of the lighting, and the receding of the upper fronts, as before mentioned, objectionable shadows under the boxes are obviated. In the ceiling of each tier are a series of ventilators, each communicating with an extracting flue in the roof. The same firm has also fitted up the float-light. This float, which is of novel construction, demands special notice. Its first introduction into England was in the theatre built by the same architect last year at Brighton, where it has proved in every way successful. It consists simply of the argand burners reversed, with the lights burning downwards, all the combustion being taken away through a large iron cylinder underneath to a flue at the back of the proscenium. A joint on each burner is so contrived that if any one of the glasses breaks it falls, and so shuts off the gas in that burner. This plan combines safety also, as not a particle of heat escapes into the house, and a gauze handkerchief might be placed on the top of the burner without ignition. It also removes the unpleasant vapour screen between the audience and the stage, which is the necessary result of the old method. By an ingenious contrivance, also, the mediums or coloured glasses, required now so often in special effects, are worked on a frame in front of the lights, by means of levers—very much on the principle of a switch on railways, and can be changed from white to red, green, or any other coloured required, in an instant. The stage is separated from the audience by a solid brick wall, carried on an arch over the proscenium opening up to the roof, and behind the proscenium are stone staircases on either side, leading from the basement to the roof, with communications on every level. The drop curtain, painted by Mr. W. Telbin, will be in harmony with the decorations of the house, and will represent a Greek temple, painted on a medallion, set in a frame of lace, and fringed with amber drapery.

The difficulty of arranging satisfactorily for the multifarious requirements behind the scenes is evident from the lack of width between the walls; more, however, could not have been made of the available space, and the lack of width is amply compensated by the great height over the stage, it being practicable to take up a large scene 30ft. out of sight. The depth below the stage is also amply sufficient for all mechanical effects; while the construction of the stage itself is of the most elaborate description, the whole being made to slide away like a shutter. The transverse joists are laid in iron stirrups, fitting like saddles upon the longitudinal beams, and by a simple and expeditious contrivance the joints can be all pushed back, thus forming one enormous opening in the stage for the rise of castles, bridges, or other mechanical effects. The stage and machinery have been constructed under the immediate direction of the architect, by his chief clerk of works, Mr. G. R. Tasker. There are two tiers of flies, 9ft. 6in. wide, the upper or working flies being about 30ft. above the stage, and the lower 20ft. On these last are arranged two dressing-rooms, on either side approached by staircases at back of stage, opening on which are four tiers of other dressing-rooms. Under the stalls are placed the green-room, and a large room for the ballet, with two small dressing-rooms, approached by the staircases in proscenium before mentioned. The painting gallery is at back of stage, on a level with the first tier of flies, having two frames, 36ft. wide, which can be made available for ascensions of figures, scenery, &c. On the mezzanine floor are spacious property rooms, and over the proscenium and part of auditory ceiling a large and convenient room for the wardrobe. Other rooms connected with the working of the theatre—such as treasury, manager's room, housekeeper's residence, and tailors' shops—are in that part of the building over the grand entrance in Long Acre.

It only remains for us to mention that the works have been carried out by Mr. Samuel Simpson, contractor of Tottenham Court-road; the gasworks, except as before mentioned, by Messrs. Jones and Co., of Bow-street; the stall and dress circle seats by Wadman Brothers, of Bath; and those in the private boxes by Mr. Church, of Bath; while the whole of the works, in every department, have been executed from the designs, and under the immediate direction of Mr. C. J. Phipps, F.S.A., of 9, Adam-street, Adelphi.

Lutheran Church

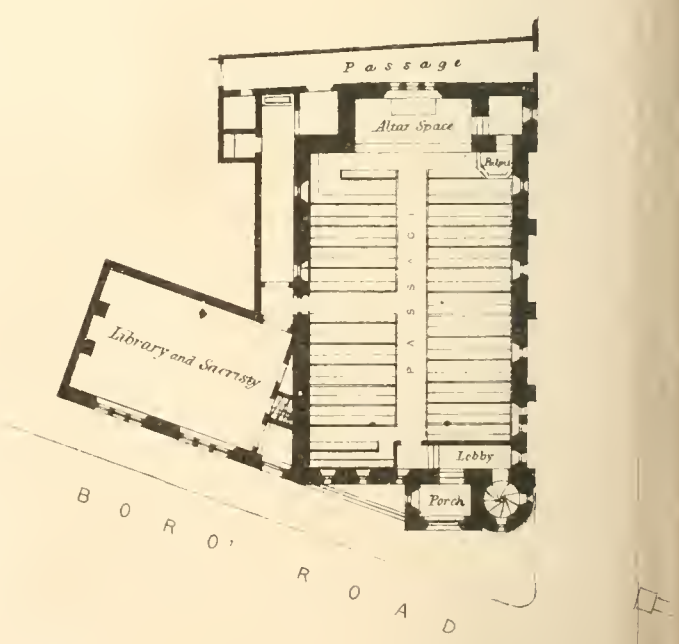
North Shields



S.W. View.

F.R.N. Haswell. Archt.
North Shields.

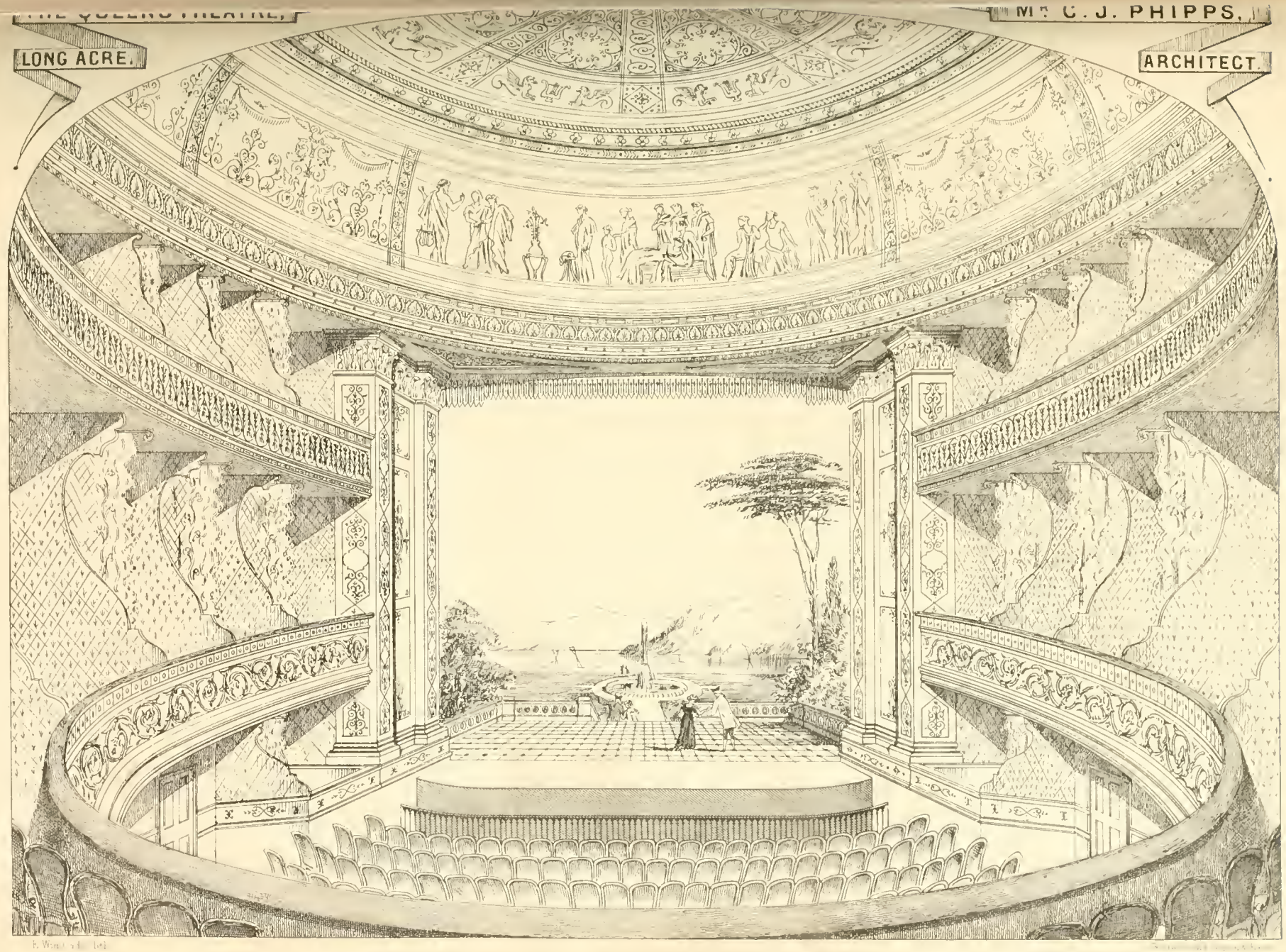
Sketch Site Plan.



Plan of Church.

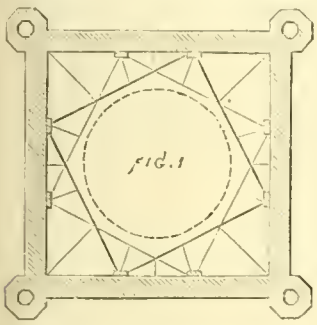
SCALE 24 FT TO 1 INCH.

Litho Whiteman & Bass High Holborn London

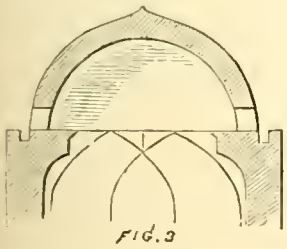

THE QUEENS THEATRE,
LONG ACRE.
MR. C. J. PHIPPS,
ARCHITECT.

CONSTRUCTIVE AND ÆSTHETIC DESIGN.—No. VI.

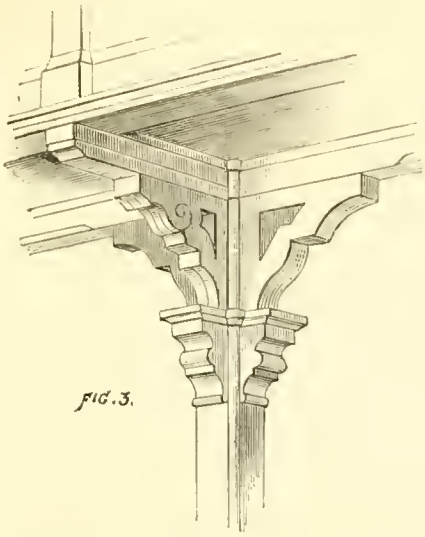
FOLLOWING the wall in the order of constructive development, we will notice ie arch and vault, and its position in modern rchitecture. It was this constructive—and,) some extent destructive—feature that emanded wall thickness and the more econoiical substitute of the buttress, while it led) a more beautiful, though complex, system of esign, in which horizontality and rectanguarity became subordinated to vertical, pyraiidal and curvilinear forms, the distinuishing elements in nearly all Renaissance nd modern buildings. The form of the arch) traceable to an early period. Sir Gardner Vilkinson* has proved the existence of rched forms in the Egyptian tombs 1540 B.C.; vaulted roof of a tomb at Thebes belongs to ie time of Amenoph I.† The remains at bydos show an approximation to the arch orm, the horizontal courses being cut to a urve. Mr. Hoskins, in his "Travels in thiopia," mentions pointed and semicircular one arches to the porches of the pyramids f Nubia, and attributes the latest of them to date not more recent than the age of ambyses. At Saccara, and near the pyramids f Gizeh, several stone arches have been rought to light—one of the better examples eing given by Mr. Fergussou,‡ and the ime author, not without reason, contends that ie arch was used as early as the time of the yramids of the fourth dynasty. The Assyans as early at least as the eighth century .c. used both the round and pointed arch aults in drains and chambers beneath their



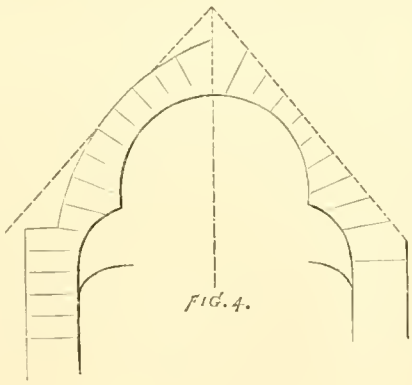
alaces, as at Nimroud and Khorsabad, cording to the researches of Layard; while ie roofs of the Lycian tombs of the fifth centry B.C. indicate pointed arches. The eneral application, however, of this conructive expedient was left to the Etrurians nd Romans, the Cloaca Maxima at Rome, uilt under the Tarquins, presenting us with ie oldest vault perhaps in Europe, composed f three rims. In the last article I hinted a ery probable conjecture of the origin of the rch, borne out by some of the earliest ex-

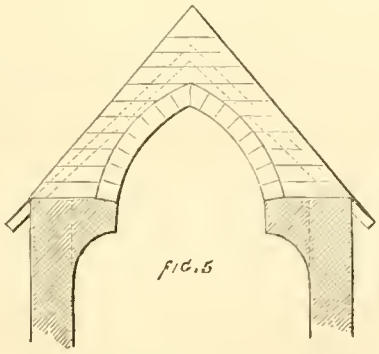


mples, and from analogy. It is quite certin that its earliest use was limited to posiions which gave ample abutments, for we nd all these vaulted tombs and chambers, as iat of Atreus at Mycence, at Delos, &c., subrranean, or else imbedded in rock or iasonry, and many of them constructed, not with radiating joints like a true arch, but with horizontal layers which could exert little or no thrust. The Pelasgians seem to have preferred these thrustlers, horizontally con-



structed arches, and they are so indeed by all oriental nations. The Jaina temples of India, erected by a kindred race, show a decided preference for this mode of constructing their domes, as well pointed out by Mr. Fergusson in his Indian studies—a mode of construction, moreover, which naturally suggested the horizontal decoration of the domes of the East, the ornaments being disposed in concentric lines. Indeed, the bulbous pointed domes, and that clever static system of pendentives, so beautifully developed at Delhi, and, above all, in that scientifically arranged marvel of Eastern construction—the tomb of Mahomet at Beejapore—(figs. 1, 2), indicate to us a plan of covering, yet, I think, very inadequately adopted in covering our square buildings and compartments. The bracketting expedient (fig. 3), so characteristic of Indian and Persian construction, is also another very effective method of combining rigidity and beauty, and improving the rectangular lines of a building—the Alhambra

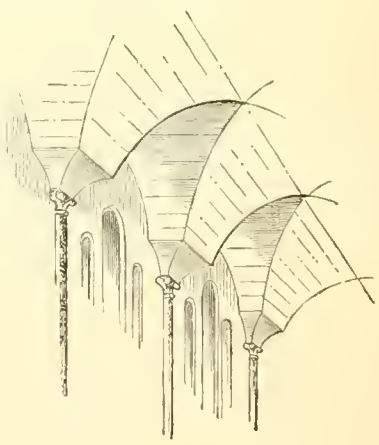




Palace, in Leicester-square, being, perhaps, the only well-known instance of its modern, though overdone, adoption. But the trefoil-shaped arch (figs. 4 and 5), suggested by the pendentive dome, is a mode of arch construction that seems to me to have been singularly neglected, except as an ornamental feature in Gothic arcading, panel-work, &c. The celebrated mosque of Cordova, in Spain, and other Moorish examples, show a less timid adoption of this principle of arch building than we do. Witness their horse-shoe and cinquefoil arches.

Constructionally and æsthetically this form of arch has many advantages over its European rival—the simple curved and radiating vault and dome. The springing arcs, forming internal projecting masses of work, help to counterbalance the tendency of the upper vault to spread, while the apparent weight of these lower portions or cornices considerably lessen that visible appearance of unsafety so powerfully impressed upon the mind when viewing a wide-spreading vault or arch. In the dome at Beejapore, as seen by diagram, this is effected by the octagon pendentives formed by the intersecting arches, which reduce the square plan to an inner octagon, counteracting by its weight the spreading tendency of the circular dome, whose inner curve or intrados is also within the inner line of wall. Why Mr. Fergusson supposes an arch or vault, constructed on the same principle, incapable of standing, I am at a loss to see. It is only necessary to adjust the arch so that its drift, together with its weight, and that of the overhanging cornice, should be brought within the thickness of wall, so that the pendentive should not topple inwards. It is, of course, impossible for any dome to collapse, and therefore, in the case of this great Indian dome, the expanding thrust had simply to be counterbalanced by a sufficient mass of overhanging masonry internally. Extra steadiment is afforded also by the octangular turrets at angles, while the thrusts of the intersecting arches forming the pendentives are resolved into forces acting in the direction of the radii of the octagon.

Such a self-poised vault as I have described might be crossed or groined by others, the wall pendentives being built solidly to such a height as would ensure the stability of the

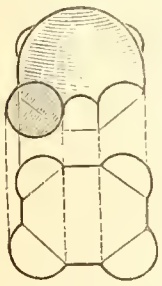


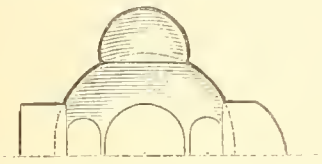
principal vault. In both cases, of course, the lower arcs, or the springing of the pendentives, must be formed of horizontally-laid stones tailed into wall, so that the lateral spread of the upper curve may be converted into nearly simple weight at the abutments. The continuous wall pendentive for a cylindrical vault might be made to assume the appearance of a cornice, the curved soffit dying into the wall face or finished with a necking. Of course such a mode of vaulting does not possess the elegance of the Gothic pendentive or groined vaulting of the mediæval builder, which nevertheless required at every springing a lateral support.

The domical system of vaulting practised by the Byzantine architects, as seen in Greek churches and Turkish mosques, though characterized by Mr. Hope as a congeries of globes growing out of one another, is yet highly suggestive of pleasing combinations. The Roman cross vault may have for us

* "Manners and Customs of the Egyptians," "Egypt and Thebes;" also, Belzoni's plates.
† Of the Great Eighteenth Dynasty, according to Chronology of Manetho. See Mr. Fergusson's elaborate Appendix on Egyptian Chronology in his Principles of Beauty in Art.
‡ Handbook, p. 252, Vol. I.

a superiority; but I think hemispherical sections is a branch of stereographic art too much lost sight of. We should bear in mind that a hemisphere can be cut so as to fit any base whose points can be bounded by a circle from a square to a triangular or polygonal plan, and that the vertical planes or wall boundaries of such plans meeting the surface of the sphere would invariably be semicircular. Thus an unequal-sided octagon gives a useful plan for transeptal buildings, and a pleasing variety of wall arches and pendentives, while the dome may be entirely carried on eight angle piers, and the sections of it fitted with small lateral semi-domes or barrel vaults. A right-angled triangle, its longest side being the diameter of the circumscribing circle or dome, is a plan useful to bring an octagon to a square ground plan, as seen in St. Paul's, where the aisles meet the dome. A covering to an octagon or hexagonal plan of much beauty and variety and curvature can be produced by making a hemispherical dome spring out of the frustrum of a lower and larger one, thus forming a pendentive dome of a similar section to the self-poised trefoil arch described above. The constructional peculiarity of the dome—that, provided its base is immovable, it cannot fall inwards, gives the dome a decided advantage over the arch and vault; for it may easily be seen that the lower dome can be truncated anywhere, the upper one merely resting as a dead weight upon it, and rather assisting than otherwise to consolidate and strengthen the under dome, this remark applying in greater force when the upper dome is seated high on the crown of the lower, and where its





tendency to spread is better counteracted by the gravitating portion of the latter.

It may be remembered that the most irregular plan, or polygon, so long as its angles touch a circle, can be domed, and, on the whole, the sections of a sphere may, conversely, assist us in planning some of our buildings and compartments.

G. H. G.

THE GENERAL BUILDERS' ASSOCIATION.

THIS association has just held a very successful half yearly meeting at Harrogate. Trades' unions are somewhat at a discount just now, and we expect that masters' associations will be correspondingly buoyant and hopeful. Mr. Thomas Whilley, of Leeds, the president, occupied the chair; and among those present were gentlemen from the following local associations:—Bath, Birmingham, Blackburn, Bradford, Bristol, Burnley, Cheshire and South Lancashire, Darlington, Dewsbury, Huddersfied, Leeds, Manchester, North Staffordshire, Preston, Sheffield and Rotherham, Stockton, Wakefield, Wigan, and York. Apologies for non-attendance were received from Barrow-in-Furness, Bolton, Inverness, Malvern, and Wolverhampton.

The report, which was read by the indefatigable secretary, said:—The most important business that has engaged the attention of the association during the past half year has been the consideration of the organization and working of trades' unions. Special circumstances, too well known to require any further allusion, drew public attention to the unions, and a Royal Commission was appointed, with supplementary examiners for particular localities, to inquire into the subject. The committee cannot but congratulate the members generally upon the fact that it is mainly, if not solely, due to the circumstance that the building trade was organized and represented by this association, that the inquiry has brought to light the actual condition of the labour question. The building trades were put into the front of the inquiry, and had it not been for the fact that the existence of this association enabled us to accept the responsibility of our position in reference to the whole inquiry, we believe that that inquiry would not have had the effect of eliciting the whole truth.

In reference to the contract question, you appointed a Special Committee. In addition to their general report, which is appended, we beg to further report that our attention having been called to the facts connected with the contract for a public building in a locality where we have a branch association, we thought that they were such as afforded a good opportunity for getting an authoritative judgment upon some points at present in an unsettled and unsatisfactory position. This opinion was so largely shared by branch associations in all parts of the kingdom, that they had separately guaranteed a considerable portion of the estimated cost of bringing the case to trial. Under these circumstances we felt that it was the duty of the General Association to relieve branch associations of the guarantees they had given, and take the responsibility upon itself. The case has, however, been settled without trial under advice contained in the accompanying papers. The gentlemen more immediately concerned have returned you thanks for the public spirit displayed in your offer of assistance. Some portions of the correspondence, as emanating from disinterested and very able advisers, we especially recommend to the attention of all builders.

The report of the auditors, together with a statement of accounts, showed that during the year ending September 1, £1,193 17s. 3d. had been received, and £1,338 6s. 10d. expended, leaving a balance then due to the secretary of £144 9s. 1d.

LUTHERAN CHURCH, NORTH SHIELDS.

THE large increase of Norwegian, Swedish, and Danish shipping frequenting the Tyne, led to vigorous efforts on the part of the Lutheran Missionary Society in Norway to obtain a church in a favourable locality for the use of the crews. Through the active exertion of the pastor, the Rev. Mr. Meyer, with the co-operation of the Norwegian and Swedish Consul at Newcastle-upon-Tyne, funds have been raised, and the building (of which we give an illustration), will shortly be erected. It is intended to circulate the lithographs among the crews of vessels leaving Norwegian and Swedish ports, who will be enabled, by means of the sketch plan of site, to find their way to the church. The library will serve the purpose of a sacristy. The benches will all be open and free, and a small gallery at the west end is provided for organ, &c., access to which is obtained by circular stair. In the basement will be a chamber for a gill stove. The roof will be covered with Westmoreland slates, and boarded internally, the centre part over the collar beam being waggon headed in form, and brought down to wall plate, with a sharp curve of much smaller diameter. The great advantage attending the use of internally boarded roofs is, that it prevents echo in any moderately sized building, and is a great aid to warming and ventilation.

THE CONSERVATIVE LAND SOCIETY.

THE Sixtieth Quarterly Report of the Board at the meeting held at the offices in Norfolk-street, Strand, on Tuesday, the 15th inst., states the receipts for the fifteenth financial year ending September 30, were £116,983 0s. 11d., and the grand totals to Michaelmas, 1867, £1,100,603 7s. 9d. The shares issued were 27,783 at £50 each, making £1,389,150; and the total withdrawals since the formation of the Society (1852) to Michaelmas, 1867, £306,749 0s. 2d. The total sale of land for the same period was £537,050 19s. 6d. The Reserve Fund to Michaelmas was £13,348 3s. 0d. The second portion of the East London Estate was allotted on August 2, and building operations are in active progress thereon. Additional portions of the Forest Gate Estate will be offered in due course, the continued demolition of houses, owing to the extension of the metropolitan railway system, rendering the opening up of new districts within an easy distance of town absolutely necessary. Bolingbroke Park, with its mansions and grounds, its extensive frontage to Wandsworth Common on the one side, and frontage to Battersea Rise on the other, the whole being close to Clapham Junction and New Wandsworth Stations, had been acquired for the Society. Mr. Persé Stace, public accountant, and Mr. Newnham Winstanley for the Board, and Mr. W. H. Clemow, and Mr. Jas. Goad are the four auditors to report as to the accounts and balance sheets for the financial year ending September 30, 1867, to be presented at the annual meeting early in December next. The Executive Committee, in conclusion, congratulated the members on the happy auspices under which the sixteenth year of the Conservative Land Society had commenced. There were present at the meeting Viscount Ranelagh, chairman; Ed. Brownlow Knox, M.P., Hon. and Rev. W. Talbot, Major Jervis, M.P., Mr. Currie, Mr. T. K. Holms, Mr. Newconan, Mr. Winstanley, Mr. Goad, Mr. Stewardson, Mr. Rentmore.

NEW THEATRES.

THE NEW EFFINGHAM THEATRE.—New theatres are now the order of the day, and, however stagnant all other branches of trading enterprise may be, the providers of public amusements show no symptoms of fatigue and faint-heartedness. Whitechapel has long boasted of one large and elegant theatre—the Pavilion—and it now has another, the Effingham, known for some years as a "saloon," and for the last fifteen or twenty years as a large and well-conducted local theatre. This house and some adjoining buildings have been pulled down, and a new theatre, called "The East London," has been erected in their stead, capable, it is estimated, of accommodating 4,000 persons. The new East London Theatre is one of the prettiest at present to be found in East London. It possesses a large stage. A new drop-scene has been painted for the theatre by Mr. J. Gates, formerly of the Lyceum Theatre. The front of the pit is devoted to stalls. There are two tiers of boxes. Those nearest the stage are fitted up for the accommodation of private parties. The centre of the first row of boxes is the dress circle, or rather the half circle. The architect was Mr. Hudson, and the builders Messrs. Palmer and Sons.

BRISTOL.—Bristol New Theatre was opened to the public on Monday last. The theatre has taken about six months in building, and now that it is up it is a credit to all who have been concerned in its erection. The stalls will seat 40 persons; dress circle, 250; private boxes, 64; upper boxes and amphitheatre, 300; pit, 800; gallery 700. Total, 2,154. In addition to this there will be standing room for several hundreds more. The Park Row Theatre will accommodate about 550 persons more than the old theatre in King-street, which will seat 750 in the boxes, 320 in the pit, and 530 in the gallery. The decorations of the theatre have been designed by Mr. George Gordon, of the Bristol Theatre, and are Greco-Italian in character. The principal feature in the decorations is a large painting on the frieze above the proscenium 30ft. long, and 7ft. deep. It is by Mr. Henry Holiday, of London, and represents Apollo and the Muses, the figures being rather larger than life size. The theatre is lighted by means of one of Strode's patent sunlights fixed in the centre of the ceiling. By an ingenious invention of the lessee (Mr. Chute) the float lights may be instantaneously changed to any particular colour that may be required. These changes are effected by means of coloured glasses which revolve on cylinders around the lights. Great pains have been taken to prevent the building taking fire. All the walls dividing the annexes, corridors, and lobbies, are built of fire-proof materials. Over the proscenium arch a solid brick wall is carried up through the roof, cutting off all connection between the two parts of the building. On the stage, hydrants are placed, with hose always fixed in readiness, and water at high pressure. So ample are the means of egress that are provided that in case of any occurrence of an alarming character the house might be cleared in five minutes. The plans are by Mr. C. J. Phipps, of London and Bath. The builders are Messrs. Davis and Son. The plumber's work was executed by Messrs. Osborne and Son, of Redcliff street; the painting and plastering by Mr. Cowtin, of Milk street, and the paper-hanging by Messrs. Champion and Sons. The clerk of the works was Mr. G. R. Tasker.

WATER SUPPLY AND SANITARY MATTERS.

n important sanitary reform has lately been ied out at St. Leonard's-on-Sea. Hitherto, most seaside places, St. Leonard's got rid of sewage by discharging it into the sea, from pipes fixed along the beach, polluting both it the sea, into which the refuse from the town all supposed to run. All these "long dirty s" have been removed. An intercepting r has been constructed, which commences at St. Leonard's archway, the boundary between tings and St. Leonard's proper, or West St. nard's, which carries away all the sewage l it reaches the western extremity of the n. It is then received into the reservoir, and scharged twice in the twenty-four hours, and the strong current of the ebb-tide is carried s away to sea in the direction of Beachy-head. e plans, which are found to answer perfectly, designed for West St. Leonard's by Mr. J. Bazalgette, the engineer to the Metropolitan d of Works.

BERTON.—At a public meeting of the inhtants of Liberton, Stenhouse, and Greenend, aturday last, a committee was appointed with r to raise further funds and to take estimates the works to be erected for the purpose of lying the neighbourhood with water.

TILIZATION OF THE DUBLIN SEWAGE.—It is d on the authority of the *Irish Times*, that it ntemplated to form a company to utilize the e of the Liffey at a distance of five miles the city. The names of many highly iutial persons have been communicated who undertaken to act as members of the board, e purpose of carrying so desirable an object successful issue.

Building Intelligence.

CHURCHES AND CHAPELS.

e ancient parish church of St. Bartholomew, nchester, is about to be rebuilt and made a g place for the remains of Alfred the Great is Queen Alswitha. The remains are to be sed in two mortuary chests, with felt crown, uitable inscriptions.

ree costly churches are now being erected in n, U.S.; one is Catholic, one Unitarian, and rinitarian Congregationalist. The Unitarians ecting two others, and the Episcopalians are adding two more, not specially expensive.

e parish church of Hinton, Waldrist, which een beautifully restored in accordance with ans of J. W. Heyall, architect, was reopened vine service on Saturday last.

e corner stone of a Roman Catholic cathedral aid at Boston, U.S., on the 15th ult., which ses to be the largest and finest religious ure in New England.

Luke's Church, Lyncombe, Bath, has just built, the total outlay being upwards of 0. There still remains a debt of £455, and gh the church is quite finished it cannot be crated until this is cleared off.

Thursday last the foundation stone of a new h was laid at Llanbrynmair, North Wales. ost of the church will be about £900, Mr. Harrison, of Montgomery, being the con-r, and Mr. David Walker, of Lord-street, pool, the architect, from whose designs, and whose superintendence, the works are being d out.

ew church, constructed of iron and zinc, has erected in St. John's-road, Angel-road, Brixnd will be opened for divine service this e

Tuesday morning, the Earl of Carnarvon laid undation stone of a new church at Southampedicated to St. Matthew, and intended to be as a memorial to the late Bishop of Ro-r.

new church of St. Bartholomew, situated at d, Flintshire, on land which, a century since, nder the waters of the estuary of the River Dee, nsecrated on Tuesday by the Lord Bishop of saph, in whose diocese it is. The church uilt by contributions, about £2,000 to 0 in cash being contributed, of which the Dee Company subscribed £1,250.

sbury Chapel, which has been closed three s for alterations and repairs, was re-opened on Sunday, the 13th inst. The pulpit has been brought forward several feet, and a lecture or school-room 50ft. long and 17ft. wide, with two vestries at one end, has been formed the whole length of the Chapel-frontage, with a wide gallery over, in which the new organ is placed. An entirely new arrangement for heating and lighting the spacious building, which has two galleries, and will seat about 2,000 persons, has been adopted. The ceiling has been newly decorated, and the whole of the internal woodwork, pewing, &c., painted and grained. The contract has been executed by Messrs. Staines and Son, of Great St. Helen's, under the direction of Mr. W. Allen Dixon, architect, of Kentish Town.

A Wesleyan school-chapel, in the Prince of Wales'-road, Haverstock-hill, is approaching completion. It consists of a large room, which will, for the present, be used as a chapel, two class-rooms over which an end gallery is formed, and a kitchen. These will alternately become school premises when the large chapel contemplated is built. The site is the property of the Tailors' Benevolent Institution, the trustees of which have approved plans for the chapel and school buildings with which the ground is to be covered. These now in progress are only an instalment. Mr. E. Hoole, of Craven street, is the architect; and Mr. Hodson, of the Adelphi, the builder.

On the 10th inst., Dr. Clampton, the newly consecrated Bishop of Rochester, laid the foundation stone of a new church of the district of St. Andrew's, Plaistow. The church is cruciform in shape, with semicircular apse. It will consist of nave, north and south aisles, south transept, and north chapel (which may be used for week-day services); the vestry is in two parts, for clergy and choir. The extreme length is 156ft.; there is a central tower and south porch. The western entrance has double doors, with carved and moulded capitals, and richly foliated carvings. The building is highly substantial in character, of faced Kentish ragstone inside and out, with Bath stone dressings. Mr. J. Brooks, of Serle-street, Lincoln's Inn, is the architect; Messrs. Perry and Co., of Stratford, the builders; and Mr. J. Sharp, the clerk of works.

BIRMINGHAM.—The first stone of the church of St. Gabriel, in Barn-street, being the second church erected by aid of the Ryland fund, was laid last Thursday week. The first church, it may be remembered, was commenced in Dartmouth-street, in June last, and the first stone of a third church was laid on Tuesday last in the parish of St. Stephens, by Mr. Frederick Elkington. The church is to be built of brick, and is to accommodate 600 adults. The contract is £3,110. Mr. Chatwin is the architect, and Messrs. Wilson and Son are the builders.

BUILDINGS.

A fine new hotel is to be opened to-day at Torquay. The hotel is situated at the corner of the avenue leading to the abbey and Miss Burdett Coutts' residence. It is in the modern Italian style of architecture, and will be built from the designs of Mr. Edward Appleton, F.I.B.A. It is said to be a well arranged and very convenient hotel.

About a fortnight ago the large arch leading into Crown-court, Old Broad-street, near the church of St. Peter le Poer, gave signs of weakness, but was underpinned and restored.

The site of Winchester House has been cleared, and the foundations are being put in at a great depth. The excavations have exhibited numerous layers of old foundations and deposits.

A new school has just been opened at Newton Bromswold, Northamptonshire. It is from the design of Mr. W. M'Carthy, of 20, Cockspur-street, London, and is in the First Pointed style. The builder was Mr. John Boddington, of Wellingborough.

THE CUTLERS' HALL, SHEFFIELD.—The new wing of the Cutlers' Hall is fast approaching completion, and will be ready for occupation in ample time for the forthcoming feast, which will take place on the 31st inst. The new hall is one of the finest in the West Riding, and in its general appearance bears some resemblance to the Victoria Hall at Leeds. It will accommodate about 350 persons at dinner, which is about twice as many as could be accommodated in the old hall, in which the cutlers' feasts have always been inconveniently crowded. Messrs. Flocton and Abbott are the architects of the new premises; the decorations have been executed by Messrs. J. and J. Rodgers; the ornamental plastering by Mr. C. Green, Sheffield; and the chandeliers have been supplied by Messrs. Chabrié Frères, Rue des Martyns, Paris.

THE NEW HOP AND MALT EXCHANGE.—The new Hop and Malt Exchange, Southwark-street, was opened for the transaction of business on Wednesday morning at ten o'clock. In the immediate neighbourhood of hop warehouses and offices, and close to London Bridge, the site for the exchange was admirably chosen. It is an imposing building, and the interior is well adapted for the transaction of the large business connected with the hop and malt trades which have been up to the present time unprovided with a public exchange. The exchange room is a noble hall, 80ft. long by 50ft. wide, and 75ft. high to the cornice, from which springs a glazed roof, the crown of which is 115ft. from the floor. The apartment is splendidly lighted, and the accommodation for carrying on sales is such as to expedite the work of buyer and seller. Around the walls three tiers of cast-iron galleries extend, and adjacent to each are offices and show rooms in abundance. A refreshment room and a subscription room are close to the exchange room, and, scattered over the building, are upwards of 1,000 offices and warehouses, capable of storing 50,000 bales of hops. The total cost of the exchange will be about £50,000. The stands in the exchange room are nearly all engaged by eminent firms, but the continuance of Weyhill fair prevented much business on Wednesday. Hops, however, were being rapidly stored in the warehouses, and consignments, the insurances on which amount to about £40,000, are now in store. Messrs. Frampton and Williamson have done the carving connected with the building.

TO CORRESPONDENTS.

NOTICE.—The "BUILDING NEWS" is now Published at the NEW OFFICES, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—R. M.—B. H. and B.—R. C. and Co., the letter was forwarded.—E. W. J.—J. F. and Son.—A. G. H. G. Sons and Co.—R. D. N. H.—C., with drawing of tomb.—J. D. W.—L. S.—J. H. T.—W. J.—T. F.—H. and Co., Liverpool, with photograph of Compton House.—S. and W.—J. F. D., Liverpool, with photograph of Accrington Market.—E. Y.—A. W.—F. R.

J. C. L. H.—There is no such work published.

C. P. E.—You are quite right about the fanciful lettering on the lithograph last week. We had spoken to the engraver about it before. It will not occur again.

W. B. H.—As a rule we do not illustrate unsuccessful designs.

Correspondence.

PUGIN *v.* BARRY.

To the Editor of the BUILDING NEWS.

SIR,—It appears to me that up to the present time the Messrs. Barry have carefully evaded Mr. E. W. Pugin's request that certain letters which were lent to Sir Charles in 1860, should be returned to him, and also that he should be informed as to whether they are destroyed or not. Mr. Alfred Barry now says that when the matter is before the court of arbitration they will state what documents they have, and produce any paper, or answer any question, which the court may think fit. Mr. E. W. Pugin states that these letters contain the main part of his evidence, and wants to know whether they are or are not destroyed. It seems to me that the Messrs. Barry want to have it all their own way, and wish to drag Mr. Pugin into court while they have destroyed his main evidence—according to his showing. I cannot see how this matter can be settled until the Messrs. Barry distinctly state what has been done with these said letters. It is very certain that the Messrs. Barry have each

and all taken this matter very much to heart; and whatever they may say to the contrary, some people will not be satisfied until it is properly settled; so I should advise them to remove this only—as far as I can see—obstacle in the way of a final settlement.—I am, &c.,

Adelphi.

Sir,—On September 23 the Rev. Alfred Barry addressed the *Times*, saying that he had been requested to write, because all Sir Charles's letters, diaries, &c., have been placed in his hands. I accordingly applied to him through my solicitor for the seventy-six letters I lent Sir Charles in February, 1860, and he referred me back to his brother, Mr. E. M. Barry, because the papers are in his hands. My solicitor then applied to Mr. E. M. Barry for the letters, and from him he can obtain no reply. This evasive shuffling has been carried on for the space of two months, and now Dr. Alfred Barry, after reducing the discussion to the level of a personal squabble by accusing me of giving garbled quotations, misdating, misquoting, and inventing, and suggesting doubts as to the character of an irreproachable lady, finally caps his extraordinary personalities by a communication of which this is the sum and substance:—"If you can prove that you gave the letters to Sir Charles Barry, we will admit the fact; if you cannot, we will deny it." I think that few confessions have ever equalled the effrontery of this. It has been reserved for a doctor of divinity to defend a dishonourable act as a preparation for admitting or denying it to have taken place according to the evidence on which it rests.

Now, why have not these gentlemen the manliness to come forward and say at once, plainly and distinctly, whether they have the letters in their possession or not? Why this fencing and subterfuge? Especially, why insinuate that I depend on these letters for proof of my claim? I state openly and fearlessly, in the most solemn way possible, in the presence of God, that I did deliver those letters into the hands of Sir Charles Barry, receiving from him an undertaking to return them; but if his sons imagine that I depend on them for anything more than corroborative evidence of a narrative which I am able to prove without them, they may undeceive themselves at once. They may cease to draw attention away from the disgrace attaching to their own reticence, no less than to their father's violation of his pledged word, to what they are pleased to call my "uneasiness." They little know me or the unhesitating determination with which I am pursuing my course. I neither falter nor fear, and to prove it—although claiming the letters on the grounds of right and justice—I willingly once again accept their challenge, without waiting for the production of the letters, and I give them the benefit of their unspeakable meanness and evasion. If they simply wished to discover the truth, they would long ago have given a plain, straightforward answer, and met me by a fearless confession or denial, instead of shifting their ground and shirking the question by special pleading. The fact of their having the letters or not can in no way be changed by my possession or want of evidence, unless they intend to use either fact according to the result of the evidence produced. They might have spared themselves the suspicion of this dishonour, had they the manliness to speak the truth.—I am, &c.,

E. Welby Pugin.

21, Savile-row, October 16.

P.S.—In answer to Mr. Alfred Barry's statement that "Sir C. Barry had been appealed to for his testimony to bar a pecuniary claim of mine on one of the firms engaged in the work at the New Palace," I take this opportunity of saying that we have his written statement proving that the knowledge of our having a claim at all emanated from himself, and promising that the account which established it should be delivered by him in person as soon as it was prepared.

RETFORD TOWN HALL.

Sir,—"Comparisons are odious," and I venture to add, in the interests of friendly feeling, not desirable; but, as Mr. E. W. Godwin has courted it in this case with questionable taste, I will, with your permission, contribute a little information on the facts. Next to winning, I think it most honourable to be "well licked." I was one of the competitors, and I went to see the designs; and I thought at the time, that all things considered, Messrs. Pearson and Bellamy's design was decidedly the best. The elevations were only roughly in pencil, and unfinished, but the plan, the scheme, the professional assistance that the corporation required was well matured, the various rooms and buildings were skilfully disposed and adapted to the real wants and requirements of the case. I had occasion to inspect this building a few weeks ago, and I was agreeably surprised with the elevation, which is very superior to the unfairly comparative drawing with which you have illustrated it. There are many points of excellence, and it suits its situation admirably, and I certainly think better than any other design would have done among those submitted.

Most people admire Mr. Godwin's Northampton Town Hall; his Congleton building is a parody upon it; and the Retford design a somewhat improved edition of that at Congleton. I fear Mr. Godwin does not see the difference between an architect and a mere designer of stone fronts and details. With the one exception of his lesser hall, I thought his plan a decided failure, inconveniently arranged, and utterly unworthy the front wall—a complete misconception of the requirements of the case, and prostitution of the architect to the designs of front walls. The question of suitability of style to this plan and purpose is purely a matter of taste. As a mere matter of caprice and fancy, I should have preferred seeing Mr. Godwin's front in the market-place to either Mr. Bellamy's or my own.

Architects regard these questions too much from their personal or professional point of view, and I consider them very unfit judges of a competition. To a corporation, not a private individual, it is infinitely more important to obtain a convenient and suitable building, practically meeting the requirements of the case, and suiting its individual site and the spirit of the place than an elevation of the highest art, according to any one's notions, clothing an ill-contrived and inconvenient interior. I enclose an extract from one of the local prints of the day. The design numbered 7, was the one selected and executed; No. 6 is Mr. Godwin's, and No. 5 my own. Messrs. Pearson and Bellamy completely avoided the great and fatal error that I made, of running a road through the Corn Exchange. The site was an awkward one to deal with, and required to be nearly covered.—I am, &c.,

Thos. Chas. Sorby.

27, Brunswick-square, E.C., Oct. 13.

THE MANCHESTER TOWN HALL COMPETITION.

[The following letter has appeared in the *Manchester Guardian*].

Sir,—I crave a last word in your columns touching the memorial addressed by Mr. Allom and myself to the Corporation, wherein is set forth:—

1. That whereas twelve designs may be selected according to the conditions for the final competition, eight architects alone, contributing ten designs, are so selected.
2. That of this number four are Manchester architects, contributing six designs of the selected ten.
3. That in a national and renowned competition, wherein the best architectural ability of the kingdom is represented, it conveys an appearance, if not the substance, of favour, to award more than one-half the honours and prizes to Manchester.
4. And, therefore, your memorialists—included of those in the provisional selection—respectfully seek to have the present list extended to the full number allowed under the terms of the competition.

For an answer to this the memorialists are solely indebted to the public press, through the medium of which a curt communication is reported, that the General Purposes Committee decline any discussion or correspondence on the subject of their selection. They are right. They have nothing to say in justification. The facts stated in the memorial are undeniable, and the third paragraph is only too mildly expressed. The propriety of the concluding plea has been endorsed by such journals as the *Athenaeum* and the Building News. More need not be said.

It is right, however, to be known, that while the selected designs are very carefully withheld from public inspection, on the alleged ground that the architects might copy from each other in the final competition, the Corporation are so little impressed with the merits and convenience of some, at least, of the chosen plans, as to announce in their instructions for the second competition, that "the competing architects are in no respect bound by their drawings, sent in for the first competition, but are at liberty to send in entirely new designs, or to make any alterations they may think fit in their preliminary plans." And thereafter follow the new stipulations and provisos, not contained in the original instructions. These "final instructions" are a caution to unsuccessful competitors. They embody whatever is excellent in all the exhibited plans, obtained and appropriated without payment. I, for one, feel quite flattered in a measure at the liberal call for certain features which my plans possess, and make my best bow accordingly.—Very obediently yours,

James Hibbert.

19, Fishergate, Preston, October.

FASHIONABLE *v.* COMMON SENSE ARCHITECTURE.

Sir,—It is a curious comment on our present architectural position that principle and beauty are in high quarters set aside for ugliness and crudity. Mr. Welby Pugin, in his letter last week has well stated that where we once studied and worked out with care a building, we now go out of our way to produce a sensation; and he alludes to the same mischievous habit in what he aptly calls the "Mexico-Chinese" fashion of modern female dress. Perhaps our church building is most infected with this fashion *furore*. Of course there will always be fashionable architects, like fashionable milliners, readily patronized and sought after by people who put implicit faith in the opinion and taste of other people. There is too much following, and too little consulting, just now, and it needs only for a well-to-do architect to introduce a foreign phase of art, or a continental brick style, as we import the fashions from abroad, and he will find an increasing demand for his importation. Clergymen, who but a few years ago preferred nothing but stone simplicity, now will have nothing but mixtures of brick and tile; and from English Pointed, with all its finish and detail, straightway go to the card-board tracery and unstudied design of a crude continental Gothic. That we have profited by adopting a simple continental Pointed style for our *point du défaut*, in preference to our own late Gothic, cannot be doubted, though I fear our Early Pointed style afforded us all the material, if not the freshness, we required. Unfortunately, we have not stopped at the beauties of our adopted models, but are copying their defects; indeed our enthusiastic worship of a new idea speedily leads to a blind infatuation in which the distinction between good and bad is lost. The employment of the most perishable materials, as red brick for labels and other exposed features, in lieu of stone for stone exteriors is an anomaly and an absurdity only equalled by some of the ultra-ritualistic practices of the present day. Decent chants, uncased Scudamore organs, the abandonment of galleries, a well-appointed choir and respectfully-conducted ritual, are decided advances in the right direction, but when to these are superadded excesses now deemed ridiculous because unsuited to our progressive thought, and features that repel the common sense of an advanced knowledge, we sadly fall in arrear not only of our own age, but of that from which we seek to draw our inspiration. The able remarks published in the Building News on "Plaster and Wall Painting" will give us a case in point. Mere antiquity, carried affected adherence to truth, is quite enough for some professors of art; they even denounce plastering, and prefer to leave their walls rough rubble interiorly, not considering that a so-called gesso or plastering—always resorted to by the mediæval architects—is a refinement common sense and Nature both dictate. So utterly are the followers of fashion, that imperfection is accounted a beauty, and antiquity is confounded with reason! The only hope for the future of art, the development of principles on the basis of common sense, is the self-condemnation and failure that await this intemperate indulgence in excesses.—I am, &c.,

G. H.

WHY MUST WE HAVE MATHEMATICAL HERETICS?

Sir,—While Mr. Guillaume, and his coadjutor the Mechanics' Magazine, are deferring the "upsetting" existing mathematics, we may perhaps draw a less two of various kinds from this class of geniuses. Let however, it would be ill-natured to leave them all without an attempt at saving their pains, hopeless as they may proverbially be. Of course, they are far too ever to devote an hour to the rudiments of the science they are to upset, but there are other ways in which the facts may be brought face to face. They might learn from any sea captain that every figure employed in computing his ship's daily place, whether by dead reckoning or observation, is taken out of the table of sines and tangents or else, in the latter case, from the almanack. Neither almanack maker will tell them every figure in his calculations or in those of the public almanacks whence he copied them, depended on the same tables. Now any of the accounts usually prefixed to these tables, stating how they were calculated, will show that every sine and tangent in them depends on the circumference whose diameter is being taken at 3·141592653590 (these are, according

Herschel, the utmost extent of decimals yet employed; ugh industriously idle Dutchmen rivalled each other, turies ago, in carrying on this computation to 36, 100,), and some of our countrymen lately to 400 and 600 ces!) An error in the third of the above decimals uld, of course, affect every single line of the tables, and such way that every arc or angular measure arrived at their use, would differ from the truth, in the very ratio it the assumed circumference differed from the true. . Guillaume has admitted, I believe, that the ratio of 22 is 1:3·1428+, and that this exceeds 3·1416 by above art in 2500. Well, then, if the 7:22 were, as he now ls us, "rather below the truth," every arc found by se tables would be too little by at least 1 in 2500. But ry position of heavenly bodies predicted in all almanacks has reckoned, and would, therefore, be attained by the th and other bodies sooner by 1 in 2500 than the time dicted. That is to say, any position predicted a year fore hand would be attained some 3½ hours too soon; l everything in this year's Nautical Almanack, having n published in 1861, would be now occurring 21 hours ly—last month's eclipse, of course, included.

But now, to be serious, here we have two more (assuming . Guillaume's account of Mr. Harvey to be correct), led to Mr. Smith, the Liverpool Dock director, l a Mr. Peters of Brighton, of this long procession and ny of martyrs to something, who continue to every age pretting the existing theory" of the very first thing exact science that their schooling in "the three R's" not happened to reach. Of course, the droll expression our new quadrator's second letter (Sept. 13) about suming the ratio of the diameter to the circumference be as 1 to 3·14159 rather than the Archimedian rule of 3·1428," should have warned us of this; but I assumed possibility of his English being awkward. So truly, rever, did he mean this, that we see him now prepared "assume" the reverse of the above, that it is "rather" 28 than 3·1416—nay, even exceeds the former—so that himedes (whom he seems to imagine to have fixed it at 2 instead of between this limit and 71:223, or between 28 and 3·1408) was quite wide of the mark; and, of rse, not simply "most modern mathematicians," but in the last 21 centuries wrong with him.

ow, how strangely unlucky is this particular theorem ld Archimedes! No other mathematical fact, none so slightly above or below it, seems questioned. His very next discoveries, the equality of surface between re and cylinder, or the ratio of their solidities, we er hear attacked; nor anything in Euclid; nor the tiplication table of Pythagoras. These same venerable dozen figures maintain their ground for the vexation outh, and nobody wants a 23 or 31 introduced among n from age to age. Why must only one theorem in exact science, only this circumferential ratio, resemble this respect nothing else but the Bible? Like the aic history, it has one constant succession of Colensos rting it (though in neither case usually D. D. or bishops) since it was written. Here, in our day, is the "existtheory" upset by Mr. James Smith with his 3·125, by Peters with his 3·2, and about to be upset (happily not he BUILDING NEWS, but alas for the poor *Mechanics' gazine*!) with some other figure. Really, considering the "existing theory" is, like all other mathematics outcome in some way of that plaguy old Pythagorean e, I think our upsetters are most half hearted in not g back to the root of the evil. Out upon such nibbling eform! This enslavement to an old formula is unworthy e age. It is as bad as Mr. Pugin's purist objections e architecture of the day, and your other critic's to thwark street in particular. Such austere and straightd people would do well to consider this reputed line Persian poet:—"Let us drink wine, and let us break this tiresome old roof of heaven into new shapes." y with your reasons. If a mediæval emperor was *grammaticam*, how much more, let me tell Mr. Pugin, ld architectural genius be above such rules as his s's, about "decorating construction and not constructdecoration," and the like.

w the reason of this immunity enjoyed by the multiation table and other mathematics, higher and lower, the continual upsetting that poor Archimedes his umference gets, I take to be this—We all of us, Guilles and Harveys included, are at school put through said table, and its applications to the "four rules of metic," and apparently even to that of extracting the re root, to judge by our never hearing of that rule g upset, and even Mr. Guillaume remarking on my use , that "figures are convincing" (p. 640). But we are all put through even the first book of Euclid, or when re, none are usually made to apply its 47th proposition ugh the above seemingly generally taught rule of re root, to ascertaining, to four or five decimals, the umferences of two polygons, inscribed and circumscribed the same circle. All of us might, as soon as arriving at necessary stages in geometry and arithmetic (which usually reached about the same time) be just as well on this task as on any of the hackneyed sums; the er, for instance, that is always to be planted 30ft. from all 40ft. high, or *vice versa*. Findings to 6 decimals. sides of an inscribed or circumscribed hexagon, thence e of two dodecagons, thence of two polygons of 24 sides, thence of 48, 96, and 192, would be enough. Were school exercise regularly imposed, no circle-squarers l grow up among us. They are simply martyrs to free ation-mongering.

e whole tribe are but a fruit of this branch of "free e," a branch that, be assured, a reformed Parliament very soon lop. Compulsory, and therefore regulated, ation, whether we think it English or un-English, is ng that, depend on it, "our future masters" will not ng in introducing; and then we shall produce no more e-upsetters than Germany or America does. We know authority there must always be heresies in religion, heretics in mathematics are quite a gratuitous and entible product.

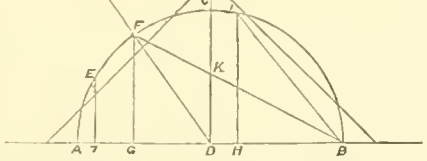
w, let no one think this applies also to physical science. o means. You could not, for instance, by any unity of drill and text books, from the university down very dame school, secure the present (Lyellian) geology upsetting; because it happens to be not science at but a creed, a mere system of dogma received by faith. re is a grand evil lurking in this introduction of physciences into school and general teaching, instead of ing all to learn them as they can. They come to be ounded, in the half-educated mind, with science proso called.

we look at it, the error of our Guillaumes (in thinking thematical ratio can have its "existing theory" upset) is fundamentally the same error with that of Colenso and his class, but inverted in its action. Both circle-squarers and Colensoites lack the notion of the great gulf fixed between exact science, and what are miscalled physical sciences—now mostly not even theories. The Guillaume sort of men, because whatever they have learnt under the name of science is of the latter kind, think science proper is no surer. But the Bishop of Natal, because all the science he learnt in youth was of the exact kind, enabling him to write school arithmetics and algebras, when he meets with books like Lyell's, makes just the converse blunder to the above, and takes whatever is labelled "science," just as he would have taken, if living 400 years ago, the Ptolemaic astronomy, and joined the outcry of which Pascal speaks, just before telescopes were invented, "Look at these ridiculous old Hebrew Scriptures, talking of the stars as innumerable, when we know they have all been catalogued ages ago, and are only a thousand and twenty-two!" Just as your new squarer thinks the ratio of the circumference no better known than the length of the year, this episcopal charlatan thinks a fossil's age must be as sure as anything in his algebra book, or pounds, shillings and pence tables; in which he is so perfect as to know how to retain as many of each as he gets, whether from the people he serves, or disserves after engaging to serve—whether extorted as legal pay for what he refuses to do, or given him in charity for being a "victim of bigotry," and to take care none of either goes to help his fellow-victim (?) Mr. Heath, out of prison.—I am, &c.,

E. L. G.

SQUARING THE CIRCLE.

SIR,—To square the circle and to circle the square geometrically, draw the cord A E equal to half the radius and the perpendicular E 7; make 7 F equal to 7 D. Then will F be the determining point. Draw F B and F G, then will F B be the side of the equal square, and G B equal to ¼ circumference. Bisect G B at H, draw H I and I B, then will I B equal half the diagonal of the equal square. Finally, draw D F to any length you please, and it will



determine the point F, on any circumference struck from the same centre.

To circle the square, let A B be the side of a square, then will B K be the radius of the equal circle.

Note.—This gives the proportion of 7:22, and will serve for any other proportion; the only difference is in finding the point F.

I may show how to approximate to 113:355 in my next.—I am, &c.,

WILLIAM BUTLER.

Tower Lodge, 123, Strand-road, Sandymount.

October 15.

Intercommunication.

QUESTIONS.

[608.]—QUERIES.—1. Are there any manufacturers' pattern sheets published giving sections of rolled iron, and weight per foot lineal?—2. What is the best and most reliable work on the strength of cast iron, by which it would be possible to ascertain the breaking weight of any description of rolled iron? The more simple the calculation the better.—3. Can any of your readers give a ready method of finding the external diameter of a lead pipe, the internal diameter, and the weight per yard or per foot lineal being given?—4. Is there any instrument made for taking the thickness of metals in inches and decimals of an inch, or gauges of any description for sheet lead and zinc; if so where are they to be obtained?—5. It being stated as an objection to the use of tubular girders that they are liable to internal corrosion where it is not possible to obtain access for painting or other preservative, what would be the objection to filling up the interior with grout, composed of lime and sand, iron buried in mortar being always free from rust?—Z.

[610.]—COSTING FLOORING BOARDS.—In purchasing flooring boards from timber merchants I have been in the habit of inspecting wood previous to its conversion, when a price per standard has been quoted. I have naturally inquired "What would prepared flooring cost per square from these goods?" and with scarcely a minute's consideration the merchant is prepared with an answer. There is evidently some ready system of mental calculation, and if any of your numerous readers could enlighten me on the subject I should be very pleased.—A BUILDER.

[611.]—ESTIMATING CARPENTER'S WORK FROM HEWN AND CONVERTED TIMBER.—As the modern custom of supplying quantities to builders is to give all timbers for carpenter's works reduced to the cube, it has often struck me as being a questionable system. Wood that is obtainable from converted timber, *i.e.*, deals and battens, will cost somewhat less per cube than wood of special sizes, which can only be obtained from hewn timber. Could any of your numerous readers inform me the reason of this growing system being adopted. Is it not ignorance on the part of the quantity surveyors, or is it an advantage or a disadvantage to the contractors?—AN ESTIMATOR.

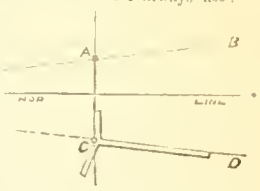
[612.]—APPRENTICESHIP.—I have an apprentice who was bound to me after he was 22 years of age. Have I got the same legal claim on him as if he was under age when bound?—G. T.

[613.]—BLACK BRICKS.—What is the best description of naglazed black cutters; will they cut easily, and will the colour hold, or by running disfigure the face of the work after the first shower of rain? If the black bricks are not applicable, what is the best substitute or imitation, and how should the colour be fixed? What is the proper recipe for good deep coloured black mortar for bedding brickwork in lieu of stopping or pointing with black only?—H. C.

[614.]—MEASUREMENT OF WASTE.—"Measure the cuttings and waste to hips and valleys by the foot run," so say all writers on the measurement of the carpentry of hip and valley roofs. What width is generally allowed for waste? The waste, I suppose, means the cuttings to rafters, purlins, &c.? Is the allowance the same in roofs of stiff as in those of flatter pitch?—T. H. L.

REPLIES.

[566.]—CENTROLINEAD.—In answer to "S. T.," I give the following simple method, which I always use:—Find two lines, A B C D, converging to the V p, one above and one below the horizontal line (this may easily be done by proportional lines.) Draw a line A C, crossing these at any convenient angle. Set one arm and the ruling edge of the centrolinead to angle C A B, the other to angle A C D (as shown), the pins being fixed at A C. This "clumsy instrument" (?) will be found to work quite accurately.—W. PENSTONE.



[573.]—PERSPECTIVE.—By parallel perspective I take your correspondent "S. B. F." to mean what is otherwise called "isometrical perspective," which differs from angular perspective in having no vanishing points. It would, of course, be impossible to teach a person perspective in your columns of "Intercommunication," but the principles may be briefly laid down. The basis of parallel perspective is that all lines, or the extremities of all lines, are either situated in, or parallel to three primary axes, which make equal angles with one another. Hence the term "isometrical," signifying, in its derivation, from two Greek words, "equal measure." This common angle is 60 deg.; and when the axes, of which one is perpendicular, and the other two consequently at an angle of 30 deg. with the horizon, are laid down, the "putting," as it is called, of a drawing into isometric, is comparatively an easy task. Of ordinary perspective there are two descriptions—viz., aerial and linear perspective—the latter of which I presume is that alluded to by "S. B. F." Theoretically, this description of delineation is the representation on a plane surface of objects of certain form and position, as they would appear to the eye, supposing that to be in any given position. It virtually may be considered as making a section of a cone, of which the base and the vortex are known. The eye is the vortex, the base is the collection of objects to be represented, and the cutting plane is the intended picture or representation. In the case alluded to it would be necessary for "S. B. F." either to put his plan into perspective first, or to make an orthographic projection of his interior. He cannot project a perspective drawing from an orthographic plan, although, by a great deal of labour, he might put it into perspective. He will find the following books of use to him:—"Descriptive Geometry," by Mr. Heather, one of Weale's series; and an excellent little shilling work on perspective, by Aaron Penley, with practical examples worked out.—L. S.

[575.]—ARCHITECTS' PUPILS.—It would depend upon the nature of your agreement, and whether you are an indoor or outdoor pupil. It is to be hoped that if the latter, no master would interfere with the manner in which a pupil chooses to employ his leisure time, more especially if that employment were calculated to benefit him. If, however, the pupil's work clashes with that of his master, there is no question but that the latter could put a stop to it. The fact of the matter is, that no pupil is a free agent, and this appears to be lost sight of, judging from the numerous applications made to the "Intercommunication" upon the matter.—APPRENTICE.

[579.]—RAILWAY WORK.—Will you allow me to inform "C. E. Junior" that there are no recognized terms for young engineers for the services he alludes to. An engineer to whom is entrusted the getting up of a line of railway, receives so much per mile for the parliamentary part of the work; and then, again, so much per mile for the contract work. He employs his assistants, and they receive from £2 to £6 per week, according to their capabilities, with all travelling and professional expenses. A *bona fide* engineer will be allowed at least three guineas per diem for attendance in any court of justice, but the amount he would receive for attending before committees would depend upon the value of his position and name as a witness. In the present state of the profession, it is ridiculous for a young engineer to talk about terms. Let him take what he can get and be thankful.—C. E. SENIOR.

[580.]—ADULTERATION OF WHITE LEAD.—White lead, which when pure is a carbonate, chemically represented by the formula PbO, CO^2, which possess two distinguishing characteristics—namely, great specific gravity and complete insolubility in water. The ordinary white lead of commerce always contains a certain proportion of the protoxide of litharge PbO, which is soluble in water, and its purity may evidently be tested, either by comparing the weight of a known volume of it with that of the pure carbonate, or by immersing it for some time in water.—ANALYST.

[582.]—DEADENING SOUND.—A partial remedy for the evil that "J. H." complains of may be obtained by padding the wall next to his neighbour with a good lining of felt, horse hair, cork, or even oakum, but it is for him to consider whether the remedy would not be worse than the evil. The real cure is thick walls, but thick walls do not belong to the present generation.—P. N.

[584.]—WROUGHT-IRON ROOFS.—Let the diagram represent one half of a roof truss of 40ft. span and 8ft. depth; assume the trusses to be 16ft. apart, and the greatest load

60lb. per foot super, including the effect of wind and other occasional forces. The length of the rafters A B will be $= \sqrt{20^2 + 8^2} = 21{\cdot}5$ft., and the weight upon it will $= 21{\cdot}5 \times 10 \times 60 = 12900$lb. The angle which the rafter makes with the horizon may be found trigonometrically thus:—As the sum of the two sides $\overline{A\,h}$, $\overline{h\,B}$ of the triangle is to their difference, so is the tangent of half the sum of the opposite angles A and B to the tangent of half their difference. This will give the angle at A = 21° 48′. In like manner the angle which the strut $\overline{e\,h}$ makes with the horizon will be found to be = 38° 40′, assuming that the tie is equally divided. Now, calling the weight W = 12900, and considering it to be equally distributed over the length of the rafter, the equivalent loads on the several parts will be as follow:—

$$\text{At A a load} = \frac{W}{6} = 2150 = W_I$$

$$\text{At } d \quad ,, \quad = \frac{W}{3} = 4300 = W_{II}$$

$$\text{At } e \quad ,, \quad = \frac{W}{3} = 4300 = W_{III}$$

$$\text{At B} \quad ,, \quad = \frac{W}{6} = 2150 = W_{IV}$$

Following generally the notation of your article on iron roofs, at p. 220, but with some modifications, on which I have already addressed you (see pp. 466 and 486), the strain in compression produced on the shoe of the rafter by the load W_I will be $= \frac{W_I}{\text{sin. A}} = \frac{2150}{\text{sin. } 21° 48'}$, and working this out we have—

Log.	2150	= 3·3324385
— Log. sin.	21° 48′	= 9·5698043
Log.	5789	= 3·7626342

Whence the strain at the point $A = \frac{W_I}{\text{sin. A}} = 5789$lb. call this ..... (S1)

The strain in tension on the bar $\overline{A\,g}$ due to the load W_I will be $W_I \times$ cotan A.

Log.	2150	= 3·3324385
+ Log. cotan	21° 48′	= 10·3979710
Log.	5375	= 3·7304095

Whence the strain on $\overline{A\,g} = W_I \times \text{cotan A} = 5375$lb. (S2)

The strain on the rafter produced by the load W_{II} at the point $d = \frac{W_{II}}{2 \text{ sin. A}} = \frac{4300}{2 \text{ sin. } 21° 48'} = 5789$lb. (S3)

The strain on the strut $\overline{d\,g}$ produced by the same load W_{II} is similar and = 5789lb. ..... (S4)

The horizontal strain on the tie $\overline{A\,g}$ due to the load W_{II} is $= \frac{W_{II}}{2} \times \text{cotan A} = 5375$lb. ..... (S5)

We come now to the secondary truss $\overline{A\,e\,h}$; this, in addition to its load W_{III}, at the point e, has also to sustain $\frac{W_{II}}{2}$ transmitted through the bar $\overline{g\,e}$, its total load therefore at $e = W_{III} + \frac{W_{II}}{2} = 6450$, and this will be supported by the bars $\overline{e\,A}$, $\overline{e\,h}$ in the following proportions:—The load carried by $\overline{e\,A}$ will be $= \left(W_{III} + \frac{W_{II}}{2}\right) \frac{\overline{e\,h}}{\overline{A\,h}} = \left(4300 + \frac{4300}{2}\right) \times \frac{1}{3} = 2150$lb. And the load supported by $\overline{e\,h}$ will be $= \left(W_{III} + \frac{W_{II}}{2}\right) \frac{\overline{A\,g}}{\overline{A\,h}} = \left(4300 + \frac{4300}{2}\right) \times \frac{2}{3} = 4300$lb. The strains produced upon the several bars $\overline{e\,A}$, $\overline{e\,h}$, and $\overline{A\,h}$ by these loads will be found in the same manner as those in the tertiary truss $\overline{A\,d\,g}$.

Thus strain on $\overline{e\,A}$ will be $= \frac{\text{load}}{\text{sin. A}} = \frac{2150}{\text{sin. } 21° 48'} = 5789$lb. ..... (S6)

Strain on $\overline{e\,h}$ will be $= \frac{\text{load}}{\text{sin. } h} = \frac{4300}{\text{sin. } 38° 40'} = 6882$lb. ..... (S7)

Strain on $\overline{A\,g}$ will be = load on e A × cotan A = 2150 × cotan 21° 48′ = 5375lb. ..... (S8)

The strain on $\overline{g\,h}$ produced by the load on $e\,h$ is equal and opposite to that on $\overline{A\,g}$ by the load on e A. The load on $e\,h$ is supported by half the king bolt $\overline{B\,h}$, and is a tensile strain upon it = 4300lb., and this must be added to the original load W_{IV} on B to obtain the entire load at that point: $W_{IV} + 4300 = 6450$lb. = total load at B. The strains exerted on the bars $\overline{A\,B}$, $\overline{A\,h}$ by this load are to be found by the method already explained. Thus strain on $\overline{A\,B} = \frac{\text{load}}{\text{sin. A}} = \frac{6450}{\text{sin. } 21° 48'} = 17368$lb. ..... (S9)

Strain on $\overline{A\,h}$ = load on $\overline{A\,B}$ × cotan A = 6450 × cotan 21° 48′ = 16126lb. ..... (S10)

Summing up the strains to obtain the total stresses on the bars, we have—

			lb.
For the rafter—	Strain on $\overline{B\,e}$ = (S9)	.....	= 17368
	do. on $\overline{e\,d}$ = (S9) + (S3)	.....	= 23157
	do. on $\overline{d\,A}$ = (S9) + (S6) + (S3)	=	28946
	do. on A = (S9) + (S6) + (S3) + (S1)	.....	= 34735
For the struts—	do. on $\overline{e\,h}$ = (S7)	.....	= 6882
	do. on $\overline{d\,g}$ = (S4)	.....	= 5789
For the ties—	do. on $\overline{A\,g}$ = (S2) + (S5) + (S8) + (S1)	.....	= 32251
	do. on $\overline{g\,h}$ = 32251 — (S)	.....	= 26876
	do. on $\overline{h}$ = 26876 — (S8)	.....	= 21501
	do. on $\overline{e\,g}$ = load on $\overline{d\,g}$	.....	= 2150
	do. on $\overline{B\,h}$ = load on $\overline{e\,h}$	.....	= 4300

It must be remembered that $\overline{B\,h}$ will have to sustain an additional and equal load due to the other half of the truss not now under consideration.

Having thus determined the stresses upon the various parts of the truss, it only remains to compute the sectional area required by each bar to resist those strains, which may be done by the method given in your article, No 4, on Iron Roofs, at p. 252. Thus the strain on the foot of the rafter being = 34735lb., and assuming that the iron to be used can safely resist a pressure of 4 tons = 8960lb. per inch of section, the area of a section through that part of the rafter will $= \frac{34735}{8960} = 3{\cdot}87$in. In like manner the scantlings of the other parts of the rafter may be calculated, but in the case of so small a roof as the one under examination, it is usual to make the whole rafter of one piece of iron, and supposing the T-form to be adopted,

the upper table may be 3½in. by ½in.	= 1·75in.
and the flange may be 3¾in. by 9-16th in.	= 2·11in.
Together.....	3·86in. area.

By the same method it will be found that T iron having a sectional area of ·78in., will be sufficient for the strut $\overline{e\,h}$, and that a sectional area of ·66in. will give strength enough for the strut $\overline{d\,g}$.

The greatest tensile strain upon the main tie at $\overline{A\,g}$ being 32251, and taking the safe tension at 5 tons = 11200lb. per inch of section, the area of section necessary to resist the strain must be $\frac{32251}{11200} = 2{\cdot}88$in.; and if the tie be of round iron $\sqrt{\frac{2{\cdot}88}{{\cdot}7854}} = 1{\cdot}9$in., the diameter of the tie in that part. This diameter may be reduced between g and h, as shown by the diminished strain on that part, its thickness being computed as above. The diameters of the bars $\overline{e\,g}$ and B h calculated in the same way will be found to be ½in. and 1in. respectively.

It must be borne in mind that all the above are the nett sectional areas of the bars; therefore, where those areas are decreased by rivet or bolt holes, or other causes, the loss of strength must be compensated either by additional pieces, as packing pieces, or by increasing the dimensions of the bars themselves.—E. Swansborough, 6, Great James-street, Bedford-row.

[588.]—BOX GIRDERS.—There is an error in working out the result of sectional area as stated by "E. E. C." Instead of 14 square inches, it should be 17·33 square inches. This latter is 1·09 square inches in excess of my result, owing to the fact that in the formula used by "E. E. C." the constant 75 assumes the breaking strain of the iron at 18·75 tons per square inch, or a safe strain under the load of one-fourth of this or 4·6875 tons per square inch, whilst I assume a safe strain of 5 tons per square inch; this accounts for the difference in the results. The section I call effective is the breaking area or the section of plates and angle irons of boom taken along the line of fracture. Of course it will be necessary to add to this all section required to be cut away for rivets, to make the complete or gross section of the boom.—F. Hope.

[600.] — FLOW OF WATER. — The only formula "Querist" would seem to require is that there are 10 gallons in a cubic foot.—E. L. G.

[605.]—AN ARCHITECTS' CLUB.—In your impression of last week there appeared a suggestion for the establishment of a club for architects. I am sure that something of the sort would be greatly appreciated by the younger members of the profession. Truly, we have the Kensington Museum library, but for the generality of students it is altogether impossible to attend because of its inconvenient position. Again, there is the Architectural Association, with its lecture classes for study in design, construction and the figure, all very well in their way, but what can we say about the library. We ask, is it a library? They tell us "Yes." We naturally ask where is the library? We are pointed to a cupboard, the dimensions of which do not exceed 7ft. square, and that is half filled with old papers, the other portion being entirely devoted to works of art, and the student can mostly change his book once a week, provided he is not particular about getting the one he wants, that being altogether impossible after the first week of the session, and between the session it is closed to all. This is the state of the only circulating architectural library founded by the Association to aid the coming architectural generation in attaining a thorough knowledge of their profession and advancement in art. It is not so much a museum we want as a library, in a central position, where, after business hours, members could change their books, and so be constantly supplied with materials for their improvement. If this were taken in hand by that energetic body, the Royal Institute of British Architects, I believe we should soon have plenty of subscribers who would be only too glad to give their one or two guineas per annum, and such a club (if such it may be called) would be a great blessing to both the old and young in art. Could not our late president help us in this instead of trying to press us into the artists' rifle corps.—A Member of the R. I.

[606.]—STAINING OAK.—"A Joiner" can stain oak dark, almost black, by means of bichromate of potash, diluted with water.—J. H., Sydenham.

[607.]—GUM, &c.—The gum used on postage stamps is made from starch on a large scale, and sold at photographic shops by the name of Dextrine (so called from its action on polarized light, differing from that of sugar by turning the poles of the ray to the right instead of left).—E. L. G.

STATUES, MEMORIALS, ETC.

A statue of the poet Camoens was last week inaugurated at Lisbon by the King and Queen. There was a State ball in the evening, and the city was illuminated.

A very elegant and carefully-designed monument of white marble has been erected in the Glasgow Necropolis, to the memory of the late Mr. Graham Gilbert. It has been executed by Mr. W. Brodie, R.S.A., the eminent sculptor, from the designs of Messrs. Heath, Wilson, and D. Thompson; and the sculptor has executed a profile portrait of the late distinguished artist in the pediment of the monument.

A monument has been erected to the late Bishop of Tuam (Lord Plunket). It was executed by Mr. Alexander Ballantine, of Dublin, in Cumberland red sandstone, and is a fac simile of the Ancient Cross of Clonmacnoise.

Colossal statues of the Virgin, St. Patrick, and St. Albert, are to be placed on top of the west gable of the Roman Catholic Cathedral at Thurles (Ireland). They have been executed in Portland stone, by Messrs. Earley and Powell, of Dublin.

On Tuesday last her Majesty unveiled the statue of the late Prince Consort, erected to the east of Balmoral Castle, on the south side of the Dee, and almost directly opposite the church of Crathie. His Royal Highness is represented in bronze as a highland chief in full costume, something similar in many respects to the well-known painting by John Phillip. The pedestal is a rough natural cairn of huge granite boulders, 10½ft. in height. On this the figure 13½ft. high stands. The left leg is slightly advanced, and resting on the edge. A favoured staghound is leaning against the right knee, and the right hand is placed on the dog's head. The left hand grasps a rifle near the muzzle. The statue is, in fact, a reproduction of the marble statue by the same artist at the foot of the grand staircase in Balmoral Castle.

STAINED GLASS.

The window to the memory of the late Rev. J. J. Coles is now in its place in St. Barnabas' Church, Bristol. It is the south window in the chancel, and contains three medallion groups on a rich mosaic ground. The window is the work of Mr. J. Bell, of this city.

LEGAL INTELLIGENCE.

Important Decision under the Metropolitan Building Act as to Railway Exemptions.—Mr G. B. Steward was summoned by Mr. N. E Jennings, District Surveyor of Central Lambeth and part of Battersea, before Mr. Elliot, at the Lambeth Police Court, for having erected a building enclosed with wood, contrary to the first schedule of the act, on land belonging to the London and South-Western Railway Company, at Nine Elms. Mr, Walter Taylor, of 29, John-street, Bedford row, solicitor for the district surveyor, contended that the case was not within the exemption clauses. Mr. Steward was an annual tenant of the railway company, holding under an agreement, at a rental, and such agreement contained a clause that the company should have the right of purchasing the office agreed by Mr. Steward to be erected on the land; and if they declined to purchase, Mr. Steward was to remove the same at his own cost. It could not, therefore, be contended that the building belonged to the company, for it was not likely they would have agreed to purchase what was already their own. The mere fact of their having the reversion as freeholders, and not the actual possession, was not sufficient to constitute them the owners of the building, according to the Act of Parliament. That one of the exemption clauses was conjunctive, and that to bring the case within that clause it must be shown that the building both belonged to the company, and was used by them for the purposes of the railway. He thought he had shown that the building did not belong to the company. He should show that it was not used for the purposes of the railway, as it was used by Mr. Steward in his business of a hay salesman. It was part of the purposes of the company to carry hay, but not for the profit of third parties, as in this case. As Mr Steward was a tenant, and not an agent or representative of the company, and used the office for his own profit and advantage, the case was not within the exemption. Mr. Jennings being sworn stated the building was not within the other exemption clause, as it was only 16ft. from the next building, and proved the above facts. Mr Crombie, of the Law Clerk's Office of the London and South-Western Railway, for Mr. Steward argued—first, that Mr. Steward was not the builder, as when he stated to the district surveyor that he was building the office in question he meant he was employing some one to build. That this was not a building, as it was not at all substantial or worthy of the name of a building that it was constructed away from the spot and completed, leaving a space for the fire-place on one side, and then brought to the spot. It was consequently movable, and of a temporary nature. That being 78ft. from the ground or building of an adjoining owner, and 28ft. from a public way it came within the second exemption. That the railway company were the owners, as when the building was once erected it became a fixture and a part of the freehold; that it was used for the purposes of the railway, being for the receipt and dispatch of hay, &c., by the railway; and that they had terminated the agreement and bought the office from Mr. Steward. Mr. Elliot agreed with Mr. Taylor that the building did not belong to the railway company, they having demised the land to Steward, with a covenant to build

neither was it within the other exemption. That it was not used for purposes of the railway, being for Mr. Steward's business as a hay salesman; but Mr. Steward not being the builder, the summons, as against him, must be dismissed. A summons must be taken out against the builder, upon which he would make an order. As to the company having purchased the building since the summons had been taken out, he thought that would have to be settled with the Board of Works.

General Items.

There is a screw loose with regard to the Master and Servants' Act. Some magistrates say that the jurisdiction to enforce the payment of wages is taken away, whilst others say it is not so. Some establishments keep a poet. Why does not the Government keep a literary man to draw up Acts of Parliament with precision?

As an evidence of the fluctuating value of City of London property, we may instance the price of a plot of land in King William-street, which has just sold for £20,000. Last year £35,000 were offered and refused for the same plot.

"Eagle Eye," in a letter, says:—Sir,—Will you kindly allow me to make my annual protest against the imperfect lighting of our streets, more especially the great crossings, such as at the Mansion House, Charing-cross, Circus, Piccadilly, &c. Why not adopt the "sun" principle, now so well established in our large public buildings, to the lighting up of our streets? Not only the safety, but the pockets, of the public would be thereby benefited. The garotter and thief love not light.

An American paper announces the death of Elias Howe, jun., the inventor of the sewing machine, on the 3rd ult., in the midst of his family and friends, at Bridgeport, Connecticut. His funeral took place on Sunday, the 6th inst., at Cambridgeport, Massachusetts. Elias Howe was born in 1819, at Spencer, in Massachusetts. It was at Boston, in the shop of Ari Davis, where he first thought of the sewing machine. It was four years from the time that his curiosity was first awakened, to his application of his mind to that which afterwards proved the great object of his life. Poverty for some time prevented the development of his ideas, but, in 1844, he succeeded in convincing a friend with some means of the feasibility of his conception. In April, 1845, he sewed a seam with his machine, and by May of the same year he had completed his work.

Some time next week the contracts for the restoration of Sutton in Ashfield Church, from the office of Mr. C. J. Neale, of Mansfield, will be advertised for. We learn that it is proposed to spend about £1,000.

The following is an extract from the conditions of contract drawn up by a Durham architect, forming an agreement to be entered into by the successful contractor, for sundry alterations to premises in that city:—"In addition to the sum of £5 per week penalty for delay, as hereinbefore stated, the contractor will be required to deposit the sum of £50 with the architect, when the contract is entered into, as a guarantee that he will finish the whole of the work contracted for within the time specified, and should the contractor fail to complete the work, according to plans, specification, conditions, and details, on or before the time hereinbefore stated," February 28, 1868, "the aforesaid sum of £50 will be forfeited and become the property of the proprietors, in addition to the penalty for delay, as stated in the second clause of these conditions. Should the work be finished within the specified time according to the satisfaction of the architect, the said sum of £50 will be repaid to the contractor."

It is reported that the Board of Arbitration and Conciliation for the lace trade of Nottingham and district is now organized. It is proposed, in a short time, to hold a meeting for the purpose of agreeing upon a code of rules for the future guidance of the board.

The death of Seurre, the French sculptor, is announced. The deceased artist was a member of the institute since 1852. His best known productions are the statue of Molière on the Fountain, Rue Richelieu, and that of Napoleon I., in the overcoat and little three-cornered hat, recently removed from the column in the Place Vendome.

The work of demolition of buildings between Doctor's Commons and Cannon-street, for the formation of the new street leading from Blackfriars to the Poultry, progresses rapidly. Old Fish-street, Bread-street-hill, Wardrobe-terrace, Rutland-place, Earl-street, and the intersecting courts and lanes are a heap of ruins, and workmen are actively engaged in removing the foundations, filling in preparatory to paving, and marking out the boundaries of the new street, the south-west portion of which, from Cannon-street to Earl street, it is expected will be opened for traffic early in the ensuing year.

The work of demolition necessary for making the new street from Maudlin-lane to Park-row, Bristol, is being carried on in good earnest. Opposite the King David Inn, the houses of Lower St. Michael's Hill are rapidly being pulled to pieces, and the materials carted away.

We believe there is some likelihood of Liverpool becoming the depository of a very valuable collection of paintings, and that the Fine Arts Gallery may be well stocked as soon as completed. The late Mr. Gower died possessed of a collection of works of art valued at about £30,000, and among his papers has been found a document referring to the paintings dated as far back as 1857, wherein he leaves directions for them to be in the first place offered to Liverpool; if refused, then to Edinburgh, then to Newcastle, to Bristol, to Nismes (in France), to Bordeaux, and, last of all, to Marseilles.

Immense works have just been commenced in the south of France for rendering the Rhone navigable from Arles to the sea. First of all, large sandbanks, which stretch over a distance of more than three miles, and now permanently block up the river, have to be removed. Then the canal St. Louis must be carried along about two miles further, a lock erected at its mouth, while a bassin and port have to be constructed at other points. The cost of this undertaking is valued at 8,000,000 of francs. In the same province they had also begun draining the marshes and improving the state of the Carmargue—a sort of island formed by the two branches of the Rhone.

The French Government contemplate a new and vast project which will greatly benefit the nation. It is proposed to enlarge the Canal du Midi, better known perhaps as the Canal des Deux Mers. At present it is not suitable for large vessels on account of its want of size and depth, and it has upwards of fifty locks in its course of 150 miles. In order to fill the canal, the innumerable streams of the Pyrenees and the hills of Auvergne are to be collected and imprisoned in vast reservoirs, whence the water can be discharged as occasion requires at different points. The result of this enterprise, says the *Echo de la Dordogne*, will be that the French fleet will no longer be compelled to pass beneath the guns of the fort of Gibraltar.

The executive committee of the National Exhibition of Works of Art, to be held at Leeds in 1868, have placed the entire designs for decoration of the building in the hands of Professor Lewis, of University College, London, who is now engaged in carrying out the scheme originally proposed by Mr. J. B. Waring, chief commissioner.

With regard to the want of facilities for obtaining a technical education, the *Mining Journal* points out that the Royal School of Mines now offers all the advantages which could be desired. The full three years' course can be taken for less than £20 per year; the first and second years' lectures are equally suited to all students, whatever branch of industry they may be connected with; and the students have in the Royal College of Chemistry, which has become the property of the Government, the gratituous use of all the larger and more expensive instruments of the laboratory, and the necessary reagents, gas, and fuel are likewise supplied. The professors are all men of the highest position—Dr. Frankland, chemistry; Dr. Tyndall, physics; and Professor Willis, applied mechanics, for example—and it is suggested that by the addition of a fourth or "Industrial Division," in the third year's course, embracing chemistry (inorganic and organic), assaying and applied mechanics, the wants of all classes would be thoroughly supplied, and the prosperity of the institution as a technical school secured.

MEETING FOR THE WEEK.

Mon. — Society of Engineers. — Discussion on "The Quality of Iron as at Present Used," by Mr. E. Matheson; and, "On Mechanical Saws, by Mr. S. W. Worssam, jun.

Trade News.

TENDERS.

Birmingham.—For shops, corner of Dale End and Albert-street, for Mr Isaac Horton. Mr. Thomas Plevins, architect. Quantities supplied by the architect on the appointment of the builders:—Barnsley and Sons, £6,988; Hardwick and Son, £6,495; W. and J. Webb, £6,320; Jeffery and Pritchard, £6,285; Cresswell and Sons, £6,200; W. Matthews, £6,198; Briggs and Son, £6,190; W. Partridge, £6,150; W. and B. N Smith, £5,990; Horsley Brothers, £5 777; Charles Jones (accepted), £5,571.

Brighton.—For erecting six first-class houses at Hove. Mr. T. Simpson, architect. Quantities supplied:—Timms and Martin, London, £9,577; Nightingale, London, £9,467; Cheesman and Co., Brighton, £9,300; J. W Sawyer, Dulwich, £8,996; D. Bland, Blackheath, £8,945; Longhurst, Worthing, £8,890; Hazell, Croydon, £8,450; Chappell, Steyning, £8,185; Hall, Brighton, £8,050.

City. For erecting house and premises, London Bridge, for Mr. Toby. Mr. H. Carry, architect. Quantities supplied by Messrs Strudwick and Co.:—Bayley, £3,324; Coleman, £2,989; Newman and Mann, £2,896; Hart, £2,8.0; Downs (accepted), £2,787.

Clapham.—For houses and shops, after deducting the old materials. Mr. R. P. Notley, architect:—Newman and Mann, £8,815; Hart, £8,600; Turner and Son, £8,575; Colls and Son, £8370; MacLaughlan, £8,366; Browne and Robinson, £8,215; Adamson and Son, £8,030; Webb and Son, £7,797; Myers and Sons, £7,758.

Notting Hill.—For building the new school hall of the Notting Hill and Bayswater Proprietary School, Mr. John Crawley, architect:—William Bird, Kensington (accepted), £1,932.

Tunstall.—The burial board have accepted the tender of Messrs. S. and J. Smith, of Hanley and Newcastle, for forming the ground and drainage of the new cemetery, at a cost of £943.

BATH STONE OF BEST QUALITY.

Randell and Saunders, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[Advt.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

A. Brown, Fugglestone St. Peter, near Salisbury, builder, October 24, at 1—John Hopkins, Norman-road, New Wimbledon, carpenter, October 24, at 1—I. May, sen., Upminster Hill, near Romford, carpenter, October 29, at 12—John Rule, Kingston-upon-Thames, builder, October 29, at 1—Richard Walker, New Windsor, Berkshire, builder, October 29, at 12—John Jordan, Meman-road, Lower Clapton, builder, October 30, at 11.

TO SURRENDER IN THE COUNTRY.

Jacob Brough, Carlisle, builder, October 28—Henry Cheshire, Rugeley, builder, October 25—W. Dungay, Denver, Norfolk, carpenter, October 26—G. W. Myers, Jarrow, journeyman mason, October 22—S. Williams, East Dean, Gloucestershire, stonemason, October 24—Henry Butler, Southwell, plumber, October 23, at 12—William Dolphin, Brompton, near Chesterfield, mason, November 4, at 11—John Neill, Chorlton-on-Medlock, joiner, November 5, at 9·30.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

Timber, duty 1s per load, drawback, 1s.

Teak .....load	£9	0	£10	10	Archangel, yellow ..	£11	10 £13 0
Quebec, red pine	3	0	4	10	St. Petersburg, yel...	10	10 11
,, yellow pine..	2	15	4	0	Finland	8	0 9 0
St. John N.B. yellow	0	0	0	0	Memel.....	0	0 0 0
Quebec Oak, white ..	5	5	5	10	Gothenburg, yellow	8	10 10 0
,, birch.....	3	10	4	10	,, white	8	0 9
,, elm	3	10	5	0	Gefle, yellow.....	9	0 11 0
Dantzic oak	3	10	6	0	Soderham	9	0 10 10
,, fir	2	0	3	0	Christiania, per C.,		
Memel fir	3	0	3	10	12 ft. by 3 by 9 in.		
Riga	3	0	3	5	yellow	16	0 22 0
Swedish	2	0	2	5	Deck Plank, Dantzic,		
Masts, Quebec red pine	6	0	7	0	per 40 ft. 3 in.	0	15 1 4
,, yellow pine..	5	0	6	0	Pumice Stone pr ton	6	0 8 0
Lathwood, Dantzic, fm	4	10	5	0	Oils, &c.		
,, St. Petersburg	8	10	7	10	Seal, pale....per tun	39	10 40 0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Sperm body	100	0 0 0
Quebec, white spruce	13	0	19	0	Cod	38	0 0 0
St. John, white spruce	13	10	15	10	Whale, Sth. Sea, pale	38	10 39 0
Yellow pine, per reduced C.					Olive, Gallipoli	70	0 0 0
Canada, 1st quality.	17	0	18	10	Cocoanut, Cochin, ton	56	10 57 0
2nd do.....	11	10	12	10	Palm, fine	42	0 42 10
					Linseed	38	15 0 0
					Rapeseed, Eng. pale..	40	0 40 10
					Cottonseed.....	34	0 40 0

Metals.

Iron:—				
Welsh Bars in London .. ..per ton	6 7 6	6 10 0	3	
Nail Rod ..... do	7 10 0	7 15 0	2½	
Hoops ..... do	8 10 0	9 0 0		
Sheets, Single ..... do	9 15 0	10 0 0		
Staffordshire Bars ..... do	7 10 0	7 15 0		
Bars, in Wales ..... do	5 15 0	8 0 0	3	
Rails ..... do	6 5 0	0 0 0	nett	
Foundry Pigs, at Glasg. No 1 .. do	2 15 0	3 5 8	2½	
Swedish Bars ..... do	10 5 0	10 10 0	net	
Steel:—				
Swedish Keg, hammered .....per ton	15 0 0	15 10 0	2	
Swedish Faggot ..... do	10 10 0	12 10 0	2	
Copper:—				
Sheet & Sheathing, & Bolts ....per ton	84 0 0	0 0 0	3	
Hammered Bottoms ..... do	93 0 0	0 0 0		
Flat Bottoms, not Hammered .. do	88 0 0	0 0 0		
Cake and Tough Ingot ..... do	74 0 0	75 0 0		
Best Selected ..... do	81 0 0	83 0 0		
Australian ..... do	84 0 0	89 0 0		
Y. l. Metal Sheathing & Rods ....per lb	0 0 7	0 0 0		

Tin:—							
English Block	per ton	96 0 0	0 0 0	2½			
do Bar	do	97 0 0	0 0 0				
do Refined	do	99 0 0	0 0 0				
Banca	do	94 0 0	95 0 0	nett			
Straits	do	89 10 0	90 0 0				
Lead:—							
Pig, English	per ton	21 15 0	0 0 0	2½			
„ Spanish Soft	do	19 15 0	19 10 0				
Shot, Patent	do	23 0 0	0 0 0				
Sheet	do	20 15 0	0 0 0				
White	do	30 0 0	31 10 0	5			
Spelter:—							
On the Spot	per ton	21 0 0	21 2 6	net			
Zinc:—							
English Sheet	per ton	26 10 0	27 0 0	2			
Devaux's V. M. Roofing Zinc	do	26 10 0	0 0 0				
* And 5 per cent. discount if laid upon the new system.							
Quicksilver	per btl	6 17 0	0 0 0				
Regulus of Antimony							
French	per ton	28 0 0	0 0 0	0 2			

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THE BUILDING NEWS.

LONDON, FRIDAY, OCTOBER 25, 1867.

LONDON ORPHAN ASYLUM, WATFORD, HERTS.

A LIMITED number of architects having been invited to send in designs for the above-named buildings, the drawings are now to be seen at No. 8, Old Jewry, E.C.; the exhibition has been open to the public within the last few days. The instructions, which are precise, require accommodation for 600 children, viz., 200 girls, and 400 boys. The accommodation is what might be expected in an institution of this nature. Chapel, dining hall, two school rooms, one for 250 senior boys, and one for 150 junior; playground, and covered spaces for exercise in wet weather; dormitory to contain not less than 650 cubic feet of air for each child, and swimming-bath about 50 × 25ft. For the girls, a school room for 200 is required, a work room, and a music room with separate and well-ventilated compartments, so as to admit of eight girls practising simultaneously. In addition to these above-named rooms, the necessary administrative apartments, such as officers' rooms, board rooms, reception rooms, infirmary, kitchens, &c., have to be provided for. It was, moreover, wisely determined that the 400 boys should be housed in separate but adjoining divisions of 50 boys each, with distinct supervision. The cost, exclusive of fittings, not to exceed £65,000, and no canvassing or solicitation of any member of the Board of Managers on any account to be permitted. The premiums, three in number, are respectively £250, £150, and £100. The Board is in no hurry to award the premiums, and the result of its deliberations will not be known for some weeks. Such information, as a careful and by no means brief inspection enables us to give, we lay before our readers. The land on which the asylum will be built is situated at Watford, about 300 yards south of the station of the London and North-Western Railway. The total area is about 36 acres, 20 acres of which will be devoted to the asylum, the remainder being laid out in building plots.

Including an alternative design, by Mr. Collier, 26, Philpot-lane, City, eight sets of drawings are exhibited. To his designs, whether Italian or Gothic, we can give but partial approval. The Italian elevation is spoilt by the introduction of what should be string-courses, but which are every whit as important as the main cornice, and for this there is the less excuse, as they are made to resemble pseudo-balconies. A blank balcony is an abomination, and in this instance they add many hundreds to the cost. On the principal front there is a run of sham balcony for 270ft., and on the return front for about the same length. This is, however, the only attempt at decoration which the elevations exhibit, and if it were omitted they would be plain certainly, but by no means offensive. The Gothic design is the best arranged, but the use of large pointed windows of three and even four lights in the top storey is to be condemned. It is not Gothic practice. The plan seems to meet the requirements fairly, but the architect must have queer notions about music, when he provides for the eight simultaneous piano players little boxes only 5ft. square. There is, also, a superabundance of light in the dormitories, and consequently a number of beds placed against windows—at all times a most objectionable arrangement, unless the windows are at a great height from the floor. In an hospital or infirmary the wards should be light and cheerful, but in a dormitory, for people who are well, an excess of light is a positive nuisance. Are we not accustomed to let down the blinds, draw the curtains, and close the shutters, if we are so fortunate as to have any, expressly to exclude the light? The material for the Italian design is yellow brick, with red brick archivolts. There is no rustication, and the elevations are of commendable plainness. The Gothic design shows elevations of red brick, with stone dressings. The central tower, which contains a tank in the upper storey, is not in the Gothic style, nor, indeed, in any other. It is, however, excessively ugly. Neither of these designs, although they have certain good points, are of sufficient merit to warrant their adoption by the Board of Managers.

The next set of drawings is by Messrs. J. and J. Belcher, F.R.I.B.A., 5, Adelaide-place, London Bridge. This perspective view is uncommonly badly coloured, and not particularly well drawn. The circular window to the recess in dining hall is as bad as anything we have seen for a long time. Perspective is not difficult, but, to be pleasing, it must be correct. The pen and ink elevations are well done. The central portion of the principal front, about 160ft. in length, containing the entrance and inner halls, board room, waiting and reception rooms, library, &c., is of stone—all the rest of the building, excepting the chapel, being of red brick, with stone dressings. The effect is not harmonious. The style assumes to be Gothic, but of what date or country it is impossible to say with any accuracy. There is some savour of French Gothic, as rendered by Mr. Burges, with a *soupçon* of Hampton Court. The interior of the chapel is, however, very pretty, though a trifle too fine. What do the children want with Minton's tiles all over the place? In the central portion of the building, where the Board meets, and where the visitors are received, the use of Minton's tiles seems somewhat excessive, as the area of hall, vestibule, and corridor, covered by this expensive material, is about 3,500 superficial feet. The accommodation which this plan furnishes is good. The play rooms, 107ft. by 40ft., are excellent. The dining hall is on the principal or first floor, the ground storey being 14ft. high. With the exception of an excrescence at the northern end, taking the form of a circular window of bad proportions, the dining hall is a handsome room. On this floor are the school rooms, one dormitory 60ft. by 40ft., kitchen, music rooms, &c., the latter 12ft. by 14ft., which is a reasonable space for a pupil practising simultaneously with seven others. The general arrangement of the building is compact, and, though symmetrical, seems perfectly convenient.

Mr. T. H. Watson, M.R.I.B.A., 9, Nottingham-place, exhibits a well-drawn and beautifully-tinted design in the Gothic style, prevalent in France during the 13th century. The material—except for the dining hall, where Corsham stone is used—is yellow brick with a very modest amount of stone dressing. The plan is irregular, but great picturesqueness is produced, and abundance of light and air obtained. As in most of the other designs, the dining hall is the principal feature. It is 100ft. by 50ft., and is placed on the first or principal floor, and has attached to it a water tower about 110ft. in height. The general arrangement is sufficiently open without being diffuse. The infirmary is placed in front of the main building. In the other designs the infirmary will, for the most part, be found at the rear. The extensive corridor by which the chapel and infirmary are approached give much character to the design. The elevations are plain but handsome, and the dormitories are not spoiled by having as much glass as a greenhouse. The music room is decidedly objectionable, being 22ft. by 17ft., containing eight compartments 6ft. by 4ft. each, to hold a piano and simultaneous practitioner. These pens are formed by glass partitions, as at the Merchant Seamen's Schools, Snaresbrook. It is stated that ventilation is provided for, but it would appear that acoustics have been neglected. With this exception the plan appears to be an extremely good one.

Mr. Henry Dawson, 16, Finsbury-place, exhibits two block plans, each showing possible extensions. The plan is rather diffuse, and the chapel, which is at a considerable distance from the main building, is not approached by a covered way. In this plan a thorough system of subdivision has been carried out, the building being divided into groups of apartments, each to receive fifty boys. This arrangement is especially desirable in the dormitories, where the sub-matron's room is placed between two dormitories, each containing twenty-five beds. Each group has its separate day room, stairs, &c., and is completely self-contained. The chapel is becomingly plain, the interior being of yellow brick, with a few red and black bands. The material of which all the buildings are constructed is yellow brick, with the usual amount of red and black which goes to constitute the Victorian style. The elevations are plain, but have no other merit whatever. The hipping of the roof of central building, containing the administrative offices, is most objectionable, besides being purely gratuitous. The merits of this plan are its openness and distribution, though the former has, perhaps, been carried to the utmost limits compatible with convenience. This is the most that can be said in favour of the plan. The elevations are such as we should be very sorry to see carried out.

Mr. G. Somers Clarke contributes a well-coloured perspective view of a building in no recognized style. Its roofs, for the most part, and horizontal lines generally ally it to the Italian style, while the details of the windows, if anything, are debased Flemish Gothic. The senseless decoration under the sills of ground-floor windows is not what might be expected of so eminent an architect as Mr. Clarke. When we describe it as a band of delicate carving, such as is often seen in a rood screen or Gothic cornice, we think our opinion will be shared by our readers. Blameworthy as this feature is, it is matched by the south-western tower, whose roof and turrets are almost ludicrous; it must be seen to be appreciated. From the top of the tower rises a lofty roof, with a little round turret at each angle. There is neither parapet nor cornice, this notable device in slate and lead being plumped down on the square head of the tower, without the intervention of even a corbel. The building is of extreme length, about 625ft. frontage, and is three storeys high. The dining hall is on the ground-floor, and the arrangements appear to be good, each group of fifty boys having its separate day-room, &c. The arrangement of the dormitories is not so good as shown in Mr. Dawson's plan, a large room to contain fifty beds being substituted for two containing twenty-five each. A capital library, 54ft. by 20ft., is provided, and a dining hall little less gorgeous than the Guildhall. Why should the orphans require a roof to their dining hall nearly as elaborate as that which Mr. Lockwood designed for his central hall of the New Law Courts? All excessive decoration in charitable institutions is out of place, as the money which is thus thrown away might do good in affording permanent support to an increased number of children. The covered space provided in the girls' playground for exercise in wet weather should be increased.

Mr. Fred. H. Williams has sent a set of drawings of which we will say nothing.

Mr. Fred. Peck, 15, Furnival's Inn, exhibits a Gothic design of considerable merit, the chapel and tower being particularly pleasing. The plan differs from most of the others in having a long front, 430ft. to the north, the front to the west being about 540ft. This we regard as an objection. The plan has, however, many good points. There is an excellent covered playground for 250 senior boys, 100ft. by 37ft., and another for 150 junior boys, 56ft. by 37ft. The day rooms are capacious, 33ft. by 37ft., and well situated. The interior of the chapel is original and effective, without being excessively costly. The music room provides separate compart-

ments, 9ft. by 7ft. 6in. The arrangement of the infirmary seems to be very good, a fever ward being detached. The material is red brick with stone dressings, a little black brick being here and there introduced, but not in large quantities. This set of drawings is well worth seeing.

Mr. E. C. Robins, 13, Southampton-street, Strand, is the author of a very peculiar plan. It consists of twelve distinct buildings of similar character, placed on three sides of a square, the connection being made by means of a corridor. The advantages of this plan are that each group of fifty children is isolated, and that the building can be extended almost indefinitely. Mr. Robins styles this the "pavilion" system. We are not prepared to go deeply into its merits, but we are certain that it must be a very expensive one. Each "pavilion" has its four walls as complete as if it stood alone on Salisbury Plain. When to this method of construction an expensive style of elevation is added, the cost must be excessive. There is no doubt that in their estimates the architects have kept somewhere near the limit of £65,000, but it is impossible to believe that a plain design like that of Mr. Dawson, and that of Mr. T. H. Watson, will not cost less than Mr. Clarke's or Messrs. Belcher's. This is, however, a matter for the consideration of the surveyor to the Board. Mr. Robins' design is in the Gothic style, with a strong resemblance to Mr. E. B. Lamb's peculiar treatment, and this we regard as no light commendation. It would be well, however, if the "pavilions" were deprived of their large pointed-headed windows in the upper storey, as they make the whole institution appear like a lot of chapels with school rooms beneath dotted about a field. There can be no possible grouping, and, as the pavilions are all alike, a most disagreeable and monotonous effect would be produced. The chapel is light in construction—perhaps too light—and has a temporary rather than a permanent character. The usual accommodation is provided as in the other designs, and calls for no especial notice; the play room, however, is too narrow, being only 17ft. in width. The chapel and master's house are detached. It will be seen that only seven architects have eventually responded to the invitation of the Board, though a much larger number originally entered into the competition. Regarded as a whole, there is great room for improvement, and there is not a single design which could be recommended in its entirety. If Mr. Dawson's plan is not too diffuse, it seems to answer the requirements of the Board, but his elevations are bad. Of the elevations, the best is that of Mr. Watson, which is simple without being poverty-stricken—appropriate, in short, to the purposes of the building. The result of the competition will not be made known until the middle of November, the Board being determined to act with deliberation.

HAYLING ISLAND AND ITS PROSPECTS.

A RECENT visit to a comparatively unknown spot on the southern coast of Hampshire so favourably impressed us with its happy position, fine sea frontage, and bathing facilities, that we promised to resume our notes on the place and its prospects; and in doing so we will here submit a few suggestions calculated to improve the locality and its railway communications. Till quite lately a ferry was the only access to the island from Portsmouth, whereas now—thanks to private enterprise—a railway connects it to Havant, where the Brighton and South-Western systems unite. Within two hours of London, and about half that time of Southampton, on one side, and Brighton on the other, its favourable position is incontestible, outstripping, in this respect, its isolated rival, the Isle of Wight, a charming view of which it also commands. In sight of these advantages, and considering the present depressed condition of railway property, it is clear an opportunity is now open to improve the revenue of one company at least in this direction. Railway companies are too often blind to one great resource in improving their position and receipts, namely, the encouragement of the erection of houses in the vicinity of their stations—at once a source of revenue to the shareholders by the traffic thus derived, and a judicious disposal of their surplus land. Voluntarily or compulsorily purchased, such waste land unnecessary for the purpose of the line, may thus be made a valuable resource, as the directors of the London, Brighton, and South Coast Railway Company have lately found out, having realized by auction, and rendered available for building purposes, as much surplus land as has produced them upwards of £100,000; and, we may add, a sum small in comparison with that derivable from traffic created by the erection of buildings upon such land. We may exemplify these remarks by what has been already done by the same company in connecting the watering-place of Eastbourne to the parent line, another very desirable means of improving railway receipts and developing at the same time desirable residential districts; and we are at a loss to discover the explanation of that miserable blindness to their best interests some companies evince in this direction. By the connection of Eastburne to the main line, the above-named company have created, we believe, a revenue of about £50,000 a year, a sum derived mainly from that place alone.

Hayling and the South-Western Railway Company offer a precisely parallel case. On reference to any railway map our readers will see that the Brighton Railway possesses exclusively the most important watering-places on the south coast; but it is quite evident, and it is a point well worth the attention of the South-Western Company, that the Brighton Railway Company are not interested in developing Hayling, because they will only get at the best a share of the traffic from the junction of the two lines at Havant, whereas to all the other places on the coast they get the whole. It is alone, then, to the interest of the South-Western Company to use their best energies to the development of the Hayling Railway and South Hayling as a watering-place—a measure that would unmistakably realize to the shareholder a greatly increased dividend, besides developing a locality that, in spite of existing drawbacks, must become in a few years immeasurably superior to Brighton from its more sheltered position, varied scenery, and sea bathing qualities. At present, indeed, the South-Western, or particularly the direct Portsmouth portion of it, is essentially a pleasure line, destitute of any great source of revenue or attraction such as its rival possesses at Brighton, and if that territorial jealousy which has retarded so many improvements were to give place to a liberal policy, this desideratum would be supplied, and we might predict for Hayling all that its most ardent admirers could desire. Next to the liberal working of the Hayling Railway by the parent companies another, though minor, essential is necessary: we mean the establishment of a steam floating bridge from Cumberland Fort, connecting Hayling with Southsea and Portsmouth.

The present open boat ferry, necessarily restricted to the conveyance of passengers and light luggage, is quite insufficient as a communication at this important point of Hayling—carriages, cattle, and merchandize, having to take the circuitous route through Havant. Various designs for a bridge of the above description have, we understand, been prepared, and we believe one of these has already received the sanction of the Admiralty and War Department, and will probably be carried out forthwith.

To meet this accommodation, the extension of Hayling Railway, from the existing terminus westward to the ferry is contemplated—a line that will, in course of time, be extended across Langston harbour, through Southsea to Portsmouth, effecting a union of the islands of Portsea and Hayling. Connected, as we have pointed out, by an efficiently-worked railway and steam floating bridge to the mainland, the future of this rural waterside cannot fail to be a bright one; for, as we have remarked, it possesses all those elements that combine to make an attractive and fashionable retreat. Besides its fine sea-bathing, with the other advantages referred to in our former article, its very position is favourable. Insular, though not to such an extent as to remove it from easy access to the world of life without; sheltered from the north, east, and west, while it enjoys the exhilarating air and aspect of the south; its roads and lanes fringed with foliage—a feature of which other coast-bound places are destitute; an abundance of fresh water springs; and a beautiful turf gallop of four miles along the sea, render Hayling just that happy locality where business-worn life may be restored, and the invalid and pleasure-seeker find equal benefit. Field sports the island affords the means of enjoying, for game is in abundance, and the Hambledon fox-hounds, and other packs, meet in the neighbourhood; while the race course, recently formed, is considered nearly equal to that of Goodwood. We cannot omit to notice, briefly, among the inducements of Hayling—which we have here had merely time to outline, rather than fill up—the wonderful oyster culture being carried on by the South of England Oyster Company (Limited). The oysters laid down by this company have yielded a prolific amount of spat, unexampled of late years. We understand an enclosed area of eighteen acres of water, from 5ft. to 6ft. in depth, are crowded with young oysterlings; and in making excavations for new beds some time since, the remains of a skeleton, interred with knees drawn up to the chin, and surrounded with remnants of these molluscs, were discovered. Shall we aver, with the natives of this island, this discovery to have been the remains of the first oyster-taster! The creeks and indented coast-line east and west of Hayling certainly favour artificial aids for the breeding of this species of bivalve, which, from time immemorial, seems to have thriven in Langston, Emsworth, and Chichester harbours; and we certainly believe water-side bipeds will find the splendid bay of South Hayling equally inviting.

We found the island not altogether destitute of antiquities. South Hayling Church—now being substantially restored under Mr. Street—we hope to revert to in a future article; while Warblington and a few surrounding churches repay the trouble of a visit. Hotel-like house accommodation is sadly deficient, the want daily increasing. We are, therefore, glad to find that a contract has been entered into for the erection of a hotel at West Town, Hayling, near the railway station, from the designs of Mr. F. Whitaker; and that some land in the same part has been plotted for building operations. We may add, a great inducement to build here is the fact that the local rates and taxes do not exceed 2s. in the pound.

JOTTINGS IN LONDON.—No. III.

(By a Roving Correspondent.)

I MADE some remarks the other week about two heads on the large unfinished block of chambers in Great Winchester-street. The heads were those of a bull and a ram, each presiding over a cordon of flowers, and I wondered what the other heads would be, as I had then only seen one side of the building. I now learn from the other side that the corresponding pair are an elephant and a lion—emblematology beyond comprehension. It is well worth while making these remarks, because the building shows much study, and possesses great merits. It is a building which we could not have got a quarter of a century

ago. For appropriateness of application to its purposes it is much to be commended; the rooms are well lighted, while, with wide window space, the solidity of the building and solidity of appearance are unimpaired. So far as situation will allow the owner ought to make his account of it, and get good rents, as it will always look well, and wear well, and, so far as can be judged, the money is thoroughly well laid out. There is enough ornamentation, and not too much. The money for that, too, is well spent, and neither architect nor assistants have spared pains. Each detail is separately designed and distinctly carved in free carving. Even the small doorways in London Wall are studies. Such being the case, and it being evident that the architect is an artist and a man of mind, and, it must be, a man of conscience, one pauses almost in dismay, for there is not a feature of ornamentation which is at all appropriate and befitting—nothing which has any relation to its history, situation, or application. Then comes a hesitation, and the thought is self-born in doubt, that all this design, so far as it is art, may not be the mere reproduction of some Italian palazzo one has forgotten, or the outturning of the architect's note book from his continental tour. Copying, indeed, there must be, for it is Italian and Renaissance in character and type, and what there is of original after all, who knows. One would like to think otherwise, to believe in the original in art, to think that we have still artists among us, and that we may witness the newly-blooming fruits of design, as Italians did before us in the middle ages. Why not? Must we copy bulls and rams, and elephants and lions? Has this city no annals—has our country no history? Nay, that very site is historical; and, surely, some matter of reference might have been found beyond the beasts referred to, or staring heads of nobodies, from Italy or France, looking out of the wall like Peeping Tom of Coventry. All that is on this building is meaningless, and such is the doom of architects, unless the building belongs to the Government or a Queen's tradesman, as then the coat of arms and lion and unicorn can be got; or in the case of a town hall, for there are the town arms, supporters, and motto. Were we a people without a history, and without a name, we might bear to have foisted upon us the worn-out pageantry of Greece or Rome; but with the greatest empire the world has yet seen, and with the foremost race on both sides of the Atlantic and Pacific, it is strange we should want subjects of allusion. Has India no emblems, Australia no kangaroo, Canada no beaver, the States no stars and stripes, but we must even copy or beg sacrificial bull's heads; and we, who sacrifice no bulls, but butcher them honestly, must be condemned to see their naked skulls with garlands on warehouses or on churches!

The sight of the buildings of the east end or the west end is a sorrowful one in this—that we can only see poverty of thought, and, in that, trace out poverty of knowledge. These architects use the religious and conventional emblems of Greece or Rome, not because they know anything of Greek or Roman history, or have any feeling as scholars, but because they can copy them off engravings of Greek and Roman history. They are, in truth, as innocent as of English history. You may travel, indeed, through London from east to west without knowing that you are in an English country, beyond seeing the aforesaid lion and unicorn, and their belongings. Some architects and artists devote themselves, as they call it, to their art, which is almost another name for laziness and avoidance of those studies which are needful to make a man a professor of liberal knowledge. The canon which Vitruvius, so many centuries since, laid down as to the intellectual qualifications of architects, holds good now, but few observe it. The study of English history would be a great assistance to the architect, and a strong corrective of unmeaning elaboration. The city is now full of heads, masques, festoons, and shields, which might belong to Florence, Timbuctoo, Teheran, Tehuantepec, or Moscow; and what we say as to London is as applicable to Liverpool or Manchester. One consequence of this absence of congruity is a want of local colouring in our English cities. We all know Venice with its lion of St Mark, and Constantinople with its crescents: but London wears the cast-off ornaments of Bologna, Florence, Parma, and the provincial cities of Italy.

Before the time the electric telegraph came into the world nearly thirty years ago, other modes of telegraphing were being investigated. Professor Wheatstone and Mr. Hyde Clarke were occupied in experiments on the transmission of sound. The former, it is said, had invented an acoustic chair, in which a person could sit and hear sounds from a distance at his will, a far remote conversation, or a band playing a long way off; and the latter gave a plan for diffusing the sound of organs and instruments, and enabling a small organ to fill a large church, or the organ of the mother church to play in all the distant churches. A sketch was published, too, of one of those inventions for laying music on to the houses, as gas and water were then laid on, and as telegraphy is now. By establishing colossal instruments as reservoirs of sound, and by taking advantage of the acoustic properties of communication, it was said the philosophers proposed to provide that the ratepayers, by touching a tap, should in their own drawing-rooms be provided with opera selections or dance music for their parties, and on Sunday evenings with a full oratorio or choral service. Whether there ever was such a company this deponent sayeth not, but such a scheme is not perhaps beyond the compass of science, or the powers of Professor Wheatstone, if he were supplied with sufficient funds for experiment and practice; and, by-the-by, we may say that acoustics is a neglected science, as we know in more ways than one, —theatres, concert rooms, and meeting rooms, for instance. If the want of sound be one form of evil, its superabundance is another. Now, I am not a shareholder in the Limited Company for supplying music to inhabited houses, but I am a customer without having given an order. Here, in my apartment, in a first-class house, erected by an eminent builder, whose fame has extended beyond a span, I am, willy nilly, enjoying the full piano practice of my fair and accomplished neighbour next door. Not a note is lost. I own she is a good performer, and her selections of pieces to be admired, but it is I who just now am not in tune. I am rather a fidgetty person; my thoughts are disposed to wander, and for the life of me I do not know whether to listen to and admire her playing, or whether to gather up my scattered thoughts, and go on with my self-imposed task; or, shall I give this up, and betake myself to the weighty tome lying by my side, demanding equal attention, and to which opera airs are alike inimical. If I had the range of the house, I might resort to some other room. I believe I should be safe in bed, as the mattresses do not propagate the sound, but then I must give up my pursuits. Here the piano, which is in the next house, on the upper floor, is playing distinctly over my head. Not a note do I lose: each is sharp, distinct, or mellow—unchanged, unimpaired in the transmission.

The architect and builder deserve great praise for this. The transmission is perfect; and one thing alone have they forgotten, and is wanting, and that is the means of shutting off the supply of sound at will. In the case of the company referred to, you could turn off the tap in the drawing-room and modify the sound, or tell the maid to shut off the main service in the hall. Here the designers have made no such provision. In Paris you are generally so well cared for that if you have only a floor you are safe from sounds lateral, supernal, or infernal. The floors are well filled in, so that if a ball is given overhead you suffer but little; yet, in English houses, there is rarely a provision of this kind, although it is generally needful, as much as a provision for stopping lateral sound, which is so wofully neglected. Piano practice is a well-known nuisance in London houses. There is no reason why bedrooms should not be secured from the noise of the day apartments, where there is an invalid, a child, or some one who wishes to lie a-bed when others are up, and the girls want to practise on the piano. We have not, say what we will, as much privacy as we boast of, particularly in comparison with many foreign neighbours, and privacy is one part of home comfort and independence.

The music of my neighbour is very agreeable, and I trust she is so too, though I have never seen her, but her music could never come into my house, like trickling water, if the persons concerned in the building had not made adequate provisions. It comes in by vibrations communicated to the timber in my house along the flooring of her room, and there must be a communication of timber through the party wall, notwithstanding the district surveyor. The thought has forced itself into my mind that where music comes another element may come, and that is fire. If music can leak, flame will. There cannot be much doubt of some defect about the skirting, and it is quite possible a wood brick or chock is in communication; if so, my few books, manuscripts, and title deeds, may be in danger. Until time or architects alter these arrangements, I recommend all persons taking a house on lease for years, or apartments, &c., for a short time, to ascertain under what professor the ladies on each side have learned music, and to get a guarantee that no unqualified daughter from school or female visitor shall be let into his neighbours' houses so long as he chooses to remain in his own.

A new street is being cut through Bucklersbury. I may give our architectural friends a hint that if they want subjects for ornamentations for the offices to be set up there, they can use Sir Thomas More and Erasmus, for the latter dwelt there in More's house. The "Encomium Moriæ" alone will give abundance of subjects, and the Holbeinesque illustrations of the old editions will yield most ugly masques.

MEMORIAL TABLETS.

We have more than once called attention to the subject of putting up memorial tablets on houses in which remarkable men lived, or where remarkable events took place in London. The Council of the Society of Arts have taken the matter in hand, and have prepared an alphabetical list, a portion of which appears below. Other parts will follow. The Council request the assistance of members of the Society and others in completing and correcting this list, especially with reference to dates and the insertion of other names. We willingly give currency to their desire, and should feel obliged by any of our readers sending us any reliable data on the matter. While the Council intend to proceed with this work they desire to see it carried on by others, either by corporate bodies or individuals. The metropolis is rich in historical associations; every street has some interesting biographical story to tell, and when it is told on tablets all who run may read.

Eldon, John, Earl of, Lord Chancellor (b. 1751—d. 1838): a templar. Cursitor-street (No. 9?), Chancery-lane, was what he called his first lodge, and from here, in early life, he told his secretary he had often ran down to Fleet-market with 6d. to buy sprats for supper. He lived in No. 6, Bedford-square, from 1804 to 1815, and here occurred the memorable interview between him and the Prince Regent, afterwards George IV. The latter was determined to have his friend Jekyll, the great wit, appointed to the vacant office of Master-in-Chancery; this Lord Eldon rejected. To accomplish his purpose the Prince walked straight into the Lord Chancellor's bedroom, when ill in bed, and requested him to do as he wished; on being at once refused, he stated his intention of staying where he was till the appointment was made, the prince pitying the chancellor because he would never

see his wife again. He built the house at the corner of Hamilton-place, Piccadilly, which was his last London residence. A portrait of him hangs at Merchant Taylor's Hall, and another in the gallery at the Privy-garden, Whitehall.

Elizabeth, Queen (b. 1533—d. 1603); dined at the "King's Head," No. 53, Fenchurch-street, off pork and peas, after attending service at All-Hallows-Staining, Fenchurch-street, on her release from the Tower. The metal dish and cover she is said to have used are still preserved; lived, when a girl of thirteen, in the same house, in Chelsea, with Queen Katharine Parr and her second husband, Thomas Seymour, the Lord Admiral, afterwards beheaded; also lived in Durham House, Strand, which was granted to her by Edward VI.; opened the Royal Exchange in person, January 23rd, 1570, and on that occasion dined at Sir Thomas Gresham's house in Bishopsgate street; was present at the house-warming in Sir Robert Cecil's house (Salisbury House), on December 6th, 1602: she died at Richmond, and her body was brought with great pomp, by water, to Whitehall, was buried, and there is a monument to her memory in Westminster Abbey. The statue of her over the Fleet-street doorway of St. Dunstan's-in-the East is the only known relic of any of the old City gates, and stood in the west front of Ludgate, Temple Bar not being a City gate, but only a bar to mark the liberties of the City.

Empson, Henry VII Emissary, lived in Walbrook, "in a fair house with doors," leading into the garden of the Prior of Tortington, now Salter's Garden.

Erskine, Thomas, Lord, Lord Chancellor (b. 1750—d. 1823); he commenced life as a sailor, then became a soldier for three years, and then studied the law; student at Lincoln's-inn; lived at No. 36, Lincoln's Inn-fields, in 1805. A statue of him stands in Lincoln's-inn Hall.

Ethelbert, King of Kent (b. 616); founded St. Paul's Cathedral.

Etty, William, R.A. (b. 1787—d. 1849); painter; lived at No. 14, Buckingham street, Strand, from 1826 to within a few months of his death.

Eugene, Prince (b. 1663—d. 1736); stayed at Leicester House, when on a secret mission to England for the purpose of preventing peace between England and France.

Evelyn, John (b. 1620—d. 1706); was a templar; lived about nine doors up on the east side of Dover-street, Piccadilly; lodged at the "Three Feathers," in Russell street, Covent-garden; took a house in Villiers-street (No.—?), York-buildings, Strand, in order to educate his daughters; was taken prisoner in Exeter Chapel, Strand, for attending service on Christmas day.

Fairfax, Sir Thomas, afterwards Lord (b. 1611—d. 1671); the Parliamentary general; married at the parish church, Hackney; lived in Great Queen-street (No. —?), Lincoln's Inn-fields; also in York House, Strand, which was given to him by Cromwell.

Faithorne, William (d. 1691); engraver; lived at the sign of the "Ship" in the Strand, next to the "Drake," without Temple-bar; died in Printing House-square, Blackfriars, and was buried at St. Anne's, Blackfriars.

Fanshawe, Sir Richard (b. 1608—d. 1666); lived in Boswell-court, Fleet-street; also on the north side of Lincoln's Inn-fields.

Farnaby, Thomas (d. 1647); schoolmaster; kept his school in Goldsmith's-alley, or Goldsmith's-rents, Cripplegate. He is described by Wood as the chief grammarian, rhetorician, poet, Latinist, and Grecian of his time. "His school was so much frequented, that more churchmen and statesmen issued thence than from any school taught by one man in England."

Ferguson, James (b. 1710—d. 1776); the astronomer; lived at No. 4, Bolt-court Fleet-street, where he died. Buried at the churchyard of St. Marylebone.

Feversham, Lewis de Duras, Earl of (b. 1709). He commanded King's James the Second's troops at the battle of Sedgemoor. Lived in St. James's-square (No. —?), and was buried in St. Mary-le-Savoy.

Ffolkes, Richard (temp. Charles II.); lived in Newport-street (No.—?), Long acre.

Fielding, Sir John (d. 1780); one of the originators of the Magdalen Hospital, St. George's-fields, and the Marine Society; lived in Bow-street (No. —?), and was buried at St. Luke's, Chelsea.

Fielding, Henry (b. 1707—d. 1754); dramatist and novelist; lived in Bow-street (No. —?).

Finett, Sir John (circ. 1656); author of "Finetti Philoxenis—some Choice Observations touching the Reception, Precedence, &c., of Foreign Ambassadors in England;" lived in St. Martin's-lane (No. —?), Charing-cross.

Fisher, Kitty, the celebrated courtezan; lived in Carrington-street, May-fair (No. —?), about 1779.

Fitz-Alwyn, Henry, first Lord Mayor, and mayor for upwards of 24 years, and a goldsmith of the guild; lived "in a very fair house" on the north side of the church of St. Swithin, London Stone, Cannon-street; he was commonly called Henry Fitz Alwyn of London Stone.

Fitzroy, George, Duke of Northumberland (b. 1665—d. 1716); lived in St. James's-square.

Flatman, Thomas (b. 1633—d. 1688); poet and miniature painter; lived and died in Three Leg-alley (No. —?), (now Pemberton-row), Fetter-lane; he was buried in St. Bride's, Fleet-street.

Flaxman, John (b. 1755—d. 1826); sculptor; lived in New-street, Covent-garden (No. —?), from 1771 to 1772; from 1781 to 1787 at No. 27, Wardour-street, Oxford-street; and also at No. 7, Buckingham-street, Fitzroy-square, from 1796 to his death; buried in the burial-ground attached to St. Giles-in-the-fields.

Fleetwood (temp. Queen Elizabeth); Recorder of London; lived in Bacon House, off Cheapside.

Fleetwood, Charles (b. 1692); Lord Deputy; lived in Wallingford House; was Oliver Cromwell's son-in-law; buried in Bunhill fields burial ground.

Florio, John, author of the well-known dictionary that bears his name; lived in Shoe-lane (No. —?), Fleet street.

Ford, Parson (b. 1731); died at the "Hummums," in Covent-garden, formerly a bagnio, now an hotel; it was really believed, for a long time, that his ghost appeared to a waiter in the cellar of this house.

Foster, Mrs. Milton's grand-daughter; kept a chandler's shop in Pelham-street, Spitalfields.

Fox, Charles James (b. 1749—d. 1806); the statesman; lived in Albemarle-street, "on the left hand a little way up as you go to St. James's-street;" also for a short time in Arlington-street; Godolphin House, in the stable-yard of St. James's Palace (pulled down to erect Stafford House), was his last London residence. He is buried, and has a monument to his memory, in Westminster Abbey.

Fox, George (b. 1624—d. 1691), the founder of the Quakers; preached in a chapel up a narrow court opposite the old-fashioned gate leading to St. Edmund-the-Martyr. Died in the house of Henry Goldney, in Gracechurch-street (No.—?). He is buried in Bunhill-fields burial-ground, but no monument has been erected to his memory.

Fox, Stephen, 2nd Lord Holland (1774); built and lived in the mansion in the centre of the Albany, Piccadilly, and sold it to the 1st Viscount Melbourne.

Fox, Henry Richard Vassal, Lord Holland (b. 1773—d. 1840), the famous Whig; lived at Holland House, Kensington. "He called on Lord Lansdowne a little before his death and showed him his epitaph of his own composing: Here lies Henry Vassal Fox, Lord Holland, &c., who was drowned while sitting in his elbow chair." He died at Holland House, in his elbow chair, of water in the chest. There is a monument to him in Westminster Abbey.

Francis, Sir Philip (b. 1740—d. 1818); one of those to whom the letters of Junius were ascribed; was educated at St Paul's School, and lived in 14, St. James's-square. Lady Francis lent this house to Queen Caroline, who lived here during the first proceedings of her trial.

Franklin, Benjamin (b. 1706—d. 1790); printer, philosopher, and statesman. He worked in Palmer's printing office as a common journeyman printer, and assisted in setting the type for the second edition of "Woolaston's Religion of Nature," and "continued," he says, "at Palmer's nearly a year;" during this time he lodged in Little Britain, next to a bookseller of the name of Wilcox; he also lived at 7, Craven-street, Strand, and was employed as a journeyman printer at Watt's office, in Duke-street, Lincoln's Inn fields, opposite the Roman Catholic Chapel.

Frederick, Sir John (d. 1757); his mansion was in Frederick-place (No. —?), Old Jewry, which derives its name from him. This house was used after his death, till 1768, as the London Excise Office.

Fuller, Thomas (b. 1608—d. 1661); author of "The Worthies;" lived in chambers in Sion College, London-wall while collecting materials for his "Church History;" his book is dated from here. He was also lecturer at the Savoy.

Fuseli, Henry, R.A. (b. 1741—d. 1825); lived at No. 13, Berners-street, Oxford-street; also at No. 100, St. Martin's-lane, from 1784 to 1785; and at 72, Queen Anne-street East, Cavendish-square (now Foley-place), between 1788 and 1792. He was buried in St. Paul's Cathadral.

Gainsborough, Thomas (b. 1727—d. 1788), the artist; lived in the western wing of Schomberg House from 1777 to 1783.

Galt, John (b. 1779—d. 1839), the novelist; lived at 34, Tavistock-place, Tavistock square.

Gardiner, Stephen, Bishop of Winchester (1555), lived at Winchester House, Southwark, in great style, having a number of young gentlemen of family as pages, whose education he superintended. He used the Lady Chapel, at St. Saviour's, Southwark, as a consistorial court.

Garraway, Thomas (circ. 1650); founder of Garraway's Coffee-house in Exchange-alley, and was the first who retailed tea in leaf and in drink, and may almost be considered the founder of the present system of tea-drinking.

Garrick, David (b. 1710—d. 1779), actor; was living in 1745 in King-street, Covent Garden, in his lodgings at Mr. West's, cabinet maker; also in Mansfield-street, Goodman's-fields-street, during the term of his first engagement in London; also in 27, Southampton-street, Strand, before he removed to No. 5, the Terrace, Adelphi, in 1772. In this house he died. He frequented the Bedford Coffee House, under the Piazza in Covent Garden; and also St. James's Coffee House, St. James's-street (no longer standing). He made his first appearance on a London stage in Goodman's Fields Theatre, as Richard III. He is buried, and a monument erected to his memory, in Westminster Abbey.

Garth, Sir Samuel (b. 1665—d. 1718), author of the "Dispensary;" lived on the east side of the Haymarket, the sixth door from the top, from 1699 to 1703. He was one of the thirty nine members of the Kit Kat Club.

Gay, John (b. 1688—d. 1732), poet; his "Beggar's Opera" was first produced at Lincoln's Inn-fields, and played 62 nights in one season. He was buried, and a monument erected to his memory, in Westminster Abbey.

George, Prince of Denmark (b. 1653—d. 1708), Queen Anne's husband; was Lord High Admiral from 1702 to 1708, one of the exceptions to the rule that this office has been held in commission since the Revolution of 1688. He was married in St. James's Chapel, St. James's Palace, and died in Kensington Palace.

Gerarde, John (b. 1545—d. 1607), the herbalist; lived in Holborn; used to collect specimens, particularly water violets, in St. George's Fields, also in Mile End, Whitechapel. He makes the earliest mention of Piccadilly.

Gibbon, Edward (b 1737—d. 1794), the historian. He was educated at Westminster School; was a member at Almack's Club; afterwards M.P. for Liskeard; lived in No. 7, Bentinck-street, Manchester-square, where he wrote a large portion of "The Decline and Fall of the Roman Empire," and the whole of his Defence of his noble history. He also resided at No. 76, the corner of Little St. James'-street, where he died. This spot is now part of the site of the Conservative Club.

Gibbons, Grinling (b. 1648—d. 1721), carver in wood; was born, it is said, in Craven street, Strand, then called Spur alley, but this is very doubtful. He lived in Belle Sauvage-court (No. —?), Ludgate-hill, and also in a house about the middle and east side of Bow street, Covent Garden, where he died. This house was distinguished by the sign of "The King's Arms." He lies buried in St. Paul's, Covent Garden.

Gifford, William (b. 1755—d. 1826), editor of "Ben Jonson" and the "Quarterly Review," and author of the "Baviad and Maviad," &c.; lived and died at No. 6, James'-street, Buckingham-gate. At the shop of Wright, the bookseller, in Piccadilly, Gifford assaulted Peter Pindar, and got the better of him in the struggle. He lies buried in Westminster Abbey.

Godfrey, Sir Edmundsbury (b. 1678), the famous Protestant martyr; lived in Green's-lane (No. —?), Strand. He was a wood merchant here, and had his wharf at the bottom of Hartshorne-street, Charing Cross, now called Northumberland-street. He is said to have been murdered at Somerset House, Oct. 17th, 1778, and his body taken and thrown into a ditch near Primrose Hill. There is a monument to him in Westminster Abbey.

Godwin, Mary Wolstoncraft (b. 1759—d. 1797), authoress of the "Vindication of the Rights of Women." She was the first wife of William Godwin, and mother of Mrs. Shelley. She lived at the "Polygon," Somer's Town, where she died, and lies buried at St. Pancras-in the Fields.

Godwin, William (b. 1751—d. 1836), author of "Caleb Williams;" lived at the "Polygon," Somer's Town, which is now surrounded by Clarendon square. He kept a bookseller's shop for several years, at 41, Skinner street, Holborn, and lies buried with his two wives at St. Pancras in the Fields.

GLASGOW ARCHITECTURAL SOCIETY.

THE annual general meeting of this society was held on Monday evening, within Carrick's Royal Hotel, George-square, John Honeyman, jun., Esq., architect, president, in the chair. Mr. MacLean, the secretary, read the annual report and treasurer's statement, which showed the affairs of the society to be in a satisfactory condition. The report and abstract of the treasurer's statement were directed to be printed and circulated among the members. The following gentlemen were elected to be the office bearers for the next year, viz.:—President—John Honeyman, jun., Esq., architect. Vice-presidents—Horatio K. Bromhead, Esq., architect; John Mossman, Esq., sculptor. Hon. Secretary—William MacLean, Esq., 88, West Regent-street. Hon. Treasurer—James Howatt, Esq., measurer. Councillors—Jas. Salmon, Esq., architect; A. Carlton, Esq., painter; James Boucher, Esq., architect; William Clarke, Esq., architect; Alexander Marshall, Esq., wright; John Gordon, Esq., architect; Alexander Thomson, Esq., architect; John J. Stevenson, Esq., architect; John Hay, Esq., ventilating engineer; Daviel Cottier, Esq., glass painter; W. Leiper, Esq., architect; John M'Donald, Esq., builder; Campbell Douglass, Esq., architect; Walter Macfarlane, Esq., ironfounder—late vice-presidents.

At the annual supper which took place in the evening, Mr. Honeyman again presided. In giving the toast of the evening, the Glasgow Architectural Society, he made the following observations on

THE LAW COURTS.

The designs for the law courts offered a most interesting and instructive field for the contemplation of the student. The vast extent of the project and the multiplicity of its detail required the grasp of a master-mind to grapple with the mere arrangement of the plan; and it is peculiarly interesting to observe how the various difficulties have been met by so many well-known men. Still more interesting, however, and still more instructive is it to observe their treatment of the whole as artists. I may not now attempt any discriminative criticism, but let us pause a moment over these magnificent drawings, the latest works of men who are generally regarded as the most eminent in their profession. I may say at once that I cannot accept them as the best productions of these men, for I do not believe in a man doing his best in a competition. But may we not at least take them as a fair index of the exact position of our art in England at the present day? and if so, I would ask, are you perfectly satisfied with them? Do you think they are in advance of anything that has gone before, otherwise than in their extent and the execution of the drawings, for that is the important point. Do they show any signs of healthy vigorous vitality, or even of feeble hopeful vitality? Any indication that our art lives, and that its roots have at last struck down into what is best and noblest in our national idiosyncracy? For myself, I shall confess that I am disposed to take rather a desponding view of the present position and prospects of our art. I had hoped for better things from the revival of Gothic architecture than we have yet seen. My expectations, perhaps, have been unreasonable, or their realization may only be deferred; but if this revival is to lead us to nothing better, I fear there may be too much truth in what a distinguished predecessor in this chair affirmed, that Gothic architecture was but a fashion—the rage of the day—doomed soon to pass on to oblivion or contempt, like the patches and periwigs of the past, or the crinolines and chignons of the present; and, if so, gentlemen, what next? That is the question. In this boasted age of progress are we to be for ever retrogressive in our art? With the treasures of past ages daily more fully unfolded to us, with all the appliances of modern science at our back, and all the wealth of the richest country in the world, are we never to emerge from the servility of copyism, or venture beyond the confines of experiment? Our art I fear is more influenced by other characteristics of the age than that of progress. This is not an age of progress merely. It is an age of indifference, of scepticism, of infidelity—an age of unrest, of haste, or selfishness—and it is impossible but that our art should be affected

; these evil influences, even if progress be ad-itted. The architecture of the day, indeed, is a ·ry embodiment of latitudinarianism, its professors ›ing very much whatever is right in their own ·es, without reference to any recognized canon—ithout faith, without control. We cannot even nong ourselves agree as to the orthodox archi-ctural creed, and therefore we are powerless to rect others towards the true and the beautiful, ıe beautiful because the true. How often, too, ›es our art lend itself to the mere expression of irry and bustle, and selfish jostling. What a ınt of repose there is, for example, about any of ese great law court designs. How appropriate ems the filling in of the foreground with the ·er restless rush and crowd of Temple Bar. The o wanders over the whole expanse of clustered afts and statues, of towers and pinnacles, and ocket fringed gables, and mediæval monsters, d feels, I fancy, much like the bewildered dove Noah on her first voyage of discovery. Haste, leed, in many shapes, is one of our worst enemies. common with our fellows we are not exempt ›m the snare of hasting to be rich; and, practi-lly, there is no work for those who refuse to ıke haste. We must make haste, and the ten-ncy of this is to convert us into mere traders in t—art which we can hardly call our own. There neither patience nor pay for the artist, and he ıst give place to a man of great business capacity ıo can supply architecture in any style and to any tent on demand. Now, obviously the effect of is state of matters would be bad enough, if we d a fair start on the true path, and in our pre-ıt perplexity it is pernicious in the extreme. the one case it is probable that some ıld be found who preferred eminence to opu-ıce, but while the foundations of our architec-al faith remain so unsettled, the temptations to lifferent course are almost irresistible; and all nour be to the few who, thoroughly persuaded their own minds, work perseveringly on in that :h which to them seems the path of truth. ıs, that they are not pressing on side by side; t that it must be said of even the best that ir paths lie in exactly opposite directions. Let ıot be imagined from what I have now said ıt I ignore the existence of much that is ad-rable in the art of the present, and particularly these law court designs. By no means. I re now purposely directed attention only to › shady side of the picture. It is the side least ractive, and least likely to be thrust upon our tice; but not the least instructive; not certainly › least worthy the study of him who wishes to ıke sure of his footing and seeks to eliminate › density or the power of the various obstacles ich imperil his faltering progress.

The remainder of the gentleman's speech was ·upied in discussing local matters, and particu-ly the sanitary condition of Glasgow, which s proved to be at a very low ebb indeed. Profes-Gardiner and other gentlemen spoke at con-erable length on local matters.]

INSTRUCTION IN ART.

VE are frequently receiving letters, and particularly for our "Intercommunication" ›artment, asking for information regarding truction in art as afforded at the National Art ›ining School, South Kensington. The follow-will be pretty exhaustive on the subject:—

nspector general for art, Richard Redgrave, ·A.; head-master, Richard Burchett; deputy ıd-master, R. W. Herman.

Mechanical and architectural drawing, H. B. Ha-·en; geometry and perspective, E. S. Burchett; nting, freehand drawing of ornament, &c., the ıre and anatomy, and ornamental design, R. rchett, R. W. Herman, W. Denby, R. Collinson, l C. P. Slocombe; modelling, F. M. Miller. male classes—Lady superintendent, Miss Tru-k; female teachers, Mrs. S. E. Casabianca and ›s Channon; matron, Mrs. Garrett; attendant, ›. Abel.

.. The courses of instruction pursued in the ıool have for their object the systematic train-: of teachers, male and female, in the practice of and in the knowledge of its scientific principles, ıh the view of qualifying them to impart to ›ers a careful art-education, and to develop its ›lication to the common uses of life, and its ıtion to the requirements of trade and manu-tures. Special courses are arranged in order to ıllify schoolmasters of parochial and other ools to teach elementary drawing as a part of ıeral education concurrently with writing.

2. The instruction comprehends the following subjects:—Freehand, architecture, and mechanical drawing; practical geometry and perspective; painting in oil, tempera, and water colours; modelling, moulding, and casting. The classes for drawing, painting, and modelling include architectural and other ornament, flowers, objects of still-life, &c., the figure from the antique and the life, and the study of anatomy as applicable to art.

3. The annual sessions, each lasting five months, commence on March 1 and October 1, and end on the last day of February and the last day of July, respectively. The months of August and September, one week at Christmas, and one week at Easter or Whitsuntide, are vacations. The classes meet every day, except Saturday. Hours of study—Day 10 to 3; evening, 7 to 9.

4. In connection with the Training School, and open to the public, separate classes are established for male and female students; the studies comprising drawing, painting, and modelling, as applied to ornament, the figure, landscape, and still-life.

Fees for classes studying for five whole days, including evenings:—

£5 for the session of five months.
£4 for three months.
£3 for two months.

For three whole days, including evenings:—

£4 for the session of five months.
£3 for three months.
£2 for two months.

For the half day, morning or afternoon:—

£4 for the session of five months.
£3 for three months.
£2 for two months.

To all these classes there is an entrance fee of 10s.

Evening Classes.—Male School. £2 per session.
Artisan Class. 10s. per session. 3s. per month.
Female School. £1 per session, three evenings a week.

5. Classes for schoolmasters, schoolmistresses, and pupil-teachers meet on two evenings in each week. Fee 5s. for the session. Similar classes are formed at the Spitalfields, St. Martin's, and Lambeth district schools.

6. The morning classes for practical geometry and perspective, and also for drawing from models, are open to all students, but they may be attended independently of the general course, on payment of a fee of £1 per session for either class.

7. With the view to meet the applications of parents, young persons at home for the Christmas and Midsummer vacations can attend the drawing classes at South Kensington, from December 15 to February 14, or from June 15 to July 31, on a payment of £1. Hours of attendance, daily, except Saturday, from 10 to 12.30, or from 1 to 3.

8. Students properly qualified have full access to the collections of the museum and library, either for consultation or copying, as well as to all the school lectures of the Department. The public also are admitted to the same privileges on payment of small admisson fees—for which see the prospectuses of the museum and library.

9. A register of the student's attendance is kept, and may be consulted by parents and guardians.

Lectures at South Kensington.

Lecturer on Anatomy, John Marshall, F.R.S., F.R.C.S. A course of twelve lectures on anatomy as applicable to the arts is given in each session. The spring course may be attended by ladies. Fee for the course, 6s.; for a single lecture, 1s.

Lecturer on Botany, Christopher Dresser, Ph.D., (Jena). The course of lectures on botany may be attended separately on payment of a fee of 6s. for the course.

Other lectures are delivered occasionally, which will be duly announced.

Metropolitan district schools of art are now established at the following places:—Entrance fee, 2s.; fees, 2s.; and 3s. per month. These schools are open in the evening from 7 to 9.

1. The Female School of Art, 43, Queen-square, Bloomsbury, W.C. (removed from 37, Gower-street).

2. Spitalfields, 12, White Lion-street, Norton Folgate.

3. St. Thomas' Chaterhouse, Goswell-street.

4. Rotherhithe Grammar School, Deptford-road.

5. St. Martin's-in-the-fields, Castle-street, Long-acre.

6. Lambeth, St. Oswald's-place, Upper Kennington-lane.

7. St. George's-in-the-East, Cannon-street-road.

8. St. Mary's, Hide-place, Vincent-square, Westminster.

9. West London, 204, Great Portland-street.

At the Bloomsbury, Spitalfields, Charterhouse, Westminster, Lambeth, and West London schools, there are female classes. Applications for admission, prospectuses, or any other information, to be made at the schools in each district.

There is an annual examination for prizes in all the schools and a national competition.

RULES OF THE ART TRAINING SCHOOL RELATING TO FEES ONLY.

Students entering for a session after its commencement will be allowed a proportionate reduction of the next session's fees, if they continue students of the school, but no reduction for less than one month will be allowed, thus:—

Whole Day, Including the Evening. Hours 10 to 3, and 7 to 9.

Students entering for five months, or the whole session, £5 day and evening.

Students entering when				£ s.
	4 months of the session have to run.	£5	and have at their own option a right to attend on the following session at a fee of—	4 0
	3			3 0
	2			2 0
	1			1

Three Whole Days. Hours 10 to 3, and 7 to 9.

Students entering for five months or the whole session £4.

Students entering when				£ s.
	4 months of the session have to run.	£4	and have at their own option a right to attend on the following session at a fee of—	3 4
	3			2 8
	2			1 12
	1			0 16

Morning or Afternoon. Hours 10 to 12.30, or 1 to 3.

Students entering for five months or the whole session £4.

Students entering when				£ s.
	4 months of the session have to run	£3	and have at their own option a right to attend on the following session at a fee of—	3 4
	3			2 8
	2			1 12
	1			0 16

Evening. Hours 7 to 9.

Students entering for five months or the whole session £2.

Students entering when				£ s.
	4 months of the session have to run	£2	and have at their own option a right to attend on the following session at a fee of—	1 12
	3			1 4
	2			0 16
	1			0 8

The summer session commences on March 1, and ends on the last day of July. The winter session commences on October 1, and ends on the last day of February.

The schools are open free for the inspection of the public every Saturday, from 2 till 9 p.m. Entrance through the museum. For further information inquire of the attendant at the entrance to the schools.

DRINKING FOUNTAIN.

THE beautiful fountain presented by the Earl of Dudley to the inhabitants of that town was formally inaugarated last week. The fountain consists of a quadrilateral, pierced by arches in one direction, and in the other supported by semicircular projections, bearing two dolphins on the outside. Immediately above these latter are the upper basins, supported by two large fronts of sea-horses, the whole surmounted by a pyramidal roof, culminating in an allegorical group, representing Industry in general and Industry in particular. The former figure is a girl, with a spinning apparatus, and the latter is an engineer. The chief feature of the structure is the arched and domed part of its centre. The dome itself is perforated by two windows, glazed in a coloured glass, thus providing light to the central jet which starts from a series of three marble tazzas, one superposed to the other. On the two sides corresponding to the exterior semi circular projections, are niches occupied by figures representing an agriculturist and a miner, in allusion to the characteristics of the county. The corners of the quadrilateral are ornamented with festoons of fruits, while the keystones are decorated with the heads of a river god and a water nymph. The spandrils of the arches are enriched by genii bearing scrolls with appropriate mottoes. The legend, subdivided into four parts is (Numbers xxi, 17)—

Spring up, O well;
Sing ye unto it.
The princes have digged tho'well,
The nobles of the people have digged it.

There are two streams of water supplied to ladles from boldly-conceived lions' heads; two large basins, for the use of cattle, and four smaller ones near the ground for the accommodation of dogs and other small animals. The cattle troughs are supplied from the mouths of the dolphins previously mentioned. The height of the fountain is 28ft. Mr. Forsyth was the sculptor, and the cost was about £3,000.

It is stated that the tariff for messages of ten words, per Atlantic cable, to America, is about to be reduced from £10 to £5; the charge per word for more than ten words being 7s. 6d. Five words, not exceeding twenty-five letters in length, will be allowed for name and address of sender and receiver of message in each case; and extra charges for code messages are to cease.

ANCIENT TOMB OR ALTAR DESTROYED AT CONISBOROUGH.

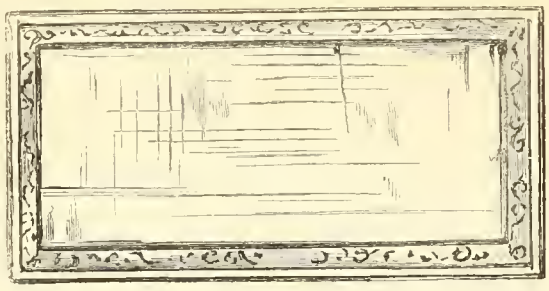


Fig. 1.

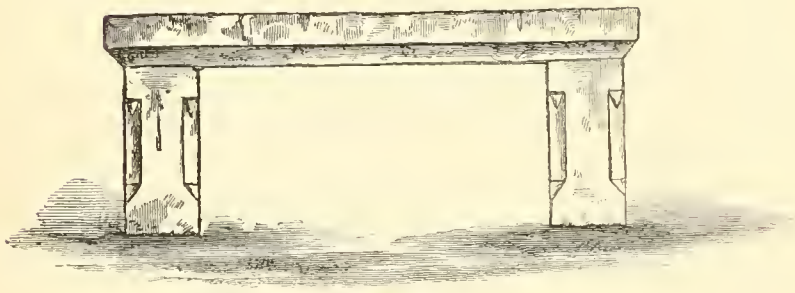


Fig. 2.

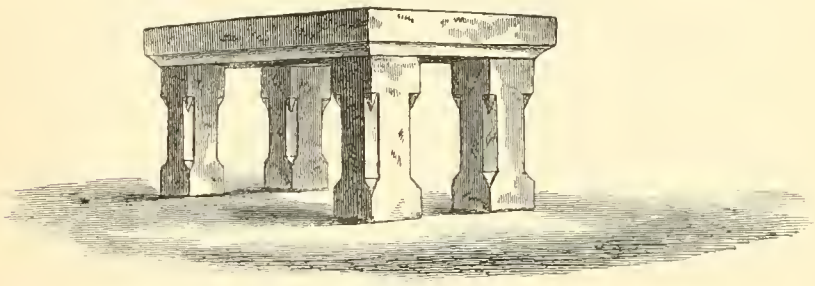


Fig. 3.

ANCIENT TOMB OR ALTAR DESTROYED AT CONISBOROUGH.

We give this week illustrations of the very curious and interesting tomb or stone altar which was destroyed among other objects of interest at the spoiling of Conisborough Church. The drawing was fortunately taken before the destruction. It had no inscription, but there were faint marks of crosses at the corners, so that the slab was very possibly an ancient altar. If it had been a tomb, one would have expected some inscription. Whether tomb or altar, its demolition was a senseless act of vandalism, though unfortunately not without frequent precedent of late among the northern so-called church restorations. We give three views of the tomb or altar. The first represents the top, which had an incised pattern nearly defaced; the second is an elevation; and the third a perspective of the same.

FIVE SHOPS, SHEPHERD'S BUSH.

These five shops are situated in the high road, and are built of brick and stone at the cost of only £2,500, and everything is done in the best manner, and of the best materials of their several kinds, the chief aim in the design being to get effect and strength into as little money as possible by using only such materials as are common and good, such as good timber, bricks, mortar, and stone. All the breastsummers over the shop fronts are exposed to view, and stained with Swinbourn's best stain, and varnished. All the bolts are showing, as in detail, properly japanned, to preserve them from rust; a flap of lead runs along on top of the beam to preserve the edges from the effects of the mortar; these beams are all well seasoned and sound, as can be seen. The shop fronts will be made to match the breastsummer, both in material and staining. The plan of showing the breastsummer is cheaper than the usual way of casing it, and is by far the better method. The casing is, in general, only a dodge to hide the worst of material—or to make as much as possible of a too small quantity of good—and if this be the case, it is in the end far the most expensive treatment. The beam will be sure to bend bow shape, which not only spoils the design in effect, but tends considerably to make the building unsafe. There are two stringcourses of red bricks, as seen in the drawing. All the arches over windows are of red moulded bricks. The roofs are flat on top, slated front and back with purple and blue slates. The dormers in front are also slated, and have their purlins and plates projecting to carry overhanging portion of the roof; all this woodwork is stained. The rafters in main roof project, and are shown under the guttering; this guttering runs from dormer to dormer, and the water is taken, by means of a lead gutter laid between the floor joist, to the back of house, and down the downpipes into drain. All the mouldings, except those done in stone, are done in moulded bricks. In front of these shops there will be tile paving—done in 9in. square Staffordshire tile—laid on concrete and in cement. The whole of the works have been carried out well and carefully.

LITERARY THEFT.

(From the Athenæum).

As an illustration of the unscrupulous way the editors of certain periodicals obtain "matter" for their pages, I will mention a case or two out of an immense number of others I could furnish, in which myself and immediate friends are sufferers.

In *The World of Science* for September 28, appears a long paper on "Porter," which is there printed as an *original article* by the editor, or one of his staff. The *same* article appears in *The English Mechanic and Mirror of Science and Art* of the same date, where it is likewise given as an editorial or an original article. In *Public Opinion* of the 5th inst. this article is reproduced, preceded by the words *English Mechanic*, indicating it to be an original paper taken from that periodical.

Now the article on "Porter" alluded to is stolen *verbatim et literatim* from my Cyclopædia, published by the firm of Messrs. Churchill and Sons, of New Burlington-street. It was originally written for the third edition of that work, and is repeated in the fourth edition.

The continued wholesale robbery of my works by the editors of some of the minor periodicals has reached a point that necessitates legal proceedings to check it.

The *English Mechani* and the *World of Science* are, I am told, owned by the same person. Their imprints show that they are printed and published by the same parties.—Arnold J. Cooley. October 7, 1867.

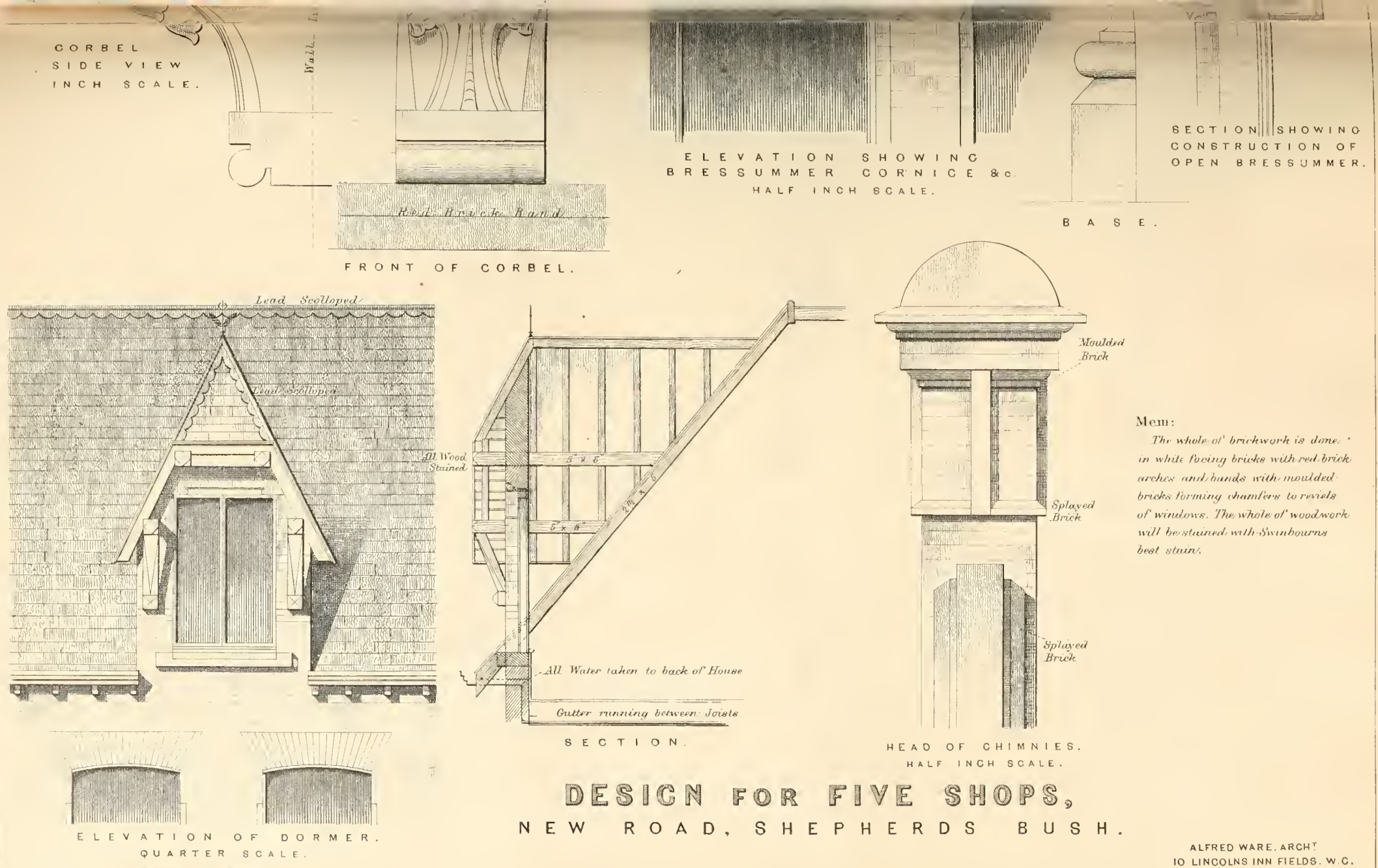
NEW STEAM ROAD ROLLER.

A new steam roller has been made by Messrs. Moreland and Son, of Old-street, and is designed in accordance with a recent patent of Mr. D. Thomson. It consists externally of a square wrought-iron casing of great strength and rigidity, which is nearly balanced on a large central roller, with the engine on one side and the boiler on the other. On the boiler side are two leading wheels, which take only a small portion of the load, and serve for steering. The boiler is vertical, on the Field principle, and the engine works direct on the large roller, by means of two pitch chains, without any intervention of gearing. The dimensions are:—Diameter of roller, 7ft. 6in.; length, 6ft.; length of external casing, 18ft. 6in.; width, 8ft.; height above roadway, 8ft.; diameter of steering wheels, 3ft. 6in.; width, 1ft. 2in. The machine was shown turning at right angles into roads, and is quite manageable even in a crowded street. When at work, it is not turned round at the end of its course, but goes backwards and forwards with equal facility. The vertical boiler is said to be a great source of safety, as horizontal boilers, when mounted on such a machine, and working on inclined roads, cause the water to leave the upper end, and give rise to considerable danger of explosion of the boiler. The explosion of the Paris roller may be attributed to this. The machine is supported on springs, and this, together with the great strength of the case, and absence of gearing, secures in an unusual degree the durability of the roller. The diameter of the boiler is 4ft. 3in.; height, 10ft. 6in.; two cylinders 11in. diameter, 1ft. 6in. stroke. Five strokes of the engine make one revolution of the roller. The pressure of steam is 100lb. per square inch, and the gross weight 25½ tons—21½ tons on roller, and 4 tons on steering wheels.

CORROSION OF MARBLE.

Marble is supposed by many to be everlasting. This, however, is not the case, as may be seen in Salisbury Cathedral, and many other places. "J. H. B.," in the last number of *Notes and Queries*, says:—The intelligent head verger at Salisbury Cathedral recently pointed out to me that all the marble in that church is corroded in a peculiar and uniform manner. Vertical surfaces, and horizontal surfaces turned towards the ground, are invariably corroded after a few years; but horizontal surfaces turned towards the roof invariably escape corrosion. In a monument of black and white marble of the last century, it will be found that the white inscription tablet has lost all its polish, the side pillars the same, and the under part of the moulding also, but that the upper part of the mouldings is as highly polished as when they came from the mason's hand. The same phenomenon is observable in the Purbeck bases; though, of course, the polish of the upper surface is less perfect than in the other instance I have named. Can any explanation be given of this curious fact?

In Durham Cathedral, the Frosterley marble shafts of the Nine Altars' transept were all repolished from floor to roof, some five years ago, at an expense of several thousand pounds; but they are already losing their fine surface, and in a few years the expensive work carried out will be all undone. My own idea, and that of some old servants of the cathedral there, is, that this corrosion of the marble arises from some pollution of the air by the coke stoves which are kept burning night and day in the cathedral of Durham during seven or eight months of the year. Salisbury Cathedral also, until recently, was warmed by open braziers. Is it possible that carbonic acid can so affect marble, and that the peculiar action I have stated arises from an upward current? Or is chlorine one of the products of combustion when coke or charcoal are used as fuel? The question is one of very great importance, and I hope it may find attention at the hands of some of your scientific readers.



Mem:

The whole of brickwork is done in white facing bricks with red brick arches and bands with moulded bricks forming chamfers to reviels of windows. The whole of woodwork will be stained with Swinbourns best stain.

DESIGN FOR FIVE SHOPS,

NEW ROAD, SHEPHERDS BUSH.

ALFRED WARE, ARCHT
10 LINCOLNS INN FIELDS, W.C.

H Abbott, Lith
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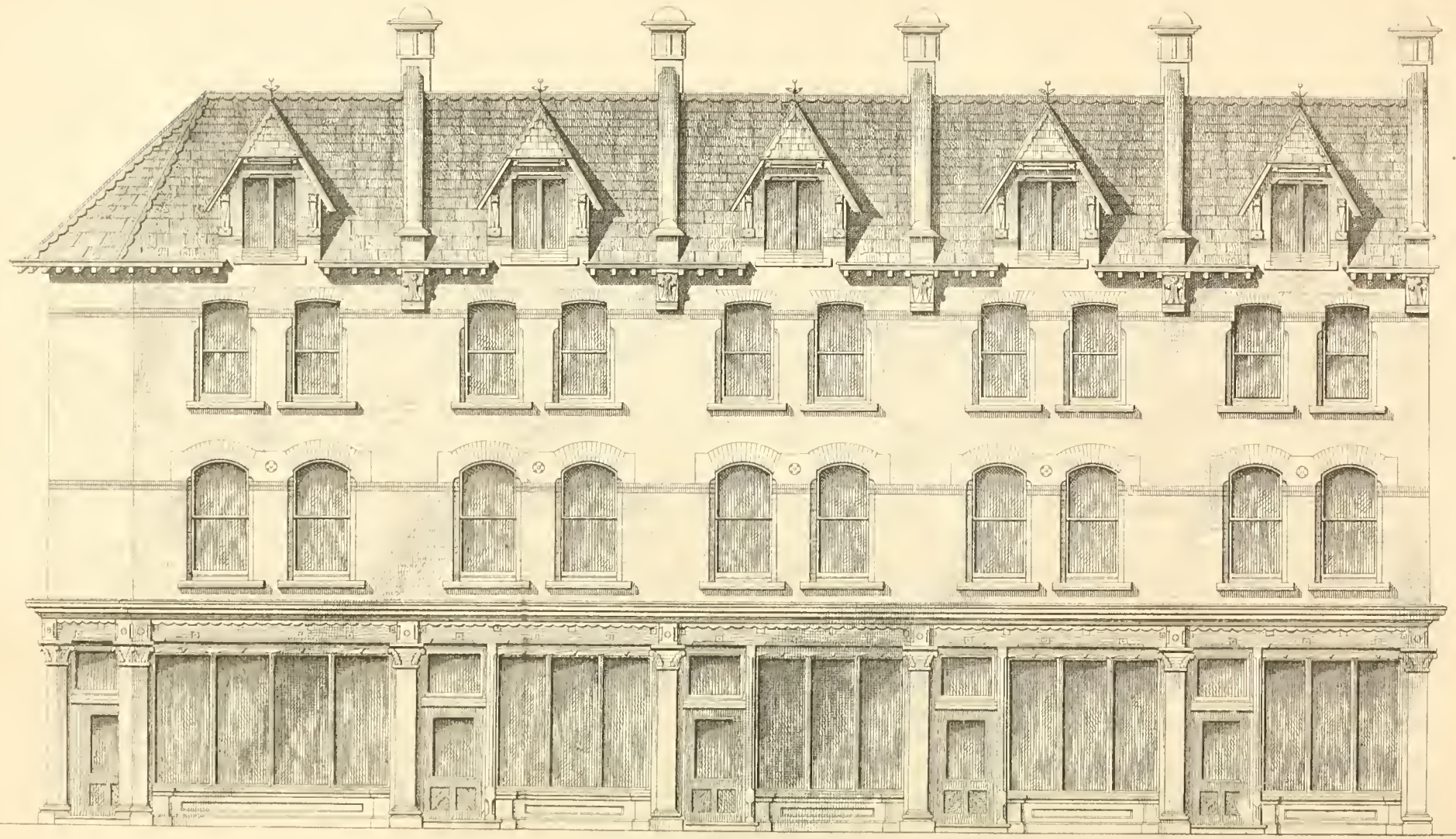

FRONT ELEVATION.

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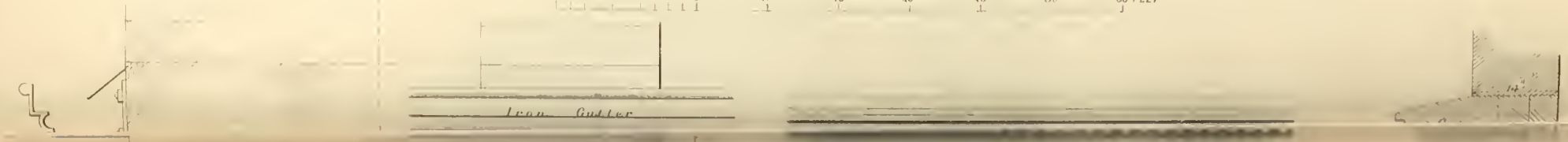


CHURCH DESTRUCTION.

THE writer of the following letter has sent us his name, which is a sufficient uarantee for the general accuracy of his tatements:—

"I beg to call your attention to the wanton estruction of Beighton Church, near Sheffeld, a most interesting thirteenth century uilding. I have called attention in a local aper to the question, and I now make an apeal to you, who have done so much to ward ff the hand of destruction from our old hurches. I have made several special jourveys to Beighton Church, for the purpose of aking sketches before its final destruction, hich I look upon as the most fatal act of reoration (!) on record—at any rate, in these arts. If the architects of Sheffield let this hurch be further sacrificed it will redound to heir shame. Let them, one and all, send the ector a respectful protest, and he will surely ee how his present adviser has led him stray. If the rector will call in Scott, of ondon, or any one of the best Sheffield men —Hadfield, Webster, Fawcett, and others—nd they do not at once tell him he is comitting sacrilege, I will pay their fees, whatever they may be. To-day the men have een employed in trying, vainly, almost, to deolish an old chapel or chantry attached to he chancel. It would make you cry to see he havoc. Let me add one more challenge: f Mr. Rawlinson, of Chesterfield, the archiect (!) employed, will stop the works for one eek, and, during that time, will let his plans e submitted to any good authority—*i. e.*, cott, Street, Burges, Pugin, Slater, or the ommittee of any archæological society—I ill pay £10 if he is not told they are *rubbish* ompared with the place he is pulling down. ome men cannot earn fame by good deeds, nd have, Nero-like, to do but bad ones to ake an ill fame." I am, Sir, yours respectlly, TOMBSTONE. October 22.

LONDON BARRICADES.

ONE HUNDRED AND FIFTY-SEVEN barricades in the London streets! Four ersons killed last week! A great number ounded! Though slightly sensational in orm, this is a fair epitome of the statements ade in a very plain and business-like manner t last week's meeting of the Metropolitan Board f Works. The architect of the Board had preared a plan, showing the position of the hole 157, and official testimony was prouced to vouch for the number of deaths and oundings caused by the overcrowded traffic f our main streets, to which these obstrucons so largely contribute. The barricades, n the shape of gates and bars, maintained by rivate owners of property for their supposed rivate advantage, are all around us. In the arish of St. Pancras, there are 29; in Westminster, there are 20; in Marylebone, 8; in addington, 8; in Clerkenwell, 3; in the olborn and Strand districts, 7; in Shoreditch, ; in Whitechapel, 2; in Poplar, 7; in Iackney, 8; in Lambeth, 3; in Camberwell, 2; in Southwark, 2; in Bermondsey, 2; in t. George the Martyr, 2; in Greenwich, 6; n Plumstead, 10; in Woolwich, 9; in Chelsea, ; in Kensington, 6; and in Hampstead, 3. rom this list it will be seen that they are ot only in the more roomy suburban disricts, where, though looked upon with very reat disfavour, something might perchance e urged for a limited toleration but in the ery heart of London. We will take one disrict as an example of the obstruction caused. rom King's-cross on the east, to Edgwareoad on the west, is the magnificent thoroughare of the Euston and Marylebone roads. Northward are the principal passenger and oods stations of the most important railways n the kingdom, and the traffic to and from hese alone is most enormous, not to mention raffic of other kinds. There are many fine road streets, communicating directly with Holborn and Oxford-street, but in the whole distance of three miles, very few of these are open for heavy traffic, and the light traffic is permitted, as will be seen, merely upon sufferance. Let us walk along the road. Passing several short streets of no account, we come to Judd-street, a good wide thoroughfare, but only as far down as Brunswick-square and the Foundling Hospital. Judd-street must therefore be dismissed as a direct route. Next we come to an opening leading into Burton-crescent, unnecessarily narrowed by a gatekeeper's lodge and some low shops, and we notice the first bar, where a traveller in a cab is waiting while a woman comes out of the lodge, wiping her hands from the soil of her household work, and unlocks the gate for him. Nay, never chafe, my friend in the cab, but employ your enforced leisure in glancing up at yonder board over the lodge, where you will find cause to be grateful to "the Commissioners" by whose "order" it is that you are graciously allowed to pass at all, but by whose like order, carts, drays, waggons, &c., are excluded. We go from hence till we come to the region where the great Bedford estate abuts upon the road. Here, every street leading southward is guarded by gates and posts ornamented with the ducal coronet and gold laced beadles, who inhabit small lodges surmounted by the armorial bearings of the Duke of Bedford, and the following gracious inscription, which we transcribe with due reverence:—"By permission of his grace the Duke of Bedford, and during his grace's pleasure, gentlemen's carriages of every description, hackney coaches, cabriolets, and persons on horseback, may pass this gate from 7 o'clock in the morning till 11 o'clock at night. Empty hackney coaches, empty cabs, and carts, drays, waggons, trucks, cattle, and horses at exercise will not be permitted to pass.—Bedford office, Bloomsbury, July, 1835."

By this notice one of the straightest and best thoroughfares in London, namely, from the pedestal of the Cobden statue in Camden Town, through Seymour-street, by St. Pancras church, and Russell-square, direct into Holborn, is stopped "during his grace's pleasure." Gentlemen's carriages, and the like, having some affinity with his grace's nobility or that of his tenants in the squares, are graciously permitted to pass "between the hours of 7 in the morning and 11 at night," but carts, drays, and vehicles of labour must go round by Tottenham-court-road. Every thoroughfare by which the journey through this estate might be facilitated is stopped in like manner. In Oakley-square, north of these, where the freedom of traffic would be a great public advantage, and where the intimation of "his grace's pleasure" is affixed in like terms, we notice that at this present writing the roadway is green with grass. This is worth reflecting on. One London thoroughfare overgrown with grass at a nobleman's pleasure, and others so crowded that lives are constantly destroyed, and limbs imperilled and broken. Return we, however, to the Euston-road. Gower-street is blocked by a bar opposite the Hospital and the University College. Surely, this is not necessary. The quiet of the hospital might be secured by some non-resonant paving, and the relief afforded to traffic would help to diminish the number of accidents brought there for treatment. Passing on, we thread our way with some difficulty across the stream of vehicles in Tottenham-court-road, and going by a few inconsiderable, short streets, we observe that Cleveland-street being narrow and confined, has been left unbarred. Great Portland-street is open into Oxford-street. Then comes another district of bars and beadles, comprehending Portland-crescent, Harley-street, Devonshire-place, and Wimpole-street, each of which would afford good communication with Oxford-street, but is closed except to carriages, cabs, and the like, by order of Her Majesty's Commissioners of Works. High-street, Marylebone, being very crooked, narrow, and leading nowhere, is left free and open. We then pass to the Edgware-road, and excepting several short streets, each leading into a labyrinth, and some of which have bars in their course, the only available thoroughfares are Baker-street and Gloucester-place.

Now, all this obstruction is not only vexatious and intolerable, but unnecessary. We believe it is supposed to secure the quietude and aristocratic repose of the inhabitants. Even if it did, we should consider it indefensible. No one has a right to live in the heart of a great city and endeavour to create the solitude of a desert round about him for his own private convenience. The exclusion of the traffic from north to south not only increases that of the thoroughfares open in the same direction, but enhances that from east to west, which must pass much greater distances along the route in order to reach the north and south lines left open to them. It seems a monstrous absurdity that enormous sums should be expended, as they have been, to open new streets, for improving the lines of traffic, while these private bars should be allowed to stand. The deaths from street vehicles in 1855 were 232, but in 1866 they were only 205, and the decrease is attributed to the improvements in street communication. We can only say the improvement has been very small, and the decrease of deaths on a corresponding scale. The non-fatal accidents are about 1,700 per annum, besides a large number unreported, the great bulk of killed and wounded being run over by heavy vehicles. A sacrifice of the health or life of five or six individuals per day to the Juggernaut of London traffic, be it remembered, chiefly of that sort which is excluded from passing out of the way through the barricaded streets.

In the suburbs, likewise, the system should not be permitted to grow up. Every man who builds streets upon his estate should be compelled to open them throughout for public traffic. A gentleman from Kensington remarked that that parish refused to adopt any street with a bar across it. We are glad to hear it, and wish other parishes would do the same, but we rather doubt their power, for the returns show six bars as already existing in that district, and the Metropolis Management Act compels parishes to adopt all roads which were in a fit and proper state as to repair at the date of the Act. The parish of St. Marylebone has expended £2,000 only two years ago in the endeavour to get one gate removed, and failed, so strong is the reverence of our law for private rights, even when they are contrary to public advantage. But it cannot be allowed to remain so, for not only are these nuisances and obstructions allowed to exist, but the parishes are actually compelled to repair, to light, to water, and to watch the streets through which they have not yet the free right to pass. To such glaring inconsistency it is only necessary that public attention should be called, and we are sure that every one—except, perhaps, the few who fancy they have a personal interest in maintaining them—will wish success to the Board of Works in their proposed Parliamentary crusade against them, and join heartily in the cry of "down with the barricades."

THE REGENT'S CANAL DOCK.

FOR some years past, says the *Mechanics' Magazine*, it has been felt that the dock accommodation of the Regent's Canal Company at Limehouse is totally unequal to the requirements of the shipping interest there. It has therefore been necessary to enlarge this dock, and the extensive and important works for this purpose were commenced in May last, and are being carried out according to plans prepared by Mr. Edwin Thomas, M.I.C.E., the company's engineer. The foundation stone was laid by the chairman of the company, William Parker, Esq., in the presence of the directors and officials, with the ceremony usual upon such occasions. The works consist of a ship entrance lock, 350ft. long by 60ft. 7in. wide at coping level, the outer gate sill being fixed at 28ft. below Trinity high-water mark. The lock will be fitted with three pairs of wrought

iron gates, by which arrangement provision is made for dividing the large chamber if required into two compartments of 120ft. and 230ft. long.

A wrought-iron swing bridge, with 25ft. clear roadway and 128ft. 7in. long, is to be provided across the lock at Narrow-street. The sluices, six in number, for filling and emptying the lock chambers, will be 7ft. high and 4ft. wide, and will be fixed in spacious chambers constructed in the walls of the lock. Ready access to the sluices will thus be afforded in case of repairs being needed. Ten of the discharging culverts will be constructed at an angle of 45 deg. to the face of the wall, and pointing towards the outer end of the lock, and four at an angle of 63 deg. pointing in an opposite direction, for the purpose of preventing any deposit accumulating at the upper end of the lock chambers. A wharf, extending from the west side of the Limehouse Cut entrance to the new ship entrance lock, is to be constructed on the bank of the river Thames, and the bed of the river opposite thereto deepened to about 26ft. below Trinity high-water mark. A similar jetty is to be made on the east side of the lock, and will extend into the river 56ft. from the face of wharf wall. The water area of the dock is to be enlarged, exclusive of the new entrance, 51,605 superficial feet, and will afford additional accommodation for vessels, with an aggregate amount of cargo, of about 32,000 tons. The increase in quay space will be 830ft. in the dock and 220ft. on the river. The estimated cost, inclusive of land, is £200,000. The following quantities of materials, &c., will be required in these works :—There will be 200,000 cubic yards of excavation, nearly all of which will have to be removed from the works; twelve millions of bricks, 3,650 tons of Bramley Fall stone, 1,010 tons of Cornish granite from the De Lank Quarries, and 10,000 yards of concrete will be used.

Building Intelligence.

CHURCHES AND CHAPELS.

The foundation stone of a new United Presbyterian church was laid at Frenchie, N.B., last week, by Mr. Thomas Lumsden, a well-known local manufacturer.

A church is to be built in Castle-terrace, Edinburgh, for the accommodation of the congregation of the late St. George's Church in Lothian-road, demolished by the Caledonian Railway Company. It is to be in the Palladian style, and will have an external length of 125ft.; breadth 78ft., height from the floor to the centre of the ceiling; 32ft. The cost will be about £18,000, and the building will accommodate 1,250 sitters. The architect is Mr. David Bryce, R.S.A. The contractors are :—For the mason and carpenter's work, J. Watherston and Son; plumber's work, Mr. Beattie; plaster work, Mr. Annan; slater's work, Mr. Anderson. A Gothic design of some merit was, in the first instance, prepared by the architect, but, for "various reasons," was abandoned.

Frifield Chapel, Knowle, was reopened for public worship last week. It is a neat building, the exterior being of galvanized iron, and interior of stained deal. It is lighted by means of two large gaseliers, and the sitting accommodation consists of chairs, which are fastened together in rows. The chapel has been erected by Mr. Lysaght, of the Galvanized Ironworks, Temple Backs, at a cost of about £600.

The church of St. Martin, Leicester, was reopened last week for public worship. The whole of the main fabric has now been, we believe, rebuilt or restored.

It is expected that the restoration of Chichester Cathedral will be completed about the middle of next month.

On Thursday week the Archbishop of York consecrated a new church at Marske, Yorkshire, dedicated to St. Mark. The style of architecture is Early French. There is a tower 91ft. in height at the south-east angle of the building. The exterior is of freestone, with slated roof; the interior of red brick, faced with freestone, and the roof of red pine. The columns are of Dunn House stone, and the capitals and bases are richly carved. At the east end of the building there is a large stained glass window, divided into three compartments, the centre compartment representing the Crocifixion and the Transfiguration; the sides represent Christ blessing little children, and the Last Supper. This window has been presented by subscription in memory of the late Countess of Zetland. The length of the building is 108ft. east to west; 85ft. width of nave and aisle; the chancel is 37ft. high, and the nave 44ft., and computed to seat comfortably 720 people. The whole cost of the erection and fitting up is about £6,000, towards which Lord Zetland, with munificent liberality, has subscribed £5,000. Mr. Joseph Pease, of Darlington, presented a clock for the tower. Mr. F. P. Cockerell is the architect.

The restoration of the great cupola of the Church of the Holy Sepulchre at Jerusalem is proceeding rapidly. The two French and Russian architects act together in perfect accord, and the Turkish authorities have given every assistance in the removal of the old masonry which encumbered the approaches to the venerable edifice. It is expected that the church will be completely restored in time for the Easter festival of 1868.

The project for the restoration and completion of St. Philip's Church, Maidstone, is progressing favourably. The additions will include north and south transepts, a tower and spire facing the town, and a stone porch. The west end will be strengthened by buttresses and pinnacles, and a chastely-designed window will be placed at the end. The present belfry will be removed, and the pulpit replaced by a new one. The roof, also, is to be renovated, the architect reporting that, through faults of construction, it is gradually decaying, and cannot last more than a few years. Provision will be made for 200 free seats. The cost of the alterations and additions will be about £2,300.

St. Mary Magdalene Church, Liverpool, has recently undergone alterations, and was re-opened on Sunday morning last. The church was built in 1859, but, owing to insufficient funds and a desire to make the most of the limited space, serious defects existed, which have now been remedied.

Mr. Cazenove laid the foundation stone on Tuesday last of a new church for the district of Kennington. It is designed to relieve the parish of St. Mark, which contains an enormous population, with but one church. The new building will be dedicated to St. John, and an ecclesiastical district will be assigned to it by the Commissioners.

The neighbourhood of Reading has lately been infested by a gang of thieves, who prowl about at night and strip the churches of the copper wire by which the stained glass windows are protected. Both the churches in Wokingham were robbed in this manner a few nights ago; and we have been informed of several other attempts of a similar kind. Churchwardens who cannot afford the trouble and expense of having their churches watched at night are advised to lose no time in substituting galvanized iron for copper wire, as the former possesses no value in the eyes of these gentry.

On Tuesday morning last the Devon House of Mercy, at Bovey Tracey, in connection with the Clewer Sisterhood, was opened. The Earl of Devon presided at the luncheon. Mr Woodyear is the architect of the new buildings.

The restorations of Chichester Cathedral having been nearly completed at a cost of £50,000, the building will be reopened on the 14th of next month.

A new church is in course of erection in the Old Kent-road, near the Half Way House; Messrs. Dove are the contractors. The amount of the contract is £4,754, with another £1,000 if a tower is erected during the progress of the rest of the work.

The tender of Messrs. Wilson and Son, contractors, of Soho Hill, Handsworth, has been accepted for the erection of a church at Slack Heath, Rowley Regis. The amount of the contract is £5,000, and Mr. W. J. Hopkins, of Worcester, is the architect.

A new church, to be called the Church of St Augustine, has just been erected by "Brother Cyprian," on premises attached to St. Augustine's Home, Montpelier, near Bristol. The church will accommodate 500 persons. It is built of iron, and is 109ft. long, 41ft. wide, and 31ft. in height, and consists of a nave, chancel, and two aisles, the latter separated from the nave by rows of octagonal pillars. The dimensions of the chancel are 35ft. by 21ft. The high altar is of Caen stone, the supporting pillars of Aberdeen granite, with carved caps and bases of white marble. The pulpit is made of oak; Messrs. Tupper and Co., of Moorgate-street, were the builders. The masons' work was executed by Mr. Kingstone, and the carpenters' work by Mr. Grigg, of Bristol. The paintings over the altar and the general decorations are by Mr. Ridley, of Kingsdown. The church is to be heated by steam.

The foundation stone of the Stowell Memorial Church was laid on Saturday by the Bishop of Manchester. The site is at the end of Cross-lane, Manchester, not far from Christ Church, where Canon Stowell laboured for so many years, and it is expected that sufficient money will be raised to build a parsonage as well as a church.

BUILDINGS.

The Town Hall at Kinross, N.B., is to be enlarged. About £300 has been subscribed, and a sub-committee appointed to consider plans and report to a future meeting.

Five new cottage houses have been built in Vincent-square, in replacement of old brick-heaps. They are in Italian builder's style, rather heavy.

Coopers' Hall, Basinghall street, is being rapidly demolished. It has three frontages. This was formerly well known as the place where the lottery tickets were drawn by Bluecoat boys. It will, in its reconstruction, afford a very large block of chambers.

In Paternoster-row, at the corner of Ivy-lane, a very large site is being excavated for foundations. The opening shows a dangerous relic of olden times—the back of a dwelling-house entirely of boarding, and standing since two hundred years. There is no reason why provision should not be made for the reconstruction of such exceptions to building acts.

After various attempts to enlarge the present workhouse belonging to the Aston Union, by the erection of new schools and other buildings, the project was, by the advice of the Poor Law Board, abandoned, and a new site has been purchased in Luckcock's-lane, near the Gravelly-hill Railway Station, containing about ten acres of land. Upon this it is intended, ultimately, to erect a new workhouse, with schools, infirmary, &c., complete. For the present, only a portion of the schools are erected. The work has been entrusted to Mr. Yeoville Thomason, of Bennett's-hill. The cost of the whole, including engineers' work for the water supply, boundary walls, roads, and approaches, was estimated at the sum of £8,500. The present outlay has been limited to £5,200. The works have been ably carried out by Messrs. Jeffrey and Pritchard, under the superintendence of the architect.

The foundation stone of a new Mechanics' Institution was laid at Crook, near Durham, on Wednesday, the 16th inst. Mr. James D. Thompson, of Bishop Auckland, is the architect of the proposed building.

The Bristol city authorities speak about building a hospital for infectious diseases. A piece of land has been placed at the disposal of the city, should it be determined to erect the hospital.

Emmanuel Schools, St. Philip's, Bristol, were opened last week. The building is Gothic, of Pennant stone, with freestone dressings. There are separate staircases for boys and girls, and great attention has been paid to the ventilation of the building. The architects were Messrs. Popes and Bendon, and the builders Messrs. J. J. Foster. The cost is about £2,300.

A masonic hall—the only one in Wales—has just been erected at Llandudno, and it is intended to celebrate the event by a grand opening ceremony on the 25th of this month, to which the whole of the brethren in the North Wales and Salop province have been invited.

A new branch office of the Clydesdale Banking Company has just been erected in West George-street, Glasgow. Its architectural features are of considerable merit. The front is adorned by rich carved work from the chisel of Mr. Charles Grassby, a local artist, and is very satisfactory both in design and execution. Mr. John Burnet, of Glasgow, was the architect.

The Royal Engineer Works Department in Woolwich Arsenal have received final orders from the Secretary of State for War to select a site and commence the erection forthwith of the long-desired infirmary demanded by the Medical Department of the Arsenal, so that it may be ready for use, in case of need, within six months.

Newcastle-on-Tyne.—The foundation stone of the new wing of the Ragged and Industrial School was laid on Wednesday, the 9th inst. The exten-

n will consist of a large and commodious boys ool-room, with class-room, store-room, and rk-rooms on the ground-floor, and a large boys' mitory and reading-room above. The new g will correspond in its style of building with existing premises. Every care has been taken make it dry, warm, cleanly, and well ventted. A layer of slates set in cement is carl all round the foundation, to prevent the ap from rising; and the walls of the schoolm, class-room, dormitory, and reading-room, built in the inside of buff-coloured glazed ks, to a height of 5ft. from the floor, and ve this height they will be faced with Parian ent, so that no paint, whitewash, or other orbent material will appear to view, and the le of the walls can be washed down more frently, with advantage to the health and clean ss of the inmates. The ventilation will be acting, with additional resources when red; it is designed on the "through and ough" principle, with openings opposite, and windows are also arranged on the same plan. re will be a large cubic quantity of air to each on, and abundance of light. The warming is rely by open fireplaces, which also assist in ventiing the rooms. New latrines are provided the boys, and will be thoroughly ventilated on same principle as the rooms and dormitories. eased accommodation will be provided for reen 50 and 60 inmates, and about 100 day lars in addition. The drawings have been e by Mr. Thomas Oliver, under whose supntendence the works are now being carried Mr. Henry Andrews is the clerk of the s; and Mr. William Gibson, of the Red es, is the sole contractor. The total cost it pected, will not exceed £2,000.

ANTAGE, BERKS.—The demolition of two of blocks of old almshouses has been going on for some time past, viz., those in Newburyt and Mill-street; and the governors of the ities intend to erect a block of new ones on latter site as soon as possible. The buildings consist of separate houses, for the accomation of eight old people, and will be from lesigns and under the superintendence of Mr. . Spencer, architect and surveyor, Wantage.

TO CORRESPONDENTS.

OTICE.—The "BUILDING NEWS" is now Publ at the NEW OFFICES, 31, TAVISTOCK STREET, OVENT GARDEN, W.C.

OUR READERS.—We shall feel obliged to any of our rs who will favour us with brief notes of works conated or in progress in the provinces.

ters relating to advertisements and the ordinary busiof the paper should be addressed to the EDITOR, AVISTOCK STREET, COVENT GARDEN, W.C.

vertisements for the current week must reach the before 5 o'clock p.m. on Thursday.

ICE.—The BUILDING NEWS inserts advertise for "SITUATIONS WANTED," &c., at ONE LING for the first Twenty-four Words.

EIVED.—J. J.—W. H. T—R. D. W.—E. W., send the ng and you shall know.—J. T. P.—G. T. S.—G. A.—R. L.—J. Z.—J. P. S.—F. R. J. B. A.—J. L.—T. K. C., next week.—J. T. R.—G. W. G.—J. W. A., is no necessity for the alteration.—J. C. J.—M. G.—H. B., the sketch will appear in an early number.

N SCOTT.—Write to some photographic paper, or ask photographer.

Correspondence.

PUGIN *v.* BARRY.

To the Editor of the BUILDING NEWS.

,—With regard to the letters that Mr. Pugin ts he gave to Sir C. Barry, the Messrs. Barry as to give information except before a proper nal; but Mr. Pugin says that Sir C. Barry him "an undertaking" to return them. It irable that he should state whether this was tten undertaking, and, if so, he should pub copy of it. If not, he ought to explain how s that with the purpose of following up the er, which he has evidently had from the first, rted with them without such a written underg, and why he has suffered the matter to re until after the decease of the only man who fairly be expected to be in a position to er his peremptory demands. It is easy to conceive that the sons, after this lapse of time, should, under the circumstances, hesitate to be cross-questioned in a newspaper correspondence, and should wish to reserve the documents and evidence upon which they alone can depend to establish their father's reputation, till all that exists can be laid before a body capable of deciding what must now be a difficult question. Mr. Pugin's coarse and opprobrious language should in the interim be dropped; and, Sir, I venture to think it should find no longer a place in your journal. Why, in conclusion, I would ask, does not Mr. Pugin state whether he will accept the Messrs. Barry's challenge to lay the matter before the Royal Institute of Architects.—I am, &c.,

London, October 19. F.R.I.B.A.

[We cannot insert any more letters on this subject. It is not a question of *nisi prius* or special pleading. Mr. E. W. Pugin solemnly declares that he lent the late Sir C. Barry seventy-six letters, under the distinct promise that they should be returned. The Messrs. Barry do not deny that the letters were lent, but they virtually admit it, by pleading, as an excuse for their non-production, that written letters are the joint property of the writer and the receiver. They as good as say to Mr. Pugin, "Yes, you lent the letters, but they were written by our father to your father, and you have no more right to them than we have." Mr. Pugin says they contain important admissions on the matter in dispute; that they should have been returned long since; and that their non-production is not only a violation of faith, but a tacit admission that, if brought into court, they would weaken the architectural claims of Sir C. Barry. When the Messrs. Barry say they know nothing of the letters, then "F.R.I.B.A.," or anyone else, may doubt the solemn declaration of Mr. Pugin. We would strongly advise the Messrs. Barry to say at once whether they have the letters. And if they have them, either to give them up or copies of them. No one can arbitrate without the letters, if they be in existence. Let them be forthcoming, and we see no reason why three or five gentlemen selected from the Institute of Architects may not without further delay take the matter in hand, and give a decisive judgment.]—ED. B. N.]

RETFORD TOWN HALL.

SIR,—Mr. Sorby's letter, both as to its matter and its logic, not to say its English, may be left for the amusement of your readers. It is the old question of art architects, or artists *versus* surveyors; and the question will remain open until we get a Royal Society or University to recognize only the former.—I am, &c.,

EDWARD W. GODWIN.

197, Albany-street, October 21.

SIR,—Everyone that takes an interest in architecture—that is, every cultured man—will thank you for your plan of publishing in your journal drawings of the designs which have been successful and unsuccessful in architectural competitions. Satire is often most telling when most devoid of animus. In your case there was probably no satirical intention; you simply bid the public "look on this picture and on that," when you published side by side a rejected and the accepted design for Retford Town Hall; and yet the comparison involved an admirable, though unconscious, practical satire upon either the local influence, or the art incapacity, which too often decide in our architectural competitions. Such satire will do great good. It will hang *in terrorem* over municipal ignorance of art, and will deter men from the exercise of influence or of jobbery. Future town councillors will know that the art public and art critic will have an opportunity of comparing the design they select with a design which they reject; and they will dread the ridicule which will attend, in future decisions, which should resemble some of those which have disgraced the past. Incompetent architects may also dread a success which gibbets them before the profession and the public. Satire will thus do its proper work, and will discharge an office for which mere argument is incompetent. Your satire is surely not ill-natured, since it consists merely in placing facts in contrast. I trust, Sir, that you will proceed, although you must, no doubt, lay to your account that you will excite a certain amount of animosity on the part of architects who are not artists, and on the part of municipal authorities who are incompetent to sit in judgment upon architecture. You will, on the other hand, deserve the gratitude of all true architects, and of that portion of the art public which interests itself in the selection of good and beautiful designs for the English public buildings of the future.

One specimen of the animosity to which I allude is shown by a letter which appeared in your columns last week, signed Thomas Charles Sorby. Few of your readers will be able to repress a smile at the spectacle of an architect who feels a sense of enjoyment in being "well licked" by such a design as that which was selected at Retford. That design appears to be composed of builder's Italian, surmounted by a Chinese hat; and to present a pleasing compound of the front of a shawl shop, crowned by the turret of a railway station. Mr. Sorby only claims for it good inner accommodation, but it may fairly be considered an open question whether the design of Messrs. Godwin and Crisp was not as well thought out in the interior as was possible, consistently with the requirements made known to the architects; while it will, I think, be admitted by the profession and the public that their design would have been an ornament to Retford, and a credit to our architecture. Mr. Sorby speaks sneeringly of "stone fronts and details," and seems to think that he is the best architect who produces the worst elevation. The sympathy is, in short, wholly with the builder, and not with the architect. The Town Hall of England is the Rath-haus of Germany, and the Hotel de Ville of France and Belgium. Surely, the stone fronts and details of many of these are of a beauty which must cause severe annoyance to Mr. Sorby. It is not an unfair deduction from that gentleman's strictures to imagine that he has no sense or care for architecture as an art, and values a building merely on account of the accommodation which its interior may afford. It would, indeed, be disastrous if such doctrines found wide acceptance, more especially in the present condition of English architecture. A few gifted and earnest men are striving, and with some success, to elevate the character of our national architecture, and to give to the work of the nineteenth century a distinctive character and value. The architecture of the future must be based upon a profound study of the art of the past.

We shall not, I trust, be dragged back into Georgian sympathy with builders preferred to do the work of architects. Competition ought to secure for, at least, our public buildings, good and even high class art designs. The taste, however, of those who have to decide upon designs requires to be educated; and it is, also, good for architects to know that going into a competition will involve competitive publicity for their designs. This service to art, Sir, your present plan tends to render; and I trust you will continue to publish in juxtaposition drawings of such designs as the one which lost, and the one which gained, the Retford competition. Mr. Sorby, by the way, is rather inconsistent. After stating that architects are so warped by either personal or professional points of view, that they are "very unfit judges of a competition," he, proclaiming himself an architect, proceeds to sit in judgment upon the Retford competitors. One is tempted to ask whether it be a personal or a professional point of view which impels Mr. Sorby to declare the successful design to be "better than any other design" submitted to the art critics who have secured for Retford such a noble monument of architecture. I need not, however, further allude to Mr. Sorby. The question at issue is so large that we need not concern ourselves further with an individual. The vital point is, whether competitions shall secure for us public buildings of art, worth, and beauty, or whether aldermen and builders shall inflict upon us edifices which are eyesores to the critic and reproaches to the art of the nation. You, Sir, are labouring to get the question settled for us in the right way. May the decision at Retford render a similar decision in any future case impossible.—I am, &c.,

London, October 21. W.

THE MANCHESTER TOWN HALL COMPETITION.

SIR,—As your correspondent who first pointed out the injustice of the scheme of this competition, I might indulge in a little self-glorification as to having proved a true prophet, and some of my friends who then thought me wrong have now acknowledged that I was right. Mr. Hibbert seems hurt that the selected eight are now allowed by the corporation to alter their plans, and adopt the arrangement of the plans by himself or any

other of the unsuccessful competitors which those gentlemen have, with all the simplicity of Mr. Verdant Green, permitted to be exhibited for the purpose. The disappointed, who have burnt their fingers, will perhaps fight shy of such alluring offers until next time. That next time may not be so far off, as other committees can hardly fail to profit by the dodge of the Manchester Corporation, who have, at the expense of the profession, learnt what instructious to give to those they are now employing, for the first time on fair terms; and the profession, as eels, like being skinned, but eels only enjoy the heat once in their lifetime —architects over and over again, and there are always fresh victims to crowd to the sacrifice. But if moths will singe their wings the cruelty of those who hold the candle to them on purpose is none the less, and wreckers are, in my opinion, far more reputable members of society than these committees. A word of warning, in conclusion, to the few who dislike being done, as undoubtedly the body of competitors in this case have been. When asked to compete, as I was in the case of the Liverpool Exchange (another affair nicely cooked from the beginning), shall answer thus :—I shall have no objection to throw £200 with any number of architects into the Bristol Channel, if the committee will choose one by lot and give him the commission, but I object to lose my time and my temper as well as my money.—I am, &c.,

Tail-tip.

CLOYNE CATHEDRAL COMPETITION.

Sir,—A brief recapitulation of facts, without any comment on our part, will be a sufficient answer to the lengthy communication from Messrs. McCarthy and Goldie on the above subject, which appeared in your journal of the 11th inst. Three gentlemen are invited to enter a competition on certain stated conditions. Two of the gentlemen thus invited, without consulting the third, coalesce for the purpose of effecting a total alteration of the terms of the said competition. They endeavour to impose upon the committee a set of amended conditions, drawn up and signed by themselves, and then send them to the third competitor for signature, having, however, previously done their utmost to secure two things :—

1st. That their "amended conditions" should be binding on the third competitor, whether he signed them or not.

2nd. That his refusal to sign would make a bad impression on the committee.

The third competitor, first, not recognizing the right of the other two gentlemen to interfere in the manner they had done, and, second, seeing no reason for departing from the original conditions, which he had already unreservedly accepted, refuses to sign. At last, after repeated but ineffectual efforts on the part of the coalition to force their "amended conditions" upon the committee, and obtain the signature of the third competitor thereto, the committee finally desire the two dissatisfied competitors either to accept or decline the competition on the original terms, with a minor alteration. The two still attempt to enforce their amendments, and thereupon the third competitor is absolutely chosen.

It is the old story of the "biter bit," or "too clever by half."—We are, &c.,

Pugin and Ashlin.

90, Stephen's Green, Dublin.

MR. BUTTERFIELD AND ACOUSTICS.

Sir,—On Sunday evening last, I went to St. Alban's Church, Baldwin's-gardens, Gray's Inn-road. You are aware that the ritualistic, and, I may say, Romanistic practices at this church have recently made it notorious. I am candid enough to admit that I went there more from a feeling of curiosity than from any other motive. I won't say that I was very much instructed with what I heard, for I was near the door, and I could scarcely hear a single syllable distinctly. I admired Mr. Butterfield's architecture. I looked with childlike curiosity at the quaint and mystical paintings over the altar. I scrutinized the font which was near me, and I must say, I was instructed more by what I saw than by what I heard. Now, Sir, good architecture in a place of worship may be a very good thing, but if it can only be obtained at the expense of hearing, then it is a bad thing. Mr. Spurgeon, on one occasion, said that Gothic architecture was the devil's architecture, because it prevented the preacher's voice from being heard. Now, I don't see why a modern Gothic church may not be built so that people may hear in it as well as in Mr. Spurgeon's Tabernacle, where the voice of the preacher may be heard distinctly in every corner. This cannot be done at St. Alban's, and Mr. Butterfield has, I think, something to answer for in the production of such a building. Unless some improvement be made, many people will go to this church generation after generation and not be able to hear the lessons read or the sermon. A friend who went with me managed to get much nearer the pulpit than I did. He said he could hear pretty well, and that I did not lose anything by being unable to catch the preacher's words. It is the same, or, I may say, worse with the singing, and particularly if the time be quick. There appears to be a ceaseless conflict between the sound and its echo which is destructive of all harmony. This is tantalizing and vexatious, and a heavy responsibility rests on the architect. Most probably, Mr. Butterfield, wrapping himself up in monastic stoicism, may smile or sneer at my words, but they are true nevertheless; and I hope that in all future churches he may build, that he will pay some attention to the principles of acoustics.—I am, &c.,

London, October 22. Leonard Foster.

WILLIAM HENRY LEEDS.

Sir,—Mr. Lamb writes to me as follows :—"In your interesting account of my old friend Leeds, in the last number of the Building News, I am obliged to call your attention to an error relative to my 'Studies of Ancient Domestic Architecture.' My long intimacy with Leeds has led you, as well as others, into the mistake of supposing that he contributed the 'Observations' to that work. This, however, is not the fact, and for whatever faults those observations may contain I am entirely responsible. To Leeds I am indebted for several valuable suggestions, and for the correction of the press. I shall feel greatly obliged by your correcting this error in the next number of the Building News.—Yours faithfully, E. Lamb." In complying with Mr. Lamb's request I may observe that the error originated in the entry in Weale's catalogue, where the "Observations" are stated to be by W. H. Leeds.—I am, &c.,

Hyde Clarke.

32, St George's-square, October 19.

FRIENDLY SOCIETIES.

Sir,—It is not generally known that on August 17, 1867, the Earl of Lichfield presented to the House of Lords a Bill to amend the law relating to Friendly Societies, and that on August 19 the following order was made by the House of Lords:—

Ordered by the Lords Spiritual and Temporal in Parliament assembled that there be laid before this house:—Return from the trustees or secretary of every friendly society legally established in England, Scotland, and Ireland, having paid collectors or agents, of the names, residences, title, business, or occupation of the patrons, presidents, trustees, committee, directors, collectors, and agents of every such society on the 1st January, 1867, with the name of the place at which, by the rules, such society is established, and the places at which the several collectors and agents reside, together with the salaries, allowances, and emoluments of each paid officer, collector, and agent for the year ending 31st December, 1866, with the number of members of each such society, and the amount of the funds on the 1st January, 1867, and also the amount of contributions received and the expenses of management, under distinct heads, in the year ending 31st December, 1866.—Ordered to be laid before the House.—I am, &c., John Tidd Pratt.

Friendly Societies Office, 28, Abingdon-street, Westminster, S.W., October 21.

CONCRETE BUILDINGS.

Sir,—As there has been a great deal of correspondence on the superiority of concrete buildings both as regards durability and cheapness, I beg to lay before you an example of the difference in cost of brickwork and concrete walls only of a pair of cottages; for instance, say they have a frontage of 24ft., the depth from front to back 26ft., and the outbuildings 15ft. square, the cost of this in concrete would be £177 12s., thus.

Tall's patent apparatus . .	£111	12s.
Royalty, 14 rooms at 5s.. .	3	10
Concrete walls of 9in. work, 500 superficial yards at 2s. 6d.	62	10
	£177	12

If carried up in brickwork there would be about 11 rods, say, at 13 guineas, this would amount to £143, giving a difference in favour of brickwork of £34 12s. This is taking the concrete at Mr. Tall's price, which is a very low one, and I believe in his method some of the walls would have to be carried up thicker than I have taken them, on account of the chimneys. No doubt buildings of this description could be carried up in concrete at half the cost of brickwork, but Mr. Tall, in his letters, does not reckon the royalty or the cost of his apparatus, which brings the price of the building far beyond that of brickwork. It remains yet to be proved whether these thin walls of concrete are in any way superior to brickwork. —I am, &c., An Old Brick.

THE STRATFORD COMPETITION.

Sir,—The West Ham Local Board have just distinguished themselves in a manner that should be more widely known than it has become. Having determined that a town hall containing all the offices requisite for the transaction of local public business, should be built, the Board invited competition by architects for plans, &c., the conditions of the competition being drawn up by the surveyor. More than thirty designs were sent in, a selection from among them was made by a committee, and the specially honoured drawings were placed in the board-room of the gasworks. The adjudicators lost no time in deciding which of the designs should receive their approval. It was, perhaps, only to be expected that the butchers, the bakers, the candle stick makers, and others who compose the Board—all unprofessional men—would take counsel of their professional adviser, and as this seems to have been done, the surveyor not only drafted the conditions of the competition, but himself entered the lists, taking care to place his name, as well as a motto, on the design, to which was awarded £10 premium, and the honour of being adopted for building.

Two members of the Board were bold enough to challenge the fairness and the wisdom of the decision; but as the adoption of the surveyor's work is understood to get rid of the payment of architect's commission, you will readily perceive the great crime they have committed in impugning the wisdom of their colleagues and advocating the "unnecessary" expenditure of public money. It is desirable that professional men should know what amount of trust they may place in a body, such as that by which we in Stratford are unfortunately governed.—I am, &c., D.

Stratford, October 23.

Sir,—From the published report of the proceedings of the Board with respect to the town hall plans, it appears that most of the members, if not all, were fully aware that those marked "Civis" were the production of their surveyor.

This knowledge of the name of the author ought at once to preclude the Board from awarding him the premium, as one of the conditions of the competition was that "any competitor communicating his motto, directly or indirectly to any member of the Board, will be disqualified from receiving a premium."

As the Board seem all along to have intended appointing their surveyor to erect the new town hall, what could be their object in putting a number of architects to the expense of competing? I, for one, should not have sent a design had I not have received an assurance, through a friend of a member of the Board, that they had no partiality for any particular architect, and that every competitor had an equal chance of success.

As the Board, by the selection of their own surveyor's design, have saved the architect's commission, they ought at least to pay each competitor an honorarium to cover the expense of preparing his designs, to which he has been uselessly put.—I am, &c., A Competitor.

*** We have received other letters on the matter, all burdened with the same complaint, and protesting against the palpable injustice that has been perpetrated.

THE PROBLEM OF THE CIRCLE.

Sir,—"E. L. G's" scholastic, and apparently clever defence of a very doubtful problem in mathematics, which only an approximative exactness has been attained, proves him to be a very unwilling convert to any new and more definite solution of it. His anxiety to place the theorem among the admitted truths of "exact" science is no greater than that of others to do the same thing. "E. L. G." need not fear the practical alteration that new ratio would require in nautical reckoning, as the increased distance it would create round the globe itself would not exceed thirty miles. "E. L. G.'s" remarks are not only directed against me, but also against Mr. Harvey who has undertaken to demonstrate, both geometrically and numerically, the exact ratio of the diameter to the circumference in contradistinction to the generally received ratio, and, judging from the diagrams in his two first letters in the *Mechanics' Magazine*, there does not appear to be any defect in his reasoning, as "E. L. G." can satisfy himself. "E. L. G." would do well, on this debatable ground, not to claim too much exactness for school or "regulated" teaching; at any rate, not to stigmatize those who offer geometrical proof for decimal fractions as "mathematical heretics;" for he may rest assured no amount of mere school exercise can rectify, and no immediate unlearning can be expected from dogmatic orthodoxy.—I am, &c.,

Geo. Guillaume.

ZINC ROOFING.

Sir,—I was rather surprised last week at finding the name of your contributor on the above subject to be that of Mr. James Edmeston, the architect of the Vieille Montagne Zinc Company, the more so that no one is in a better position than he to know that the statements put forward by him are calculated to mislead the public, and, in the end, injuriously affect the business of the company.

In his first article on the subject, contained in your impression of the 6th ult., he states that, for zinc roofs of plain character, of No. 14 gauge, laid on boards, the price should be 7d. per foot super, "not measuring all the zinc used, but stretching a line from ridge to eaves, girth nothing, and adding nothing for rolls, caps, welts, &c."

my reply, contained in your issue of the 13th ult., I
rested to be supplied with the name of a zinc-worker
would work for me at that price. To this question I
received no reply, although Mr. Edmeston cannot fail
e acquainted with all the zinc-workers who use his
pany's zinc. I also stated that I had found it usual to
everything, and, in fact, ascertain the total quantity of
used, and that the difference betwixt the two modes of
surement was between 30 per cent. and 40 per cent.,
price per foot super on the zinc used being usually 7½d.
d.

reply to this, Mr. Edmeston writes, reiterating his first
ments as to the prices, but, to a certain extent, quali-
g them by stating that, unless the work is of such plain
acter as to allow the 8ft. sheets to drop into their place,
price must be increased. Has Mr. Edmeston, with all
reat experience in zinc-work, ever laid a roof where no
ing was required, where the gutters and levels might
btained exactly in position to suit his 8ft. sheets,
here neither chimney-stacks nor lantern-lights cropped
o prevent the sheets being simply dropped into their
ss?

ere are many other points in Mr. Edmeston's com-
ication I should like to remark upon, but I fear to
ass too much on your space; but I trust you will allow
he insertion of the following example, in which I have
d the whole cost of the zinc and the profit on its work-
I will first premise that my information as to cost of
g, &c., is obtained from a zinc-worker of many years'
ding and undoubted honesty, who has laid zinc both
ngland and on the continent, on the system introduced
this country by Mr. James Edmeston.

will commence by accepting Mr. Edmeston's proposed
for zinc per ton—£26, though the actual price at the
nt time is £26 10s. In a roof of the plainest possible
acter, say thirty-four sheets long and two deep (each
t 8ft. × 3ft.), giving a dimension, when finished, of
7in. × 15ft. 2in., there would be, according to Mr.
eaton's proposed mode of measurement, 1495 superfi-
feet, which, computed at 7d. per foot, as he directs,
d amount to £43 12s.

e quantity of zinc actually used in covering this flat,
g no account of flashings or gutters, would be—

68 sheets, 8ft. × 3ft.	1,632ft.	0in.
Roll caps	176	0
Welts	49	3
	1,857	3

d to 77 sheets, 9ft. superficial, the cost of which,
ming the price per ton to be £26, would be £29 11s. 8d.

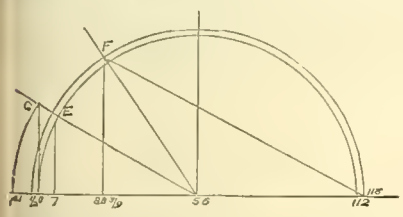
cost of labour, 10s. per square	9	5	8
o, solder, clips, nails, charcoal, &c., per square	1	17	0
	£40	14	4

would leave £2 17s. 9d. to the zinc-worker for profit,
of men's tools, cartage of material to job, foreman's
sional superintendence, rent of premises, &c.

king all these matters into consideration, and also the
risk of bad debts incurred by all the minor trades
ndant on building operations, I have determined that I
ld rather remain an architect than accept the whole of
zinc-working in the country on Mr. Edmeston's terms,
am confident the more work I did the more would be
oss.—I am, &c., C. H.

SQUARE THE CIRCLE IN THE PROPORTION OF 113:355 GEOMETRICALLY.

R,—Make OE equal to half the radius, through E draw
, make 56.S equal to 56.G, draw E.7, take 0.7 from



ut 1, then will 1 be the measuring unit which will divide
diameter into 112 equal parts. Bisect 7-S at ½0, then
56 − ½0 be the radius, to which add 8 = ⅛8, then
te the outer semi-circumference, and with the same
us and ⅛8 as a centre cut, the outer circumference at
hen will F be the determining point. Lastly, draw
' for a determining line; then draw F113 and F88⅞;
will F113 be the side of the equal square, and
− 113 be one-fourth of the circumference.
r completing this, see my diagram October 18.

WILLIAM BUTLER.

OTE.—112 and 15 each squared and added will equal
square of 113, and 56 + 15 = 71 × 5 = 355. To pro-
further with this approximation is of no practical use,
it may be done thus—To 355 + 56 = 411 × 10 = 4110,
let ⅛ of the measuring unit be put for a base, and 4110
for a hypotenuse, on which set on 1 and 3 times the
suring unit. Draw perpendiculars to the base, which
show what is to be added to the 113 and 355, though
easily to be seen.

STAINED GLASS.

very costly and handsome stained glass window has
ly been placed in the parish church of Wapley, Glouces-
hire, to the memory of the late Sir William Codrington,
.

r. Holland, of Warwick, has just inserted in Ascot Old
rch, a memorial window, containing representations
ur Saviour Visiting the Sick, and Our Saviour Healing
Diseases, under rich canopies, with angel in tra-
.

Intercommunication.

QUESTIONS.

[615.]—REDUCING TIMBER TO THE STANDARD.—Some few months ago this subject was touched upon in your columns, but it was not treated in that explicit manner which would enable the ordinary run of builders to clearly master the difficult points. I should be glad if some of your able correspondents would work out the following figures in the most intelligent manner:—

14	21	3 + 9 fourths, red deals.
10	20	
10	19	
84	18	
20	17	
10	13	
10	12	
14	11	
14	10	£3 2s. 17½d. £7 7s. 6d. £26 17s. 3d.
14	9	
200		

INTERESTED.

[616.]—ILLUMINATED DRAWINGS.—I am executing an illuminated drawing, but am at a loss to know how to do the gilding, having had no experience in it. I will esteem it a favour if any of your readers will kindly inform me of the best means of applying it in very small portions.—IGNORAMUS.

[617.]—BRICKS IN CESSPOOL.—Will any reader of the BUILDING NEWS kindly inform me of the best method of ascertaining the number of bricks required to stem and dome over a round cesspool? It is, of course, easy enough to get the sides, but the dome is to me a difficulty. I give the following as an example:—7ft. diameter in clear; 10ft. deep in all; sides rise perpendicular for 9ft. high; the dome commences at that point, and rises a foot so as to be level with the surface in the centre; an aperture 16in. diameter is left for a manhole; sides and dome in one brick in mortar.—ALPHA.

[618.]—QUALIFICATIONS FOR A SURVEYOR.—Some time ago, in the BUILDING NEWS, we were informed that the "only qualification for a surveyor was to take out an appraiser's licence," which much surprised me, as I know several surveyors who have not this licence. Now, I should feel obliged if some of your readers will throw some light upon the subject, through the valuable medium of the "Intercommunication" column. First, I wish to know whether it is usual for surveyors to take out an appraiser's licence, especially when practising in that particular branch known as dilapidation; and, second, is it absolutely necessary that he should take out such a licence, and is he subject to any fine for having made an estimate of dilapidation to house property if he has not a licence, just as an appraiser would be for valuing furniture, &c.—ONE INTERESTED.

[619.]—COMPETITIVE DRAWINGS.—Would anyone kindly inform me if there are prizes for competitive drawings or designs offered this season by any of the architectural societies or by the Society of Arts, &c., wherein a young Scotch architect, unconnected with any society or school of art, would be allowed to compete? If any, where I can get particulars. And if the Architectural Institute of Scotland have offered or intend offering prizes this year.—W. D.

[620.]—ROYAL ACADEMY STUDENTSHIP.—Can you inform an old subscriber if a set of (say six) architectural drawings of a design, executed by myself, would do to send to the Royal Academy as specimens to obtain permission to become a candidate for a studentship?—ALPHA.

[We should say that it would depend on the nature of the drawings.]

[621.]—VERY SHARP PRACTICE.—A person called at my office and wished pencil sketches of plans and elevations for a villa, stating that he required to show them to the proprietor of the ground to see whether he would be allowed to build such houses on it. A trifle was charged at the time for them as a perquisite to the young man who made them. Afterwards I learned he had got them tinted over by some person to preserve the lines, and has built and furnished the houses from them. Could you, or any of your numerous readers, inform me if I have any hold on him for the usual architects' fees, or any claim against him whatever further than the few shillings he paid at the time he got the sketches, my idea being, that if he were allowed to build, he would return and get a regular set of plans and specifications prepared, and proceed with his building in the usual way. A direct answer will oblige a constant reader and an—ARCHITECT.

[This is a decided case of fraud, but whether "Architect" would be able, without documentary evidence, to sustain his case in a court of law is another thing. Was anything said in writing, or if not was there a third party present who can testify to the conversation? If not, "Architect" had better pocket the offence, and studiously avoid "a person" in future.]

[622.]—CISTERNS.—What are the usual and proper gauges of wrought iron of which cisterns are constructed for ordinary house use, holding (say) from 50 to 300 gallons?—H. S.

[623.]—GILT PICTURE FRAMES.—Could anyone inform me of any means to restore gilt picture frames without entirely re-gilding them?—H. D.

[624.]—ILLUMINATIONS.—Could you, or any of your readers, inform me of any means to increase the brilliancy of ordinary water colours in the above work? I find they want body as well, and by using Chinese white much of the sharpness is destroyed. Perhaps there may be some colours specially prepared for this work of which I have not heard.—ISOLATED.

[625.]—MODERN LIGHTS.—I have a workroom built on my yard or garden ground with skylights in zinc flat roof. Parties adjoining have pulled down old buildings and built up a factory to a great height on my workroom wall—on the whole thickness of my workroom wall—all along to house, except just a recess that falls back to about 5ft. only, which recess has several windows, some only a foot from my house, thereby shutting out my fresh air, and taking away some of my light, and let in annoyance. Is it right that, because my house has been built only 10 or 15 years, and not 20, that for light and air I have no remedy.—A LEASEHOLDER.

[626.]—LETTERS ON PLANKS AND DEALS.—Some time since a question (No. 480) was asked as to the marks on planks, deals, and battens, which was replied to by "W. S.," of Nottingham, with some useful information. The subject is interesting and very useful, and I should be glad if "W. S.," or any other of your correspondents, would supplement the information already given, by giving some of the marks of the goods which are shipped to this country in the largest numbers; in fact, some of the more general marks, and if there are marks which distinguish yellow from white. Do three crowns represent crown deals of the best quality in a similar manner that crown Memel represents best Memel timber? Is there any book which gives a description of the qualities of the timber and deals, &c., exported from the various Baltic ports, with the peculiarities and sizes of each, and their relative qualities, with rules for judging by their appearance? I saw something of that sort some years since in a magazine article, but have forgotten the name of the book.—WOODENHEAD.

[627.]—GREENWICH HOSPITAL.—Would you kindly consent to decide in your next number a small controversy, that is to say, who designed respectively the river front of Greenwich Hospital and St. John's Church, Westminster, and oblige yours—T. R. F. J.

[Sir Christopher Wren was the architect of Greenwich Hospital.]

REPLIES.

[566.]—CENTROLINEAD.—Such a mode of setting as "W. Penstone's" may perhaps work "accurately" enough for the showboards of architects, whose present perspective is well characterized by Ruskin's remark that he knows not one in England capable of so much as putting a simple pointed arch into correct perspective. The querist will observe, however, that, as the fork of the instrument always describes a circular arc, lines ruled by the blade can never radiate from a single point unless the blade be perpendicular to this arc, which it cannot be when making unequal angles with the two arms. "W. Penstone's" way of setting will do if you take care that A C crosses not "at any convenient angle," but at equal angles to AB and CD. If it be vertical, A and C must be equidistant from the horizon, which the guiding pins can hardly ever be. But perhaps this is as good a way of setting as any, if we place the line CD as low as possible, make AB accurately correspond with it, on the other side the horizon, let C be the lower pin, and then find a place for the upper by the intersection of an arc struck from A with radius AC, and one struck from B with radius BC. Of course AC must be chosen less than half the length of one arm.—E. L. G.

[569.]—TO COLOUR TRACINGS.—May I inform "Ignoramus" that it would be impossible to produce a uniform colouring by the use of little water and much colour as he proposes. Let him proceed as follows:—In the first place, if there is any fear of any ink lines running, he must lay on the wash on the reverse side of the tracing paper. I always do so myself, but the practice is not universal among draughtsmen. Let him place the tracing paper in an inclined position; mix a wash of the colour, and wait until the solution has settled, so that he takes up nothing but the clearest part of it, which should be done from the top, and the brush should never be allowed to touch the bottom of the saucer, or whatever vessel the colour may be mixed in. Use as large a brush as possible, and the great secret is to keep it full of the colour, and lay on the wash as quickly as possible. If the brush once gets dry, a hard line or edging of colour appears, which no efforts can afterwards get rid of. The first mixing can, of course, be made light or heavy accordingly as is required, but when the wash is wanted to be deep, a preferable plan is to wait until the first wash is dry, and then lay on another. By placing the sheet in an inclined position, the colour runs much more freely than when it is flat. If "Ignoramus" will attend to these practical instructions, he will, after a little practice and patience, be enabled to lay on a wash of any depth, and perfectly uniform throughout its whole surface. He had better first try a small sized sheet, and then proceed to larger ones.—A PRACTICAL DRAUGHTSMAN.

[573.]—PERSPECTIVE.—The demand of "S. B. F." to be taught this science I suppose was a joke, suggested by that of "A Country Builder" to be taught all styles of architecture. Of course the books named by "L. S.," or any others on it, will give the information asked; but "parallel perspective" has nothing to do with what "L. S." describes, as called (in the jargon of British architects) "isometrical perspective." By "parallel perspective" everyone else, including the querist, means, I suppose, that on a plane parallel to some of the chief walls of the object represented, lines in the direction of those walls have then no vanishing point, and that of the lines perpendicular to them is within the picture, usually near its centre. It is convenient to use two other vanishing points, those of horizontal lines inclined 45 deg. to the walls, even when no such lines occur; as we are thus enabled to lay down any horizontal square, by its diagonals. Parallel perspective is the most pleasing for all interiors without exception, and often for grouped exteriors of two or more buildings that stand parallel; but for every exterior of a single building, angular perspective must be used, *i.e.*, the picture plane be so inclined to the walls that all lines, except vertical ones, may have vanishing points. Every set of parallel lines have their vanishing point (if any) at the place where a parallel to them from the spectator's eye meets the picture plane. Hence they have no vanishing point when (and only when) the picture plane is parallel to them, and this is the case with vertical lines, only because we make it a rule for all pictures to be on planes, supposed vertical. But photography, by tilting up its camera, has given us some of its best productions

with the representations of the vertical lines converging to a vanishing point. There is a stereogram of Salisbury spire thus taken that is quite unintelligible till you put it in the stereoscope, and, sitting with your back to a window, look up toward the centre of the ceiling, when the effect is marvellous.

"Isometrical" drawing has no more to do with any sort of perspective than a common plan or elevation has. It is, like them, an "orthographic" projection, *i.e.*, one made by carrying all points of the object, in parallel lines, to a plane perpendicular to them all. It has, of course, no vanishing points, all lines that are actually parallel being represented so, and the nearest and most distant lines, if parallel, being measured by the same scale. The name refers, however, not to this equality (which is common to every orthographic drawing) but to the equal foreshortening of lines in three directions, those of the object's length, breadth, and height; to effect which the drawing plane is inclined equally, namely 35 deg. 16 min. (approximately) to each of them.

There are in no sense "two descriptions" of perspective—"aerial and linear." The former merely means taking proper account of the air, in shading and colouring; and the latter, mathematically right outlining, which is the same whether there be air or no air. "L. S." might as well say there are two kinds of tailoring, one called cutting the other sewing.—E. L. G.

[584.]—WROUGHT-IRON ROOFS.—I observe that your printer has not corrected an error which I pointed out on the proof slip (Iron Roofs, p. 730, middle col.), in the position of the radical sign in the formula $\sqrt{\frac{2{\cdot}88}{{\cdot}7854}}$, and which he has printed $\sqrt{\frac{2{\cdot}88}{{\cdot}7854}}$, thus indicating the extraction of the square root of the numerator only, instead of that of the entire fraction.—Yours truly, Edwd. Swansborough.

[588.]—BOX GIRDERS.—I am very much obliged to "F. Hope" for kindly pointing out my error in working out the formula for box girders.—E. E. C.

[600.]—FLOW OF WATER.—In answer to "Querist," I think the following will give him what he requires:—

```
95ft. 0in.
 4  6 width of stream.
427  6
        9 depth of stream.
320  7·6 cubic feet.
  6
1920
  40
1960 gallons, which will pass a given
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point in 47 seconds.—H. H., Bournemouth.

[600.]—The gallons in a cubic foot are about 6·23. I have to apologise for writing 10, the number of pounds in a gallon.—E. L. G.

[600.]—The correct quantity of water is 6·644 imperial gallons to a cubic foot (supposing the water to be distilled and at the temperature of 62 deg. Fah. and barometer 30in). For all ordinary purposes of calculation, 6 gallons and 5 pints is near enough.—Hy. Scargill, 3, Cotton-road, Poplar.

[605.]—AN ARCHITECTS' CLUB.—"A Member of the H.H.," in his letter last week, says, in reference to our library at the Architectural Association "between the session it is closed to all." He is labouring under a mistake, for during this recess one of the librarians has been in attendance on the last—I believe last—Friday in each month in order that members may be able to change their books. The writer calls the Royal Institute "that energetic body." If it is "energetic," how is it that the Association has, over and over again, asked for their old books, and asked—I believe—in vain? If a man asked me why I wore a silver watch, I should say because I am waiting until I get a gold one; and so we say to those who grumble at the smallness of our library. We have asked for presents in books and money towards it, and if, as the writer says, there are "plenty" who would give "their one or two guineas per annum" towards an architects' club, why do not these "plenty" come forward and aid us with our library? If they would we should soon have a good one, and the "cuj board, 7ft. square," would grow into many shelves full of handsomely bound books. I think that our oft-repeated and unavailing petitions do not at all favour the supposition that the profession is very anxious to have a large circulating library. I can't see, however, why our late president should not help us with an architects' club as well as try "to press us into the artists' rifle corps." In a letter of last year I proposed that "a proper building for architects" should be erected, to contain within its walls the museum, the institute, the association, a large circulating library, to which we may now add an architects' club. I trust that "A Member of the H.H." will have sufficient influence with "that energetic body," the Institute, to persuade them to show their energy in the shape of handsome donations, legacies, &c., to what is so much needed—"a proper building for architects."—Adelphi.

[606.]—STAINING OAK.—In staining oak no better system is known than unaided nature is pursuing in the bogs of Ireland and the fen lands of Lincolnshire, for there we find entire trees which have absorbed a beautiful black stain which we should be glad to emulate. The chemist informs us that oak is remarkable for the quantity of gallic acid it naturally secretes, and that iron is found in strong solution in these vegetable deposits, held in a fluid state by this and other allied acids of reputed astringency. The gallic acid in the wood combining with iron in a state of solubility produces a most powerful and lasting stain for oak and other woods. Gallic acid may be purchased from any chemist; and in the process of staining wash the wood over with a solution of acid and water of any required strength, and allow it to thoroughly dry. To complete the process wash with a solution of iron in the form of "tincture of steel" or a decoction of "vinegar and iron filings," and a deep and beautiful stain will be the result. If a positive black is required, wash the wood over with gallic acid and water two or three times, allowing it to dry between every coat. The staining with the iron solution may also be repeated. Raw linseed oil will stay the darkening process at any stage.—W. S.

[608.]—QUERIES.—1. Apply to any of the firms who advertise the articles in the Building News.—2. You surely cannot be ignorant enough to suppose that rolled iron is cast.—3. The best way to test lead pipe is to cut off a foot and weigh it.—4. For lead gauges Fenn, tool maker, Newgate-street; for zinc gauges, Mr. Edmeston or Mr. Fisher, architects of the Vielle Montagne Zinc Company.—A. H.

[608.]—The specific gravity of lead being set down as 11·35, a cubic foot will weigh 11300 oz., a convenient number for reduction by the ratio 113 : 355, making four cylindrical feet = 35500 oz., and one cylindrical foot = 8875 oz. Hence, as 144 : the square of your pipe's bore in inches, : : 8875 : the ounces of lead that will fill a foot of it. Add these to its own weight, and as 8875 : the sum : : 144 : the square of the outer diameter. Extract the root of this, and it will differ from the given bore by twice the thickness required.—E. L. G.

[608.]—"Z." will find in the sheets of sections of rolled iron manufactured by Macnaught, Robertson, and Co., 41, New Park-street, Southwark (among others), many with the weight per foot given.—H. S. P.

[610.]—COSTING FLOORING BOARDS.—The ready system "A Builder" alludes to is the following:—A standard of boards, deals, or battens will make nearly 20 squares of 1in. flooring. This can be readily fixed to memory; but I give it in detail. 1131ft. 6in. lineal of 3 × 7 deal is one standard; multiplied by 3 gives the lineal feet of 1 + 7 boards when sawn. The result divided by 172 (which is one square of flooring) gives 19 squares 2 quarters 40ft., or 19¾ squares.

```
Example—          1131  6
                     3
                 ------
            172 )3394  6
                 ------
                   19  2  40
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Now, as this discrepancy only influences the cost of a square of flooring 1½d. or 2d., it is not noticed; and to aid mental calculation we say, one standard produces 20 square of 1in. flooring. By the same rule, one standard produces 10 square of 2in. flooring, 12½ square of 1¼in., 15 square of 1¼in., and 17½ square of 1½in. Supposing a timber merchant informs you that such a sample of goods are £7 15s. per standard, that is equal to 7s. 3d. per square. The estimate is made thus:—

	s.	d.
Wood, first cost per square	7	9
Sawing two cut deals	1	4
Planing, 1d. per 12ft. run	1	2
	10	3

or in other words 7s. 9d. and 2s. 6d.

With other thicknesses an addition of one-quarter, one-half or three-quarters is made to the first cost, and the consequent cost of preparing is added I give you an illustration in 1¼in. boards:—

Wood, first cost per square	7	9
Add one-half	3	10½
Sawing one cut deal	1	0
Planing, 1½d. per 12ft. run	1	9
	14	4½

or in other words 11s. 7½d. and 2s. 9d.

If foreign-sawn boards are used it is evident that the cost of sawing (as charged above) is saved, but there is a rule amongst the proprietors of sawing and planing mills to charge double price for planing foreign boards. This was necessary when foreign-sawn boards were first introduced, as they were roughly sawn and badly manufactured. The double cost of planing is still charged, although the boards of the present day are sawn as clean and regular as if done by our own machinery. I need only say that a good buyer can often break through this arrangement if he purchases his flooring boards by the standard.

I may just remark that a square of flooring, as sold by the timber merchants, will not produce a square of flooring in the hands of the builder; every board is sold as being the full width, but they lose from ⅛ to ¼ in preparing, to cover which an allowance of 4d. per square should be made on the 1in. boards and 7d. on on the 1¼in. This loss is sometimes covered by the timber merchants selling 180ft. lineal of 7in. boards to the square instead of 172ft.

With tongued and grooved boards the above difference must be doubled, and the ordinary 9d. per square charged extra for preparing.—W. Stevenson, timber agent, Nottingham.

[611.]—ESTIMATING CARPENTER'S WORK FROM HEWN AND CONVERTED TIMBER.—In reply to "An Estimator," I am of opinion that the question is not clearly understood by surveyors and contractors. The system of cubing all timbers and scantlings, irrespective of size, is adopted for the sake of brevity. In the rough draft, quantities, all scantlings, &c., are carried out according to their superficial square inches in the end section. Take the following instance:—

Item, 200ft. lineal of 3 + 4 rafters. This contains 12 superficial inches on the end, and would be carried out as 12 times 200.	2400	
Item, 86ft of 5 + 7 purlins. This, on the same principle, would be carried out as 35 times 86.	3010	
	144	5410
		37 $6\frac{10}{12}$

This divided by 144, the superficial square inches on the end of a cube of timber produces 37 cube 6 inches and $\frac{10}{12}$. Or it may be reduced by the shorter method of squaring the length by the condensed width and dividing by 12. Now, as the former size could be more readily produced than the latter, a difference might possibly arise in the cost. That being the case, a sufficient reason is advanced for keeping the two classes of timber separate in the bills of quantities, in one instance as scantlings or quarterings reduced to the 3 + 11, in the others to the ordinary cube. If the latter plan was adopted, the above 2400 would require dividing by 33. The superficial square inches in the end of a 3 + 11 deal and instead of one item of 37 cube 6 inches of timber, we should have:—

Item, 72ft. 9in. lineal of 3 + 11 deal, including sawing and labour		
Item, 20 cube 11 inches, in scantling sawn from timber, including sawing and labour		

This is clearly more trouble to the surveyor, and if adopted would render it imperative on his part to be well acquainted with the various sizes of converted timber.

For the sake of argument we will suppose that the quantities are placed in the hands of the contractor in the latter form. The first step is to compare the cost of the two descriptions of timber:—

		£	s.	d.
Scantlings from sawn deals.	First cost of deals per standard	9	0	
	Cartage and labourage		5	
	Sawing (averaging 2 rips in 3 + 11)		16	
	Labour and nails	3	10	
	Trade profit (5 per cent.)		13	
		14	5	

or 4¾d. per foot lineal of 3 + 11, equal to 1s. 8¾d. per cube.

Scantlings from hewn timbers.	First cost of timber per load of 50 cubic feet	3	6
	Cartage and labourage		2
	Sawing (averaging 4 cuts one way, including slabbing)		6
	Labour and nails	1	8
	Waste by gait of saws 1-12th		10
	Waste in slabs, &c. (say) 1-12th		10
	Trade profit (5 per cent.)		6
		6	10

or equal to 2s. 7d. per cube.

As converted timber or deals in their first cost bear the above proportions to hewn timber, it is clear from the analysis that scantlings which can only be obtained from hewn timber are 50 per cent. more costly than those obtainable from converted timber. If the sawing, waste by gait of saws, and slabs, be reduced one-half (a computation which might probably cover the cost of large scantlings) the result would still show an excess in cost amounting to 33 per cent.

In making these calculations it must not be overlooked that the waste by the saws in cutting scantlings from hewn timber has to be borne by the builder, whereas in converted timber the loss lays with the foreign makers.—W. Stevenson, timber agent, Nottingham.

[611.]—The reason for not estimating carpenter's work in quantities at per foot run of batten or deal, where the scantlings happen to coincide with those special sizes numbers is, first, for greater uniformity of practice; second for the readier ascertainment of the labour on a given quantity of material; third, that where battens or deals are not specially mentioned in the specification, most architects insist upon the scantlings being cut out of timber of a more vigorous growth and larger fibre. I should, however, like to hear the opinions of some of your readers as to whether large timber, cut into scantlings or plank deals and battens (which we know are cut from small trees), are the best, strongest, and most durable for floor joists, roof rafters, &c. It must be borne in mind, however, that few deals are over 12ft. long, or battens more than 22ft., and that this limit to their size precludes their use of them for many purposes.—A. H.

[614.]—MEASUREMENT OF WASTE.—"T. H. L." can hardly have read with care. I am not aware of such an item as "allowance for waste" in measurement of carpenter's work to hips and valleys. It is to be found in slating, tiling, and such-like work, but not for rafters, purlins, &c., these being taken as they appear. Waste would not be so great in steep as in flatter-pitched roofs.—H. S. P.

Suggestions.

COATING IRON AND STEEL.—The following is an easy method of giving iron and steel a firm coating of copper:—The plate or article, of iron or steel, which it is desired to coat, must first of all be perfectly cleansed. It must then be brushed over with a solution of protochloride of tin, in dilute hydrochloric acid. The author makes his solution by dissolving one part of the chloride of tin in two parts of water, to which he adds two parts of commercial hydrochloric acid. Directly after the solution is applied, another of ammoniacal sulphate of copper is brushed over. The latter is made by dissolving one part of sulphate of copper in sixteen parts of water and adding gradually sufficiently strong ammonia to form a clear dark blue solution. The coating of copper deposited in this way is said to be so firmly adherent that it may be polished with chalk without any fear of its being detached. A coating of copper can be obtained on zinc by merely using the ammoniacal solution of copper, and without the preliminary use of the chloride of tin solution. The coating of copper given by this process must be excessively thin, and would only be available for decorative purposes. But if answers, it is clear that an iron ship can be coppered as easily as she can be painted.

PETROLEUM OIL.—That very industrious technical chemist Dr. R. Wagner tells us that the disagreeable odour of petroleum oil can be taken away by treating the oil with a solution of plumbate of soda. This is only a solution of oxide of lead in caustic soda, and will certainly remove any such odour as sulphur compounds might communicate to the oil.

CEMENT FOR KNIFE HANDLES.—1. Lay a piece of alum on a stove, and when melted roll the knife shank in it, and immediately thrust it firmly into the handle. It will soon be ready for use. 2. Fine brickdust stirred in melted resin, and used hot, will fix knife and fork handles very firmly. 3. Mix equal parts of wood ashes and cow

ion salt with water enough to make a mortar. Fill the andle with this, and then drive in the shank and let dry.

A USEFUL CEMENT FOR GLASS, WOOD, &c.—Take part of gutta-percha, 2 parts of common pitch; melt in lead ladle and mix well together: do not let it catch fire. When required for use heat slightly, and take on a knife ist so much as required. Stick bits along the pieces to be mented, having previously heated at the fire the parts; ien, with a bent hot wire, run the cement along, and ork with finger and wire like soldering, and get all nooth. When cool the job is finished. It is an old ceipt, but not sufficiently used.

STATUES, MEMORIALS, ETC.

A committee has been formed at Nancy with the object erecting a statue to the painter Jacques Callot, who was rn n that city in 1593

The monument to Prince Schwarzenberg, at Vienna, was veiled by the Emperor on Sunday last. Herr Hassnell, e sculptor, has received the Order of Leopold.

LEGAL INTELLIGENCE.

The grinding money question came up last week an action at the Bloomsbury County Court, ainst Mr. Warren, a master builder, of Parker-reet, Drury-lane. The claimants were two car-nters, and, upon proving the custom of the ade, they obtained a verdict, with costs for two d a-half hours.

Mr. Jarvis, the district surveyor of Camber-ell, opposes concrete wall building to the ex-nt of his power, and has prevented cottages be-g erected on that plan, several times. He re-s upon "Clause I., 1st Schedule, Preliminary," cause mention is made of "other hard and in-mbustible substances," which are required to, d "shall be properly bonded and solidly put gether."

Irregularity under the Building Act.—On turday, Mr. Henry Smith, builder, of Reginald-d, New-cross, was summoned before Mr. Traill, the instance of Mr. Whichcord, district surveyor, constructing a building known as Brunswick-tage, Brunswick-street, Deptford, without st giving notice, and also for irregularities in e said building. The defendant did not ap-ar, and it was stated that since the building s finished, it had passed out of his (defendant's) nds, but that if an order was made, what was quired would be done. The omission of giving tice was proved, and for this a fine of 20s. and sts was imposed; an order also being made to nedy the defects set forth in the form of sum-ons.

The Projection from Building in Slade's-ace.—Mr. T. C. King, auctioneer and house-nt, of Slade's-place, High-street, appeared be-e Mr. Traill, on Saturday, to answer, on com-int of Mr. Whichcord, district surveyor, for cting a building without notice. It will be re-mbered that the case came before the magis-te in June, 1865, on the complaint of the Green-ch District Board of Works, on the ground that at was now complained of as a building was a jection from the regular line of frontage. An der was then made for its removal, but this had been done. Mr. Whichcord had not taken ceedings under the Metropolis Buildings Act til the tarpaulin covering which formed the f was made fast to the side walls, one front, ich is open during the day, being enclosed by tters at night. After considerable discus-n as to what constituted a building, Mr. Traill d that, at all events, the defendant would have obtain the sanction of the Metropolitan Board Works to the erection remaining as a projec-n, and the defendant then said he was about noving to more spacious premises at the Broad-y entrance to High-street, and he undertook t the projection or building complained of uld be removed by the following Thursday. order for its removal by the time stated was n made.

A memorial has been signed by some of the ding City merchants and bankers, and presented the Lord Mayor elect, requesting him to take me steps to prevent the necessity of closing the ief thoroughfares on the 9th of November next. Alderman Allen is wise he will signalize his yoralty by the discontinuance of the ludicrous nnauts of a procession which was probably once namental but has long since ceased to be useful cept to the pickpockets of the metropolis. The dsance is to be shortened not destroyed.

General Items.

The Builders' Benevolent Institution hold their Twentieth Annual Festival on Thursday, the 31st inst., at Willis's Rooms, St. James's-street, under the chairmanship of Mr. W. R. Rogers, the president of the Institution.

A conversazione of the Associated Arts Institute will be held at 9, Conduit-street, to-morrow (Saturday evening) at 9 o'clock.

The St. Olave's Board of Works have under consideration the plan of Mr. Barlow for making a way under the Thames, from Horselydown to the opposite shore, for omnibuses and other traffic.

It is announced that the Home Secretary is about to appoint several—probably more than a dozen—sub-inspectors of factories under the act of last session.

According to *Echoes of the Clubs*, it is proposed, if the consent of the members can be obtained, to omit the bedroom floor of the building for the Junior Carlton Club, which is gradually becoming conspicuous on the northern side of Pall Mall. Should this floor be retained, the building will be 12ft. higher than the Reform Club (at present the highest building in Pall Mall); if, however, it is abandoned, it will still exceed the Reform Club by 2ft.

The secretary of the Sun Fire Insurance Office stated to the Commons' Select Committee of last session on fires, that carelessness in using lucifer matches causes to that office a loss of £10,000 a year.

The annual meeting of the architectural society of the archdeaconry of Northampton was held at Northampton on Monday last week. A report of the proceedings of the society was read by the secretary (the Rev. N. F. Lightfoot), which, on the whole, received very favourably the position and prospects of the society. Plans for new churches at New England, near Peterborough, and at Kettering (by Mr. Street), had been submitted for the approval of the committee, and many other important works had been commenced and were in progress under the auspices of the society. The financial affairs of the society were in a satisfactory condition, although the balance in hand was considerably less than that of last year, in consequence of many members' subscriptions being in arrear.

On Monday last, Miss Bulmer, of Holmer, gave a supper to the whole of the workmen now employed in building her mansion at Ailstone Hill. Miss Bulmer's mansion is being built by Messrs. Collins and Cullis, of Tewkesbury, and is in a very forward state.

We hear on good authority that the legislative dignitaries of Jersey have it under serious consideration to cause the erection of a lighthouse on one of the group of rocks known as the Corbières, and situated off the south-western end of the island. It is only remarkable that this highly essential work has not been accomplished long since. The west of Jersey, which literally abounds in rocks, have no more dangerous point than that which is the site of these same Corbières. It is the terror of all shipmasters, and is answerable for a long list of maritime disasters. Let us hope that a favourable view may be taken of the Corbières lighthouse question by those whose duty and whose interest it is to lessen the risks and perils which environ all who approach the island of Jersey by night.

The Abyssinian churches are generally built on the summits of hills in the midst of cypress groves. They are round, with conical roofs, and divided, after the Jewish model, into three parts. The outer court is open; the second, which is closed, is used for public worship; the third and innermost enclosure corresponding to the Jewish Holy of Holies. This is only entered by the priest, and contains the tabot or ark in which the sacred books and vessels are kept. The exterior of this enclosure is painted with sacred subjects (by native artists), of great amusement to Europeans.

The *Athenæum*, speaking of the various motives that induce Englishmen to visit Paris, says the admiration of the English-speaking guide to the Cathedral of Notre Dame for the Emperor is immense. He says Napoleon III. has done more for the cathedral than any monarch since Clovis—he has so arranged the streets that, at the next revolution, he can blow down everyone in that quarter without hurting the church—the guide's test of a true saviour of society.

The authorities of Paris have accepted a tender for the construction of an experimental iron bridge for foot passengers, for the junction of four streets. The experiment of relieving crowded streets by such means is to be tried, at first, at the spot where the Rue de Madrid and Rue Rochet cross each other.

A short time since we gave a description of a project for bridging the Channel between England and France. We now hear that M. Boulet, the inventor and an engineer, is getting up a company for the purpose of making experiments on a large scale, and half the capital required has already been subscribed. The bridge is to be constructed in metal, and supported upon piles carried down to the bottom of the Channel, the enormous weight to be alleviated by a series of gigantic buoys. The wish of the inventor is now to construct a large model across some river or other, all the proportions being carefully observed.

The inhabitants of Maidstone and its vicinity have just presented an address to E. L. Betts, Esq., the well-known contractor, on the occasion of his departure from Preston Hall. Amongst numerous signatures are several peers and gentlemen of position, who express to Mr. Betts their "deep regret at the circumstances connected with the cause of your departure, and their deepest sympathy with you under misfortunes so rarely paralleled, and so equally unmerited. During a period of nineteen years you have often been the originator, and always the promoter, of every measure that would tend to advance the science of agriculture, and elevate the character of the labouring poor. By you schools have been erected, reading-rooms opened, old charities have been sustained, and new ones established; your aims have been directed to the relief of the sick, and the support of the needy. What you and Mrs. Betts effected in the parish of Aylesford alone entitles you to the gratitude of its inhabitants, leaving marks in strong characters not easily effaced." Mr. E. L. Betts, replying from Betchworth, feelingly thanked them for their kindness, and expressed a hope that ere long he would again become a resident of his native county, to which he was bound by so many ties.

Mr. J. T. Dexter, corresponding secretary of the Paris Excursion Committee, in a letter says:—I have had little leisure to examine for myself the vast resources within the building in the Champ de Mars. But the testimony of men whom I am bound to regard as qualified to pronounce upon such matters is given with all but unanimous consent to the verdict that, judged by their work, the French artizans are outstripping our own more free and hardy workmen, not alone in taste and delicate manipulation, but also in solid workmanship and skill. To mark this condition, and to ascertain the causes which have conduced to it, is nothing less than our duty.

Mdlle. Pauline Lucca has been singing at Frankfort. The proceeds of the concert in which she took part are to be devoted to the rebuilding of the Frankfort Cathedral.

On Saturday last, the Rev. W. Dundas, and about sixty persons, consisting of a few friends and the workmen who have been employed by him in the erection of Saint Augustine's Church, Montpelier, dined together at the Old England Tavern, Bristol. Mr. Dundas occupied the chair, and was supported by several clergymen. Mr. Dundas's health was drank with the greatest enthusiasm, and a very pleasant evening was spent.

It may be as well to record that after the 1st of January next, between 10 o'clock in the morning and 7 in the evening, the removal of ashes, dust, or refuse from any house in any street in the metropolis, as named by the police commissioner, will be prohibited under the New Traffic Act.

The works at the Holborn Valley are being pushed forward with energy, and probably in little more than a year hence the ordinary street traffic will be conveyed along the viaduct now in course of erection, though the whole improvement in all its parts can hardly be completed in less than two years from this time.

In 1823 the city of Paris sold its yearly crop of mud for £3,000; in 1831 the renters paid for it £5,600, and £20,000 in 1845. The price has now reached £24,000. This mud, when kept for some time in rotting tanks, is sold as manure at the rate of from 3f. to 5f. per cubic metre.

A stained glass window has been erected to the memory of the late rector in the restored east wall of Haseley Church, near Warwick, by Mr. Holland, of that town. It is divided into three compartments, with subjects in medallions in each, of the Annunciation, Nativity, and Crucifixion, with angels and suitable ornamental work filling up the other portions.

The newly macadamized roads in Liverpool are now rolled by a traction engine, having two side wheels, each 2ft. 6in. wide by 5ft. diameter, and one driving wheel 2ft. 6in. wide by 7ft. diameter. The weight upon the wheels is 30 tons, which is sufficient to consolidate the macadam by passing once or twice over it. This is a great improvement on the old system.

An interesting and satisfactory trial of a novel combined steam and hydraulic steam crane took place on Tuesday, at Liverpool. The crane is invented by Mr. A. C. Brown, C.E., of the firm of Brown, Wilson, and Co., by whom it was constructed. The advantages claimed by the patentee are the direct utilization of the elastic force of steam, governed by the inelasticity of water; the high working speed of load with low speed of machinery; the total absence of all cog wheels or revolving parts; lastly, extreme portability, combined with great power and speed, and without noise. It can raise 30 cwt. at a speed of 800ft. per minute, and it has, at the Hamburg Docks, where sixteen have been at work, raised as many as ninety parcels of 1 ton each per hour, or 900 tons per day of ten hours with a consumption of coal equal to 4 cwt. The crane is the first of its kind in Liverpool, and has been supplied to the Bridgewater Trust, the engineers and other officers of which express themselves as highly pleased with its performance.

The Executive Committee of the National Exhibition of Works of Art to be held at Leeds in 1868, have received the most encouraging assurances of support in their efforts to bring together a collection of sculpture in marble worthy of the English school. Several of our most distinguished sculptors have evinced a warm interest in the exhibition, while many well-known patrons of art have promised examples from their collections. Henry R. Sandbach, Esq., has offered in the most liberal manner, Gibson's famous *chef d'œuvre*, "The Hunter," together with the "Aurora," by the same eminent sculptor, the "Nymph Preparing for the Bath," by Wyatt, and the "Shepherdess and Faun," by Spence. W. R. Sandbach, Esq., will lend "The Angel's Whisper," by Spence; and Sir F. Crossley, Bart., F. Bennoch, Esq., H. Barnard, Esq., J. Rainey, Esq., James Kitson, Esq., and Arthur Lupton, Esq., will also contribute.

A new thoroughfare, being an extension of Serle-street, Lincoln's Inn-fields, intersecting the site of the New Law Courts, and leading into the Strand through Picket-place, is in course of formation. To affect this it has been necessary to pull down several houses in Carey-street between Hemlock and New courts and the premises in the rear. The buildings in Star, Crown, and Robinhood courts have already been removed, and in order to complete a direct and continuous communication for carriage traffic from Holborn to the Strand, the houses in Great Turnstile will be pulled down and the thoroughfare widened. By the opening of this important thoroughfare the necessity of widening Chancery-lane will be obviated. A large portion of the intended site for the New Law Courts, between Boswell-court, Carey-street, and Bell-yard, Fleet-street, has been cleared; but it is stated that building operations will not be commenced until the spring of the ensuing year.

Mutual Aid.

SINCE we opened "Intercommunication" a variety of questions appertaining to the price of books, apparatus, machines, and many other matters, have reached us. These questions, which are evidently asked by young men, students, and others, while not sufficiently important for the "Intercommunication" department, ought not to be altogether disregarded. We have, therefore, determined to open another column, under the title of "Mutual Aid," where questions of minor importance may be answered. The questions will not be numbered, as in "Intercommunication," and the less space they occupy the better. Judging from the inquiries which have hitherto reached us, we should say, as "Intercommunication" is chiefly characterized by professional matters, "Mutual Aid" should be devoted principally to trade matters. "Mutual Aid," like "Intercommunication," will depend almost entirely on what our correspondents make it. The following may be looked upon as samples of the questions asked:—

Could you please inform me of a work on botany, with good illustrations, suitable for the assistance of a carver, and price?—J. T. P.

Will "L. S.," who wrote in the last number of the Building News, inform me of any particular place where I can obtain the shilling work on perspective, by Aaron Penley. It is named in an answer by "L. S."—A. Brown. Darlington, October 21.

What salary might a young architect, of five years' experience, and average abilities, expect to get as an assistant in London or in Edinburgh?—W. D.

Could you recommend me good books to study on construction and on building materials?—G. T.

I should feel obliged if some one could inform me of an inexpensive apparatus for taking portraits—but particularly of buildings—on glass. If the necessary articles were enumerated, and the probable price, I should take it as a great favour.—A Regular Reader.

I should like to obtain a second-hand copy of "Ure's Dictionary of the Arts."—J. T.

I have a good gaselier, the stem of which is 4ft. long, with glass pendants. I should be glad to exchange for a copy of Colling's "Art Foliage" in tolerable condition.—W. W.

GOLD PAINT.—I should be obliged if any one would inform me of the cheapest and best gold paint.—Isolated.

EARTH CLOSET.—Will some one inform me of the price of Moule's earth closets.—W. W.

TURNING LATHE.—I want a turning lathe, and should like to exchange for it a small mahogany bookcase.—Mr. Roberts, Jun.

STAINING GLASS.—What is the best and cheapest elementary book on stained glass.—Gothic.

Trade News.

TENDERS.

Dulwich.—For Dulwich Station on London and Sutton Junction Line. Mr. Chas. Barry, architect:—Waterson, £4,990; Bracker and Son, £4,600; Patrick and Son, £4,550; Simms and Marten, £4,397; Chappell, £4,258; Winship, £4,250; Jackson and Shaw, £4,028; Sawyer, £3,991; Perry and Co., £3,975; Rutt and Co., £3,931; Myers and Sons, £3,839; Bull and Son, £3,832.

London.—For erecting the new school hall, Mr. John Crawley, architect:—Bird (accepted) £1,930.

London.—For alteration and addition to 130, Old Kent-road, for Mr. T. Couldery:—Linsdall, £382; Randall, £364; Whittick (accepted) £344.

London.—For stabling at Southside House, Holloway, Mr. J. W. Dennison, architect:—Mann, £637; Crabb and Vaughan, £659.

London.—For three houses and a Baptist Chapel at South Kensington. Messrs. C. G. Searle and Son, architects:—

	Houses.	Chapels.
Foxley	£5,800	£7,550
Patman & Fotheringham	5,488	6,798
Gammon & Sons	5,481	6,359
Sims & Marten	5,173	6,602
Hedges	5,276	6,455
Colls & Son	5,290	6,427
Perry & Co	5,270	6,325
Dove Brothers	5,320	6,273
Ennor	5,084	6,410
Higgs	5,193	6,255

London.—For alterations and additions to offices and warehouses, Cannon-street, City, for the India-rubber Company (Limited). Mr. James K. Colling, architect. Quantities not supplied:—Myers and Sons, £1,997; Brown, £1,800; Patman and Fotheringham, £1,800; Kirk, £1,734; Dove Brothers, £1,685; Langmead and Way, £1,650; Phillips, £1,540

Luton.—For Luton Corn Exchange. Messrs. Messenger and Gundy, architects:—Nightingale, £3,295; Thomas and Son, £3,290; Pattinson, £3,000; Nutt and Co., £2,948; Manley and Rogers, £2,900; Simms and Marten, £2,750; Dennett and Co., £2,625; Rogers and Son (accepted), 2,533; Smart Brothers, £2,529.

Portsmouth.—For the erection of engine and boiler houses, &c., for the sewage pumping works at Eastney, for the Corporation. Quantities supplied. J. E. Greaves, borough engineer, architect:—Simms and Marten, £2,940; Bull and Sons, £3,881; Frederick Furniss, £3,875; Burbidge, £3,703 13s.; W. R. and C. Kight (accepted), £3,593; Stevens, £3,423.

Rowley Regis.—For the erection of a new church, Black Heath, Rowley Regis. Mr. W. J. Hopkins, architect, Worcester:—J. Wilson and Son, Soho Hill, Handsworth (accepted), £5,000.

South Hayling.—For the erection of the West Town Hotel, South Hayling, Hants. Mr. F. Whitaker, 3, Westminster Chambers, Victoria street, architect. Quantities supplied:—Fish, £2,054; Perry, £2,050; Welch, £1,8[illegible]0; Lathey Brothers, £1,595; Trigg, £1,575; Stredder, £1,3[illegible]2; H. Tyler (accepted), £845.

Woolstanton.—For villa residence, at Woolstanton, for Mr. Thomas Hassels. Mr. Ralph Dain, Burslem, architect:—Matthews, £748 16s.; Woolrich, £670; Bennett and Brindley, £635; Bowden, £582; Collis and Hudson, £580; Beech, £573; Blackhurst (accepted), £572.

BATH STONE OF BEST QUALITY.

Randell and Saunders, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depot, also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[Advt.]

PROPERTY SALES.

Oct. 16.

At the Mart.—By Mr. H. Sowdon.—Freehold [illegible] plots of building land, situate at Norwood, Surrey—s[illegible] for £282.

Oct. 17.

At the Mart.—By Mr. Ward.—Leasehold house, [illegible] 3, Vine-place, Bond-street, Vauxhall, annual value £27 [illegible] per annum, term 70 years from 1847, at £4 10s. per annu[illegible] —£180.

Leasehold two houses, Nos. 21 and 22, Church-str[illegible] Kennington, producing £44 16s. per annum, term 78 ye[illegible] from 1845, at £6 per annum—£335.

Leasehold improved ground rents, amounting to £70 [illegible] annum for 82 years, secured upon houses at Kenning[illegible] and Camberwell—£1,075.

By Mr. Newbon.—Freehold ground rents, amounting [illegible] £32 per annum, secured on Nos. 14 to 17, Grafton-terra[illegible] Maitland Park, Haverstock Hill.—£705.

Leasehold house, No. 66, Carlton-street, Kentish Tow[illegible] annual value £32, term 83 years, ground rent £9—£280.

Leasehold residence, No. 1, Stanley-road, and hou[illegible] builder's yard, workshop, and stable in the rear, Nos. 1 a[illegible] 2, Alexander-road, Upper Holloway, term 99 years fr[illegible] 1859, at £10 10s. per annum—£1,290.

Leasehold residence, No 20, Oxford-road, Hallifo[illegible] street, Essex-road, Islington, annual value £50, ter[illegible] 78 years, ground rent £6 10s. per annum—£445.

By Messrs. Hards and Vaughan.—Freehold esta[illegible] situate at Sidcup, Kent, consisting of a residence, w[illegible] stable, garden, and seven acres of building ground—£3,3[illegible]

Leasehold house and shop, No. 4, Frederick's-pla[illegible] Lewisham, let on lease at £50 per annum, term 69¼ ye[illegible] from 1841, at £6 10s. per annum—£715.

Leasehold house, shop, and premises, No. 5, Frederic[illegible] place, Lewisham, let at £55 per annum, term 80 years fr[illegible] 1841, at £8 per annum—£720.

Leasehold residence, known as Rose Cottage, Lady W[illegible] Lewisham, let at £24 per annum, term 99 years from 18[illegible] at £4 per annum—£220.

Leasehold two residences and plot of land, Nos. 1 a[illegible] 2, Creed place, Maize Hill, Greenwich, producing £55 [illegible] annum, term 45 years unexpired, at £9 4s. per annu[illegible] £550.

At the Guildhall Coffee-house.—By Mr. Marsh[illegible] Freehold estate known as Verulam Hill Farm, St. Alba[illegible] Herts, comprising house, buildings, and 50 acres of land [illegible] £4,590.

Freehold ground rents, amounting to £80 2s. per [illegible] num, secured upon eight houses and plot of land at Pe[illegible] ham—£2,650.

Freehold 1½ acres of gardens and premises, situate in r[illegible] of above—£1,010.

Freehold residence known as Clifton House, East D[illegible] wich, let at £60 per annum—£1,060.

Freehold residence known as Malmesbury House, E[illegible] Dulwich, with buildings and 2½ acres of land, let at £[illegible] per annum—£2,700.

Freehold 7a. 3r. 31p. of building land, fronting Peckh[illegible] Rye—£6,300.

Oct. 18

At the Mart.—By Mr. Robert Reid.—Freehold grou[illegible] rents amounting to £71 per annum, secured on prope[illegible] in High street, Rickmansworth, Herts—£1,485.

Leasehold residence known as Arlington Villa, 43, Fin[illegible] ley-road, St. John's-wood, term 70 years unexpired, at [illegible] per annum—£1,850.

Leasehold house and shop, No. 35, Devonshire-str[illegible] Portland-place, term 16½ years unexpired, at £7 per ann[illegible] —£600.

By Messrs. Debenham, Storr, and Sons.—Fresh[illegible] ground rent of £12 per annum, secured upon Nos. 6 t[illegible] Hamilton-grove-road, Gipsy Hill, Norwood, £240.

Leasehold ground rents of £50 per annum (for 85 yea[illegible] secured upon six residences in King Henry's-road, Adelai[illegible] road, Hampstead—£945.

Leasehold residence, No. 210, New Cross-road, Deptfo[illegible] let at £67 per annum, term 43 years unexpired, at £7 [illegible] annum—£700.

Leasehold two residences, situate at West Hill, Syd[illegible] ham, let at £70 each per annum, term 34 years unexpir[illegible] at £24 10s. per annum—£840 each.

Leasehold house, No. 2A, Holland-street, Church-stre[illegible] Kensington, let at £32 per annum, term 76 years un[illegible] pired, at £6 per annum—£285.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

William Collin, Putney Common, timber dealer, Octo[illegible] 31, at 11—John Curtis, New Wimbledon, Surrey, build[illegible] October 31, at 12—William Davies, Lennox-road, Stro[illegible] Green-lane, Islington, builder, October 31, at 11—Jo[illegible] Rider, Compton-street, Goswell-road, and Cleasby Vill[illegible] Tollington Park, timber beader, October 31, at 1—Josi[illegible] Archer, Shrubland-road, Dalston, builder, November [illegible] at 11—Hyde Bateman, Coleman-street-buildings, survey[illegible] and Radnor Works, King's-road, Chelsea, engineer, Nove[illegible] ber 4, at 1—L. Scally, Fitts'-rents, Hoxton Old Tow[illegible] stonemason, November 7, at 1—Frederick Springall, E[illegible] Ham, builder, November 4, at 11—William Townsend, [illegible] Mary Cray, Kent, builder, November 4, at 12.

TO SURRENDER IN THE COUNTRY.

John Adams, Hereford and Allensmore, Herefordshi[illegible] brickmaker, November 1—John Best, jun., Scaforth, La[illegible] cashire, joiner, October 31—H. Butler, Southwell, Nottin[illegible] hamshire, plumber, October 23—Henry David Cleal, Po[illegible] land, Dorsetshire, bricklayer, October 30—Richard Jon[illegible] Llandudno, plasterer, October 28—Vincent Lock, Al[illegible] near Langport, timber feller, October 28.

THE BUILDING NEWS.

LONDON, FRIDAY, NOVEMBER 1, 1867.

THE PROPOSED NEW LAW COURTS.

ABROAD, the unsettled aspect of what is called the political horizon at home, the equally unsettled state of the money market, and the no less unsettled state of Ireland, are conditions not altogether the most favourable to the study of the arts of peace. The competition for that great national work which occupied so much attention during the past summer, seems to have quietly drifted away from us, and to have become already a thing of the past. It is perhaps just as well that it should be so. No one who took the trouble to examine carefully the very limited number of designs which so inadequately represented the position of English art and English architects, and no one who, knowing nothing of plans, will yet calmly read the reports of the Commission now before us, can fail, we should think, to arrive at any other conclusion than that embodied in the sixth paragraph of Messrs. Shaw and Pownall's report, in which they express it, as their decided "opinion, that it is impossible properly to provide" the accommodation required on the proposed site. This report is dated May 13, 1867, and may be taken as the first indication of a desire on the part of the authorities to treat the whole matter as the National Gallery competition was treated, and shelve the question until such time as the mistake of limited competitions for national works shall be fully recognized. One word, by the way, on this question of limited competition. We have heard it argued that it is the kindest thing you can do to the profession to limit all competitions to a few men (not exceeding, we suppose, in any case, twelve). The fortunate few say to their less fortunate brethren, "What is the use of your spending so much time and money out of pocket in preparing drawings, the mere size of which compel you at starting to rent extra offices, when you know, or ought to know, that there are only twelve men in Great Britain really able to enter the lists—viz., Messrs. Abrahams, E. M. Barry, Brandon, Burges, Deane, Garling, Lockwood, Seddon, Street, Scott, Waterhouse, and Gibson; and that all others would lose both their money and their temper in a vain and vexatious combat." We quite admit the truth and common sense of all this, only, in the first place, there is no necessity for a quantity of large drawings in order to find out the best architect. In the second place, we do not know that the twelve architects just named are the only men capable of designing a large building. What is wanted, in order to bring into light the art power of the nations, is not a competition, limited in the number of competitors, but limited in the quantity of manual labour required to show forth not so much the design as the knowledge of the designer. One plan, one elevation, and one section, are quite sufficient material to enable any *capable* judge to form an opinion as to the relative powers of the competitors, whilst an *incapable* judge is only confused and rendered more hopelessly inefficient by a number of drawings. To talk, therefore, of expense and time in preparing a competitive design is very like condoning one of the greatest evils of competitions; and when an architect makes this a reason for limiting the number of competitors he tacitly accepts the deplorable conditions which beset the very important question, conditions that are a disgrace to a profession which has allowed itself to be so permeated with desire for gain that it seems to be losing all sense of honour and manliness. Had the selected architects been less hungry for popularity and pence we might have taken an immense stride towards the reform of the whole question of architectural competition. Had any such thing as brotherhood in art existed, an attempt would have been made to reduce the conditions to the very simplest and easiest, so simple and easy that every man in the profession might have had his chance, and whether he had or had not a good balance at his banker, might not necessarily have suffered. Some of the twelve we believe would not risk (if they could possibly help it) the fall of their reputation by entering the lists with any stranger knight; but the great champions of art, who have written and done so much for arts' sake, whose chiefest care is to see the country once again possessed by the good spirit of art, who long, ere they die, to behold England the nursing mother of a living national architecture,—these we did think might have remembered that England and its art ploughland had other labourers beside themselves, younger perhaps, but filled with as much zeal for their work, as much hope for the future, and quite as strongly rooted in the principles of their art as the greatest of the favoured ones. It surely cannot be that the professions of these men, upon whose words, in books and papers, from chair and platform, the young architect has fondly hung, hoping much and believing more, that these outbursts of indignation, those challenges in the cause of art and truth, those lively meetings and exciting discussions, were all so much clap-trap. It seems hard to be obliged to believe it was so. It seems hard to have to tell the young architects of this generation that the men in whom they trusted, as leaders of their cause, have failed them in their need and kept them back from every chance of winning their spurs.

It was on May 13th, Messrs. Shaw and Pownall reported that the site is insufficient for the purpose. This was no new discovery. Four months before, we wrote* "the site appear to us to have two great defects—first, a deficiency of area when compared with the requirements of the Commissioners, and with the amount of light necessary for the proper illumination of the internal courts," &c., &c. Messrs. Shaw and Pownall start by condemning the site, and require an enlarged area—first, in order to obtain sufficient light and air for the several internal courts; second, "as facilitating the placing the courts and some of the more frequented and important offices on a lower level than has been found practicable in any of the present designs," and they further consider this change in "level important both as regards the convenience of the judges as well as of the numerous persons attending the courts and offices." To this the joint Committee of Bar and Solicitors, in their report, dated June 5th, 1867, dissent as far as concerns the convenience of the profession, and persist in claiming the floor above Carey-street as the best level for courts. But this dissent is valueless unless the Committee of Bar and Solicitors are prepared to add that light and air have nothing to do with the "convenience of the profession." The light and air question, which is the great question, the professional committee has preferred to avoid altogether. But it is quite clear that, unless the business of the country is to be carried on in tubes, which people may dignify by calling rooms with "powerful artificial means for effecting ventilation," it is simply impossible to provide upon the proposed site the proposed accommodation, with the exception of the huge—the insurmountable—objection afforded by the limited area of the site, the reports which, by the way, are "formed entirely without reference to the relative merit of the designs as architectural compositions," are clearly in favour of Mr. Waterhouse and Mr. E. M. Barry. The Bar and Solicitors have such a strong opinion of Mr. Waterhouse's plan that, but for Messrs. Shaw and Pownall, it could not have failed to stand high in the estimation of the final court of appeal. On the other hand, few reports could have been more laudatory of Mr. E. M. Barry than is that of Messrs. Shaw and Pownall. In the opinion of these gentlemen, Mr. E. M. Barry's plan "offers the greatest advantages" in—1, the arrangement of courts and judges' rooms; 2, the all important question of light and air; 3, the scarcely less important desideratum, quiet; 4, the relative position of departments; 5, the accesses and staircases to offices, general communication and intercommunication; 6, separation of traffic; 7, spare rooms; and 8, arrangement of water-closets, &c. Nothing could be more completely in favour of Mr. Barry than this. Now the only distinctive praise awarded to Mr. Waterhouse by Messrs. Shaw and Pownall is concerning the arrangement of the Registry of Judgments. Mr. Lockwood gets κῦδος for his central hall; Mr. Burges for refreshments, lunacy, and registries generally; Mr. Scott for some thirteen departments, including the Taxing Master's, Accountant-General's, Record, and the group of ecclesiastical courts generally; and so on. But it may be remarked in this report that not only is Mr. Waterhouse kept in the back-ground, but even that back-ground is made more dark than it need have been by the condemnation of many of the chief features of his plan implied in the excessive praise given to those plans which are utterly opposed to his. Thus, as to the floor level of the courts, the surveyors "are of opinion that Mr. Seddon's design offers the greatest advantages." As to the position of courts, and the relative position of courts, "all the designs sufficiently conform to the instructions." The instructions indicated the relative positions of the two great groups of courts to be as follows:—

Courts of Chancery, north side;
Courts of Common Law, south side.

The Exchequer Courts, we need scarcely say, belong to the courts of common law. In Mr. Barry's plan they are placed on the *north* side. Surely, the relative position of the courts was as important as the level of their floors. But here Mr. Barry would have suffered by comparison, and Mr. Waterhouse would have gained. Again, in the entrances and staircases for mere spectators, the instructions were very particular., and conveyed the impression that a *separate staircase to each court*, with entrance direct from the street, was almost a *sine quâ non*. Some competitors met this requirement: Mr. Barry did not, but only provided one staircase to a group of courts. To whom, therefore, does Messsrs. Shaw and Pownall give the preference for the solution of this important problem? We cannot tell: it is not mentioned in the report. Indeed, the more we examine these reports, the less confidence do we feel in them. Mr. Waterhouse has his merit, and so, also, has Mr. Barry. Both, too, *have their demerits*, and that in no small proportion. We therefore hesitate to endorse reports which, on the one hand, can discover hardly a fault, or, on the other hand, is blind to every excellence. Moreover, these reports are at issue on almost every point—on the question of court-level markedly so—the Bar and Solicitors' resolution in favour of the first floor above Carey-street being endorsed by the Metropolitan and Provincial Law Association. And it is not improbable that both Messrs. Barry and Waterhouse may have to regret the excess of favour with which they have been regarded by the authors of these documents. If the judges pronounce in favour of the first, what becomes of the opinion of the professional men for whose use so much of the building is provided, and who ought to be the fair judges of what they want? If they pronounce for the last, what becomes of Messrs. Shaw and Pownall? We can see no escape for the judges but in a new competition, based upon a broad, liberal, and catholic view of what a national competition ought to be. In a new competition, however, three or four drawings from each competitor should be

* See BUILDING NEWS for January 11th.

the limit, nor need the scale be larger than 32ft. to an inch if the fourth drawing be a detail of one compartment of the elevation. The cost to the profession would be comparatively small, and the satisfaction to the country and the art-world would be inestimably great. Forty-four premiums of £200 each, one of £300, and one of £500 would be far better pay than the twelve premiums of £800 each have been, and more proportionate to the labour required. A great incentive to art, if there be such a thing, would thus be given; and if a reasonably fair judgment could be obtained, there would be everything to hope, and nothing to excite fear, distrust, or disappointment. We commend this subject to the consideration of those on whose decision the fate of this great work depends. The judges of designs must do their work sooner or later. To obtain extension of site, the judges' report must be sent up to the Treasury for approval. And here we most respectfully say their lordships may very rightly shut up the present competition, and clear away the wrong by which hitherto England and her architects have been threatened. If, however, the Lords of the Treasury considered the report of the judges of designs so far as to approve a plan, then the approved plan will have to be submitted to the Commissioners for their confirmation, and even then we would ask the Commissioners to pause before they take the final steps, and, if it be possible, avert the danger of disaffecting, not only an entire profession, but all people who have strong art sympathies, and whose art faith takes a wider range than that included by any twelve architects that it may be possible to select. Some difference of opinion, we believe, exists as to the value of the various decisions and reports which have been, and are to be, made in this matter. As yet, nothing definite has been settled, and nothing can be settled until the question comes before the Lords of the Treasury.

NEW FEVER NESTS.

PREVENTION is better than cure. Obvious and unquestionable as this morsel of ancient wisdom may be, it appears, after all, our sanitary legislation, that the building authorities of the metropolis are still, to a very great extent, prevented from reducing it to practice. An illustration of this occurred last week. At the Bermondsey vestry, an application was made for the vestry's approval of a plan for building four houses in Bermondsey-buildings, Bermondsey New-road. The site was formerly occupied by a public-house, with a skittle-ground in the rear. On each side is a narrow court. The public-house having been taken down and rebuilt upon a somewhat advanced frontage, it is proposed to occupy the narrow strip of the old skittle-ground with four houses. Now, Mr. Elkington, the surveyor to the Bermondsey vestry, most strongly condemns the proposal on the score of its unhealthiness. The houses are meant to be of two storeys, above the ground floor, with rooms of the respective heights of 7ft. 6in., 7ft., and 6ft. 8in. Occupying only the narrow strip aforesaid, there is no space for any back-yard, and the water-butt, with the water-closet, and the receptacle for dust and all kinds of refuse are to be placed together in the dank basement. The ill-effect of this upon the health of the future inhabitants it is unnecessary to point out. Equally objectionable is the proposal to cover the open space of the old skittle-ground to its utmost extent. It might possibly, like most London skittle-grounds, have been a moral nuisance, but, situated between two courts, it has been a physical blessing, allowing the free circulation of light and air. The vestry fully endorses the surveyor's objection, and would fain forbid the proposed buildings, but finds that it has no power. It most certainly does not approve, but can yet be compelled to give a so-called approval. The 29th section of the Building Act expressly allows of the erection of dwelling-houses without yards, where such houses can be lighted or ventilated from an open street or alley adjoining. The Metropolitan Local Management Act gives the vestry power to forbid the erection of houses in newly-formed roads at less than 40ft. from those on the opposite side of the road, but nothing is said respecting the nearness with which they may approach each other at the back. Neither of these regulations apply to the proposed buildings, and it appears that the vestry has nothing to do but to give an official consent, which it would fain withold, and look quietly on while two narrow courts, which heretofore have enjoyed to some extent the blessing of light and air, have them both blocked out by the erection of new buildings, which not only do this, but will besides infallibly prove sources of ill-health to their own inhabitants, and perhaps of contagion to the neighbourhood. This is no isolated case; other London vestries are frequently in the same position. Endeavours have been made, and with partial success, to root out some of the old fever nests, but if new ones are thus allowed to be created they will not be of much use. A further step is needed; and the authorities, who have charge to watch over the public health, should not only be enabled to prosecute and abolish such nuisances after they are created, but to prevent new ones being brought into existence.

THE ARCHITECTURAL ASSOCIATION SKETCH-BOOK.*

By W. BURGES.

WE are evidently becoming more communistic in matters of art than we were some twenty years back. Who at that period would have thought that some hundred architectural students would have agreed to an interchange of sketches, those sketches which used to be so jealously guarded, and only shown occasionally to one or two of our more favoured friends. The preparation for the new movement was due, in the first instance, to the numerous architectural publications, and to the discovery, or, rather, the utilization, of photography; but the actual interchange of sketches began with the very numerous staff of Mr. Scott, who have issued their work under the title of the "Spring Gardens Sketch-Book." The idea has been taken up by the Architectural Association, or, rather, a portion of it, which has taken the title of the Architectural Association Sketch Club. As Mr. Scott's pupils and assistants desire their work to be considered strictly as a private affair, any observations upon it would simply be an impertinence upon my part, and I shall, moreover, be spared the somewhat invidious office of drawing comparisons between the two publications.

The work of the Association is, likewise, to a certain extent, a private affair—it is not sold to the public. As such it is, to a certain extent, exempt from criticism; and the following remarks would, therefore, not have been written had not express permission been obtained from the authorities of the Association. But, before proceeding to a description of the sketches, it will perhaps be as well to say a few words as to the nature of the revolution that photography has produced in the publication of works of architecture.

Before photography was invented, or even fully developed, the only good way of representing architecture and the branches of the fine arts was by means—firstly, of drawings; and, secondly, of engravings, lithographs, &c. Now, both these, *i.e.*, the drawings and the engravings, were liable to be more or less correct, according to the skill of their respective producers. To make a collection of really good engravings, was, and, indeed, still is, a very costly undertaking, quite beyond the means of the ordinary architectural student, while it was almost impossible to put a true value upon the printed sketches of such men as Blore, Mackenzie, Cattermole, &c. The consequence was that the possessors of such sketches were naturally rather jealous of either lending them or permitting their publication. They were precious objects, and consequently treasured as such.

Since those times we have had photography, which not only gives us the general effect of the building, but also the perspective effect of the details with surpassing accuracy. Hence the publication of perspective views has to a great degree declined, for what fingers can draw or engrave like the sun. It is true that the architectural student still draws his perspectives of old buildings, but he does so for his own instruction and not for that of the public. And very well it is that he should draw them; for, although he well knows how impossible it would be for him to compete with photography, as regards accuracy, either if detailed or of perspective, he is yet aware that the mere act of drawing makes him regard the relation of the proportions, and ask himself why some features are more prominent than others, &c., and such like questions. In fact, he has been thinking all the time he has been drawing, whereas the possession of all the photographs ever produced could do him no possible good, unless he studied them carefully one by one. And here it may be observed that studying from a photograph will probably be found to be a much longer and more difficult process than is generally imagined; for the deep shadows so frequently occurring in the photograph often hide portions of the details which are necessary to a proper comprehension of the entire scheme, and, after all, necessitate an inspection of the actual building, if we want to understand the affair thoroughly.

But, although the art of drawing a building by eye tends to induce a habit of thinking, it must not be imagined that the same advantage would result from the use of the camera lucida—an instrument in great favour with those architects who test their work by the number of pieces of paper they have covered. Like many other inventions, ancient and modern, the camera lucida is a very good servant, but a very bad master. If the operator is only a draughtsman, *i.e.*, a man who gets his living by drawing and nothing else, and whose only object is to produce as many drawings as possible in a given time, he will find both the camera obscura and the camera lucida most useful in getting the outline, and consequently the proportions of the object. It is true that unless he is very expert indeed this outline will require redrawing, but even if it does the proportions are all marked out, and the help afforded is very great.

It may, however, be fairly presumed that the object of the architectural student is not to produce as many drawings as possible, but to learn his art as thoroughly as his opportunities permit. His attention will, therefore, be directed to the proportions, the details, and the construction.

These he learns in two ways—one of which is drawing by the eye, and the other is drawing by measurement. As to the drawings produced by the former process, they should simply be regarded in the light of memoranda to himself; to others they will be perfectly useless, when put into competition with good photographs. The measured drawings, on the contrary, show what no photographs can possibly exhibit, such as sections of mouldings, mortices of timbers, joints of masonry, and other things which the student will have continually to consult until he is tolerably perfect in his profession—a point which is rarely attained at an early age in the present day. By this time all the most beautiful buildings in Europe have been photographed to a decent size, and can be obtained at a tolerably moderate price. What we now

* "The Architectural Association Sketch-Book." 1867. Entered at Stationer's Hall. Nos. 1, 2, 3.

eally want are carefully measured drawings f their details, and it is such details that we aturally expect from the sketch-book of such body as the Architectural Association. Vhether we obtain them will be seen further n, but in the meanwhile let us consider what ualities a drawing of details should possess.

In the first instance, it should be on a ood large scale, ½in. of stone one scale of ood.

Secondly. The mouldings should be drawn ull size wherever practicable; where not, to as arge a scale as possible.

Thirdly. The drawings should be made ith good thick lines, with the hollows of he mouldings either blacked in or hollowed o show that they really are hollows. On the ther hand, some of the unimportant fillets ay be omitted; I mean in the ½in. or inch cale elevations. They can, however, genally be indicated in the profile at the end of he lines.

Fourthly. The details of the construction hould be most carefully marked. In fact, it s a good plan to draw in all the construction efore putting in the mouldings and ornament.

Fifthly. A little perspective of parts of the onstruction will be found of the utmost tility both in explaining the drawing to a tranger and in causing the student to think bout the construction, and ferret out its eculiarities. After making a few drawings f this sort he will begin to find that he ases to have that desire he had formerly to ketch every thing that came in his way, for e will find that the construction is generally he same, however much the ornaments may ary.

Under this system he will probably bring ith him, after a month's absence from home, ome dozen or dozen and a-half dirty blotted ieces of paper; but the contents of those lotted pieces of paper are in his head. Were hey (*i.e.*, the papers) torn up the day after is return he would be but little less rich.

I confess I should greatly like to see some f these dirty pieces of paper, dirty in conequence of being drawn in dirty roofs, or at he feet of ladders. In the Architectural Exibition we could well dispense with some of he elegantly-coloured perspectives, with fashnable ladies and children in the foreground —not put in by the architect—if there were ny want of room.

But to return to the sketch-book of the rchitectural Association. Up to the present ime four numbers have appeared, each conining six sheets. I propose going through ach of these sheets separately, designating he artist either by name or initials, as he may appen to sign himself. Although some diffiulty arises in the case of the initials, by the ery ingenious manner in which the letters re combined, so that it is often very difficult, f not impossible, to tell which of them reresents the surname.

Now, one of the very first questions that e shall have to ask ourselves in looking over hese sketches, will be the principle of their tility—*i.e.*, why were they drawn, in the first nstance; why were they published, in the econd; and, above all, were they worth drawng at all. These questions come upon us nore especially with reference to the perpective views, one of which may be said to egin the first number of the work. It repreents the south aisle of St. Mary Overie, outhwark, looking east, and, considering the difficulties presented by the groining, it is by o means a bad specimen of the skill of he gentleman signing himself H. W. L. n an architectural point of view it is intructive, as showing the inconveniences of putting mouldings taken out of a square section pon a round abaci, one of the orders of the reat nave arches overhanging the cap in a nost unpleasant manner. The French archiects, at least, in this matter, were more logical, nd employed a square abacus to a square ectioned moulding. Unfortunately, the very ilapidated state of the Church of St. Mary Overie demanded a thorough restoration at a time when much less was understood about mediæval art than at the present time, and although it is only fair to say that the restoration was exceedingly well done for the time, it would be rather hazardous work to draw too many conclusions from what we see at present. As Mr. H. W. L. has had the good taste to study near at home, might it be suggested that a carefully measured drawing of the triforium and clerestory of the choir of the same church would be infinitely more useful to his fellow students, and far more instructive to himself than show drawings like the present. The second sheet is contributed by Charles Henman, jun. It contains measured drawings of the sedilia and piscina at St. Leonard, Upper Deal, and of those at St. Martin's, Great Mongeham—both Kentish examples, and evidently the work of the same architect. They can hardly be said to be particularly creditable to him, for the way in which the two differently shaped circles meet on the cap of the centre column is rather to be avoided than copied. The same may be said of the containing string, in the Great Mongehan example, which runs into the labels in by no means a pleasant manner. The mouldings, however, are very good. When we look at the drawings we regret that Mr. Henman has not filled in the hollow of his mouldings (in the elevations) with black or cross hatching, so that we might be able to tell at a glance where the said hollows occur. The scale is to half an inch—perhaps the best for stonework—and the details one quarter full size. The desiderata are sections of the work, and a detail of the centre cap (foliated) in the second example. The draughtsman has had the courage not to draw the depth of the upper deal arches, but simply tells us that they are blocked out. The question is apt to arise, whether he has been equally candid about the stone joints. We all know that ashlar stonework is not a very common commodity in Kent, but the number of stone joints distributed over both the drawings would lead us to the idea that both chancels were lined internally with this material. With this exception (in regard to which the criticism may be quite wrong), Mr. Henman has produced a very conscientious and useful piece of work. The third sketch is literally a sketch by R. P. S., of the antique gate at Perngier. Elaborately coloured, with a beautiful blue sky, and figures in the national costume in the foreground, it would make an excellent exhibition picture for one of the water-colour societies, but in the present form it can be but of little use to architectural students, while the masonry and the carving of the caps would be shown ten times better in a photograph. The fourth page contains studies of fonts by E. T. Three of them, viz., those from New Shoreham, Willesden, and Worth are Norman—that from Sherrington is Perpendicular—while it is very difficult to give a date to the Old Stantonbury example, the decoration consisting of eccentric incisions resembling those so much in vogue at the present day with some architects, who attempt to confound ingenuity with art, not but that they are quite conscious themselves that it is not art, but it is far less troublesome, and as the arithmetic books of the last century used to express it, "within the reach of the meanest capacity." The three Norman fonts are all of the same type, viz., a square basin, supported on five shafts, the centre one being by very much the largest. Unfortunately, E. T. has omitted to either give us the mouldings of the base or to tell us that they are too decayed to be taken, as would appear to be the case if we may trust the sketches, for it should be observed that these are all sketches, only a few figured decorations being given. Some of the ornament on the bowl of Worth Church font would appear to be a later addition of the thirteenth century; for, although we know, from the Oxford MS. of Credmon, that the Anglo-Saxons used quatrefoils as ornaments, they would hardly have gone the length of a series of pointed three-foil headed arches.*

THE ARCHITECTURAL ASSOCIATION.

THE winter session of this association was opened on Friday evening at the institute, in Conduit-street, with the customary forms and festivities. Architectural designs, figure drawings, and water-colour paintings covered the walls, and the rich and varied dresses of the ladies who honoured the occasion with their presence, gave to the crowded rooms a brilliancy which in itself was not an uninstructive study in colour. Prizes were distributed for designs, figure drawing, and for plans for dwelling-houses at a specified cost; after which the President (Mr. Phené Spiers) delivered the inaugural address.

Mr. Spiers first remarked on the increasing influence of the Association, and the large number of new members added to the list. In remarking on the various classes, he noticed the revival of an old class under a new name—the class of construction and practice, which he said formed an admirable complement to the class of design. The establishment of a sketch-book club, of which a notice appears by Mr. Burges in another part of to-day's impression, in which the lithographed sketches are contributed by the various members. Mr. Spiers then went on to make some remarks on the value of sketching tours, as affording great advantages for the study of architecture, and deprecated, to a certain extent, the confining one's attention to ancient work, to the exclusion of all modern development. Mr. Spiers also advocated the making of water-colour drawings as affording the only means of attaining to a just appreciation of the value of harmony and contrast, and, as a proof of his assertion, remarked that those who, for the last fifteen years, had had the greatest reputation as colorists, such as Mr. Digby Wyatt, Owen Jones, Burges, and others during the student portion of their lives, never lost an opportunity of making water-colour drawings, and the drawings of the late Mr. Welby Pugin show that the great revivalist of Gothic art regarded colour as one of the most essential complements to true architecture. He then mentioned with regret that no voluntary architectural examination had taken place this year, and ventured to suggest that the probable cause of their failure was that they proposed to examine students in a variety of subjects in which there was an entire absence of preparatory instruction of any kind, and in which they failed to point out any system beyond that of reading books, by which these subjects could be studied. In speaking of the Architectural Exhibition, Mr. Spiers spoke highly of the new system of exhibiting sketches and drawings of ancient monuments in England and abroad, but regretted that the senior members of the profession were so poorly represented. He then drew a comparison between the building of the Great Exhibition held in Paris this year and our Exhibition building of 1862, remarking that if the French building were as ugly as ours, that as they had attempted nothing more than the erection of a simple shed to cover over the objects exhibited, whilst we in 1862 aimed at erecting an architectural feature as a permanent ornament to the metropolis, they may be said to have entirely succeeded in the object they aimed at, whilst we as egregiously failed. He then spoke of the great beauty of the French drawings exhibited, and the astonishment of the French at the marvellous power exhibited in the tinting of our architectural perspectives. In speaking of new buildings, Mr. Spiers spoke of the Thames Embankment and the Holborn Valley Improvements, hoping that before long the completion of these great works, or portions of them, would call forth the architectural talent of the country to embellish them and surrounding thoroughfares with monuments worthy of the great position this country holds in wealth and commerce. A few words on the Albert Memorial, the New Freemason's Hall, the lions at Trafalgar square, the Venetian-Gothic building of Mr. Somers Clarke, and the blocks of warehouses in Blackfriars, winding up his remarks with the Grosvenor mansions in Westminster. Whilst fully appreciating the noble object in view of stamping the nineteenth century with an impress of the magnificence of its private buildings, and remarking on the magnificence displayed in these

To be concluded next week.

mansions, the adaptation of all the latest improvements for convenience and comfort by careful study of the requirements of the neighbourhood, he regretted that French architecture should have been so closely copied in the want of projection in the cornices and mouldings, without having that delicacy of contour and refinement of ornament to compensate for it, for which our foreign neighbours are so justly celebrated, and which the employment of French sculptors would have remedied. He then made a few remarks on the great competitions that had taken place lately for the National Gallery, New Law Courts, and Manchester Town Hall, and concluded his paper with a review of art education and suggestions for its further development in England, which, from its importance at the present moment, and the special study Mr. Spiers has been able to make of it, we give *in extenso*.

He then offered the following observations on

ART EDUCATION.

I have from time to time during the course of my paper made comments on the want of a theoretical education in this country. This absence of any system of teaching of the principles of either science or art has of late been deplored continually in the various journals, comparisons being drawn between the products of all countries in the Exhibition now being held at Paris, and, generally, not in favour of our own. It would appear that notwithstanding the immense advance we had at one time acquired over other countries in engineering and commerce, the workmen of these countries, such as Germany and France, being instructed in the theory of their mechanical operations, were able to work with so much greater intelligence, that not only had they caught us up, but were really surpassing us in what we imagined to be entirely our own ground; and our great manufacturers, apparently, not content with the schools of the Science and Art Department, have lately instituted commissions to make serious enquiry into the systems of education abroad, with a view of introducing them into England. In art, we have always been allowed to be far behindhand, and though the progress made in England between the Exhibitions of 1851 and 1862 were such as to give us reason to hope that in a few years we should have equalled our foreign neighbours, this present Exhibition shows us we are still as far behind as ever. It would be out of the scope of my address to enter generally into the vast systems of education in France and Germany, but I wish to call your attention this evening to the great desirability of establishing some more definite system of architectural education. So long as the history and principles of art and architecture be completely ignored in our schools and colleges as one of the most intelligent means of learning the history of nations, so long artists and architects must *con amore* instruct themselves in the best way they can, without expecting to receive from the public that assistance or approbation of their endeavours which is always necessary to the production of true art. At the present day, the only class which can be said to take any interest in architecture are archæologists, and though, I must allow, that they have worked much good among us, to be always dependent on them would be fatal, as we should be always obliged to move in the groove of precedent. Out of this groove we must force ourselves in some way, and it is best to be done by forming schools where students can work in co-operation together, and interchange ideas, &c. In support of what I am now saying, I cannot help referring to an admirable paper contributed to the American Institute by Professor Ware, who is now travelling in Europe, forming materials for the formation of a school in America. Professor Ware remarks that "whilst every other branch of applied science has multiplied schools in every part of the country, the art of building, upon which more money is spent and mis-spent than upon any other, is handed down from generation to generation by personal tradition alone." "The system of articling or apprenticeship," Professor Ware says, "in America, has disappeared, as being unsuited to the temper of the time, and no other sufficient means of education has taken its place." In the meantime, the building profession is suffering from the isolation of its members, who, in other professions, are brought together, as lawyers in court, physicians in hospitals, &c., but architects never meet; and the profession presents the singular spectacle of a score of men living and working within a stone's throw of each other, and as much allied among themselves as they are separated from the rest of the community by taste and education, but leading each the life of a hermit, and not only cut off from the stimulus of personal intercourse, but, although all are engaged in the solution of the same problem, never comparing results, or profiting by each other's experience.

Now, our Association does much good towards remedying this state of affairs, and there is not one here this evening who will not bear me out, and especially the members of the class of design, when I speak of the great advantages offered for the study of architecture and the promotion of friendly feeling amongst one another. But our number, or, rather, the number of those who attend here, is limited, and a great deal has yet to be done. The Association has from the first exerted itself in favour of architectural education, and from time to time has memorialized the Institute to that effect. To its pressure may be ascribed the formation by this body of a voluntary examination, and it did its utmost to promote the proposed school of which Mr. Scott threw out the first suggestions. The voluntary examination, for the possible reasons before stated, has almost fallen to the ground, while Mr. Scott's scheme never took wing at all; and I shall hope to be able to convince you this session of the advisability of taking further steps in this matter. You will all agree with me, I think, in allowing that the position of the Institute is such that, if a school were formed, it ought to be its chief promoter and director. I fear, however, that it may be taken out of their hands, as it is the intention of the directors of South Kensington to establish there a school of architecture, the principles of the formation of which school will be adapted from one already existing in Paris, of which I propose in a few words to give its purpose and history.

The Ecole des Beaux Arts, in Paris, is, as you are probably aware, a government institution, open to all students, whatever their nation, on their passing an examination. The chief prizes are, or, rather, were, awarded by a jury consisting of the members of the Institute of France, a society similar to our Royal Academy, though more extended in its influence. The secondary prizes were awarded by various professors of the school. Now, as many of these professors, and some of the members of the Institute, had private ateliers or studios of their own, their feelings naturally prompted them to be indulgent to their own pupils when awarding prizes, and a considerable abuse therefore had crept into the school, causing at times great disturbance. In the midst of this, M. Viollet le Duc, the eminent Gothic architect, obtained the ear of the government, and in consequence a decree was published in November, 1863, changing the constitution of the school as follows:—

First. The prizes were to be awarded by a jury selected from the architects in Paris.

Second. Ateliers or studios were to be established in the school under the care of the government professors.

Third. Any Frenchman might compete for the grand prize without being a student of the school; and

Fourth. A new staff of professors was appointed, amongst whom M. Viollet le Duc himself was named professor of the theory of fine art in architecture; the students were to attend regularly all his lectures, pass examinations in the same, and frame their designs in accordance therewith.

Now much as the students appreciated the various publications of M. Viollet le Duc on Gothic architecture, the pill he wanted them (hitherto of classic tendency) to swallow was much too large to be taken at one time; consequently, after three ineffectual attempts to make himself heard in the lecture room, he retired in disgust, and the government allowed the school to relapse into nearly its former state, without, however, stultifying itself by withdrawing the decree. Shortly after this circumstance, M. Emile Trelat, professor of the school of arts and manufacture, conceived the idea of forming a school of architecture based on the theories of construction, and construction alone. He pretended that art had nothing to do with architecture, that all the problems of antiquity had been worked out by reasoning alone, and that the necessary conditions for stability and equilibrium had been all that the Classic or Gothic architect had had to deal with. To M. Trelat, M. Viollet le Duc goes at once to aid him in forming a rival school to the Ecole de Beaux Arts, but unfortunately their principles were not the same. M. Viollet le Duc has the greatest belief in art and archæology: M. Trelat discountenances both. A compromise, however, seems to have been effected. M. Trelat would advocate the principles of art, and lecture on them, if M. Viollet le Duc would give up archæology and the study of ancient monuments. The school, then, was formed two years ago, and when in Paris in August last I was conducted through the establishment, and saw the result of the two years' labours, as far as architecture was concerned, the compositions were as wild, extravagant, and ugly as possible. The system of studying the practical details of architecture, such as construction, materials, and physics seemed good. I was there informed that the authorities of the Department of Science and Art had visited the schools, made earnest enquiries into the whole system, and bought a large number of drawings, which were pointed out to me, with the intention of forming a similar school at South Kensington, a "great want," I was told, "having been felt in England, of some regular system of studying architecture." Glad as we should be to see any system established for the education of architects, it would be, I think, a source of regret to all, if the Institute should allow what is really their province as the only chartered society of architects, to be taken out of their hands by a department which, though admirable in its own sphere, was founded for an entirely different purpose—namely, the artistic education of artizans. Now, many will remember a paper read before the Association in these rooms, three years ago, by Mr. George Gilbert Scott, in which, after remarking on the utter inadequacy of the present system of articling to supply to the student a theoretical knowledge of architecture and power of drawing, he suggested a scheme of education, and recommended the formation of a committee consisting of delegates from various architectural societies to make inquiries into the said scheme, and report upon it. The Association nominated four delegates, but as we have never had any communication from them, I may assume, as I believe to be the case, that this committee never met, and the whole affair was allowed to fall in "abeyance." Now, this scheme of Mr. Scott's, admirable in many ways, and containing in it the chief elements of a school which I hope will some day be established in England, had the further advantage of being more feasible than any other scheme (and there have been many) hitherto brought forward; but it would seem that a link of the chain which connects its promotion with the present system is wanting. We are rather too apt to sigh for fresh changes and improvements, without looking around us to examine and find out what really exists—if instead of endeavouring to engraft any new and untried scheme on an old one we were to take note of the numerous advantages and inducements held out already, and work them in a regular defined system and *procede* of study to begin upon, the difficulty experienced would be less, and the result, I feel sure, more satisfactory. With your permission I will just enumerate a few of the opportunities which exist for the acquirement of a proper knowledge of the theory and practice of architecture, and show how little use is now made of them. The Royal Institute of British Architects offers each year nine prizes or medals of the intrinsic value of £170, and there were last year twelve competitors only in all subjects; they hold also a voluntary architectural examination, to pass which four only presented themselves; they have a most valuable technical library, but with the exception of the librarian and one or two others connected with its establishment, there are no readers. The Architectural Association offers seven prizes of the value of 24 guineas, and there are but twelve or thirteen competitors this year. The meeting and classes are well attended, and good use made of the library, though it is small. The Royal Academy offers four prizes of the value of £180, for which there were five competitors only last year. They have amongst others a valuable course of lectures on perspective, and permission to study in the antique school. In addition to these societies we have the Architectural Museum, the Society of Arts, the classes, and the library at South Kensington; the lectures, by Professor Hayter Lewis, on "Architecture and Construction," at University College," and on "Construction, Materials, and Designs," by Professor Kerr, at King's College; also, a series of lectures of the greatest utility, at the two above-named colleges, in surveying and levelling, geometrical drawing, descriptive geometry, physics, geology, chemistry, &c., which, to my certain knowledge, are not attended at all by architectural students. Here, then, is a long

t of prizes and medals offered, and of induce-
ents held out to students, of which, for want of
proper system of education to practical use, are
nost entirely neglected, for the average number
competitors for prizes I find to be little more
an one for each subject; many of the lectures
s not attended at all. How is this to be ac-
unted for? I can scarcely believe, when I see
many around me to-night, when I remember
e large audiences at our meetings last session,
at the younger members of the profession are
athetic and care not for distinction. There
ust be some other reason, which I venture to
ink is this. During the period of his articles,
s student either does not get or take sufficient
terest in his profession, or else is so hard-worked
ring the day as to be little inclined to continue
s studies in the evening. When out of his
icles, he is inclined to fancy himself already an
chitect, and, instead of competing for these
norary prizes and medals, as a further means of
udy, plunges into the vortex of public competi-
ns, in which he is tied down to economy and
actical conditions, and from which he learns
le but of the partiality of the members of
vn council committees and juries for their own
vate friends. Now, whether I am altogether
ht or wrong in these latter surmises, much of
s would be remedied if the Institute would
blish a pamphlet as advice to students and their
rents and guardians on the course to be pur-
ed in architectural education, pointing out, for
tance, how and where instruction in special
bjects could be obtained, what medals or prizes
students should compete for, and when and
at should be the general skeleton of study to
adopted. Assuming, for instance, that five
ars is the least time (it was formerly seven), in
ich an architect's education can be completed,
first year might be spent in making up for
it deficiency of scientific teaching, so much to
deplored in English schools, by following the
urse of lectures at King's and University Col-
e in mathematics, descriptive geometry,
ysics, surveying, and other subjects before
med, drawing from the cast in our architectural
useum, and, when established, attending a
hool of elementary design in architecture. The
xt three years might be spent in an office, doing
actical work four days out of the six; the other
o days to be devoted to the preparation of com-
titive drawings for the various medals and prizes
fore enumerated; the fifth year to be spent in
avelling and in preparing one's self for the volun-
y examination of the Institute, which might
supposed to terminate theoretically the
chitectural student's education, in the same
y that the degree of M.R.C.S. for a
ysician, or being called to the bar for a
rrister, completes their courses of study.
ow, such a programme as this, which I leave in
ur hands as a suggestion only, is one which
ould be perfectly feasible in the present day, and
ould go far to remedy some of the defects which
e felt by one and all in the present system, or,
ther, want of system, of a course of architectural
udy. In concluding my address, let me call the
pecial attention of the members to the syllabus
t forth for them this session, and, in doing so,
remind them that the main object of our society
ing mutual instruction, they are bound to a
rtain extent to attend our meetings as frequently
possible, and, by taking part in the discussion,
give whatever information may be in their
ower; and, in order to be better prepared, it is
cumbent on them—let me especially impress
n you the importance of this—to read up and
udy beforehand the various subjects on which
apers are read; thus will they be able to impart
o others the result of their labours in return for
hat afforded them, and will derive far greater
enefits themselves by their previous study; so
hat, working together and mutually assisting
ach other in the great object that we all have at
eart, remembering that the monuments we are
alled upon to erect, if not more lasting than the
ecorded memory in history of our great heroes or
atesmen, exert a far more extended influence by
heir magnitude, utility, and constant presence
mongst us; and that as in all ages the architecture
f a country has testified more than aught else to
s greatness, so we have before us the proud
uty of raising those edifices which shall in gene-
ations to come bear witness to England's great-
ess and power, and be able to attain to such lasting
ame as that which attaches itself to the memory
f that great architect, Sir Christopher Wren, in
hose *chef d'oeuvre*, St. Paul's Cathedral, the
assing traveller now reads on his tomb these
lasting words—*Lector, si monumentum requiris, circumspice.*

At the close of the meeting, the President called on Professor Hayter Lewis to offer a few remarks.

Professor Lewis, remarking on the paper just read, was able to offer his testimony as to the difficulty of getting men to compete for the prizes offered at University College, and, in remarking on the figure drawing class, said he had been putting himself in communication with the College authorities and Mr. Poynter with the view of establishing a figure drawing class there; he concluded by proposing a vote of thanks to the President for his address.

Professor Kerr, in seconding the vote of thanks, remarked on a mistake generally made as to the age of the Association, which in reality was established in 1847, on the ruins of an old society, which had before existed, but which had been founded for an entirely different purpose to that for which the Association now exists. He entirely agreed with the President as to the cause of the failure of the voluntary examination, and further remarked on the immense value of the Association and the important service it had rendered since its foundation.

Mr. Roger Smith made some comments on the drawing at the Paris Exhibition, and said that the Association had to congratulate itself on having a President this year who had, so to speak, risen from the ranks.

The vote of thanks was carried, and the company proceeded to partake of the entertainment provided, which concluded with a concert of instrumental music.

NEW ARCHITECTURAL SOCIETY.

On Monday last a meeting of architects was held in the Council Hall, Sheffield, for promoting the formation of an architectural and archæological society. There was a very good attendance, and a resolution was unanimously passed that the society be formed and called "The Sheffield Architectural and Archæological Society;" to consist of architects and gentlemen interested in the objects of the society. A further meeting will be called on an early day, for discussing questions of detail. There is little doubt but that the society will not only be successful, but a most valuable institution.

DROMORE CASTLE, CO. LIMERICK.

We give this week a second illustration of Dromore Castle, now being built for the Earl of Limerick. Our view shows the west side. Over the entrance gate is the chapel; the lower building connecting the main structure with the south-west angle tower is the great hall, which is to have a boarded panel vaulted ceiling, minstrel gallery and dais. The lower part of the tower contains servants' rooms opening to hall, and the upper floors are for the chaplain's residence. Between the gateway and the north-west angle are arranged the principal staircase vaulted in stone lavatories. By this arrangement scarcely any of the habitable appartments look west, and as the galleries occupy the north side the rooms are completely sheltered from the rough winds and driving rains. The whole of the walls are to be lined with brick, separated from the stone by a space of 2in. The architects are Messrs. Godwin and Crisp, of London and Bristol.

ARCHÆOLOGY.

On the 14th ult., the archæological researches in the British tumuli on the Yorkshire wolds were resumed on the Potter-Brompton estates of Sir Charles Legard. The openings have continued to arouse much interest, and the visits of the gentry and clergy, with their ladies, have increased. Two large barrows are now completed, the openings revealing interesting facts, particularly the first, in which a perforated stone axe was found interred with the burnt bones of its owner. This is a discovery quite unique in Yorkshire—and quite a rarity generally, the instances on record being very few. In the second barrow, the body was also burnt and buried with its flint arrows and scrapers, in the usual manner. The first tumulus was 60ft. diameter, and 2ft. altitude, much ploughed down, and formed of earth and chalk. Near the outer margin, on the east, was a deposit of large blocks of flint, and a similar deposit was on the south. In the centre was a circular grave 6ft. in diameter and 6ft. deep. This was covered by large blocks of flint, and many more were arranged on the bottom. In the soil and other material used in filling in, were found broken human bones, two parts of urns, and a flint implement. A foot above the bottom of the grave was the deposit of burnt bones, and with them a fine stone axe, burnt with the body, but quite perfect. This was 5in. long, was round at one end and brought to an edge at the other, and was perforated for the handle. The edge was not sharp, as if an implement for hewing wood, but rather blunted, as if for a weapon of defence. The axe was laid just S.W. of the bones, and touching them, and the burial itself was made rather south of the centre. The occurrence of an axe with a burial is the first of the kind met with in the series of Yorkshire openings. The next tumulus was of 70ft. diameter and 1½ft. high. In the centre was a body, burnt on the spot, the bones being collected and placed in an oval hollow, 2ft. by 1½ft., and 6in. deep. Upon the bones was an urn 8in. high, having a projecting rim, but of plain pottery. The urn was on its side, with the mouth to the south. With the bones was buried a bone pin. Quantities of large blocks of charcoal surrounded the burial. In the materials of the houe were a "thumb-flint," a barbed arrow head, two long flint scrapers, and various other flints. The investigations are proceeding in a tumulus containing a large number of unburnt burials, in which some discoveries of much interest have already been made.

Senator Fiorelli, Superintendent of the Museum of Naples, has lately published a very interesting report of the important archæological discoveries made in Italy, from 1846 to 1866. During this period 25,864 different objects have been found at Pompeii, amongst which the most numerous are 9,831 ancient coins, chiefly of bronze. Articles of female jewellery, surgical instruments, sun dials, arms, cymbals, mirrors, metal lamps, and tools of various trades have also been found. Twenty-seven human skeletons have been disinterred, from some of which plaster casts have been taken.

A Massive Ancient Roof.—For some time past extensive improvements and alterations have been proposed to be made in the High Churches of Stirling. These churches are of very ancient date, and traces of them may be obtained so far back as prior to the fourteenth century. Some years ago it was proposed to erect a new transept at the entrance, and a considerable sum of money was collected, although by no means sufficient to erect the transept in a complete and satisfactory state. Mr. M'Leau, acting for the architects of the proposed new transept, has examined the unoccupied space above the present modern plaster ceiling of the West Church, and finds that there still exists the old oak roof of the thirteenth or fourteenth century in all its completeness and harmony of massive oak carpentry. A tracing of this roof has been taken, and the wonder is that beauties which are now brought to light in this ancient church should ever have been concealed under a mass of meaningless plaster. The churches are situated at the head of the town of Stirling, contiguous to the ancient ruins of Mar's Work, at no great distance from the Castle. Some years ago, in the course of excavations made at Mar's Work, undoubted evidences of a monastery having at one time existed there were exposed, probably enough connected with the churches. The interesting discovery of the old oak roof will doubtless engage the attention of those who take interest in these relics of the past; and, as the buildings are redolent of regal and historical associations, an effort will probably be made for the thorough and satisfactory restoration of all parts of these ancient edifices.

The Corporation of London have now under their consideration a scheme for erecting, at an estimated expense of £36,550, a number of additional slaughter-houses at the Metropolitan Cattle Market with all the necessary conveniences. The necessity of such an arrangement as a preventive measure has been further impressed on the civic authorities by the cattle plague. Of all the slaughter-houses, both on the Continent and in the United Kingdom, those of Edinburgh are, in the opinion of the City architect, the most perfect, though, of course, they are on a much smaller scale than anything of the kind required in London. Plans have been prepared for the erection, at present, of twenty two abattoirs, the site selected on the east side of the market affording sufficient space for fifty-five, with all the necessary appurtenances.

STRENGTH OF MATERIAL.*

THERE is not a pupil in an engineering school, an apprentice in an engineer's or architect's office, or a competent clerk of works, who will not recognize in the scientific volume newly given to circulation an old and valued friend. Omitting all consideration of the abstruser portions of the work, relating to the conditions affecting elastic bars when subjected to the action of intermittent loads, it will be conceded by all that, so far as the strength of timber is concerned, there is no greater authority than Barlow. It is true that Tredgold must not be passed over altogether in silence, and both Nicholson and Robinson are names familiar to those who have studied this subject in a professional light; but without, for a moment, depreciating the value of other works, it must be admitted that the treatise of Professor Barlow has been the universal favourite, and generally recommended as the text-book for students in engineering and architecture. While there is no question that timber no longer plays the prominent *rôle* it once filled, so far as relates to permanent structures and buildings, yet it is still employed as abundantly as ever in all temporary constructions. Anyone who casts the most rapid and casual glance at the works in progress at Blackfriars Bridge, at those of the Thames Embankment, the Metropolitan District Railway, or even the drainage and sewage operations in London, cannot but be cognizant of the fact that timber is, in one sense, more omnipotent than ever in construction. Granting that its employment is merely on a temporary scale, yet it must not be forgotten that the scale of our present temporary structures far surpass in magnitude and solidity the permanent ones of a former epoch. It is, however, stretching the point too far to maintain that the use of timber is restricted solely to purposes of a secondary character, when we have abundance of examples in railway stations, roofs, and bridges that the contrary prevails to a great extent in our own country. In concurrence with our views on this section of the volume, the editor has very judiciously introduced no radical alteration in that portion of the text; in fact, it would have been scarcely possible to have done so, since no new facts or reliable data for calculating the strength of timber, whether regarded as compressive, tensile, or transverse, have been elicited since the author's time. Consequent upon the love of variety inherent in nature, no one piece of timber is endowed with exactly the same degree of strength as another, although they might have been both cut from the same tree. From this it follows that a rule and a constant which is a correct criterion for one specimen of timber is not so for a second, and therefore a large margin must be left for contingencies. This margin and the liability to fracture being proportionally greater in timber than in wrought iron, it would appear, *prima facie*, that the former material was not strictly adapted for purposes requiring a close and nice adjustment between theory and practice.

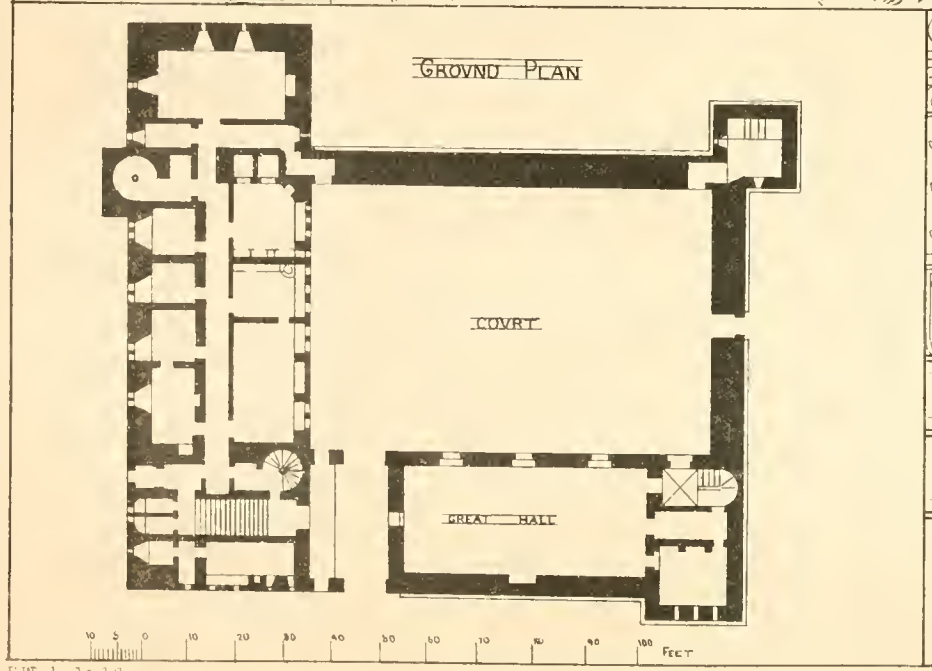
There is one common mistake into which all compilers of new editions invariably fall. They totally forget that the edition should at least bear the stamp and superscription of the current year, and not appear to have been issued half a century ago. In the present volume, the chapter upon the transverse strength of cement is allowed to remain altogether unbenefited by the recent valuable experiments conducted upon that important matter. The author remarks that "we have but scanty information on the subject," and this was undoubtedly the case many years ago, but since then, not only have numerous experiments been undertaken, more particularly during the works of the metropolitan drainage, but several very excellent papers have been read before the different professional and scientific societies in reference to the subject. Any volume treating of any subject, and published in 1867, which does not bring down its information to the latest date, is not, correctly speaking, a new edition, but simply the old work *réchauffé*, and lacking even the sauce which is able to impart some relish to the repast. Whatever *prestige* attaches to the name of Barlow as an authority with respect to timber, the same is indissolubly connected with that of Hodgkinson regarding the material cast iron. It was that gentleman who first investigated, theoretically and practically, and scientifically and empirically, the proper form and dimensions that should be given to cast-iron girders. He was the first to establish the now universally-acknowledged proportion between the upper and lower flanges of a beam, and the results of his experiments amply confirmed the mathematical accuracy of his reasoning. For a full description of his labours our readers should consult the work bearing his own name, although, in the present volume, a large portion of it is included. Passing on to the chapter of "Malleable Iron," the reader will find much valuable though somewhat obsolete information respecting the tensile strain of that material, until he arrives at the experiments conducted by Mr. Fairbairn, which are entitled to every reliance. The comparison instituted between an iron and a steel girder is especially worthy of careful perusal, since it tends to demonstrate that the exaggerated anticipations of the superiority of steel over iron, in a constructive sense, are not by any means well founded. The test for all similarly constructed girders is the value of the constant derived from the weight which actually breaks them. Taking W to represent the breaking weight in tons, L the span in the clear (in feet), D the depth (in feet), and A the number of square inches, or the total gross sectional area, the constant being represented by C, we have $C = \frac{W \times L}{A \times D}$. The results of the test gave for steel, C = 28·39, and for iron, C = 26·7, so that the relative strength of the steel and iron tubes is as 28·39 to 26·7, which allows but a very small advantage to the former material. In addition to obtaining a value for the constant, it is of importance to ascertain the actual amount of strain that the beam is undergoing at the time of its giving way under the load. The part usually selected for this calculation is the bottom flange. Put S for the strain required, and the other letters as before; then, from the principle of the lever, we obtain $S = \frac{W \times L}{4 \times A \times D}$, and in the instance alluded to this value of S was 22·01 tons, a tensile strength not exceeding that of good wrought iron. This experiment cannot, however, be considered conclusive with respect to the tensile resistance of steel, as it is probable that the manufacture of the plates was not so good and sound as it ought to have been. Moreover, in the same girder the deflection was found to be greater than that of an iron one, evincing a relative want of rigidity in the material. Some further experiments upon steel plates and bars, and built up girders, are indispensable before engineers can adopt the material with that advantage they have hitherto been in the habit of anticipating.

An isolated experiment, by the same authority, with reference to a lattice girder, gives a result comparatively disadvantageous to that system. Independently of the fact that one solitary experiment is of little value, it must be borne in mind that Mr. Fairbairn is an advocate for the solid web girders, and never was partial to the open web principle. A glance at the bridges erected, and in progress of erection, both at home and abroad, is more than sufficient to demonstrate that the open web girder has nearly superseded its older and more cumbersome rival. We take exception to the opinion expressed in the text of substituting side plates only one-eighth of an inch in thickness for the lattice bars. Plates of a thickness so exceedingly small would require nearly as much metal, in the shape of T-iron stiffeners, as would suffice for the bars themselves of a lattice girder. By inserting a few of the valuable experiments, made by Mr. David Kircaldy upon the strength of steel and malleable iron bars, the editor has exonerated himself, so far as this subject is concerned, from the censure we passed upon him respecting the brief chapter upon the strength of cements. The experiments of Mr. Kircaldy are the most recent and the most complete of any that have yet appeared; but for the reader to do justice to them he must refer to the work itself.* It contains not only the actual results of the breaking strains, but a vast amount of information besides, useful to the architect, the engineer, and the metallurgist. The subject matter proper of the volume under review terminates with a record of some miscellaneous experiments connected with railways, undertaken many years ago at the request of the directors of the London and Birmingham Railway, and embodied in the different reports of the author to that Board. Interesting as this chapter undoubtedly is, it is questionable whether there is any real utility in inserting it, as the form and dimensions of rails have been long since agreed upon by all practical engineers. It is, also, somewhat incongruous to combine in the same volume experiments upon iron and steel conducted but a couple of years ago, and others undertaken between thirty and forty. Either the old are more to be relied upon than the new, or the more recent are of most value. One or other clearly appear superfluous. The appendix commences with theoretical investigations on the effect of the deflection of rails, inclined planes, and gradients, and this is a subject which has been too much neglected by railway engineers, although it may not be so much their fault as that of the company by whom they are engaged. Briefly, the question of good and bad, or flat and steep gradients, is one of expenditure of capital, and there are no instances more glaring of adherence to the old motto of "penny wise and pound foolish" to be found, than in the manner in which gradients are laid out. We could adduce instances of competing lines where the gradients of the one last constructed are so steep that the same engine power can only haul half the number of waggons that can be taken upon the metals of its rival. A flat gradient ensures light working and small expenditure of power, while a steep one is a constant source of expense and annoyance. An essay upon the effects produced by causing weights to travel over elastic bars brings the book to a close; and the name of the author, the Rev. Robert Willis, the Jacksonian professor in the University of Cambridge, is a guarantee for the value of its contents. Although the mathematical investigations are of a somewhat intricate nature—in fact, the complete theoretical analysis of the subject is almost beyond the limits of scientific attainment—yet the practical results deduced are well deserving attention, as they bear prominently upon the question of rolling loads upon bridges. The plates are both numerous and well got up, and the volume contrasts favourably with its predecessors.

* "A Treatise on the Strength of Materials, with Rules for Application in Architecture, the Construction of Suspension Bridges, Railways, Etc.; and an Appendix on the Power of Locomotive Engines, and the Effect of Inclined Planes and Gradients." By Peter Barlow, F.R.S., Mem. Inst. of France; of the Imperial and Royal Academies of Petersburgh and Brussels; of the American Soc. Arts; and Hon. Mem. Inst. C.E. The whole arranged and edited by William Humber, Assoc. Inst. C.E. and Mem. Inst. M.E. London: Lockwood and Co., 7, Stationers' Hall-court. 1867.

* "Results of an Experimental Inquiry into the Tensile Strength and Other Properties of Various Kinds of Wrought Iron and Steel." By David Kircaldy. Second Edition. Glasgow. 1864.

Mr. Holman Hunt has almost finished a picture of considerable size, representing "Isabella with the Basil Pot," from Keats' "Eve of St. Agnes."



NORTH: WEST: ASPECT: OF: DROMORE CASTLE: Co: LIMERICK THE: PROPOSED RESIDENCE: OF: THE: EARL: OF: LIMERICK

GODWIN & CRISP, ARCHITECTS.

E. Wimbridge, lith.

CONSTRUCTIVE AND ÆSTHETIC DESIGN.

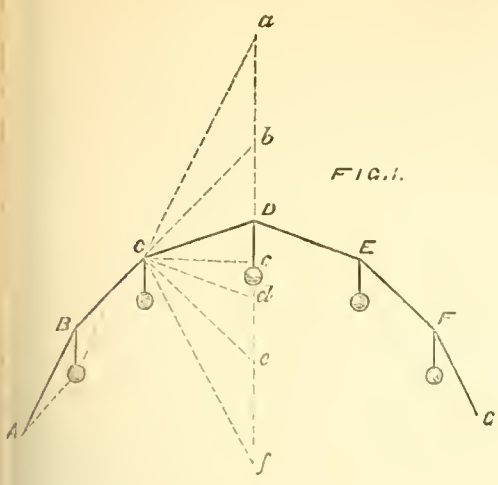
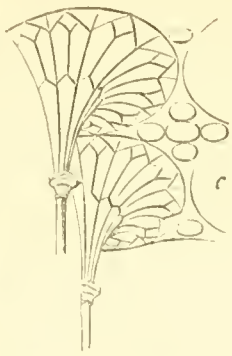


FIG. 1.

FIG. 4.



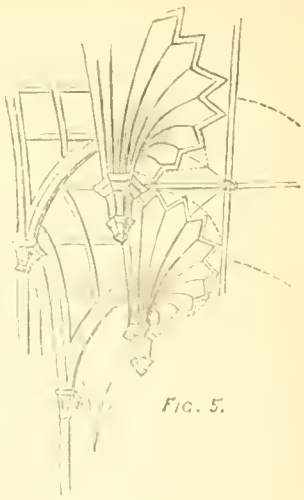


FIG. 5.

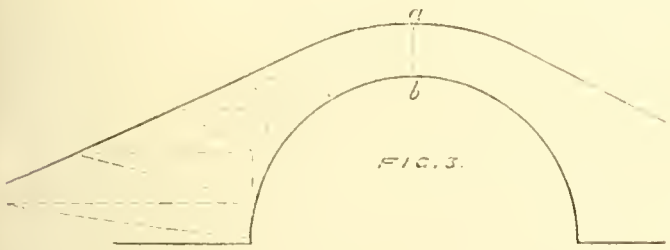


FIG. 3.

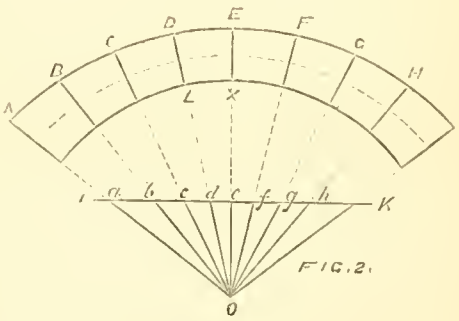


FIG. 2.

CONSTRUCTIVE AND ÆSTHETIC DESIGN.—No. VII.

DOMING, a subject on which treatises may be written, so little has it been dealt with, is a branch of constructive art of high interest, and most prolific of suggestion to the architect. The spherical dome—the most perfect of dome shapes—is, as we have seen, not confined to circular plans, but is applicable as a covering to the most varied bases—from triangular to polygonal—whether these be equilateral or not. After the dismemberment of the Roman Empire the dome seems to have been chiefly developed in the East, while the rectangular vault remained the favourite covering of the western nations. It is the Roman dome and vault that we shall here consider. The theory of the arch, like its origin, has been a fruitful theme of conflicting opinions. Unfortunately, the hypotheses that have been advanced have been founded upon insufficient experimental data, and the purely abstract theories of mathematicians. The combination of the two methods of investigation—mathematical theory and experiment—has been neglected, like it has in many other branches of knowledge, the consequence being that theorists and practical men are continually at variance, and concrete science falls into the rear.

It seems to me there are two very distinct conditions in practice under which an arch should be mechanically considered, but which theory has often confounded—namely, the first, when an arch has to stand of its own gravity, as in vaults supporting nothing; and, secondly, when it has to carry a weight. The arch of equilibrium, and the caternary belong to the first condition, any extra or uneven weight displacing the parts. Leibnitz, Bernouilli, and Dr. Hooke solved the latter problem; and La Hiré, Parent, Coulomb, Attwood, with varying results, laid down the proportions of weights of the balanced arch upon the principle of the wedge. An arch in "equilibrio," or that sustained by the mutual action of its parts—the weights and thrusts of the component arch stones, these being free to slide upon each other—can be of little practical account, when we suppose a varying load over it, as often is the case; though, when we consider the effect of friction or cement between the voussoirs, always the case, the theory may still be useful in determining the curve or "line of pressure." This line of equilibrium, being of so delicate a nature when regarded without friction, the parts merely touching in single points, we can suppose it contained within the thickness of an ordinary arch—an idea practically resorted to by the mediæval masons in their use of ribs, enabling them, moreover, to reduce to a comparative thinness the intervening parts or spandrels of their vaults. Dr. Hutton, in his "Principles of Bridges,"* suggests the plan in bridge building of giving the whole masonry over the arch stones the radiating jointing of the arches themselves up to the road level—a plan undoubtedly good, as ensuring strength and apparent safety, and rendering considerable deviations of the balanced curve of no moment. The rib expedient has of late been often employed in our stone and iron bridges with good effect.

The properties of the equilibrated polygon, so ably pointed out by Dr. Hutton and other later mathematicians—involving a principle so useful in the equilibrium of timber framing—are precisely those of the equilibrated arch composed of wedges or voussoirs. If we investigate a polygonal system of beams or rods, movable at the joints, held in a state of equilibrium by a series of weights applied to the angles or suspended from them, we shall find that the condition of the pressures is such that they can severally be represented by lines drawn parallel and proportional to them, meeting each other conformably to a well-known principle in statics. Thus, lines drawn parallel to the direction of the component bars from any point C, terminated by a vertical line *a f*, will be respectively proportional to the oblique forces in the directions of the bars—namely, C *a* proportional to A B, C *b* proportional to B C, &c., and the parts intercepted by these parallels on the vertical line *a b*, *b* D, D *d*, &c., will be proportional to the respective weights of B C D, &c. It follows that any angle, say B, is kept in position by three forces, the vertical weight, and the two abutting pressures, proportional to the three parallel lines *a b*, C *a*, *b* C, respectively. Hence, if one of the weights and the positions of the sides or bars be given, the other weights and oblique forces may be determined by making the given weight the diagonal of a parallelogram, its sides giving similar sides of other parallelograms.

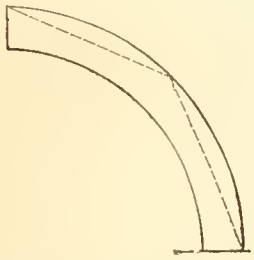
Again, it will be seen, each oblique force resolves itself into two others—a vertical force and a horizontal one, the latter, or C *c*, being the same for all the other sides of polygon; hence it follows the horizontal thrust at every angle is the same constant quantity, and becomes a measuring unit for estimating the other pressures; the vertical *a f* is also equal to the sum of all the weights. It is obvious that the lengths of bars do not alter proportions of pressures, their parallels remaining the same. Hence, the general rule, as given by Dr. Hutton, that "the oblique thrusts in directions of bars are to one another directly in proportion as the recants of their angles of elevation above the horizontal direction, or reciprocally proportional to the co-sines of the same elevations, or of the sines of the vertical angles made by their vertical line; that the weight on each angle is directly proportional to the difference of the tangents of the two lines which form angle; that horizontal thrust at every angle has the same proportion to the uppermost weight as radius has to tangent of elevation of uppermost bar."

Substituting wedges or arch stones for the bars, the theory of the frictionless arch may be deduced. Let A B C D, &c., be arch stones free to slide, each being kept in equilibrium by the mutual action of three forces—its own weight and the thrusts of two adjacent stones, these thrusts being perpendicular to the joints or sides of stone. By a known theorem, whenever three forces balance each other they have severally the same ratios as the sides of a triangle perpendicular to the directions of the forces. Then the radiating lines meeting in point o form several such triangles with any line I K: thus, wedge D E is balanced by three forces proportional to the three sides of triangle *d e o*, the side *d e* being

* Tract 1, section 3.

perpendicular and proportional to the vertical weight; *d o* and *c o* perpendicular and proportional to the side thrusts at joints D and E, and so of the rest. It will also be obvious that the horizontal thrust at every joint is proportional to the radius *c o*, and remains the same constant quantity. Hence the following rule: That the weight of any part of a semi-arch is always proportional to the tangent of the angle of inclination of the lower wedge to the vertical line, while the oblique push perpendicular to the joints is proportional to the secant of same angle. In this case, again, the constant horizontal thrust is a unit by which the two other circumstances, the weight and the oblique push, may be found, thus:—$h \times t =$ weight of semi-arch; and $h \times s =$ oblique pressure, where $h =$ horizontal constant; $t =$ tangent of side's inclination to the vertical; and $s =$ secant of same angle. It will be seen from the foregoing that the semi-arch increases in weight and pressure towards its springing, where joints approach the horizontal, and the tangent and secant of the angle are there infinite. From any assumed curve of intrados (which is not restricted) we can determine the curve or extrados. This can be done geometrically by setting off on centre lines of voussoirs from intrados lengths bearing the same ratios to each other as the weights of corresponding voussoirs, a line of contrary flexure being the result. As the triangles formed by the above method have all the same altitude, O *e*, they have the same ratios as their bases intercepted on horizontal line, these being proportional to the several weights; and as these triangles have angles respectively equal to angles of corresponding sectors, their areas are proportional to squares of their corresponding sides. It is only necessary, then, to lay down geometrically the differences of the squares of the respective sides. Thus, for the arch stone D E (supposing $O\,c^2$ be equal to $O\,E^2 - O\,X^2$) make $O\,D = \sqrt{O\,L^2 + O\,d^2}$; for stone D E: $O\,e\,d :: O\,E^2 - O\,X^2 : O\,c^2$. A simpler method of determining the outer curve is shown in fig. 3, where, from points on soffit of arch, perpendiculars, all equal to *a b*, are set up, horizontal and radiating lines from extremities of them giving the extrados.

The catenary may be most usefully employed as a mechanical method of finding the difference of curvature required for equilibrated arches; but the element of cement or friction, and other considerations, must be considered in practice. The line of pressure, in the case of voussoirs or considerable segments of an arch being held together by cement is unquestionably (when arch is much loaded) more or less straight, as Dr. Robison thought, and we can suppose a polygon of such lines within the thickness of an arch, the least deviation of their points of contact beyond this thickness causing the several parts to turn on their edges. A straight, triangular arch, Dr. Robison considered, met this best, so that a straight line might be drawn from keystone to abutments, slipping of stones being impossible; mere crushing of materials would then be the only destruction. Such a straight-sided arch, however, would only do for small spans.



I think, then, that though, in the case of the equilibrated arch, the line of pressure is a central curve, or an appreciable one, somewhere between the extrados and intrados, in practice, when the cohesive effect of cement is considered, we may practically assume this line to be straight-sided through those parts or voussoirs so compacted, failure only resulting when the points of contact or angles are not kept in position by a properly-distributed load, or when their equilibrium has been deranged. In a few words, the pressure must be communicated in straight lines to certain points of resistance, a sufficient balance of these points being essential to stability. In practice, unequally-loaded arches are common, and such a condition can only be met by the cohesive strength of the cement, and the compacted nature of the superimposed masonry. From the "limiting angle of resistance" (30 deg. for stone), slipping of the voussoirs is practically impossible, and, therefore, it is only from the "line of pressure" deviating from the substance of the arch proper that failure is attributable. Mr. Atwood, in his work on the "Construction and Properties of Arches," has ingeniously suggested the practicability of making the voussoirs of such relative weight, and of so adjusting them, or their angles of joints, that their friction may compensate for their irregularity of weight. The catenarian curve is the strongest form of arch, and perhaps the best for domes constructively and æsthetically, for the flattest part of the curve is just where there is always a tendency to rise, *i.e.*, at the haunches; at the same time it obviates that depressed appearance a spherical dome always has when viewed from below. Often, indeed, double cupolas are formed, the outer one being of a pointed or prolate form—to correct this perspective foreshortening. It may be noted that an inverted polygon would require the same relative weights suspended from its angles, to give it the shape of our example, as that required, drawing and tension taking the place of compression and thrust. The pointed arch unquestionably ranks with the catenary as the strongest form for crown pressure; the flatter varieties, as the elliptical and cycloidal, all require great pressure at abutment and flanks. A good plan adopted by Labelye, the architect of old Westminster-bridge, was to make such arches double, the under one being of a quicker curve than the upper, both being bonded together.

The vaults and domes of the Roman and mediæval masons, however unacquainted they may have been with the equilibrium theory, rarely show defective practice. From the simple pyramidal pendant (*a* fig. 4), formed by the cross vault to the complex polygonal or inverted conoid, the development of vaulting is as suggestive as interesting, though it is easy to see mere *tour de force* rather than an æsthetic result was arrived at in the intricate "fan" vaulting seen at Henry VII.'s chapel, in which mere tracery took the place of the constructive and angular ribs. The four inverted cones (*c*) left an awkward flat centre often filled with ornament, and it was only when a four-centered curve was adopted that this defect was avoided by carrying the ribs to a higher domical centre, where a central pendant was omitted. In compartments where the lateral arches are less in width than the longitudinal vault, inequality of ridge level or rib curvature is the result; for, if the longest ribs meet in a point, the other ribs must of necessity form sharper points, the wall ribs or "formerets" being often acutely pointed. In such vaulting the transverse ridge must partake of a curve more or less convex, a curve of contrary flexure being often hideous in effect.

In the progress of vaulting, surface or transverse ribs were exchanged for groin or angular ribs, till these were multiplied into surface tracery. Perhaps the vaulting of choir (fig. 5) in Oxford Cathedral combines the beauty and mechanical ingenuity of the whole art, the pendants and lateral arches helping to counterbalance the thrust of main vault in the manner of the trefoil-shaped arch noticed in our last paper.

In our next, we hope to indicate the application of the arch and vault, and the effect it has had upon design generally.

The Superintending Architect of the Board of Works has had his salary raised from £1,000 to £1,200 a year.

Building Intelligence.

CHURCHES AND CHAPELS.

A new chapel has been erected on the premises of the Bristol Female Penitentiary. The cost is £2,200, and the area 64ft. by 26ft. in the clear. The style is fourteenth century Gothic; and it is built of Pennant stone with freestone dressings. The architects were Messrs. Popes and Bindon.

The chief stone of a Congregational chapel for Small Heath has been recently laid by the Mayor of Birmingham (Mr. Thomas Avery). The chapel will be Gothic in style, and from the designs of Mr. W. P. Poulton, architect, Reading. Blue brick, with stone dressings, will form the material of the structure. Mr. Charles Jones, of Belmont-row, Birmingham, is the builder.

It is intended that the church of St. Mary Somerset, in Thames-street, which has been closed for some time past, shall be sold in a few weeks. In the church is the grave of Gilbert Ironside, D.D., Warden of Wadham College, Oxford, and who was Vice-Chancellor of that university when James II. seized upon Magdalen College, and sent his commissioners to expel the fellows. On the accession of William III., he was created Bishop of Bristol, whence he was translated to the see of Hereford, which he held till his death in 1701. It is stated that the Warden and Fellows of Wadham have expressed to the rector and churchwardens of the parish of St. Mary their wish that his remains may be handed over to them for re-interment in the chapel of the college, over which he presided for twenty-five years. The other bodies in the church will be removed to the City Cemetery at Ilford, with due decorum.

A new Wesleyan chapel is approaching completion at Maiodee, near Bristol. Under present arrangement it will seat 300, but galleries are to be erected at some future time if required. Mr. Samuel Hancorn, of Newport, is the architect, and the contract has been taken by Mr. Webber, of Maindee, at £1,247.

St. Phillip's Church, East Collingwood, near Melbourne (Australia), has lately been consecrated. The cost is £2,414, and it at present will seat 300, but will seat double that number when finished. It is in the Gothic style, and Mr. Lloyd Taylor is the architect.

The foundation stone of a Roman Catholic church, dedicated to St. Ignatius, has been laid at Richmond (Melbourne). It will be Gothic, and consist of a chancel, two aisles, and lady chapel. The ground measurement is 140ft. by 60ft. The materials employed will be bluestone with freestone dressings.

The church of St. Sennen, Land's End, has been reopened, having been restored under the direction of Mr. J. P. S. Aubyn, the work being executed by Messrs. Carah and Edwards of Crowan, at a cost of £800. It now consists of a nave 60ft. long, an aisle 50ft. long, and a transept 14ft. long. The church will seat 200.

On Saturday last, Lord Hotham laid the corner stone of a new church at Falsgrave, near Scarborough. Mr. G. F. Bodley, of London, is the architect. The church, though small, will be of fine proportions, and will consist of nave, chancel, and south aisle, with organ chamber and vestry. The cost will be about £5,200.

The Bishop of Carlisle has laid the foundation stone of a new church at Gamblesby, Cumberland. The style is Early Gothic; the material used is new red sandstone. The architects are Messrs. Cory and Ferguson, of Carlisle.

The restoration of the ancient parish church of Selmeston, commenced about eighteen months ago, has just been completed, from the designs of Mr. Christian, the contractors being Messrs. Avis, of Hastings. The style of the old church has been faithfully followed. The windows in the aisle have been filled with stained glass, all of them being memorial. The tower has been rebuilt, and the chimes have been arranged on a new principle, similar to that in use at Westminster. The cost of the restoration has been £2,500.

The Syndicate of the University of Cambridge have lately had under their consideration a report furnished by Mr. Scott, on the condition and proposed restoration of Stourbridge Chapel. The total estimate is about £800. The Syndicate have determined to adopt the report if sufficient funds are offered them for the purpose by Easter.

The parish church of Weston (Herts) has been 'stored. The tower has been rebuilt, but the d stone was again used being of a very hard and rable kind (Barnack rag). The peal of bells has een re-hung, and one of the number re-cast. The orks have been carried out under the direction Mr. Robert Hesketh, of London; the builder nployed being Mr. James Hayward. The cost ightly exceeds £2,000.

A new church, named Allan Park Church, was ened at Stirling on the 20th ult. It has been ected by local contractors, from the designs of essrs. Pidder and Kinnear, at a cost of about 4,500. The style is Early Gothic, and accommo- ation is provided for 700 persons. A peculiarity that part of the foundation rests on moss, but driving in piles the building stands on a base firm as the hardest rock.

A new Episcopal church is to be built at Alloa, e cost of which is generously defrayed by the arl of Keelie, on condition of the old church ing placed at his disposal. Mr. R. Anderson, of dinburgh, is the architect selected. The style lopted is Early Geometric Pointed Gothic. The tire cost will be over £3,000, and the church will at about 200, exclusive of space for chairs.

On the 14th inst. the memorial stone of a apel and schools (in brick and stone) at Ilford, ssex, for the congregation of the United Metho- st Free Church, was laid by George Axton, Esq., Shepherd's-bush. The building is a substan- al brick structure, containing chapel on ground oor, with seating for nearly 800 adults, and schools basement. The works are being executed from e designs of Mr. A. Manning, architect, by essrs. Hill and Keddell, of Whitechapel-road.

BUILDINGS.

A commodious new home, lately erected for the lasgow Magdalene Institution, at Lochburn, near aryhill, North Britain, was opened on Saturday st. It is three storeys high, the ground floor ing used as offices, &c, and the upper floors as ormitories. At each end of the building is a acious staircase. The general effect of the ilding is pleasing, being dependent mainly in grouping and outline, the small amount of or- ment admissible having been judiciously applied. r. Honeyman, of Glasgow, was the architect; the ntractors were:—Masons' work, Lyall and Leckie; iner work, M'Craw and Kay; plumbers' work, r. W. Reid; plasterers' work, Mr. A. Campbell; d slaters' work, J. Stewart and Sons. The clerk the works was Mr. W. Kent.

The Bristol Royal Infirmary has been lately dergoing some extensive alterations; in the ont of the infirmary the works are limited to the ising of the roof; the height of the upper storey s been raised from 8ft. to 12ft. A clock tower ected is semicircular, and of neat design. The st of this portion of the work is £3,200; the ntractor is Mr. W. Baker, of Canons Marsh, and e architects are Messrs. Pope and Bindon. In e rear of the building new wards are being ected. There has been no attempt at ornamen- tion in this part. Messrs. Godwin and Crisp ere the architects. The general contractor was r. E. J. Hatherly, of Stoke's Croft, the masons' ork being done by Mr. J. P. Stephens, of York- reet. Mr. Tuckey, of Milk-street, did the lumbers' work, and Mr. Cowlin, of Milk-street, the lastering and glazing.

The new national schools at Sneyd, near Burslem, ere opened last week. The plan of the schools in the form of the letter L reversed. That for he boys is 60ft. long by 20ft. wide, and for the irls 50ft. long by 20ft. wide. There are lass rooms attached to each. The building is of plain Gothic character, and is constructed of rick—red prest ones—blue brick for bands, &c., eing used for the exterior, and white prest ones or the interior walls. The roofs are covered with lue and red tiles laid ornamentally. The builders re Messrs. Bennet and Brindley, of Newcastle- treet, Burslem. Mr. Dain, of Burslem, was the rchitect.

The extension of the accommodation for the in- ane inmates of the Clifton Workhouse has just een completed in the addition of two wings, one n either side of the building. One of the wings for the male and the other for the female patients. 'he new buildings are constructed of Pennant tone, with Bath stone dressings. Mr. M. King- tone, builder, of Redcliff-street, was the contrac- or. The architects were Messrs. Fosters and Vood, of Park-street, Bristol. The buildings ave been put up at an expense of about £1,800.

We understand it is in contemplation to add a new wing to the Oxford University Museum, the requirements of the various professors making the enlargement absolutely necessary. The new structure will, we hear, be devoted to experimental philosophy under Professor Clifton, formerly of Manchester. Great improvements have been made in the neighbourhood of the new museum.

The Earl of Derby laid the foundation stone on Wednesday week, of the New Southern Hospital, at Liverpool. The estimated cost is £35,000, including land. Of this sum, £24,105 has already been raised. The frontage will be 300ft. to Hill-street, and the depth 180ft. There will be a central and two end divisions. The central division will contain the administrative department, the operating theatre, the chapel, the board-room and offices, and the two end divisions will be devoted towards nurses' rooms, affording accommodation for 200 beds.

The new street in a direct line with High-street, Aldgate, extending in a south-easterly direction towards the Commercial-road, with which it forms a junction at the corner of Backchurch-lane, is rapidly progressing towards completion, a large number of houses in the Commercial-road, Backchurch-lane, Colchester-street, Leman-street, Whitechapel, High-street, and the adjacent courts and lanes, having been pulled down by order of the Metropolitan Board of Works. Another new route between the Commercial-road and the eastern entrances to the London Docks is about to be formed by the widening of Backchurch-lane, a portion of St. George's-street (late Ratcliff-highway), and Gravel-lane, St. George's-in-the-East.

WATER SUPPLY AND SANITARY MATTERS.

A conference of the officials connected with the local corporations and other authorities of the pottery towns was held last week at Stoke, for the purpose of considering the questions of smoke consumption and the general sewerage of the district. With regard to the smoke nuisance it was unanimously determined to put in force the smoke clauses of the sanitary act of 1866. The sewage difficulty, however, was not so easily disposed of, the only result arrived at, after a meeting of three hours, being a resolution of the committee recommending to the local authorities the reconsideration of their respective modes of dealing with the night soil, and requesting within two months their opinions on the desirability of substituting the dry for the water-closet system.

The neighbourhood of Blyth, Newcastle, has outgrown its natural resources. It is now hard up for want of a proper water supply. It will scarcely be credited, but it is nevertheless a fact, that in Cowpen Quay and Waterloo, where there are about 5,000 inhabitants, there are no means of obtaining water beyond that which is hawked about the streets in a cart. In these two townships there are no less than 700 tenancies, representing property of the value of £150,000, and if a fire were to occur, would most likely be entirely burnt down for want of water to extinguish it. Most of the well-to-do people have wisely bad wells sunk, but those (comprising, of course, the great majority) who cannot afford such a luxury are dependent on the water carriers, who, in their turn, are at the mercy of the managers of the reservoir which supplies the town of Blyth proper, from whom they purchase their supplies. The matter does not receive the attention it deserves at the hands of the members of the Cowpen Local Board.

On Monday, the Local Board of Health for Rochester accepted the tender of Mr. J. Coker, jun., of Tunbridge, for the execution of the new drainage works in that town. The amount of the tender is £2,814 2s. 9d.

A correspondent of a daily paper writes from Crawley, praising the dry earth system of sewage which has now been in operation in that village for more than eight months. During that time not the slightest difficulty has been experienced in supplying the dried earth and removing the excreta. Experiments are now in progress for the purpose of ascertaining the value of the manure thus obtained, and there is every reason to believe that it will be found a successful rival of all other artificial manures.

The National Portrait Gallery will be closed from November 2 to November 25 inclusive.

TO CORRESPONDENTS.

NOTICE.—The "BUILDING NEWS" is now Published at the NEW OFFICES, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—W. P.—E. W. P.—W. P.—J. P. T.—E. W. G.—R. H.—J. B.—A. and Co.—E. L. G.—E. L. P.—J. H. L.—L. and N.—J. E.—G. H. G.—D. J. B.—J. R. B.—T. P. and Co.—E. N.—W. and D.—J. B.—R. W. D.—J. H.—B. H., with copy of address.—A. B.—E. R. R.—B. B., with manuscript.—C. S. N.—J. C. J.—C. C.

T. C. S.—Your letter would only call forth an equally irritating reply.

W. H. T.—Your letter is so badly written that, after exhausting our patience, we dropped it into the waste basket.

J. DAY.—We will give you the desired information soon.

W. W.—Too late. You forget that we begin to "make up" the paper about 5 o'clock on Thursday evenings.

WILLIAM SHAW (Alfreton).—The manufacture of ladies' bonnets is a little out of our way.

JOHN RATTRAY.—It is beyond our province to offer an opinion on the colour of Milton's hair.

W. D.—Your question was asked under "Mutual Aid," on page 750, last week.

MR. STREET AND "J.C J."—We have received a very long letter from "J. C. J." in answer to Mr. Street's last communication in our columns, but it is too long, too personal, and too discursive for insertion. We cannot allow the BUILDING NEWS to be made a vehicle for personal disputation. It is a pity that art critics cannot agree a little more among themselves before they attempt to teach the world.

W. H. T., DAVEY JAS. BROOKES, AND A RETFORD TOWN HALL COMPETITOR have addressed us letters on the Retford Town Hall Competition in reference to Mr. Sorby's letter and E. W. Godwin's reply. The letters are rather too personal for our columns. Mr. D. J. Brooks says that we gave an inferior illustration of the accepted design, in order to make it ridiculous. This is not true, and we should scorn doing such a thing. Mr. A. H. Haig, the artist, did his best for both illustrations, and both had the same quality and quantity of work bestowed on them.

Correspondence.

RETFORD TOWN HALL.

To the Editor of the BUILDING NEWS.

SIR,—Admirable and praiseworthy as the effort on your part undoubtedly is, to let the architectural world see what sort of taste prevails among competition committees, by ranging the successful and a judiciously-selected unsuccessful design side by side in the pages of your paper, yet, I would ask, is the comparison a fair one? For instance, if you were about to build a house, you could not possibly tell what would be likely to suit your requirements by simply being shown an exterior view of what the architect proposed. But yet you ask your readers to decide which of two designs would be the better suited to the requirements of the Retford Committee, giving them only views of their respective front elevations on which to base an opinion. I do not know if Mr. Godwin's plan be inferior to that of Messrs. Bellamy, and it is precisely because I do not know, that I am unable to decide whether Mr. Godwin is the injured individual the present comparison would leave him; for it is monstrous to suppose that, because the exterior is all that could be wished, therefore the design should be forthwith selected, irrespective of defects it may possess on plan; for committees, like individuals, are more likely to look to convenience before art, preferring the useful to the ornamental when they find they cannot get the two combined. Your correspondent "W." expresses a hope that we may not be dragged back to the Georgian age, when builders were employed to do the work of architects. I think the best way to prevent such degeneration will be for the so-called art architects to give a little more attention to the convenient planning of buildings—not necessarily the work of a surveyor—and then committees, in their desire to get a convenient building, will not be driven to accept such an architectural monstrosity as the present Retford Town Hall.—I am, &c.,

E. W.

[If Messrs. Godwin and Crisp, and Messrs. Pearson and Bellamy, will send us the plans for their Retford Town Halls, we would engrave them and put them side by side, as we did the elevations.—ED. B. N.]

AN ARCHITECT'S CLUB.

SIR,—I have perused the several remarks on the subject of an architect's club which have appeared in your columns of late, but the subject seems to me to have been taken up principally by students, or those desirous of obtaining purely elementary information and instruction, by means of a good architectural library and reading-room. Of course an architectural club ought to include accommodation for men of an entirely thoughtful and reflective turn of mind; but to be a club, in the recognized meaning of the word at present, it should also afford convenience for those, who, having already acquired a fair education in art subjects, after an arduous day's work in their professional duties, may wish to obtain a little relaxation, and have an opportunity of making the acquaintance of those who, from holding reciprocal views, are the best able to converse together on a mutual footing. I feel sure that there are quite a sufficient number of us (young architects), judging from the crowded state of the rooms in Conduit-street, on the occasion of the opening *conversazione* last Friday, to organize and support an architect's club in London, if it were commenced with a moderate entrance fee, and yearly subscription of about £3 3s.; and I see no reason for supposing that the interests and advantages of the Association would be interfered with in the least, but be rather strengthened, by having its members the better acquainted with one another; and I should like to see the Association, through its talented and energetic president, making the first move in the matter. I must add my most sincere wishes to those of "Adelphi" last week, that the Institute will assist in this work.—I am, &c,

London, S.W., October 31. ADOLESCENS.

THE STRATFORD TOWN HALL COMPETITION.

SIR,—Will you allow me to reply to several misstatements respecting the above. It is not true that the Local Board have awarded the first premium, and the honour of the work, to their own surveyor. The design "Civis" was the joint production of Mr. Giles, of Craven-street, and myself, and we are now employed as joint architects to carry out the work. It is not true that I placed my name, as well as motto, on the design. Each competitor was supplied with a lithographed plan, upon which, or a *fac simile* thereof, he was required to draw his block plan; consequently, my lithographed signature appeared on several of the designs.

It is not true that the authorship of "Civis" was known to the Board. A committee of the whole Board made a report awarding the premiums. At this time the authorship of the designs was not known, but during the week which elapsed between the final meeting of the committee and the regular meeting of the Board, the authorship of all the premiated designs became more or less known. As to the merits of the decision, I am quite satisfied that had the superior excellence of any other design forced itself upon the attention of the Board, no consideration would have prevented its adoption. I accepted office only three months previously, with the distinct understanding that I should not be excluded from the competition. Had I not been a competitor, I should, practically, have been the referee and adviser of the Board. I certainly prefer being attacked as one of the successful competitors than as referee, in which position, judging from recent examples, taste, knowledge, and honesty, would have been alike assailed.—I am, &c., LEWIS ANGELL.

THE STRATFORD COMPETITION.

Sir,—As another competitor, I fully agree with the letter signed "A Competitor" in your last number. I believe this so-called competition to be such a glaring instance of injustice and partiality that it ought not to be allowed to pass over without some steps being taken to bring the West Ham Board to a sense of propriety, and I have no doubt that if a meeting of the competitors was held, resolutions would be adopted that would have the desired effect. I would, therefore, propose that such a meeting should be called together at some central place by advertisement, and that arrangement be made to obtain legal advice as to the liability of the board to compensate those whom they have unjustly deprived of their time and labour. I am persuaded that competitions will always be open to jobbery until a legal liability is established, which, I am of opinion, may be done in the present instance. Architects can hardly expect to be treated either with justice or respect, when a member of their own profession, and an F.R.I.B.A., acts as an encourager, if not a prime mover, in such disgraceful jobs as the Stratford competition.—I am, &c., L. A. W.

October 29.

ZINC ROOFING.

SIR,—In reply to a letter signed by "C. H.," which appeared in your impression of Friday, the 25th inst., permit me to state that I am willing to undertake to lay a plain zinc roof, in Italian formed zinc, No. 14 gauge, at 7d. per foot superficial nett measurement, and using my patent underlock fastening, by the use of which fastening the cost of the boarding beneath the zinc is dispensed with. —I am, &c., ROBERT FOX.

26, Tomlin's-terrace, Limehouse, E., October 29.

SIR,—In reply to the further letter of "C. H." upon this subject, I can assure him that if he will apply to me I will find him more than one zinc worker who will execute a roof of "plain character" at the price I name. During the last six years the average price of zinc may be very fairly taken at £26, the price I assume. I have seen thousands of squares of zinc roofs laid where no cutting at all was required, and when neither chimney stacks nor lantern lights cropped out to prevent the sheets being placed as prepared and delivered from the shop.

As to gutters and flashings, I expressly say that these must be measured extra. The lowest price is 7d. for a plain shed roof in London, and "C. H." will allow that the only possible and proper way in naming a starting price is to take the plainest work as a basis. In difficult work, small-hipped roofs, octagonal lantern lights, dormers, moulded and circular work, and the like, such a price is, of course, no guide, as such works cannot be dealt with at any general rate. If men have to be sent into the country it is also very well understood that expenses are incurred which must be allowed for, and which, if the work is small, add a large proportionate cost to the labour. I must say that I do not think it needful to take into account the risk of bad debts, which is a separate question altogether, and I give below the calculation according to which the price is fixed. (I consider "C. H." puts his labour too high, and I am very well aware that it is often done for even less than I put it at)

A ton of No. 14 zinc contains				1643 supl. ft.		
Deduct for loss in laps, caps, &c. (20 per cent.), which is a correct and sufficient allowance in a plain roof.....				320 ,,		,,
Leaving for the completed roof covering				1314 ,,		,,
The cost of this, at 7d. per foot, is				£38	6	6
Deduct cost price of zinc	£26	0	0			
Deduct less the deduction of 5 per cent. allowed for certified good work, and under which head the company's agents have, during the last seven years, paid hundreds of pounds	1	6	0			
Nett.....	£24	14	0			
Turning up edges and forming roll caps at shop, at 1s. per square	0	13	2			
Labour in laying, done on the roof, at 8s. per square.....	5	5	2			
Clips, nails, &c., at 2s. per square	1	6	4			
Cartage	0	7	6			
				32	6	2
Leaving a profit per ton of...				£6	0	4

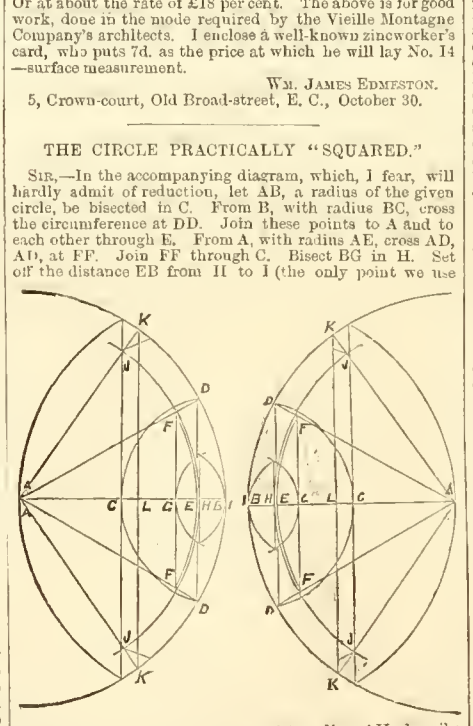
Or at about the rate of £18 per cent. The above is for good work, done in the mode required by the Vieille Montagne Company's architects. I enclose a well-known zincworker's card, who puts 7d. as the price at which he will lay No. 14 —surface measurement.

WM. JAMES EDMESTON.

5, Crown-court, Old Broad-street, E. C., October 30.

THE CIRCLE PRACTICALLY "SQUARED."

SIR,—In the accompanying diagram, which, I fear, will hardly admit of reduction, let AB, a radius of the given circle, be bisected in C. From B, with radius BC, cross the circumference at DD. Join these points to A and to each other through E. From A, with radius AE, cross AD, AD, at FF. Join FF through C. Bisect BG in H. Set off the distance EB from H to I (the only point we use



outside the circle). From A, with radius AH, describe JHJ. From I, with the same radius, cross this arc at JJ. Draw lines from A through JJ to KK, and lastly, join KK through L. From L to the further end of the diameter (which call Z) will be a quarter the circumference, with an error less than a ten-millionth of itself. Thus the circumference (or any aliquot part of it) is practically rectified, which is the only useful part of this problem.

If a square be constructed, whose side equals ZK, it will equal the area of the circle within a five-millionth.

Lastly, to circle the square whose side is ZB (or twice AB), the diameter perpendicular to this will cut off from KZ the required radius, within a ten-millionth.

This appears to be the construction most readily giving the 113:355 ratio, to which I have been led by studying Mr. Butler's last diagram, p. 747, though I confess my efforts to make it agree with his description, or to understand the latter, have failed. Nor can I see by what principle he is led to the choice of the numbers 56, 10, and 4110, for his next approximation, which I have shown to be a false one. The next approximate numbers above 113:355 are 33102:103993; and the next that erron the same side as 7:22 and 113:355 are 33215:104343

Mr. Butler's former construction, giving the 7:22 ratio, was certainly a very neat way of cutting off $\frac{14}{11}$ of the diameter, and it is singular that both this fraction and the $\frac{355}{452}$ should be obtainable so readily by a few geometrical operations. I recommend any reader who would not forget his Euclid to work out the demonstration of that construction, as well as of mine above; and also that assuming the GB in the former to be one-fourth the circumference, the other lines FB, IB, KB, would have the properties Mr. Butler describes.—I am, &c., E. L. G.

Intercommunication.

QUESTIONS.

[628.]—POLISH FOR OAK.—I have a vague idea of a good polish for oak being made from resin and bee's-wax. Can any of your readers give me a definite receipt for such a polish?—INQUIRER.

[629.]—ACID TO WASH PAPER.—Could any of your numerous readers inform me of the name of an acid that when you wash it over paper it makes it transparent, but soon goes back to its original in transparency?—A DESIGNER

[630.]—REMOVING RUST.—Can anyone inform me there are any mechanical or chemical means of cleaning rust, &c., off (already erected) iron fencing, preparatory for painting? Having many miles to clean and paint I find (present means employed) manual rubbing with wire carding a very slow and expensive process.—T. C. T.

[631.]—TIE BEAMS.—It is a theory amongst architects that in a simple king-post roof the tie beam acts only longitudinally; if so, the truss ought to be equally strong whether the tie beam be scarfed in the centre or be in one piece. Are we to understand that this is a fact, always supposing that the scarfing is perfectly firm in the direction of the length of the tie; or, if not, why? And will the same hold good in a queen-post roof, where there is no king?—A DOUBTFUL ONE.

[632.]—PRESSURE ON ROOFS.—The profession is in the habit of allowing 40lb. per foot super or 36 cwt. per square dead weight, for wind, snow, &c., on roofs of all pitches, this allowance being adopted on the authority of Tredgold. Can anyone tell me how Tredgold arrived at this? The vertical pressure caused by wind alone on roofs of different pitches increases very fast, as the pitch increases, and I want to know how he came to adopt a uniform weight for all pitches?—H. W.

[633.]—STRENGTH OF BEAMS.—I have very often seen in your columns and elsewhere the method of calculating the strength of a beam when supported at both ends and loaded in the middle, or at some intermediate point, or when the load is uniformly distributed, but I cannot call to mind having seen anywhere the method of calculating the strength of such a beam when loaded at two or more intermediate points, or when the load is equally distributed over one portion of the beam, and has also to support another load acting at a point in the other portion of the beam. As a knowledge of the method of calculation adopted under these conditions would be very useful, you would greatly oblige if you would insert this question.—JUSTITIA.

[634.]—FIREPROOF MORTAR.—Can you, or any of your readers, tell me of any kind of mortar or cement that will stand fire, so as to be able to use it in setting fire-bricks in stoves or grates The mortar I have hitherto used soon burns away, and leaves an open joint.—J. McW.

[635.]—PIRACY OF DESIGNS.—I shall feel much indebted to anyone who will give me information as to the best mode of proceeding to prevent the piracy of architects' designs, having lately had some houses erected by two different contractors, each of whom is now erecting houses in the same neighbourhood exactly similar to my design, with the trifling alterations, in one case of omitting some red bricks in the front, and in the other of raising the bay windows another storey. This appears to me to be a hard case, and I cannot see why I should not have the same protection as an artist who exhibits a picture. Have I the power to charge the parties thus employing the builders any commission for using the design? If not, it appears to me that a great part of my "occupation" will be gone. —OTHELLO.

[636.]—QUERIES. — The following questions concern modern architects of all shades of opinion:—

What shape of window is best suited to the present wants?

Considering the climate outside, the blinds, curtains, and other arrangements inside, it is generally admitted that the best manner of glazing for modern England is the sash frame. With this, what shape of window is the most practical?

If the upper part of a pointed arched window has to be filled in to make it square can it be said that the pointed arch is the most practical?

If the upper part of a pointed window is filled with fixed glass, do you get good ventilation at the top?

If the upper part is made to open, can anyone say that a pointed framework of wood is pleasant to look at, or good as a piece of wood construction?

If the sash frame be made square and be placed quite on the inside of the wall, does it follow the outward pointed form of window? Is it convenient? Is it not a very inferior kind of compromise to try and get a modern manner of glazing with an obsolete form of stonework?

Is there any shape of window so practical for modern domestic wants as the square one?

Is there any manner of constructing a square window in stone, so truly constructive as the square arch, and in brick as the segmental arch?

Every age has had its particular form of glazing. Is it, en, possible to put a sash frame to an old Elizabethan illioned window without obvious incongruity?—X. Y. Z.

637.]—MARINE GLUE.—I have read that this subnce is so strong that wood joined by its aid will break any other part than where joined. I want it for joining mes that will be exposed out of doors. Can anyone e me his experience.—C. E.

638.]—CAST IRON GIRDERS.—In "Weale's Price ok" tables are given for calculating the sizes of cast-iron ders to sustain given weights. Can anyone inform me w the multiple of depth and area of bottom flange is tained, and also the meaning of the following letters ced at the top of the coloumns of the tables?—viz., ttom flange, B. *bb. b.* Top flange, T. *tt. t.* Rib, RR. R. E. E. C.

639.]—ASSOCIATED ARTS INSTITUTE.—Can anyone e some information about the constitution and purposes this society.—J. T. W.

640.]—A GOOD FOUNDATION.—I am laying the ndation of a house and have come in contact with a very ft piece of soil; it is of slaty nature, and very wet. I have ne down nearly 5ft. below the surface and still it is no mer. I would consider it a favour if a correspondent uld inform me what would be the best plan of procere?—A FOREMAN.

641]—TURNPIKE ROADS.—Considering that a wrong nion has been come by some magistrates, I shall feel liged for the opinion of one or more brother surveyors. e case stands thus—viz., a turnpike road is 35ft. wide; e greatest width from the centre of the metalling of the ad to the hedges is 20ft.; within this distance a house has en erected to the extent of 14in. I gave the parties notice remove the projection, and set back the building to the e of live fence; he objected; the encroachment was visited three magistrates; they gave it as their opinion no enachment had taken place, because it was necessary for e support of the live fence to have the bank of earth ced up in front of the quick; and to this extent the ilding is allowed to remain. I still contend the hedge nk has nothing to do with the line of frontage for brick stone erections; if the whole length of a road were so ilt upon, and on both sides of the road, it would be reced to 32ft. 8in., and if all parties did not encroach to h line, a want of uniformity in the line of roads wou'd ult.—SURVEYOR.

642.]—MODELLING.—Can anyone give me some inforation on modelling? 1. In taking the first cast from the y, with what is the clay coated to prevent its union th the plaster? 2. What is the mould thus produced to coated with for constant use? 3. What is the receipt making those elastic (shellac?) moulds? 4. Are these ulds insoluble in water; and will they withstand the ion of saturated solutions of salts?—5. In piece mould g how are the lines determined and kept true to make e pieces fit together properly?—ECCE.

REPLIES.

573.]—PERSPECTIVE.—In spite of the assertion of E. L. G." I maintain that linear and aerial perspective e the two subdivisions of the subject, in precisely the ne manner that the theory of shadows is divided into o parts, the one having reference to their geometrical lineations and the other to the depth and intensity of e shadows themselves. Your correspondent has not de a very felicitous illustration in the tailoring line, for tting out and sewing are two distinct branches of the de, the former requiring a first rate hand, what the ench term an *artiste*, whereas the latter may be done the sewing machine.—L. S.

600.]—FLOW OF WATER.—Seeing that "Querist's" estion is but imperfectly answered, I beg to offer e following, which I trust is more complete. In e first place, I will show the quantity running the stream per minute, and then deduce the forula. Now, in 47 seconds the water will have n 95 lineal feet, and, therefore, this 95 multiplied by the lth and depth of the stream will give you the number cubic feet which passed in those 47 seconds—

i.e., 95ft. × 4ft. 6in. × 9in.,
or $95 \times 4\frac{1}{2} \times \frac{3}{4}$

$= \frac{2565}{8}$ cubic feet.

gain, this divided by 47 = the quantity per second, and en multiplied by 60 = quantity per minute.

i.e., $\frac{15}{47}$ of $\frac{2565}{2}$ cubic feet

$= \frac{38475}{94}$ cubic feet per minute.

Now, as there are 6·2321 gallons in a cubic foot,

$\therefore \frac{38475}{94} \times 6{\cdot}2321$ = no. of gallons.

$= \frac{1539}{94} \times \frac{62321}{400}$

$= \frac{95912019}{37600}$ gallons.

$= 2550\frac{32019}{37600}$ or 2551 gallons nearly.

Therefore, from this is seen that the formula to find the mber of gallons discharged per minute is the following:—ultiply the width and depth by the distance the water s run (all in feet or parts) to get the number of cubic t of water. This divided by the number of seconds and ultiplied by 60 (there are 60 seconds in a minute) gives e number of cubic feet which passes per minute; which, multiplied by 6·2321, gives the number of gallons disarged in that time, as "Querist" asks. (If he require ly an approximate answer $6\frac{1}{4}$ will do as a multiplier tead of 6·2321).—J. MCNAMARA., Stratford-on-Avon, tober 19.

600.]—This cannot always be arrived at in the simmanner proposed by "E. L. G.," unless it be assumed it the section of the stream is rectangular, and it the velocity given is the mean velocity. The surface velocity of a stream having an irregular bed varies at different points of the width, but the bottom velocity at any particular point may be obtained by taking 1·03 from the square root of the surface velocity above it, and then squaring the remainder. Half the sum of the velocity so obtained and of the surface velocity will be the mean velocity. The mean velocity having been correctly determined its multiplication into the sectional area will give the flow.—T. W. H., October 19.

[613.]—BLACK BRICKS.—We have just completed the erection of a mansion where the outside brickwork was bedded in black mortar, and have used some tons of mineral black; this mixed with the mortar not only gives it the desired colour but so hardens it as to render it not inferior to cement. The cost is about £7 10s. per ton in London.—H. C. and S.

[614.]—MEASUREMENT OF WASTE.—As "H. S. P." thinks I can scarcely have read carefully on the above question, with permission I will quote verbatim the remarks I have read, those remarks being under the heading of "Measurement of Carpenters' Work" in each instance, each author having previously given rules for the allowance on slating and tiling hip roofs:—1st. "Dobson's Practice of Measuring," p. 131, "Hips and valley to be taken at per foot run for cutting and waste." 2nd. "Hurst's Handbook," p. 173, "Take ridge hips and valley pieces by the foot super, allowing for caps, and state if framed or otherwise. Measure the cuttings and waste by the foot run." 3rd. "Beaton's Quantities and Measurements," p. 19, "Calculate the cuttings and waste to hips and any irregular lines by lineal measure;" p. 20 of the same, "Take the entire lengths by foot run for cutting and waste." 4th. "Burnell's Builder's Price Book, 1866," p. 281, "All cuttings and waste to hips are to be allowed." I simply want to know what this "cutting and waste" means, and what allowance is to be made for it.—T. H. L.

[615.]—REDUCING TIMBER TO THE STANDARD.—From the figures submitted by "Interested" there is clearly a mistake in the £3 2s. 17½d., which is given as a cash amount, whereas it should be given as 3 standard 2 quarters 17 parts and ½. This is probably the fault of the printer.

In making out an invoice of the character submitted, the first step is to obtain the total lineal feet. The following is the most ordinary method adopted—A:—

A.			B.		
14 times	21 =	294	14 ,,	21 =	154 / 140
10 ,,	20 =	200	10 ,,	20 =	100 / 100
10 ,,	19 =	190	10 ,,	19 =	90 / 100
84 ,,	18 =	1512	84 ,,	18 =	672 / 840
20 ,,	17 =	340	20 ,,	17 =	140 / 200
10 ,,	13 =	130	10 ,,	13 =	30 / 100
10 ,,	12 =	120	10 ,,	12 =	20 / 100
14 ,,	11 =	154	14 ,,	11 =	14 / 140
14 ,,	10 =	140	14 ,,	10 =	140
14 ,,	9 =	126	14 ,,	9 =	126
200		3206 lin. ft.	200		3206 lin. ft.

B is a shorter method, the use of the cipher enabling you to read the figures off at sight and write down the result. For instance, the 21 at the head of the second column we should call 11, and multiply this 11 by the 14. Thus, 11 fours are 44, write down the 4 and carry four. Next, 11 ones are 11 and the 4 carried gives 15; write down the 15, which gives 154. This being done carry forward the 14 and add a cipher which changes it to 140. The result of the two combined will coincide with the example given at A. The whole of the figures may be worked out in this form, as 10 tens are 100 and 10 with the cipher added, 9 tens are 90 and 10 with the cipher added, &c. When the lengths are below 10ft. the cipher cannot be used, and as, in the instance given, the 9 must be multiplied by the 14. A shorter method still, but upon the same principle, is given at C. Here the figures with the ciphers need not be carried forward every time, the cipher being added to the total number when the first column is added up. Thus, 200 and the cipher carried forward as 2000. Where 9ft. lengths are introduced it gives a little trouble, but as no lengths under 9ft. are classed with deals there is only this particular figure to deal with. In the instance at C the 9ft. lengths have been treated as 10ft.'s.; this gives an overmeasure of 14ft., which deducted from the 2000 before setting down, or from the sum total as above, gives the same result as A and B.

These details may seem tedious, but with a person whose whole time is devoted to such work the advantage of a system effecting a saving of 50 per cent. in time is obvious. Such, again, is the case where invoices are checked over, one clerk working out the system laid down at A and another checking them over by that of C, would more readily discover an error than if one system was adopted in both cases.

C.			
14	,,	21 =	154
10	,,	20 =	100
10	,,	19 =	90
84	,,	18 =	672
20	,,	17 =	140
10	,,	13 =	30
10	,,	12 =	20
14	,,	11 =	14
14	,,	10 =	—
14	,,	9 =	—
200			2000
			3220
		deduct	14
			3206

Having obtained the lineal feet of 3 + 9 deal, we have only to *deal* with the 3206 in further illustration. It must be clearly understood that every class of deal, batten, board, scantling, or quartering has to be reduced to the 3 + 11 before it can be cast out into standards. In the above case it is a simple matter, the 3206ft. of 9in. deal requires to be multiplied by 9 and divided by 11; but where they are $2\frac{1}{2}$ + 7 your first business is to multiply the lineal feet by 5, which represents five half-inches in thickness, or $2\frac{1}{2}$in., and divide by 6, which represents six half-inches, or 3in. The width, when once reduced to 3in. in thickness, is an easy matter, and may be worked out in a similar manner to the case in point, being first multiplied by the width of the deal or batten, and then divided by 11:—

3206 lineal feet of 3 + 9
9

11)28854

$2623\frac{1}{11}$ lineal feet of 3 + 11

As we are now approaching the difficult question of the standard, a few remarks may not be out of place. A Petersburg standard contains 720 running feet of 3 + 11 deal; in other words, 60 – 12ft. deals or 120 – 6ft. deals. The latter form is the best by which we can follow up the question. 120 – 6ft. deals is termed the long hundred in the trade. In pipe staves it is the general phrase, 120 or a long hundred of staves being one standard. This being understood, we have next to divide the above $2623\frac{1}{11}$ of 3 + 11 deal by 6 in the first instance, and then by 120. Every 120 contained in the result will represent a standard, every 90 three quarters of a standard, and so on, 60 being two quarters, and 30 one quarter.

Example— 6)$2623\frac{1}{11}$ lineal feet of 3 + 11.

120)$437\frac{1}{6}$

3 2 $17\frac{1}{6}$

Or 3 standards 2 quarters 17 parts and ⅙. In pricing out, the following method is adopted. The price being fixed at £7 7s. 6d. per standard:—

3 standards at £7 7s. 6d.	£22	2	6
2 quarters at £7 7s. 6d.	3	13	9
As 30 parts is one quarter of a standard 15 parts is one eighth.			
1 eighth at £7 7s. 6	18	5	¼
We have now to deal with the remaining 2 parts and ⅙. As every part represents 6ft. of 3 + 11 we have 13ft. lineal, when the ⅙ is added £7 7s. 6d. per standard is nearly equal to $2\frac{1}{2}$ per foot in the 3 + 11, we have 13ft. of 3 + 11 at $2\frac{1}{2}$	2	8	½
	£26	17	4¾

The last item is ½d. too much, inasmuch as one standard of 3 + 11 deals at $2\frac{1}{2}$d. per foot would produce £7 10s. against £7 7s. 6d. I thus make the net amount 1¼d. in excess of the example given by "Interested."—W. S., Nottingham.

[615.]— 6 0 lin. 11 × 3 = one deal.
120 deals = one standard.

Hence, to work out the given problem, ascertain the total quantity of lineal feet of 9 × 3 scantling, which multiply by 9-11ths to reduce this quantity into 11 × 3 scantling; dividing this result by 6 gives the number of deals, again dividing by 30 gives the number of quarter standards and deals, and again dividing by 4 gives the number of standards, quarters, deals, and parts of a deal. Thus—

14 times	21 =	294	= 3206
10 ,,	20 =	200	
10 ,,	19 =	190	
84 ,,	18 =	1512	
20 ,,	17 =	340	
10 ,,	13 =	130	
10 ,,	12 =	120	
14 ,,	11 =	154	
14 ,,	10 =	140	
14 ,,	9 =	126	

$3206 \times \frac{9}{11}$ = 2623 (the number of feet of 11 × 3) ÷ 6 = $437\frac{1}{6}$ deals, ÷ 30 = 14 quarters $17\frac{1}{6}$ deals, ÷ 4 = 3 standards 2 quarters $17\frac{1}{6}$ deals at £7 7s. 6d. = £26 17s. 3d.—HERBERT PETERS, Soho Hill, Handsworth, Birmingham.

[616.]—ILLUMINATED DRAWINGS.—I should recommend "Ignoramus" to procure a gilder's cushion, knife and tip, a pot of illuminating gold size, and an agate burnisher (a pointed one is the best for general use), to apply the size in two coats (for flat gilding) to the surface required to be gilded. When nearly dry, to apply the gold leaf, having previously turned the cushion upside down upon an open leaf of his book, then reversing its position, and thereby transferring the gold leaf to the cushion, on which he can cut it to the required size with the knife. He should then grease slightly the edge of his tip, and with it raise the leaf from the cushion, and deposit upon the surface prepared, gently pressing it down with a pad of clean cotton wool. When dry it should be burnished by rubbing it with the burnisher in one direction, increasing the pressure as the gold grows bright. Care should, however, be taken that too much pressure is not used, and that the gold is quite dry, or it will be scratched or torn in the process of burnishing.—C. S. W.

[616.]—"Ignoramus" will find shell gold suit his purpose best. Shell gold is the gold reduced to a fine powder, mixed up with gum, and placed in a clean mussel shell for use. It is used the same way as water colours, that is, fill your brush with clean water, and mix up the gold in the shell to the strength and quantity you require; you must be careful and keep your brush full so as to flow freely over the part you are gilding. The shells are to be bought at any artist's colourman at 6d., 8d., and 1s. per shell. There are other ways of gilding with gold leaf, but are so difficult I would not advise you to try them till you have practised it well. EXCELSIOR

[618.]—QUALIFICATIONS FOR A SURVEYOR.—In answer to "One Interested," the 8 and 9 Vic., c. 76, s. 1, enacts, that every person enacting the calling or occupation of an appraiser, or who for or in expectation of any gain, fee, or reward, shall make any appraisement or valuation chargeable with any stamp duty, shall take out a licence. 46 Geo. 3, cap. 43, "That every person who shall value or appraise any estate or property, real or personal, or any interest in possession or reversion, remainder, or contingency in any estate of property, real or personal, or any goods, merchandise or effects of whatever kind or description, the same may be, for or in expectation of any hire, gain, fee, or reward, or valuable consideration, &c., shall be deemed an appraiser, &c., subject to the appraisement licence duty."

An appraiser must be licensed to value for probate, but the valuation need not be stamped.

55 Geo. 3, c. 184, schedule part 1, imposes an ad valorem

stamp duty on any appraisement or valuation of any estate or effects, real or personal, heritable or movable, or of any interest therein, or of the annual value thereof, or of any dilapidations, or of any repairs wanted, or of the materials and labour used or to be used in any buildings, or of any artificer's work whatsoever. And every appraiser is re-required to write or set down every valuation made by him, and deliver the same to his employer, under a penalty of £50.

But in the case of Atkinson *v.* Fell, Judge Bayley held that the words "valuation or appraisement" do not extend to such as are made merely for the private information of the parties, but to such only as are intended to be binding between them, and Judge Holroyd thought that it did not extend to valuations made merely for the information of the individual, but such only from which a right of action or some certain benefit may accrue to the party, were contemplated by the legislature. In another case the same rule was laid down and extended by the observation that the words did not apply to valuations which were not binding upon the owners of the property, although it might afterwards be made the foundation of an agreement.

From this it may be inferred that where a surveyor estimates for his client the cost of repairing dilapidations he need have no licence, nor is a stamp to the valuation necessary; but if he value the work as an arbitrator between two parties and his valuation is binding on both, then he must have an appraiser's licence, and must stamp his award. I am doubtful whether it is not necessary for an architect, who, under a contract between owner and builder, settles and values the proper charges for extra works, to hold a licence and stamp the document or account containing the prices of the work. The subject is worthy of some discussion.—A. H.

[624.]—ILLUMINATIONS.—The best way of increasing the brilliancy of ordinary water colours is to mix them up with water colour mc. guilph. Powder colours, made expressly for illuminating (the best are by Rowney and Co.) are, however, far superior.—C. S. W.

[624.]—None other than properly prepared colours will do for this work. Those I prefer are the powder colours, which produce a very fine body, and are easy of manipulation. A little gum must be mixed with them to prevent them rubbing off when dry. There are also moist colours, sold in small gallipots, prepared for use, which are also very good, but rather more expensive than the above, and I do not think they look quite so rich. Either of the above may be obtained from any artist colourman. Chinese white should not be mixed with the colours, excepting when a lighter shade is required. JACK.

[624.]—Special colours are made for illuminating by Messrs. Winsor and Newton, of Rathbone-place. They are placed in small glass gallipots, which enable you to see the colours, and, at the same time, protect them from dust. The prices are from 1s. to 5s. the gallipot, and they are as bright and brilliant as colours can be made. "Isolated" will find that a little gum water will brighten his colours, and I have always gained sufficient body by taking out the colour very thick. I have generally used moist colours in pans. EXCELSIOR.

[626.]—LETTERS ON PLANKS AND DEALS.—A gentleman qualified to write on this subject is writing a special article on it for the BUILDING NEWS.

[627.]—GREENWICH HOSPITAL.—The river front, though mostly erected by Wren for William and Mary, obviously all follows the design of the western portion, which had been begun as a palace for Charles II., by Webb, son-in-law of Inigo Jones. The two river blocks are altogether more in the style of Jones than anything of Wren's. He here seems to have carried out a predecessor's design with a scrupulosity that should have ensured his own better treatment than it received from the atrocious finishers of his two southern blocks.

I have been told St. John's, Westminster, altogether one of the most barbarous designs ever built, was by Wren's pupil Hawkesmoor, author of perhaps the very best Classic church in London, St. Mary Woolnoth.—E. L. G.

STAINED GLASS.

Two stained glass windows have been erected in St. Peter's Church, Newcastle, the one at the west end to the memory of the late Rev. Wm. Dodd. It is of four lights, and is in the Decorated style. The upper portion comprises the Baptism of Our Lord, and the Baptism of the Eunuch by St. Philip; and the lower portion Our Lord calling SS. Peter, James, and John to be his disciples, and Our Lord's charge to St. Peter. The artists were Messrs. Heaton, Butler, and Bayne, of London. The other window of three lights is in the same style, by Mr. W. Wailes, of Newcastle, and is erected to the memory of Mrs. Abbott. The subject represents the virtues of Tabitha and Dorcas.

STATUES, MEMORIALS, ETC.

A monument has been erected in Highbury Chapel, Bristol, to the memory of the late Richard Ash, Esq. Messrs. Hanson and Son, architects, prepared the design, which was executed by Mr. Boulton, of Cheltenham.

The marble statue of Andrew Marvel, executed by Mr. W. D. Keyworth, and presented to the town by Mr. Winship, was inaugurated on Monday, at Hull.

A marble mural tablet, bearing a medallion portrait, is to be erected in Greyfriars Church, to the memory of the late Archdeacon Phelps. Should the funds prove sufficient, a memorial porch is also to be built over the south entrance

MEETINGS FOR THE WEEK.

MON. — Society of Engineers.—Continuation of paper "On Mechanical Saws," by Mr. S. W. Worsam, jun., and discussion, 7.30.
Royal Institution.—General Monthly Meeting.
WED.—Geological Society, 8.
FRI.—Architectural Association.—"Archæological Collections of the French Exposition," by the Rev. C. Boutell, 7.30.

LEGAL INTELLIGENCE.

IMPORTANT TO STONEMASONS.—The following action was tried at the Rugely County Court, on Tuesday, the 22nd ult. John Emery, the plaintiff, an architect and stonemason, sought to recover from James Mellard, the defendant, £47 for stone supplied for a new building at Rugeley. The defendant had contracted with Henry Cheshire to erect a shop for £440, and Cheshire gave the plaintiff an order for the stonework which was supplied and used in the building. Cheshire got into difficulties, and then the plaintiff applied to the defendant for the amount of value of the stone supplied, stating that he took the order from Cheshire as the agent of the defendant. The plaintiff gave evidence in support of his claim, and the defendant and Cheshire stated that the order was given by Cheshire, who has since become bankrupt, on his own account, and not as the defendant's agent. The case occupied several hours, and resulted in favour of the defendant.—Mr. Wilson, of Lichfield, appeared for plaintiff; and Mr. Glover, of Walsall, for the defendant.

INTERFERENCE OF TRADES' UNIONS BETWEEN ARCHITECTS AND CONTRACTORS.—A case of considerable importance to architects and builders came before the Manchester city police-court last week. Adam Hanning, and Thomas Slater, joiners, were charged with obtaining money under false pretences from Messrs. Pennington and Bridgen, architects. Mr. Leresche, who conducted the case for the prosecutors, said they contracted some time ago with a builder in Manchester, named James M'Master, for the erection of five villas at Fallowfield. Subsequently, they contracted with the same person for the building of eight dwelling-houses in Clifton-avenue. The former account was settled between the parties, but with regard to the latter a dispute arose. M'Master claimed £140; but the prosecutors alleged that he had omitted to give them credit for £80 which they had paid him, that there were other sums to be deducted, and that the balance owing was thus less than £50. This sum they offered M'Master, but he would not accept it, and he ultimately stated that he would settle everything for £100. The prosecutors would not accede, and M'Master, after saying that he would find means to make them pay, without going to law, left them. On the subsequent Tuesday, February 12, the defendants waited upon the prosecutors, and stated that they had been appointed by the Operative Joiners and Carpenters' Association, to settle the claim of M'Master. Mr. Pennington asked in what way the society was concerned. They replied that M'Master had complained to the society. Mr. Pennington told them he could not understand how a trade society could interfere in a dispute between architects and their contractor. The defendants rejoined, "It has a very important effect on our society. If you don't pay Mr. M'Master, he cannot pay his men; and the consequence will be that the whole of them will be thrown upon the funds of the society. The society will thus be seriously damaged, and we consider ourselves competent to take it up." The prosecutors, in view of the great number of jobs they had on hand, came to the conclusion that for the sake of £50 it was not worth their while to come into collision with the society, and they paid the defendants £100, which was to be passed to M'Master, at the same time enquiring what security they had that M'Master would not repudiate their proceeding. The defendants said Messrs. Pennington and Bridgen might leave that to them; if they conformed to the regulations of the society, they (the defendants) would take care M'Master conformed too, and if M'Master applied to them, they (the prosecutors) must come to the Manchester lodge of the association at the "Cheshire Cheese," Bridge-street. On the following day, the defendants applied to the prosecutors for their expenses as a deputation; they asked for £1 each, but the prosecutors would not pay them more than a sovereign. A few days ago, M'Master sent in a claim in respect of a matter which the defendants had professed to settle, and on the prosecutors enquiring at the "Cheshire Cheese," they were told that the action taken by the defendants had not been authorized, and that disputes between architects and contractors were not recognized by the society. It turned out, on enquiry, that at the time of this transaction, the defendants were in the employ of M'Master, and the case was one which, if the prosecution could get evidence against M'Master, he (Mr. Leresche) should be glad to shape in a different way. The cheque which the prosecutors handed to the defendants was payable to "Mr. M'Master on order" and on the back of it there was the endorsement "James M'Master." Under these circumstances he thought he might be able to make out a *primâ facie* case against M'Master, and he should ask the court to allow him to include him in the charge. After some evidence in support of the case had been heard, Mr. Fowler said it might be as was set up, that the prosecutors owed M'Master money; but that was no reason why the defendants and he should conspire to recover the sum in an improper manner. He should dismiss the present summonses, and grant summonses for conspiracy against the defendants and M'Master. The summonses are to be returnable on November 7.

GRINDING MONEY.—(MITCHELL *v.* PRINCE).—An action was tried before Mr. Commissioner Kerr on Saturday last, to recover 1s. 8d., for what is familiarly known in the trade as grinding money. It was contended that since the introduction of the system of payment by the hour, an allowance for grinding tools would be equivalent to double pay. His Honour was clearly of opinion that it a matter of law, plaintiff could not recover the money. It had been proved to the Court that the men might terminate an engagement at any period of the day, and it would be most unreasonable to allow grinding money when the hiring was an hourly one. Plaintiff must be nonsuited.

General Items.

We have received a long letter from Messrs. M'Carthy and Goldie, contradicting the statements by Messrs. Pugin and Ashlin which appeared in our last impression. They affirm that Mr. M'Carthy, at the suggestion of the Bishop of Cloyne, sent a copy of the amended conditions to Mr. Ashlin, who, after the lapse of several days, wrote back to him, stating that he and Mr. Pugin declined to accede to them, and that they had already accepted the original conditions. That then, and not till then, did they (Messrs. M'Carthy and Goldie) sign the amended conditions, and request their adoption by the committee. They also say that Messrs. Pugin and Ashlin's statement, "that they had done their utmost to secure that the refusal of the third competitor to sign would make a bad impression on the committee," is entirely fictitious, and that they have no acquaintance with any member of the committee, except slightly with the Bishop and Dr. Rice, who entirely concurred in their views with regard to the conditions. We have not space for the whole of the letter, and must decline to insert any more communications on the subject.

There is to be another Working Men's Industrial Exhibition in London towards the end of next year. It will be neither local nor national only but international, and, in some important particulars, will be different from the exhibitions which have already taken place in so many of the manufacturing and population centres of England. The bazaar element, it is intended, shall be rigidly excluded; skilled work and inventions are to be specially distinguished, in preference to mere amateur productions, or examples of misapplied ingenuity; and the surplus, if any, at the close of the exhibition is to be appropriated to the promotion of technical education, the conductors of the scheme forming a permanent council to take charge of the subject. The plan which has been adopted appears to be a practicable one, and it is in vigorous, responsible hands.

A bell-ringer sends us the following:—It often occurs that parson, churchwardens, and ringers are at variance with each other about obtaining admission to the church to ring a peal on the bells on festivals or other holidays. This being a church-building age, I beg to throw out a hint to those who propose building a tower for a peal of bells. Pay a visit to a church designed and carried out by William White, Esq., of Wimpole-street, London, for Dr. Walker, N.E. of St. John's Church, Notting-hill. The tower has an external staircase to the belfry expressly for the ringers, and most ingeniously contrived.

On Saturday evening last the Associated Arts' Institute held its annual *soiree* at 9, Conduit-street. Mr. Westmacott, the president, delivered an address. From the president's remarks it appears that the society is in a flourishing condition.

The officials of many cities in the United Kingdom may study, with considerable profit, the example of the Lord Provost of Edinburgh. That gentleman is a thorough-going champion of sanitary reform. In a speech made by him at Edinburgh on Tuesday last, in which he strongly condemned the present condition of that part of the city known as the Old Town, he enumerated a whole batch of sanitary improvements he desired to see carried out, the last, though not least, of which was a proposal for the purchase, by the Corporation, of the gasworks, and transferring the whole concern to the seaside, between Portobello and Leith, thus securing the profits for public purposes, and, at the same time, banishing a frightful nuisance from the city. He also announced his intention of attempting the renovation of the interior of St. Giles's Cathedral, in the style of the Cathedral of Glasgow, and a meeting for the consideration of this subject is to take place at the City Chamber to-day.

The Marylebone Vestry propose to widen a thoroughfare in the borough called Stingo-lane. This Stingo-lane leads from the western end of Crawford-street into the Marylebone (late New) road, opposite the end of Lisson-grove. By opening up this lane for vehicular purposes, a continuous line of thoroughfare would arise from the western junction of Seymour-street with the Edgware-road, the line running in a northerly direction up Seymour-place, through Stingo-lane, up Lisson-grove, and away to St. John's-wood, Portland-town, and the confluent lines on the western side of the Regent's Park.

H.R.H. the Prince of Wales has notified to the Executive Committee of the National Exhibition of Works of Art, to be held at Leeds in 1868, that he will contribute to the picture galleries of the Exhibition the following important works:—"The Indian Tent," by Sir Edwin Landseer, R.A.; "An Italian Serenade," by Rudolph Lehmann; "The Bivouac in Egypt," by Carl Werner; "The Fight for the Diamond," by E. Corbould; and "The Emperor of Russia and the Prince of Wales Sleighing," by N. de Swertchkow.

A correspondent says:—The readiest way to remedy the solarization of the chancel, or any other windows that may be directly opposite the tube of the lens, is to borrow a horsecloth or a canvas cart covering, and fix it outside by rearing a couple of ladders or oak poles against it, the same being over the window. With this there can be but little trouble, as the articles are procurable either from some farmer, or the clergyman close to most churches.

A correspondent writes:—The Tynemouth Public Health Committee, at a meeting some days ago, affirmed the principle now generally admitted by corporations, not to relax the conditions on which their borough surveyor took office, viz., that he was not to be allowed to undertake private practice, at least within the limits of the borough. In this decision the public will consider the committee acted wisely, as it is neither advisable nor just that the official capacity of borough engineers or surveyors should be used as a means of adding to their private emolument, or that they should have to advise officially on their own plans..

In spite of the Royal Commission, the system of rattening appears to have been only "scotched," not killed, at Sheffield. The practice of stealing wheel bands has been renewed at Messrs. Ward and Hughes, edge tool manufacturers. The bands taken are those of a workman in arrears with his society. The members of the society have, however, acted in a creditable manner; a meeting has been held, and it was at once decided that the bands must be replaced, the secretary being directed to purchase new ones.

According to a return furnished by the engineer of the Metropolitan Board of Works, the average daily quantity of sewage pumped into the river Thames at the Southern Outfall Works, Crossness, is 51,151,355 gallons or 232,404 cubic metres, equivalent to about as many tons by weight.

A correspondent sends us some particulars of the new short line of railway in course of construction connecting the city of Bath with the Midland Railway. It is about 12 miles in length, and the works, which are under the direction of Mr. Allport, jun., are in an advanced state. The terminus in Bath will be in Seymour-street. The line proceeds from Bath in a north-easterly direction until it approaches Keynsham, when it deviates to the north, and joins the Midland Railway at Mangotsfield. The line, although so short, crosses the Avon no less than seven times, owing to the winding course of that river. The bridges are principally of wrought iron construction—lattice girders, supported in the centre by two rows of cast-iron columns, the double span measuring in some places probably 150ft.

Trade News.

TENDERS.

BEDS.—For proposed new cemetery, Biggleswade, Bedfordshire. Mr. J. Ladds and Mr. J. M. Hooker, architects. Quantities by Mr. J. Glenn.

	Chapels.	Lodge.	Entrance Gates, &c.	Boundary Walls.	Total.
	£	£	£	£	£
Chapell.....	1,020	342	173	250	1,785
Bates.....	964	301	166	231	1,662
Redhouse.....	913	298	172	223	1,606
Thomas & Son	856	273	145	238	1,512
Roy	845	256	139	220	1,460
* Howe.....	815	259	134	192	1,400

* Accepted, subject to revision of lodge.

COLNEY HATCH.—For erecting a new school at Cromwell-road, Colney Hatch, for the Rev. Robert Morris. Messrs. E. Habershon, Brock, and Webb, architects:—Woodhall (accepted), £531 10s.

GREENWICH.—For the erection of a shop and premises, No. 11, Church-street, for Mr. Mead. Mr. Lanchester, architect. Hatfield, £1,515; Adams and Son, £1,497; Hammer £1,400; Fox, £1,378; Willis, £1,287; Walker, £1,147.

HAGGERSTON.—For church of St. Chad, Haggerston. Mr. James Brooks, architect. Hill and Sons, £7,670; Piper and Wheeler, £7,183; Perry and Co., £6,995; Higgs, £6,780; Longmire and Burge, £6,757; Foster, £6,497; Hill and Keddell, £6,387; Ennor, £6,144; Ashby and Sons, £6,140; Henshaw (accepted), £5,990.

HAGGERSTON.—For the church of St. Columba, Haggerston. Mr. James Brooks, architect. Perry and Co., £9,065; Longmire and Burge, £8,877; Foster, £8,700; Higgs, £8,375; Ashby and Sons, £8,140; Ennor, £8,130; Piper and Wheeler, £7,990; Henshaw (accepted), £7,894.

LONDON.—For the erection of a block of offices in Budge-row, for Mr. John Pollock. Messrs. H. and J. D. Matthews, architects Colls and Son, £6,500; Adamson and Sons, £6,474; Simms and Marten, £6,460; Patman and Fotheringham, £6,370; Ramsey, £6,345; Sewell and Sons, £6,143; Moreland and Burton, £5,960; Brass, £5,823; King and Sons, £5,750; Webb and Sons, £5,487.

LONDON.—For four shops and dwelling houses, at the corner of Brydges-street, and White Hart-court, Covent Garden. Messrs. Wigg and Oliver, architects. Quantities supplied by Mr. James Schofield. Simpson, £3 125; Longmire and Burge, £3,113; Gammon, £3,071; Lawrence and Baugh, £3,010; Turner and Sons, £2,968; Ennor, £2,706; Roberts, £2,644.

OLD WINDSOR.—For the church of St. Stanislaus, Beaumont. Mr. Blount, architect:—

	Contract No. 1.		Contract No. 2.	
	Bath stone Dressings.	Tisbury Dressings.	Bath stone Dressings.	Tisbury Dressings.
	£	£	£	£
Wood	11,050	11,650	5,869	6,363
Bird	11,017	11,626	5,882	6,375
Patman & Fotheringham	10,935	11,531	5,809	6,293
Jackson	10,726	11,296	5,352	5,755
Myers	9,252	9,775	4,965	5,388

SHOREDITCH.—For Clergy-house, St. Michael's, Shoreditch. James Brooks, architect. Ashby and Sons, £2,660; Hill and Sons, £2,535; Hill and Keddell, £2,370; Henshaw, £2,343; Foster (accepted), £2,342.

STAFFORDSHIRE.—For repairs, Wolstanton vicarage, Staffordshire. James Brooks, architect. Barlow, Stoke, £1,000; Sutton, Newcastle, £963 10s.; Lowe, Newcastle, £955 16s.

THORNTON HEATH (SURREY).—For the erection of five dwelling houses for Mr. Richard Davis. Messrs. Mills and Co., architects:—Hitchcock, £1,550; Robarts, £1,443 10s.; Palmer and Turner, £1,300; Day, £1,222 10s.; Blackmore and Morley, £1,175; Holloway, £1,125; Smith, £1,030.

Mutual Aid.

QUESTIONS.

GASWORKS.—Could you, or any of your readers, inform me of a work on the general construction of gasworks, with detailed illustrations and particulars.—CONSTANT READER.

LAND DRAINAGE.—Will some one inform me of a work on land drainage, with particulars as to the minimum amount of fall recommended, and diameters of pipes for given areas, &c.—T. C. T.

OUTLET VALVES.—Will some one inform me where I can obtain outlet gauges or valves for carrier drains.—T. C. T.

NICHOLSON'S WORKS.—Can anyone inform me where "Nicholson's Builder's Director" and "Student's Guide for Measuring and Estimating Artificers' Work" are published, and the price of each.—N. S. B.

STAIN FOR WOODWORK.—Will any person kindly inform me the address of the manufacturer of Swinburn's stain for woodwork.—FRANCIS.

HARRISON'S FOLLY.—Can any of your correspondents inform me where I can obtain an engraving of the Roman Catholic retreat or asylum known as Harrison's Folly, situated in London-road, Clapton.—J. D.

SPECIFICATIONS.—Which is the best work published on specification writing, and the price of same.—W. H.

BLUE WARWICKSHIRE STONE.—Would you give me a description of blue Warwickshire stone, as regards its strength, durability and colour; or can you inform me of any other stone that forms a better contrast to the Mansfield red sandstone.—W. H.

MODELLING.—Can anyone recommend me a good work on modelling.—ECCE.

REPLIES.

"Ignoramus," in last week's "Intercommunication," will find some useful information on gilding in a little work on illumination, published by Henson and Newton, Rathbone-place, London.

URE'S DICTIONARY.—In answer to "J. T.," I have a copy of "Dr. Ure's Dictionary of Arts" to dispose of, new and unsoiled, for £1 15s.—J. R. ALLEN, Dockyard, Liverpool, October 26.

GOLD PAINT.—The cheapest and best gold paint (for illuminating) is Johnsons', sold by Barnard; it is cheaper than Bessemer's, in that it requires no varnishing, but is used with water; and better, as it does not stain, works more freely, and washes up after drying. Its price is 1s. 6d. a box.—C. S. W.

GOLD PAINT.—Shell gold is by far the best for gilding small surfaces, but where any quantity has to be done this will be found to be very expensive. Gold or bronze powder, mixed with gum water, will be found to work very well. A small quantity only should be mixed at the time, and laid on with a brush rather thickly, but very smoothly. Where raised gilding is required, the surface to be gilded must first be raised to the required height by body colour, laid on very thickly, allowed to dry, and then gilded; and this may then be also burnished with an agate or dog's-tooth burnisher. Where very large gilded surfaces occur, gold leaf should be used; but this can very rarely be used satisfactorily on a drawing.—JACK, Rathbone place.

EARTH CLOSET.—"W. W." may receive every information as to price, &c., of White and Co., 29, Bedford-street, Strand.—FRANCIS.

TURNING LATHE.—To Mr. Roberts, junr.—I have a turning lathe, and should have no objection to take a mahogany bookcase in the way of exchange for it.—WM. ALEXANDER.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots also Cost for Transit to any part of the United Kingdom furnished on application to Bath Stone Office, Corsham Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

James Frederick Brown, Lloyds'-row, St. John's-street-road, timber merchant, Nov. 20, at 11—Thomas Cutler, Winchester-street, Pimlico, builder, November 20, at 12—William H. Pepper, Dover, builder, Nov. 6, at 12—William G. Bates, Queen-street, Brompton, carpenter, November 18, at 12—George Breeze, Erith, bricklayer, November 13, at 1—George Hampton, Brighton, builder, November 13, at 12—Daniel Lampitt, Midburn-street, Somers Town, painter, November 13, at 12—Jonathan Wild, Croydon, painter, November 18, at 11.

TO SURRENDER IN THE COUNTRY.

J. O. Chambers, Marske, near Redcar, painter, November 7—A. R. Clarke, Derby, carpenter, November 5—George Ellen, Faversham, carpenter, November 6—John Plank, Wolverhampton, carpenter, November 8—Griffith Rees, Swansea, builder, November 6—G. Stanton, Birmingham, mechanical engineer, November 6—William Abbott, Salford, brickmaker, November 9—Samuel Gee, Burton-on-Trent, joiner, November 11—T. M. Hawke, St. Day, Cornwall, plumber, November 9—John Henry Nayler, Colchester, builder, November 9—W. Palmer, Middleton, Onerow, Durham, joiner, November 11—J. B. Rees, Swansea, builder, November 8.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9 0	£10 10	Archangel, yellow..	£11 10	£13 0
Quebec, red pine	3 0	4 10	St. Petersburg, yel...	10 10	11 0
" yellow pine..	2 15	4 0	Finland	8 0	8 0
St. John N.B. yellow	0 0	0 0	Memel.....	0 0	0 0
Quebec Oak, white..	5 5	5 10	Gothenburg, yellow	8 10	10 10
" birch.....	3 10	4 10	" white	8 0	9 0
" elm	3 10	5 0	Gefle, yellow.....	9 0	11 0
Dantzic oak	3 10	6 0	Soderham	9 0	10 10
" fir	2 0	3 0	Christiania, per C.,		
Memel fir	3 0	3 10	12 ft. by 3 by 9 in.		
Riga.....	3 0	3 5	yellow	16	22 0
Swedish	2 0	2 5	Deck Plank, Dantzic,		
Masts, Quebec red pine	6 0	7 0	per 40 ft. 3 in.	0 15	1 4
" yellow pine..	5 0	6 0	PUMICE STONE pr ton	6 0	8 0
Lathwood, Dantzic, fm	4 10	5 0	OILS, &c.		
" St. Petersburg	6 10	7 10	Seal, pale....per tun	40 0	0 0
Deals, pr C., 12 ft. by 3			Sperm body	110 0	112 0
by 9 in., duty 2s per			Cod	36 0	0 0
load, drawback 2s.			Whale, Sth. Sea, pale	38 10	39 0
Quebec, white spruce	13 0	19 0	Olive, Gallipoli.....	70 0	0 0
St. John, white spruce	13 10	15 10	Cocoanut, Cochin, ton	56 0	57 0
Yellow pine, per reduced C.			Palm, fine	41 0	0 0
Canada, 1st quality.	17 0	18 10	Linseed	37 15	0 0
2nd do.....	11 10	12 10	Rapeseed, Eng. pale..	41 0	0 0
			Cottonseed.....	34 0	40 0

METALS.

IRON :—							
Welsh Bars in London .. ..per ton	6	7	0	6	10	0	3
Nail Rod ..... do	7	10	0	7	15	0	2½
Hoops ..... do	8	10	0	9	0	0	
Sheets, Single ..... do	9	15	0	10	0	0	
Staffordshire Bars ..... do	7	10	0	7	15	0	
Bars, in Wales ..... do	5	15	0	6	0	0	3
Rails ..... do	6	5	0	0	0	0	nett
Foundry Pigs, at Glasg. No 1 .. do	2	15	0	3	5	6	2½
Swedish Bars ..... do	10	5	0	10	10	0	net
STEEL :—							
Swedish Keg, hammered .....per ton	15	0	0	15	10	0	2
Swedish Faggot ..... do	10	10	0	12	10	0	2
COPPER :—							
Sheet & Sheathing, & Bolts ....per ton	84	0	0	0	0	0	3
Hammered Bottoms ..... do	93	0	0	0	0	0	
Flat Bottoms, not Hammered .. do	88	0	0	0	0	0	
Cake and Tough Ingot ..... do	74	0	0	75	0	0	
Best Selected ..... do	81	0	0	83	0	0	
Australian ..... do	84	0	0	89	0	0	
Y. I. Metal Sheathing & Rods ....per lb	0	0	7	0	0	0	
TIN :—							
English Block .....per ton	96	0	0	0	0	0	2½
do Bar ..... do	97	0	0	0	0	0	
do Refined ..... do	99	0	0	0	0	0	
Banca ..... do	94	0	0	95	0	0	nett
Straits ..... do	89	10	0	90	0	0	
LEAD :—							
Pig, English .....per ton	21	15	0	0	0	0	2½
„ Spanish Soft ..... do	19	15	0	19	10	0	
not, Patent ..... do	23	0	0	0	0	0	
Sheet ..... do	20	15	0	0	0	0	
White ..... do	30	0	0	31	10	0	5
SPELTER :—							
On the Spot .....per ton	21	0	0	21	2	6	net
ZINC :—							
English Sheet .....per ton	26	10	0	27	0	0	2
Devaux's V. M. Roofing Zinc .... do	26	10	0	0	0	0	

* And 5 per cent. discount if laid upon the new system.

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ROYAL POLYTECHNIC.—LURLEY, or the BRIDAL of BELMONT. Mr. John Millard will read Fraed's charming poem, a Legend of the Rhine, daily at 4 and 9. The reading will be illustrated with New and Beautiful Scenery, by Mr. John O'Connor; also with most striking Ghost and Spectrescopic Effects (J. H. Pepper and Henry Dircks, joint inventors). Professor Pepper's Lectures on the Paris Exhibition, Introducing Machine-made Jewellery, by E. Streeter, of Conduit-street, Bond-street, daily at 3 and 8. The wonderful Leotard at a quarter to 4 and a quarter to 9.

BILIOUS and LIVER COMPLAINTS, Indigestion, Sick Headache, Loss of Appetite, Drowsiness, Giddiness, Spasms, and all Disorders of the Stomach and Bowels, are quickly removed by that well-known remedy, FRAMPTON'S PILL OF HEALTH. They unite the recommendation of a mild operation with the most successful effect; and where an aperient is required, nothing can be better adapted.
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SOLID PARQUET FLOORS
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PRICES LOWER THAN USUAL.
Specimens at Architectural Museum, 23, Maddox-street, W.
AND AT
Show Rooms, Cambridge Hall, Newman-street, London.

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TISBURY QUARRIES, WILTSHIRE.
For Prices of Random Block of best quality, suitable for engine and machinery beds, dock or sea walls, building rubbles and pitching, and for stone to dimensions, or worked stone, apply to the Manager,
Mr. T. P. LILLY, GILLINGHAM, DORSET.
London Offices—8, Old Jewry, E.C.
Prices very moderate.
Also stone of fine texture, well adapted for carving, mouldings, cornices, sills, ashlar, and building purposes generally.
The stone has been used, and may be seen, at the British Assurance Office, 101, Cheapside; the Southern District Post-office, Westminster-road; the Victoria Club-house, Wellington-street, Strand; Cornhill Chambers; the Town Hall, Bromley; the London and County Bank at Hastings and Banbury; the Royal Mausoleum at Frogmore; Salisbury and Chichester Cathedrals; and is now being used in the restoration of the Chapter-house of Westminster Abbey.
A Tariff of Prices at which the stone can be delivered at various stations will be forwarded on application.

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and
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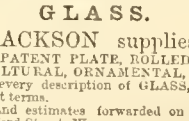
ESTABLISHED  1838.
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THE BUILDING NEWS.

LONDON, FRIDAY, NOVEMBER 8, 1867.

THE DUDLEY GALLERY.

"THE Committee of Management of the General Exhibition of Water-Colour Drawings, wishing to employ the Dudley Gallery, of which they have a lease, during that part of the year not devoted to the General Exhibition, have determined to open the gallery in the months of November and December." These words, taken from the catalogue, explain clearly the reason, or, at least, one of the reasons, for a winter exhibition at the Dudley Gallery. Whatever the reason, whether purely commercial or only partly so, we cannot but be grateful for this last addition to the very few bright spots which help us to bear patiently the outer gloom of our northern winter. For the Exhibition, which was opened last Saturday, must be unquestionably cheering so long as it contains such pictures as "Love in Oblivion" (No. 37), by Mr. Simeon Solomon; and "Over the Common" (62), by Mr. H. Wallis. If there were nothing else in the Gallery but these two pictures, so opposite and yet so admirable of their kind, we should have no hesitation in bidding all who are interested in the painter's art (and that ought to mean all who are interested in architecture) to visit the Egyptian Hall, not so much as a pleasure but as a matter of duty. Besides these two pictures, however, there are at least eight others, which deserve some thoughtful attention. Thus, from Mr. G. F. Watts we have a life-size figure, subject "Sans Merci" (127), a small figure of "Daphne" (226), and a Portrait of Mr. Swinburne (206). Mr. Armitage sends a subject from the story of Bel and the Dragon (128), Mr. Poynter an "Adoration to Ra" (65), Mr. H. S. Marks "A Tinker" (51), Mr. S. Solomon a subject from the liturgy of the Roman Church (171), and Mr. G. D. Leslie a picture called "Rose Harvest" (196).

We shall return to these ten good pictures; meanwhile, words of praise are due to other artists, some for one quality some for another, whose works we have no space to describe or criticize in detail. Thus, for grasping the character of our English landscape, our cold sky, and melancholy trees, commend us to Mr. G. Mawley, for his "When Leaves Fall and Cold Winds Come" (177); to Mr. Smallfield for his "Midsummer Mist" (181); to Mr. Field Talfourd, for having caught the spirit of "The Thames, near Henley," with its "swans of goodly hue:" each swan is a picture in itself (113); to Mr. J. Taylor, for his faithfulness in "A Bye-lane, North Wales" (15); to Mr. G. L. Hall, for his "Still Salt pool" (78); and to Mr. Henry Moore, for his marked advance, as shown in the "Valley of the West Ockment, Dartmoor" (34), which would be a remarkably good picture, if 8in. or 9in. were cut off from the top, or the sky rubbed down and repainted properly.

In figure subjects the exhibition is not strong, not because there are no figures, but because the figures, in most cases, might walk away and leave the pictures just as interesting. Thus, in Mr. Armstrong's "Under the Sunflowers" (90), who cares to have a beautifully drawn corner of an old-fashioned garden spoilt by the skinniest of girls in the skinniest of costumes. The picture is not worthy the author of "The Lesson," exhibited in the Royal Academy this year. It is very badly placed; the tone of the picture is true enough for the dusk of an English summer day, but dusk appears almost like dirt placed between a Cairo scene and "The Sunshine of Life." Mr. J. G. Naish's painting of "The Pilot's Holiday" (276), is ruined by the figures. The rocks in the background show what Mr. Naish can do, and, for the reputation of the artist, would it not be better to take out the figures altogether. The title would then be more appropriate, for pilots generally take their holidays on shore, midst the genial company of the tap-room, and of Moll, Meg, and Marian, and Margery. Mr. F. B. Barwell's "Wafted Away" (24), is sentimental enough, but no amount of sentiment can make up for the lack of painting. Not that I hold mere painting to be above idea, for that is just as dangerous as to say that to the architect a knowledge of construction, or the engineering element of his profession, is of more importance than all idea of proportion, fitness, composition, arrangement of sculpture, or any other element which helps to turn a mere conglomeration of stone and wood, however well put together, into an art work. Mr. A. B. Houghton presents us, in 288, with another example of the hopeless state to which very many artists are drifting. "A Three-tailed Bashaw" might have been sketched by Leech for the pages of "Punch," but it deserves no higher position; with the exception of the interest which may attach to it as exhibiting the portraits of a certain family, there is nothing whatever in the picture but painting, and of that not too much. Mr. Fitzgerald (153), exhibits as usual a fairy scene—"The Chase of a White Mouse"—not equal to some of his earlier works neither in fancy nor composition, but perhaps better painted. Why does Mr. Henry Garland paint a naughty-looking child in a cradle, who looks afflicted with wicked dreams, and call it "Peace?" Of course, anyone can see that the proper title for this picture would have been "The Counterpane," for patchwork, not "Peace," was manifestly the thing Mr. Garland set himself to do, and fairly enough he has done it, but this is a kind of easel painting from which art, in its broadest sense, can expect nothing. Mr. Fisk, in his "Vanity, Vanity" (176), indulges in an equally loose sort of thing. A seventeenth century staircase is painted in just the timeworn condition of two centuries old, and into this painting is imported a Puritan and his daughter of the period when the staircase was new.

Portraits or reminiscences of models or friends are beginning to find good places on our exhibition walls, under the shelter of some name which poetry or history has made familiar. Mr. V. Prinsep sends (182), a head in profile, which he calls "Esmeralda;" and Mr. Calderon (124), has an "Isabel." Mr. Perugini's "Italian Woman" (149), must not be forgotten. It has good colour and good drawing in parts, but it is a pity that it should not have received just sufficient attention to enable one to distinguish between the textures of boards, stones, plaster, tub, and flesh, which might have all been woven in the same loom as the dress. Mr. Rossiter's "Roundhead" (284), is far better than the companion picture "The Cavalier," marked by this couplet:—

> For Church and King he burns to stain with gore
> His doublet, stained with nought but sack before.

Where are the stains?

But to return to the ten pictures already marked off. Mr. Watts shows, in "Sans Merci," a life-size nude figure of a man being dragged through briars by Cupid; the part which the God of Love plays in the composition is so marvellously out of tune that one cannot help thinking the picture was made for the studies, or rather study, and not the study for the picture. The man's thighs and legs look rather long drawn-out, a special weakness, or, as I have heard some people call it, a special beauty in all Mr. Watts' figures. Of course, one does not care to see the coarse muscular drawing of Rubens repeated in these days. At the same time, one has also no desire to see the opposite exaggeration indulged in too frequently. In "Daphne," the lower limbs seem also out of proportion, and what would otherwise have been a very lovely study is marred by a parchment hue on the flesh. We should like to believe that this was purposed to express the transmitting of the life-blood into laurel sap, but, unfortunately, the same parchment hue appears in the portrait of Mr. Swinburne. This head has much of noble work about it, markedly so in the brow, eyes, and mouth, but man, happily or unhappily, has nose and chin, and they have to be heard as witnesses to character, so that portrait painters have no business to take liberties with them. Mr. Armitage has told the story of Bel and the Dragon most successfully; the upraised hand of Cyrus is somewhat in the way, and the background, *i.e.*, the side wall of the temple, is rather queer in some of its detail, but then he gives us the sad stern face of the prophet, the surprise—yet conviction—of the king, the strange touch of comedy which underlies the mystery of Bel, and, last of all, the noble idea on which the picture is based—the triumph of truth over lying, wit over cunning. Mr. Poynter, in his "Adoration to Ra," gives us a carefully-drawn figure, and a still more carefully-drawn leopard's skin; the rest of the picture is a *réchauffé* of the architectural portions of his great work exhibited at the Academy this year. As an illustration of how men worship, and the gods they adore, this painting may be interesting; but I hope Mr. Poynter will see the wisdom of not repeating his Egyptian details too often, unless he can find a subject where the poetical or the human—which is much the same thing—plays a more important part than in a single adoration to Ra, or any other god. To drop from gods to tinkers is harsh work, but Mr. Marks has made it as easy as possible for us by washing his tinker well—hands, face, clothes, boots, not a smut about him or his dog, or the snow on which he stands; and yet, with all these uncharacteristic omissions, we have a tinker and some of the poetry of the tinker's life. The old man is not a model surrounded by artist's properties, but a hard-working good-natured old fellow, that has a kind word for the most despised of curs, and knows what it is to earn a hard day's wage for a hard day's work. It is a pity Mr. Marks should neglect the dirt and the texture of things, for though we may not want Murillo's dirty little boys repeated, there is a certain nobility and poetry to be found in the blackest smuts and the coarsest frieze. Mr. Simeon Solomon's "Chanting the Gospel," is characteristic of *him*, but scarcely so, I should think, of any ecclesiastics in the whole Christian church. The Jewish type of countenance may be the noblest of types, but the title of the picture is hardly in unison with features so unmistakably Israelitish as those of the priest and attendants. The treatment of light and shade and the paintings of the vestments, are neither better nor worse than other works we have seen from the same hand. In "Love in Oblivion," the artist seems, however, to have taken a leaf out of Mr. E. Burne Jones's book. For a panel in an article of furniture, or for a medallion in stained glass, this throned figure would be a very admirable piece of coloured decoration, but why call it "Love in Oblivion?" It is true that red poppies (sacred to Aphrodite) and other field flowers have grown up round the feet of "Love," and that his wings have got chilled, and are stiffened into the most ugly outline that even the oblivion of death could have forced them to assume, but then the face is neither that of a full-grown youth nor that of a god. An English girl, or, rather, two English girls, for the upper part of the face does not seem to belong to the lower, have supplied the idea for the face of Eros, and the golden wings have turned to dullish red; and yet with all these drawbacks it is the finest piece of warm lively colour in the room, and taken as a painting of a throned figure, there is little or no fault to find. Mr. G. D. Leslie, "Rose Harvest," like the "Sick Rose" elsewhere, is ruined by the haze of yellowish green which pervades the canvas. Unless Mr. Leslie

emancipates himself from the slavery of this yellow green, his works, after a few years' toning in modern dining rooms and picture galleries, will be most melancholy spectacles of dull sickly colour. But for this and the want of finish in the heads, and texture in the dresses, "Rose Harvest" would be a very fair picture. But here, again, the question naturally arises, what is it all about? Was it worth painting? Mr. H. Wallis's very lovely work, like Mr. Leslie's, will be none the better for keeping. If such a subject—a common in the twilight of a summer's evening—is to be painted at all, Mr. Wallis has done it; but the very nature of the subject makes the truthfulness of the picture its own death warrant. "Across the Common" is unfortunately placed between the bright lights and colour of Mr. Poynter's work on one side, and the snow in Mr. Mark's subject on the other. Under the circumstances, it takes a bright day and some patience to discover all the subtle changes in the mosaic of deep tones which give to this common not only all the reality of a common, but raises, so to speak, the whole spirit of the place. The sky line of the trees, the brooding mist, the charming standing figure, are all apparent even to the passer-by; but the hollows and the hillocks, the still pools, the combined sense of openness and of loneliness—which is the very essence of a common—and the marvellous modelling of the ground, are things which require looking for, and which will be found if sought.

Altogether, the winter exhibition at the Dudley Gallery deserves to be a success. Still, as architects, we have to hope on, for out of nearly 300 paintings there is not one which would lead an architect to say, "Here is a painter to help me by decorating and ennobling my architecture."

THE ARCHITECTURAL ASSOCIATION SKETCH-BOOK.*

"ST. RADIGONDE, Poitiers, Sketch of Western Tower from the North," is the title of the fifth sheet. Considered as a transfer lithograph it is a not unpleasing imitation of the late Mr. Cotman's etchings; as an architectural drawing for the instruction of his fellow-students, Mr. Tavenor Perry, whose name appears at the bottom, would doubtless confess that it is of but very little use. This gentleman, who is so well known to all as having been the first Pugin travelling student, must have quantities of careful drawings with which to instruct us, and it is on this account that we are apt to feel the more disappointed in the present instance. The last sheet of the first number is by Henry Jarvis, jun., and represents the interior of the church of St. Zeno, Verona, with portions of the archivolt of entrance to crypt, south side of choir, and sculpture of archivolt over entrance to crypt, north side of choir. Respecting the interior, there is very little to be said beyond what has been observed of H. W. L.'s interior of St. Mary Overie, excepting that this is far less carefully drawn. This want of care is also very apparent in the details of ornament which complete the page. Now, the interior of an Italian church would be a very difficult subject to photograph. So, also, would be the details, unless we secured the assistance of magnesium wire, as Mr. Parker did, when it was a question of photographing the paintings in the Roman catacombs. Consequently, both the interior view and the details of St. Zeno are things to be drawn; but then they should be drawn with care, and if time does not allow all to be studied, it is far better to do only one subject. There is probably no greater mistake than to imagine that the more sketches a man makes the more he must learn. On the contrary, the inverse ratio is nearer the truth; and this may account for the fact that many students go to Italy and elsewhere, that they work hard, but that the good effects from the process are only visible in the very smallest degree.

The second part opens with a measured drawing of the gatehouse of the abbey of Ardennes, near Caen, by Mr. Henman. The scale is described as one-eighth of an inch to a foot, and details three feet to one inch (*sic*)—probably three inches to the foot, or a quarter full size. This is a very carefully measured drawing of a very good example of what we should almost call Early English work. It shows how the mediæval architects used whatever shaped arches they found most convenient, the principal ones, in this case, being circular. It also shows that they did not always consider it necessary to put the column and vault exactly in a line with the buttress that takes the thrust. As regards the drawing, the desiderata are:—Firstly, elevations of the ribs of the groining. Professor Willis's learned paper on vaulting, in the first volume of the "Transactions" of the Institute of British Architects, shows how to measure these ribs when a scaffold is not attainable. Their exact shape is often very important, as the diagonal ribs, being the longest, were often drawn before the others, and, consequently, exercised a great influence upon their shape. Secondly, the mouldings appear hardly to be drawn as well as they might be. It is very true that the sections of mouldings drawn with the free hand, like the Early English mouldings, are very difficult to copy, because the sections cannot be seen, and that they are also very difficult to measure. Still, with great care, they can be measured, and there is always the ingenious instrument invented by Professor Willis, by which the exact shape of the hollows can be ascertained with certainty. But when once the student has ascertained the exact shape of one example, either by the aforesaid instrument or by measurement, or by rubbing off a loose voussoir, he will soon find future examples come very easy to him. Thirdly, in the present instance, the mullions of the windows might surely have been inserted, and a note made to that purpose. At present, their omission quite spoils the south elevation. Fourthly, in the north or principal elevation, the effect of the moulded arches is quite lost by the multiplicity of lines; a remedy for this would be a careful study of the sketch-book of Wilars de Honecort. I have ventured to say so much of Mr. Henman's drawings because, as far as we have gone, they are decidedly the most painstaking and useful in the book.

The second page is a series of studies of Pershore Abbey, by G. H. Birch. It comprises a rough sketch of the interior—a beautiful Early English composition—with the eastern arch of the apse jumping up in a very inartistic manner—a sketch of a curious Norman arcade in the south transept, the ornament very elaborate, and not improbably done with the axe; a view of the round-headed triforum passage, also, in the south transept; an elaborate Norman cap, from the same place; and a small sketch of the central tower; all of which one feels inclined to give up cheerfully for a measured drawing of the beautiful Early English clerestory to the choir. The defect of this page is the amount of etching, which gives it a black appearance. Probably, no one thing has done so much harm to architecture as the comparatively modern system of etching. It may do very well to deceive a client, but, unluckily, it deceives the architect himself, making his drawings look better than his finished work. In fact, "the truth is not in it." The third sheet is a very clever drawing of the Stalls at Xanten, on the Rhine, signed T. H. W. This is apparently measured, although there is no scale or intimation of the fact. Unfortunately, neither the construction nor the mouldings are given, which is the more to be regretted, as these stalls are a very beautiful example of German thirteenth century work. Perhaps we may hope that the mouldings, &c., may be supplied in a forthcoming number of the work. The next sheet is a perspective view of the courtyard of the Palazzo del Podesta, at Florence, drawn by R. P. S. The same remarks apply to this as to the previous drawings by the same gentleman. One regrets to see that the recent "restoration" has entailed the loss of the picturesque penthouse, which used to keep the sun off the staircase.

An exterior perspective view of the Broletto or town hall of Como is the subject of the fifth page. It is a pity that Mr. Charles Aldridge, whose name is affixed to it, did not content himself with making a careful elevation of one bay. We should then have learnt something about the constructive peculiarities, such as the size of the voussoirs; or we should have been enabled to compare the proportion of the upper and lower storeys; but to do this would have demanded ladders, and would have taken time, and there would have been but little to show for it; and so it was not done, but an etched perspective is substituted, from which we learn nothing we could not learn from a photograph.

The last page is devoted to a perspective view of the cloisters of Westminster Abbey, by Mr. Edward J. Tarver. This is a very wonderful lithograph, and it deserves praise, for it gives the worn and crumbled effect of the stone in a most striking manner. It will be remembered that the wall of the refectory, which forms one side of this part of the cloister, is the work of Edward the Confessor. It is needless to say that it is very rough and rude. The cloister itself is the work of Abbot Littlington, who employed for the mass of the work the Reigate freestone, which has decayed to a much greater extent than the stone employed by St. Edward. Now, this decayed effect is reproduced exactly in Mr. Tarver's drawing, which has been lithographed by Mr. Kell. Whether it would not be more in place among a series of sketches by Gustave Doré, than in the Association Sketch-Book, is another question.

Part 3, page 1, gives us two sketches by E. Lee, one representing the Porte de Caillou, Rue de Palais, Bordeaux; the other, the inside of Rochester Castle, signed W. E. They present the usual style of sketching, with the (unhappily) usual amount of etching, and teach us nothing.

Page 2 is also a sketch, representing part of the cloisters of Erfurt Cathedral, signed R. P. S. The foliage and other details would be the better for a little more care, while the perspective of the tracery is perhaps susceptible of a slight improvement. Architecturally considered, the way in which the mouldings come down on the square or base of the angle pillars is very unusual, and would lead us to suspect a rebuilding. The third page presents us with a measured drawing, by W. G. Davie, of the late thirteenth century tomb in St. Erasmus' Chapel, Westminster Abbey. It is generally said to have contained the remains of the children of Humphrey de Bohun, but in all probability was originally in St. Edward's Chapel, and was removed thence when the tomb of Richard II. was erected. That it has been removed is very evident from its being placed on the seat running round the chapel; and from one end being much more built into the wall than the other. It has at one time been coloured and gilt, like most stone tombs of the period, and very sharp eyes can still detect traces of the shields which once were painted under the arcade.

The points to be observed in these drawings are:—1. That the elevation is over etched. In a scale drawing we certainly do not require cast shadows. 2. There is no occasion to hatch the sections; they simply make large black patches on the page. 3. The foliage requires more careful drawing. 4. The hollows should have been etched in on the quarter full-size details. 5. Having got inch scale and quarter full-size details, it is

* Concluded from page 753.

hardly worth doing the rest of the mouldings to half full-size. There is ample space on the page to have given them full-size, and thus have dispensed with the very unnecessary measurements. The fourth page contains a measured drawing of the western doorway of the south aisle of Genoa Cathedral, by Mr. Elias Aldridge. This is a careful study; and besides the elevation contains perspective views of the caps and bases; also, part of the marble inlay. The latter should have been shown on a much larger scale to have been of any use, as it would be impossible to learn anything concerning the shapes of the various figures from so small a drawing. Such a page as this should be followed up by at least two more showing the mouldings and the carving to a much larger scale. Also, there should be an elevation of the back of the doorway, together with a section; and a plan on a good large scale. Page 5 is an elevation of the well-known Chasse of St. Taurin, at Evreux, to one-quarter real size, by Mr. G. H. Birch. This chasse has been very much restored, but there is still enough left of the original to give an excellent idea of the old workmanship, and, although published by the late Père Martin in the "Melanges Archæologiques," it will still bear republication. As a subsequent number contains the details, I shall reserve my remarks until a future time. Page 6, by Mr. L. W. Ridge, contains three Norman doorways, viz., south doorway, Peakirk, Northamptonshire; priest's doorway, Rainham, Essex; and lower doorway, Clymping, Sussex. They are all drawn to half-inch scale, with details a quarter real size; the mouldings are well drawn; the stone joints look truthful, and there is no unnecessary hatching. Altogether, this is a very good page. The only desiderata would be a few perspective sketches of the Norman ornament, which is always somewhat difficult to understand from simple elevations. This concludes the third part.

At a future time, if desired, I shall be happy to continue my remarks. At present, I would, with all due reference, hazard the following suggestions to the contributors to the "Association Sketch-Book":—

1. To draw all the stonework to one uniform scale—say one-eighth of an inch, for elevations; half an inch for details, such as windows, doors, &c.; and quarter real size, for mouldings, where the space will not allow the real size to be given.

2. To have an uniform scale for woodwork, say, one inch scale, the details in this case to always be full size.

3. To give little perspectives of portions of the ornaments and of parts of the construction.

4. To give as many measured drawings as possible.

5. To dispense with unnecessary hatching.

6. To give a prize for the best and most useful drawing in the "Sketch-Book" for the year. By best I mean not the most artistic drawing, but that which shows the subject in the clearest manner.

I have thus endeavoured to point out what I consider to be the best course to be pursued with regard to the "Sketch-Book"; and should I have hurt the feelings of any of the contributors by my observations, I can only say that my so doing has been perfectly unintentional.

W. Burges.

Note.—Absence abroad prevented my having the advantage of seeing the former part of my paper through the press. The following are the principal errata:—*for* "printed sketches of such men as Blore," *read* "Finished sketches." *For* "½ inch of stone one scale of wood," *read* "½ inch for stone and one inch scale for wood." *For* "a round abaci," *read* "round abaci." *For* "Mr. Henman has not fitted in the hollow of his mouldings," *read* "Mr. Henman has not filled in the hollows of his mouldings." *For* "upper deal arches," *read* "Upper Deal arches." *For* "Perugier," *read* "Perugia." *For* "only a few figured decorations being given," *read* "only a few figured dimensions being given." *For* "Credmon," *read* "Cædmon."

MR. STREET *v.* "J. C. J."*

It is not altogether unworthy of note that, when not noticed himself in amateur criticism, Mr. Street can give admirable advice to his professional brethren as to their duty of courteous and patient reception of the remarks of those who do not belong to the profession. In his lecture upon mediæval embroidery, delivered at Durham in 1863, he begins by expressing his feeling of the duty of architects "wherever and whenever they have the opportunity, to show their respect for and sympathy with those who are engaged in the same pursuit as themselves." "I am satisfied," says he, "that the art of architecture owes very much, if not all, the advance which it has made within the last few years to the intelligent and enthusiastic interest which amateurs have taken in it." "I feel it more necessary to make this acknowledgment, because I have seen with pain lately one of those weak attacks upon non-professional critics and students of art which some of my brethren now and then make, but which never deserve more than very slight notice, *and never, I believe, proceed from men whose opinions deserve much consideration.*" But I suppose when one is the object of the criticism one's self it makes a great difference.

Mr. Street accuses me of muddle of brain in my expression of my strong dislike to unplastered walls, but really the muddle is all his own. I said that anyone who left rough walls unplastered, &c., has still to learn the rudiments of civilized art; and I am told that my first instructions (as a logical sequence) to a beginner ought to be "Plaster your walls, because if you do so you will probably design your windows, doorways, and mouldings in a civilized way." Just so; build walls which you intend deliberately and plan to plaster and paint, and you will find that your doors and windows do not crop up, like toadstools of a night—here, there, and everywhere—but marshal themselves in proper order and proper subordination. The fact is, however, that doors and windows have no necessary connection with art at all; and the designing of mouldings is one of the last things learnt, and certainly not an elementary matter. There is no other point connected with art, only excepting the power of thoroughly drawing the human figure, which requires the hand of the master so much as mouldings—nothing which more taxes all the architect's powers; and yet here they are spoken of as mere elements—A-B-C work. Well may we be alarmed at Mr. Street's declaration "that he only wishes to mark, by *a few minor alterations*—such, *e. g.*, as the sections of mouldings, &c."—[and this, too, in a so-called restoration of a building of which there are absolutely certain indications of what the fourteenth century architect intended] "that this new nave is really a work of the nineteenth, and not the fourteenth, century." Perhaps the most impudent assertion in his whole letter is that I am an advocate for *uncoloured* plaster. Why, I have so frequently insisted upon the absolute necessity of providing a proper and not too costly wall decoration, and shown the absolute certainty of the repetitition of the old white and colour wash abominations, unless our architects will exert themselves in this direction, that I am fairly sick of the subject! Mr. Street must have information not within the reach of the ordinary archæologist if he knows of the fact that the ancients left their walls unplastered, and trusted to Providence that, at some time or by somebody, they would be plastered and decorated by paintings of real value and interest. As far as my own experience goes, they, on the contrary, invariably plastered, and were content with such decoration as they could afford. And my own private opinion is that the plain ornamentation of their walls (uninteresting as it no doubt may be to ambitious minds), especially that before the end of the fourteenth century, was far preferable to the more ambitious paintings which are now desiderated, and for which we are to wait. There is one comfort, however—that if Mr. Street and those who think with him will not, or, more probably, cannot, design suitable colouring for wall space, such as monochrome pictures and decorations, there are others who, being real artists, are able and willing to do so for them, and the public are beginning to find it out. This pretence of waiting for the good time coming is mere nonsense. Why, we know many instances where the Kentish rag and other rough walling is pointed with coloured cement, and where walls anciently plastered and painted have, in restoration, been stripped and left rough! And of course the rough brickwork, which is arranged in different coloured bricks, could never be intended to be covered, though covered it certainly will be as soon as the present fashion goes out—the sooner the better.

Before proceeding to the case of Bristol, I must say a word or two more upon SS. Philip's and James's Church, Oxford. I certainly had not sufficiently considered the ground plan. I was told to notice the symbolism of the inclining nave, and, I suppose, having had that notion put into my head, the constructive reason did not strike me at first sight. I certainly could never have supposed that anything so positively inartistic could have been designed for mere constructional reasons. The real English is that this ingenious contrivance is about as fair a specimen of Mr. Street's want of art power as could possibly be found. Mr. Street has attempted to adapt the usual Oxford form of sanctuary, chancel, and tower of early date—usually Norman, as at Iffley and Cassington—to a late nave of great breadth, with narrow aisles, an arrangement which found its ultimate development in the Dominican church at Ghent. *Meulier formosa superne desinit in piscenæ.* But how was the juncture to be accomplished? The tower vault must have an abutment, and so this very ingenious and curious distortion was invented. The last bay of the nave was made to incline so as to meet and support the corners of the tower. The external ugliness of such an arrangement was obliged to be masked, and so the bright idea of adding transepts to the simpler Oxford model was formed But this is not the only novelty without art which is displayed in this church; as we get outside we see the lower part of the church of English Gothic of the thirteenth century. But, in the spire, Mr. Street goes out of his way, and copies from French work, probably Coutances, or the later and less satisfactory examples at Calvados. But the French architect's plan was entirely different to Mr. Street's. The whole spirit of the old work is essentially pinnacular; in some of the finest instances pinnacle rising above and out of pinnacle, all having reference to, and culminating in, the central spire, so beautifully combining with it that some of the spirelets incline, as it were, to the parent stem, so as to cling the closer to it. This tower and spire, on the contrary, is not pinnacular at all. The pinnacles, however, stick out right against the lines of the spire, and entirely destroy what little grace it might otherwise have possessed, and, at the same time, forms an excellent lodgment for snow and water. This is, in fact, only another instance of Mr. Street's adaptation of ancient features, without his having the art-feeling to see their real significance. Something in the same way that he is so fond of—false fenestration, one storey or clerestory having no sort of relation to the arcade or fenestration above or below; or his repeated filling-in where there is no sort of necessity for it, nor anything gained in effect or utility. These things, of course, we all know, occur in old work—through alteration of plan or purpose, or through carelessness and rudeness of the builders—but are simply absurd in new

* "J. C. J.'s" letter has been in type some time. We have omitted the first part of it because it was unnecessarily personal.—Ed. B. N.

churches or such edifices as the National Gallery or the Law Courts.

And now to proceed with the Bristol Cathedral restoration. I am found fault with for saying that the destruction of part of the monastic buildings at the south-west corner would not be compensated for by Mr. Street's steeples. How could I tell without seeing them? My answer is, that I agree with the "Saturday Review" that no western towers, however good in themselves, would be other than a mistake. "The addition of towers will not thereby give his front any character which will specially distinguish the church from Southwell or Beverley, or which will make it more like Winchester, Norwich, or Worcester. The fact is, that Bristol Cathedral is too small—above all, that its nave is too short to admit of a good grouping of western towers. Western towers, if kept in the usual subordination to the central lantern, would be so small as to be insignificant; predominant western towers—no English tradition, by the way—would altogether crush the nave." I would add to this that, from what I know of Mr. Street's steeples, as at Oxford, and more still those of the Lisle memorial competition design, the west front of which, from the description we have of what is proposed, is about the thing intended for Bristol, I should be sorry to sacrifice for them any interesting ancient feature. On this point I cannot help quoting further from the able article in the "Saturday Review":—

But there is another serious objection to the design for towers proposed by Mr. Street. At Bristol, as everywhere else, the subordinate buildings of the monastery were made to group and harmonize with the church. The silly modern notion of isolated minsters was unknown. The church was the predominant building, but still only one of a whole group of buildings. At Bristol, the remains of the conventual buildings are rather extensive. One portion in particular, apparently the abbot's house [This is evidently a mistake. The abbot's house is known to have been below, more towards the river.] joins on, *in the usual ingenious way, to the south-west corner*, and has a private way into the church. The house contains ancient portions of more than one date; among others, a small private chapel, which, if put in proper order, would form a very pleasing adjunct to the minster.

If Mr. Street's towers are ever built, "the destruction of at least part of this interesting house must follow." This Mr. Street passes over without reply, and almost tells me in so many words that I was telling a falsehood, for the sake of personally injuring him, when I merely said that, "to make way for his towers, he would have to destroy interesting old work." In this matter I can only more strongly insist upon what I said in my former communication. If Mr. Street denies that this old lobby to the priors'—not abbots'—lodgings is interesting old work, he differs, not only from me, but, I believe, nearly every antiquary in the kingdom. But it is not only this work that will be destroyed, in the south-west corner, the only evidence of the extent westward of Abbot Knowles' plan of rebuilding will be obliterated. The fourteenth century remains, with their Norman substructure, will be removed, these, containing as they do the responds of the eastern bay, the key to what ought to be a real restoration of the building.

It will, without doubt, be highly judicious in Mr. Street to destroy all such opportunities of odious comparisons, if he is allowed to do so. But the authorities will act with simple good common sense, if they insist upon the restorations following the ancient precedent, instead of running the risk of having a new nave that will match with the old choir, somewhat less than the Dominican nave at Oxford does with its modest English tower and sanctuary. It seems odd to have to remind Mr. Street that what the ancients would have demolished can be no excuse for us. There was not in the middle ages any such thing as archæological study. They had no reverence for the work of their predecessors.

If, now, Mr. Street has time between his masterly sketches, every line of which tells upon the imagination, and his correspondence, he may just as well survey his works of restoration a little more accurately. In this case, he might have found out when Abbot Knowles' lines would have inpinged on existing walls, &c. I happen to have before me vol. xx. of the "Architectural Journal," in which are some careful plans, by Mr. E. W. Godwin, probably the most accurate that have ever been taken of this building and its precincts, which show how curiously inaccurate in many ways is Mr. Street's description of the cathedral. Before closing this I must protest strongly against the Vandalism and folly of interfering with the north side of the cloister. If Mr. Street is unable to contrive a passage between it and the south wall, though it could surely be managed by half of the passage being recessed in the thickness of the wall, it would be far better to leave out the passage altogether, and leave the cloister blank, as it now stands, than to allow any tampering with it.

J. C. J.

MR. T. McLEAN'S NEW GALLERY.

THE third annual exhibition of water-colour drawings was last week opened at the new gallery, No. 7, Haymarket. The character of the exhibition may be gathered from the following brief extract from the preface of the catalogue:—"The object of this exhibition has been to collect together some of the finest works of best water-colour painters of the present day, and also the productions of English masters of eminence of an earlier period, and to include the careful works of many young artists who are, no doubt, destined to occupy a prominent place in their profession." The list includes the names of Turner, D. Cox, De Wint, Copley Fielding, Prout, Callow, Cattermole, Duncan, Linnell, sen., L. Haghe, J. D. Harding, Carl Haag, T. L. Rowbotham, T. M. Richardson, G. Fripp, J. G. Philp, Birket Foster, E. Richardson, Vicat Cole, S. P. Jackson, W. W. Deane, and several others. The collection is remarkably good considering its size, many first-rate examples of the various artists being exhibited, with scarcely a drawing of any kind which is absolutely bad. Those who admire the old-fashioned style of water-colour drawing will find choice examples from the brushes of Turner, De Wint, D. Cox, Copley Fielding, Prout, and Duncan. Those who prefer the modern pre-Raphaelitish stippled style will be gratified by the works exhibited by Birket Foster, Vicat Cole, E. K. Johnson, and many others. For ourselves, we must say at the outset that these works, though fetching high prices and enjoying the brief favour of fashion's patronage, are neither works of art nor true depictions of nature. The modern method of seeking to represent every leaf on a tree, every blade of grass within ken, is of necessity wrong. Were it possible to show every leaf, twig, blade of grass or corn, the result would even then be unpleasing, inasmuch as the eye must be focussed for the several distances, and nature is never thus seen. If we look at the distance the eye generalizes the foreground, and *vice versa*. It was thus that Claude, Poussin, Rubens, Wilson, Gainsborough, and Turner saw nature, and thus is she seen by every one who has ever held a broad brush in a bold hand. We have ever protested against the influence of fashion upon art. The picture daubed over with brown varnish fifty years ago—to give tone, forsooth!—is well nigh ruined in the present day by the process of removing the filthy mixture. The water-colour drawings of the end of the last century, brown with tobacco juice, liquorice water, and various choice mediums of the like nature, are now almost valueless, few of them comparing in effect with the mezzotint engraving of the same period, and yet fashion introduced the brown varnish and the tobacco juice just as fashion now changes the whole principle of water-colour drawing by the introduction of opaque colour in excess, gum, megilp, and, unless we are shrewdly mistaken, oil colours lifted with the palette knife. The whole difference between the process of oil painting and water-colour drawing is that in the former art the colour stands on canvas which it cannot saturate; in water-colour drawing, on the contrary, the colour sinks into the paper, and unevenness of surface, except that produced by the grain of the paper, is inadmissible. Having said thus much, which will probably furnish a key to some of the criticism we may be called upon to make, the pictures themselves demand individual remark. To notice all is impossible—there are 185; to confine remark to a few of the very best is unfair where so much is good. Taking the order of the catalogue, Mr. T. M. Richardson's "Roman Woman," No. 2, is much better than his usual conventional pieces, some of which we shall notice later. No. 4, "The Little Fisherman," by W. J. Coleman, is not worthy of a place in the collection. No. 6, "View near Haslemere," by Vicat Cole, is woolly all over; the sky is as ingenious an exhibition of wasted time and labour as can easily be matched. It will doubtless sell for a high price. No. 7, "The Cornfield," by W. J. Coleman, is photographically correct. No. 14, "An Italian Lady," by A. Bouvier, is a representation of the Venetian type of Italian female beauty—that is to say, "very fair, but yet suspect of fame." No. 17, "The Beach, Milford Haven," by B. Warren, has a sky very similar to No. 6, by Vicat Cole—that is to say, woolly, indefinite, and disagreeable. No. 19, "A Head," by E. Lundgren, is the best that he exhibits—Nos. 86, 98, 119, being positively dirty in tone and indifferent in drawing. No. 23, "The Common," J. W. Whittaker, is very natural in tone. Captain D. Lowe has sent a good drawing of a piece of Welsh scenery, No. 26, but the sky is done in the indefinite style at present in such favour. No. 27, "Sancho Panza," by John Gilbert, is of great force, good tone, and general merit. If this drawing has its deserts, it will one day prove a good investment for the fortunate purchaser. John Linnell, sen., contributes a small picture representing the "Disobedient Prophet." As a work of art it is worthless: as a specimen of Mr. Linnell's works, it has a certain value. No. 32, "Tenby Bay," S. P. Jackson, is lifelike and technical. Mr. Jackson knows a ship when he sees it, and can distinguish between a Welsh collier and the galley of Ptolemy Philopator. No. 34, "The Greeting in the Desert," by Carl Haag, is a very fine drawing, and the same may be said of all that he contributes to this exhibition. Here we have the Sphinx and the Pyramid almost invisible through a cloud of desert sand, from which a traveller on a camel salutes in passing another in the foreground. About Mr. Haag's pictures it must be said that they have character and *vraisemblance*. No one can doubt but that he has dwelt in tents, has seen Almeh dances, ladies in kôh and shintyan, starving fellaheen, rapacious Bedouins, and must have distributed much bucksheesh first and last. Nos. 55, 139, are by the same artist. No. 63, "The Lock," by B. Foster, is good in tone. No. 69, "Falmouth," J. G. Philip, is in the old-fashioned style, and forms a very pleasing picture. No. 77, "An Italian Sketch," T. L. Rowbotham, is in his usual conventional style. The idea of the conversion for chromo-lithographic purposes is never out of this artist's head. The sketch represents a boat drifting on to some rocks on a Mediterranean coast. The distant sea is blue, tolerably true Mediterranean sapphire, the water in the foreground is green, which the Mediterranean never is, unless when the sirocco is blowing, in which case the yellow cloud of Barbary sand makes the whole expanse to appear green. "A Shadowless Day," No. 78, by E. K. Johnson, represents a party of girls about to commence croquet. The piece is pre-Raphaelite, but cleverly done. No. 79, "Reverie," by G. Hicks, represents a lady looking literally blue, and altogether like a plum. No. 83, "Gipsey Encampments," by E. Duncan, is a small but very pretty picture. It is sold. No. 88, "Teaching Dolly to Dance," is the last by Mr. Birket Foster. It has sold very well. No. 48, "El Patio," the interior court of a Spanish house, by W. W. Deane, is one of his very best works. Low in tone, delicate in colour, and full of light and atmosphere, this picture cannot fail to commend itself to the true lover of transparent water-colour drawing. The price asked is, in our opinion, below its value. No. 49, "Deserted," by E. Duncan, represents an abandoned ship. It is a pity that very good artists undertake technical subjects without technical knowledge. The only object in the picture is a vessel labouring on a greenish-brown sea under a reddish-brown sky. Technically, the vessel is as much like Noah's ark as a modern brig. It is usual to place the masts of a ship in the centre of the deck, and it is unusual to "steeve" the bowsprit to an angle of 45 deg. No. 51, "The Ferry," E. Hargitt, is plastered with body colour. No. 56, "Plaiting Ivy," by A. Bouvier, is a slight thing in the modern French style. It is thoroughly insipid. No. 59, "Full Cry," by F. Taylor, has been sold for a large sum. It represents a sort of Di Vernon galloping into a lake, doing her best, meanwhile, to ride over the hounds. No. 62, "On the Wye," Birket Foster, might be in oils for aught the spectator can tell; it is floated with

ım and body colour. No. 63, "On the Thames," a good specimen of the same artist's work. o. 87, "The Bull Ring, Seville," W. W. Deane, slight, being little more than a sketch. It is ll of light and tender colour. No. 92, "Esa, on e cornice road between Nice and Mentone," . M. Richardson. This, like all by the same tist, is too good to be true, and almost reminds e observer of the drop scenes of theatres. No. 10, "A Calm Day," by Copley Fielding, is in his st style. In this portion of the gallery are ouped the works of Fielding, D. Cox, Prout, ı Wint, and Turner. These men were always ght, and out of slight materials could make a cture. L. Haghe exhibits an "Interior at Antrp," No. 129; and J. D. Harding contributes "Landscape," No. 136. Mr. E. Richardson's Durham," No. 138, appears to us to possess all e merits of the peculiar style of Mr. T. M. chardson, while avoiding the palpable struggle : effect which pervades all the works of the ter. No. 140, "A Hoar Frost," by G. Fripp, well worthy of notice. No. 142, "Off Dover," J. Callow, is a good specimen of his style, and). 156, "Up Channel," by the same artist, is chnically correct, and has the true heave and tion. No. 169, "On the Somerset Coast," by G. Philp, is another charming little piece. No. 6, "Pine Forest, Sunset," is literally ablaze with ht. There are a few rough sketches by E. Lear Nos. 177, "Venice;" 178, "Malta;" 179, Athens;" 172, "Corfu," which would be inesting as souvenirs to those who know the alities.

THE FUTURE OF LONDON ARCHITECTURE.

F the architecture of London be not improved, and if the metropolis does not become the st splendid city in the world, it will not be beıse there is a lack of advisers. A few weeks ce we noticed an article in the "Quarterly view" which found fault with almost everyly and everything, and offered copious advice the building of the New Law Courts in parular, and everything in general. The last mber of the "Fortnightly Review" contains able article on the Future Architecture of ndon, from the pen of Mr. H. Conybeare. We ıll embrace an early opportunity of offering ne observations on this article, and shall con ıt ourselves at present by taking some extracts m it. Mr. Conybeare is an advocate for amic surfaces—

"There are," he says, "two methods by which a amic surface may be obtained in the façades of nden houses: first, by facing the structure with oured bricks so disposed as to accentuate the hitectural and constructive lines of the build; in the same manner that coloured brick and ra-cotta are used in the North Italian build; of the fifteenth, sixteenth, and seventeenth ıturies, the only difference being that the oute surface of the bricks would be rendered ıt-repelling by being glazed.

'A London brick-merchant's catalogue usually ludes some thirty different varieties of bricks, ongst which are to be found at least three tinct shades of red, as many of yellow, several so-called white and blue, and also of black cks; and any of these might be had glazed r an additional cost of about £2 per thousand.'

'Bricks faced with a surface of glazed white y are now coming into very general use for the erior of office courts in the City, where rected light is required for the illumination of posite windows. Bricks of this description, nufactured of Poole clay, and of any of the egoing colours, can be delivered in London for ut £6 10s. per thousand, and each thousand bricks will face a surface of 18¼ square yards.

'The second method by which a soot-repelling amic surface may be given to our London ades is by covering them with porcelain tiles, hitecturally disposed and set in cement; and s method is already coming into very general for giving a light-reflecting surface to the inior courts, the passages, and the staircases, of y offices. It is, moreover, one which has been d for centuries past in the East, especially in sia and Scinde, on the grandest scale, with the st magnificent architectural effect."

After giving several illustrations wherein this de of decoration has been successfully adopted Persia and elsewhere, Mr. Conybeare goes on to —

'Some purists object to such a mode of deco-.on, stigmatizing it as 'veneering,' but it is really nothing of the sort. The essence of criminality in veneering is, that it is an attempt at deception; that a shaving of rosewood is glued over a deal board in such a manner as to suggest the falsehood that the whole substance is rosewood. Obviously there is no *suggestio falsi* of this sort in a tile-encrusted façade, for its ceramic surface does not imply that the structure is all porcelain. It pretends to be nothing more than it is, a surface decoration. Moreover, in the sunless and sooty atmosphere of London such a material is obviously the right thing in the right place, and therefore its adoption is in accordance with the 'eternal reason' which, as Goethe has truly sung, is the first and all-pervading principle of all real art.

"Another objection made is structural—the liability of such surface decoration to peel off the building. This would only be possible if the builder scamped the work, for we have in London the cheapest and best cement in the world, a material which the highest authorities have pronounced superior in strength and durability, in the atmosphere of London, to any building stone (except granite) that we employ. In breaking apart experimentally stones cemented together with Portland cement, the stone frequently yields to fracture before the cement. In obtaining a ceramic surface, the use of tiles has several advantages over that of porcelain-faced bricks.

"First. There is a great saving in carriage, for either tiles or bricks must be produced at a considerable distance from the metropolis, and to cover the same surface the weight of tiles will only be from one-sixth to one-eighth the weight of the bricks.

"Secondly. The tiles admit of being so packed as to be very much less liable than the bricks to having their edges chipped in carriage.

"Thirdly. In operating with tiles you are much less fettered in your design than would be the case in working with bricks of uniform and determinate size.

"Fourthly. An additional advantage possessed by tiles over glazed brick is their applicability to buildings of hydraulic concrete or "bèton agglomméré," a material which all who are cognizant of its increasing use in France, and of its great superiority in strength, durability, and economy, to brick and mortar, are agreed, will before long, as I shall have occasion to explain at the close of this article, very generally supersede the use of the latter as a building material.

"Fifthly. Tile decoration is readily applicable to any extent to existing buildings. There is not a row of smoke-darkened brick houses, with rectangular holes for windows, that might not, by encrusting it with tiles, be transfigured in a few weeks, and at a very moderate cost, into a coloured façade like those met with in the old houses of Pavia, at the same time given a surface—

Quod non imber edax, non Aquilo impotens
Possit diruere.

"In point of fact, such a wholesale application of tiles is going on at present in the courts and interior passages and staircases of a great number of City chambers and offices, and there is little doubt that it will very shortly supersede all other methods of finishing the surface in such situations. As the object in these cases is simply utilitarian, to save light, these tiles are always white, but the principle of their application is just the same."

The following is what Mr. Conybeare thinks of Romanesque and Gothic:—

"I do not advocate the exclusive use of Italian architecture in our streets, though it has some undeniable advantages. The Burgundian Romanesque of the twelfth century (culminating in the cloister of the Cathedral of Puy-en-Velay, the *ne plus ultra* of ornamented construction), is capable of a far grander exterior effect; but to obtain such effect in the Romanesque, a much greater depth is required than in coloured Italian architecture, and when ground is of such enormous value as in London, this is a very important consideration. Again, although the twenty-five years that have elapsed since the revival of mediæval architecture have established its unquestionable supremacy in the case of ecclesiastical and collegiate buildings, I do not know a single instance of its successful adaptation to the *indoor* requirements of modern domestic architecture at all approaching in fitness and architectural effect to what we constantly meet with in modern Italian interiors.

"I mention the Romanesque style instead of the Gothic as the alternative to Italian for street architecture, because I believe the use of the pointed arch in such façades to be altogether incongruous. The very essence of Gothic architecture is vertical composition; that is, the stoppage of all the horizontal lines by vertical ones, just as in Greek and Roman architecture all the vertical lines are stopped by those that are horizontal. In street architecture the leading lines of the composition must be horizontal, being those of the floors of the building, which floors are horizontally disposed one above another, and should be indicated externally by the horizontal lines of the cornices, strings, and balconies; and thus, if the whole design is not a sham, the composition of the façade must be horizontal, and consequently incompatible with the very essence of Gothic architecture. No amount of Gothic detail can make such a front genuine Gothic. The voice is Jacob's voice, though the hands are the hands of Esau.

* * * *

"Another advantage of Romanesque is that it is the only style that has a future, or admits of a farther development than it has yet attained. The Classical and Pointed styles each ran their course from prime to decadence—in fact, "played themselves out" completely; but the Romanesque, in Spain and in Germany, was suddenly and completely superseded by the importation of French-Gothic just as it gave promise of acquiring the unities of a perfect style. The French-Gothic Cathedral of Cologne was commenced while the glorious Romanesque apse of St. Cumbert's was being completed. Nevertheless, there are parts in many Romanesque buildings which exceed in architectural effect anything on a similar scale ever attained in Pointed architecture; for example, the exterior of the eastern apsides of Anderuach, Bonn, and Heisterbach; the interior of the apsidal termination of St. Cumbert, Heisterbach, and Ziozig; in each of these the semi-dome is different in type, and each is absolutely perfect in its way. By doubling each such semi-dome, and giving it twelve sides instead of ten, you can obtain a domed lantern for the intersection of the nave and transept of a cross church far exceeding in effect anything of the same kind ever attained in either Classical or Pointed architecture."

FAULTY GIRDERS.

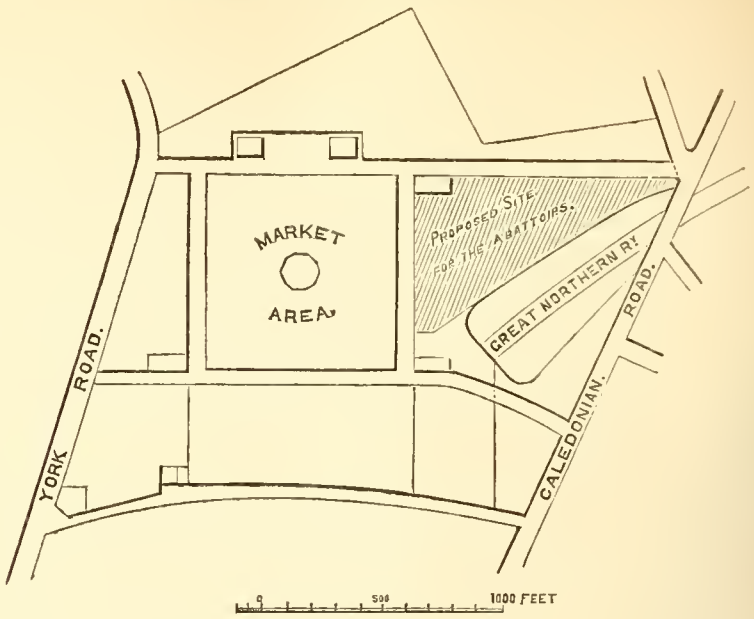
During the construction of the New Hop Exchange, in Southwark-street, the foreman noticed that a portion of the building was sinking at a very unusual rate. The attention of Mr. Moore, the architect, was called to the fact; and the sinking part having been shored up, the supporting girder was taken out, sent to Kirkaldy's testing works, tested, and found faulty. Mr. Moore thereupon very properly cancelled his order on the firm who had supplied it; and, ordering the rest of his ironwork from another house, took care to use none of it until it had been thoroughly tested. A little less careful observation on the part of the foreman, and a little less caution on that of the architect, or, if the girder had stood firm until a subsequent period, when a great mass of the building had been completed, and the consequence would have been certainly a large destruction of property, and probably a coroner's inquest. Upon whom would then have rested the responsibility? Upon the builder, with the questionable remedy of an action against the iron founder, for defective work in the material supplied. Under such circumstances, the only method of attaining protection is by rigorously testing every girder before it is fixed. Not a single exception should be made, and no ironwork should be allowed about a building until a guarantee has been given that it has been successfully tested. The introduction of iron, as a material for construction, has rendered increased engineering knowledge necessary to architects. Builders, however, should by no means take for granted the correctness of architects' instructions, with regard to girders. Testing must be rigorously applied, or complete safety will never be obtained.

We believe that the Indian Government has appointed a commission to examine and report on the various historical buildings in the several provinces of India, some of which boast an antiquity of three thousand years, with a view to their conservation. Photographs, plans, and measurements, it is said, are to be systematically taken.

METROPOLITAN ABATTOIRS.

THE report of the Markets Committee to the Court of Common Council, presented October 3, was adopted by a considerable majority at the last sitting of that body. The danger of driving cattle through the crowded streets of London would of itself be sufficient reason for the erection of the proposed abattoirs. It is computed that 500,000 foreign animals come to the Metropolitan Cattle Market annually, the whole of which are driven through the streets. In addition to the question of danger and inconvenience arising from the present system, the eventual dismarketing of Newgate Market, with its existing slaughter-houses, had to be provided for. It may not be generally known that the latter market is the cause of an enormous annual loss to the Corporation—a lease at a nominal rent having been granted many hundred years ago. This lease will expire in the course of a few years, to the great gain of the City of London. The necessity of metropolitan slaughter-houses, in connection with the Cattle Market, being universally admitted, the City architect, Mr. Horace Jones, received instructions in May last to prepare plans and estimates, and was also authorized to confer with the engineer to the Great Northern Railway relative to connecting the proposed slaughter-houses with that railway. In pursuance of his object he made a careful inspection of the abattoirs of Leith, Edinburgh, and Liverpool, and made a special journey to Paris to inspect the abattoirs which have long existed there, and also a very large new one not yet completed, but partially in use. Of the British abattoirs, he gives the palm to that of Edinburgh, remarking that the Liverpool structure affords an example of what should be avoided. To the new Parisian abattoirs, though designed on a very similar plan to the older ones, he gives the preference, stating that neither care nor expense has been spared to render them perfect. The report contains a general plan of London and its suburbs, with the site of the market at Islington clearly marked, showing that convenient accommodation could be made with the market and abattoirs, and with the country generally, as well as with the metropolis itself. It also contains a block plan of the piece of ground proposed to be appropriated for the abattoirs, with a small diagram showing the relative position of this ground and the market. This diagram we reproduce. It will be seen that it is of triangular shape, slightly sloping to the south-east, and the Great Northern Railway, on which it abuts, where a wharf could readily be formed for the loading and unloading of trucks, &c. The accommodation consists of an entrance and exit at the eastern end, with offices for the administration adjoining. The area of the ground is about eight acres, of which it is at present proposed to utilize the eastern portion only, about three acres. The accommodation, besides the administrative department, will include ten small slaughter-houses, with their addenda, ten larger ones, and two out of five special slaughter-houses, with so much of the tripery, boiling-house, chimney-shaft, and other offices, as may be necessary for the proper working of the establishment. The slaughter-houses are divided into two classes as regards size, the larger about 30ft. by 22ft., and 17ft. high, with a cattle pound 40ft. by 22ft., covered with a light shed roof. Separated from these a shed building, 22ft. by 20ft., capable of being converted into stables, cart-shed, &c. The smaller slaughter-houses to be 25ft. by 18ft., with cattle-pounds, sheds, &c. Five larger slaughter-houses are also provided, which could be used as public slaughter-houses, or let to private individuals requiring very extensive premises. There are large melting-houses, a tripery, a boiling-house, &c. The width of the roads in front of the slaughter-houses will be 60ft.; those between the sheds and cattle-pounds 25ft. The site lies well for drainage. The space is utilized thus: all round the exterior wall of the triangle are situated the stables and cart-sheds; an inner ring, if the term be applicable to a triangle, contains the cattle-pounds and slaughter-houses, while the centre of the plot is occupied by the melting-house, boiling-house, and tripery. The estimate is as follows:—Ten small slaughter-houses, £500 each—£5,000; ten larger, £7,000; two special, £2,500; entrance offices, first portion, £2,000; tripery, boiling-house, &c., first portion, £8,500; roads, sewers, &c., £5,500; contingencies, 10 per cent., £3,050; —total £33,550. The return from this sum, after all reasonable deductions are made, is calculated at £1,687, from which it will be seen that 5 per cent. may be reasonably expected upon the proposed expenditure, while, on the completion of the entire buildings, a larger percentage may be confidently reckoned on. The report having been adopted, we may expect that the works will be proceeded with immediately.

METROPOLITAN ABATTOIRS.



ST. PAUL'S CHURCH, HOOTON, CHESHIRE.

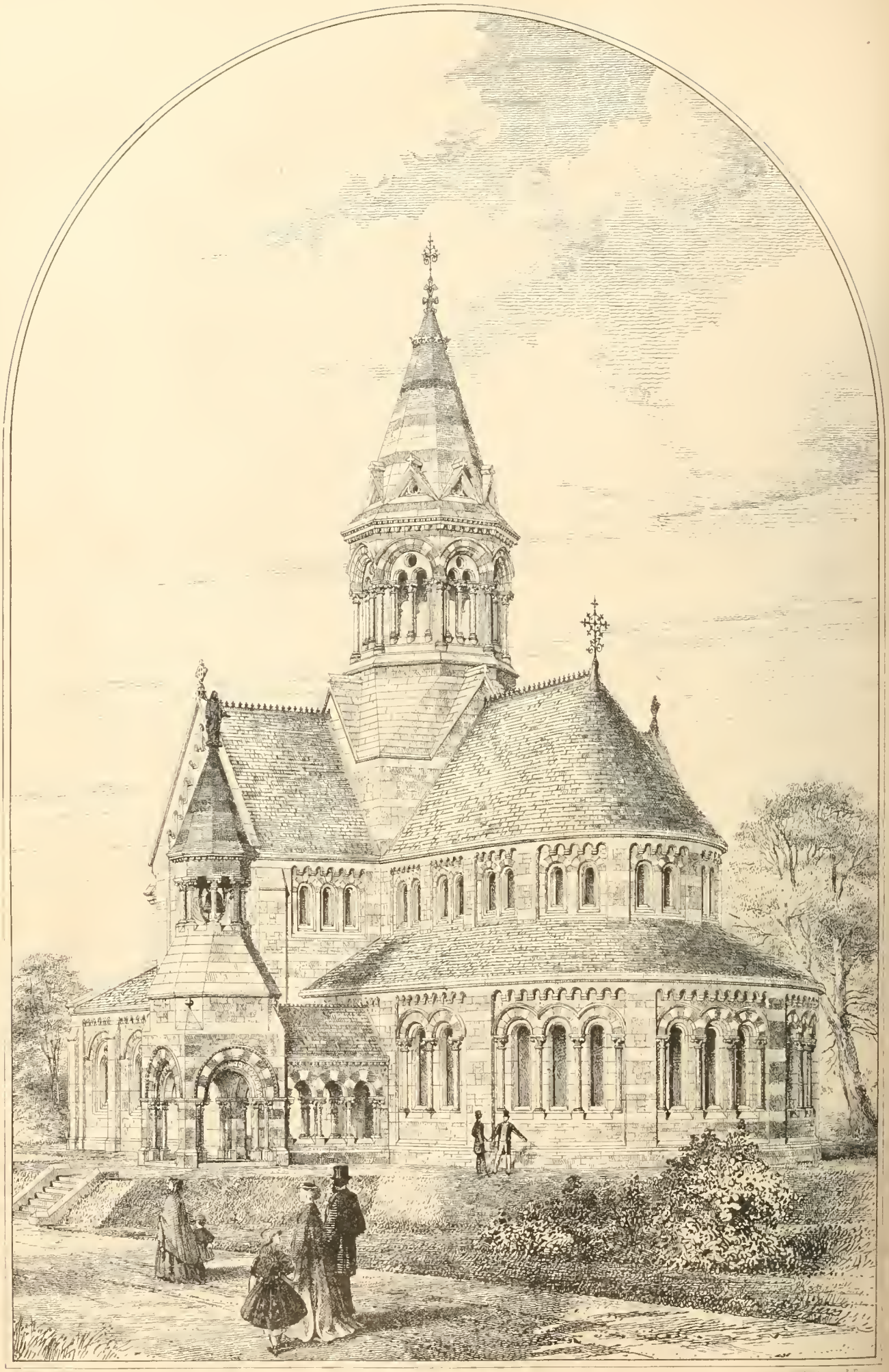
THE church of St. Paul, Hooton, Cheshire, of which we give exterior and interior views this week, has been lately erected and endowed at the sole expense of Richard Christopher Naylor, Esq., of Hooton-hall, and it is situated just within the lodge gates of the Chester entrance to Hooton-park, midway between the villages of Sutton and Thornton. The form is that of a cross with short transepts and a semicircular ambulatory at the east end, the intersection of the cross being surmounted by a stone dome and pendentives supporting a lantern which is open inside to the church. The arcade of the lantern is filled in with single sheets of plate glass, giving externally the lightness and appearance of an open lantern. The walls throughout, externally and internally, are wholly of stone. Externally the plain portions are of the red sandstone, hammer dressed, from Eastham Ferry, a quarry not far from the church, and upon Mr. Naylor's property. The bands and dressings are of the white sandstone from Stourton, near Birkenhead. Internally the stone is reversed, the walls and plain portions, as well as the carving, being of the white sandstone, the occasional bands and the alternate voussoirs of the arches being of the red sandstone. The pillars supporting the arches of the nave and chancel are of red polished Peterhead granite. The roof, which is of very solid construction although simple, is of pitch pine. The seating of the nave and aisles also is of pitch pine, selected with great care for its beauty of grain, and forms a very excellent example of seating in this very beautiful wood, and does great credit to the builders of the church. The seating and stalls in the chancel, as well as the open arched screens separating the ambulatory from the chancel, are of oak. The capitals and corbels of the nave and chancel, which are very well carved, having birds, &c., intermingled with the foliage, which is conventionalized from nature, were executed by the late Mr. Edwin Stirling, of Liverpool.

On the south side of the chancel, separated from the church by a short open cloister, having coupled shafts of polished red granite, is the bell turret, which also forms a private entrance to the hall. The spire of the turret is surmounted by a statue of St. Paul, also the work of the late Mr. Edwin Stirling. Beneath the cloister is a family vault for interment. The west entrance has an open porch with polished red granite and Cornish serpentine shafts and carved capitals. The tympanum over the doorway is filled in with elegant foliage and the words "Enter into his gates with thanksgiving."

The pulpit is executed in Caen stone with red sandstone diapered pedestal and angle shafts of Devonshire marble, having carved panels on the sides containing the monogram of St. Paul, the Greek monogram, &c., and was the work of Mr. T. Phyffers, of London. The font is of serpentine marble, and is the one which was exhibited by the Serpentine Marble Company at the International Exhibition, 1851. The east and west windows, the latter being a wheel window, are filled with stained glass by Messrs. Clayton and Bell, of London. The pavement of the nave, aisles, chancel, and ambulatory are of Minton's tiles laid in geometrical patterns. The church contains about 300 sittings. The total cost of the church was about £7,000. The architect was Mr. James K. Colling; and the builders, Messrs. Holme and Nicol, of Liverpool.

A new parsonage has just been completed near the church, which has been erected from designs by the same architect. It is of simple and unpretending appearance, being of brick with bands in the blue Staffordshire brick and a few red stone dressings. The total cost, including stables, was about £1,600. The builder was Mr. Peter Hodgkinson, of Sandbach, Cheshire.

Nothing has yet been done to carry out the alterations required in the House of Commons to afford additional accommodation to the members and to reporters, so, during the short session at least, things will remain as they have been so long. Mr. Barry's plan has been published. He proposes to curve the seats at either end of the chamber, and to raise them above each other towards the wall. By this means all the available space will be utilized, and a considerable number of additional seats gained, accommodation being obtained for about 550 members. As to the Reporters' Gallery, the only proposition at present entertained is that the old gallery above the Speaker's chair should be given up exclusively to the reporters attached to the daily press (of whom there are about 80), and another gallery found for the leader writers who crowd into the House on the occasion of any important debate, and obstruct the regular staff of reporters.



The Church of St. Paul, Hoolton, Cheshire. Mr JAMES K. COLLING, ARCHT.

F. Warry del.

Printed by Whiteman & Bass

Interior of the Church of St. Paul, Hooton, Cheshire. Mr. JAMES K. COLLING, ARCHT.

ELEMENTS OF ENGINEERING.

CANTILEVERS.—I.

WHENEVER any beam or girder, fixed at one extremity, or supported at both, or at various points throughout its entire length, is subjected to a weight placed upon any part of it which is not directly over the support, a force is generated tending to fracture it transversely to its length, or, in plain language, to break it in two. The strain producing this effect is called a transverse strain, and is, of all others, that with which those designing engineering and architectural structures have most to do. It is the most comprehensive of all strains, insomuch as it gives rise to all or most of the others contemporaneously with itself. A girder that is acted upon by this strain experiences in consequence, in some part or other, strains of compression, tension, shearing, and, frequently, of torsion also, especially if the position of the load be not regulated with a due regard to that of the centre of gravity of the structure, or if the mechanical details be not sufficiently attended to. The immediate result of a transverse strain upon a body is observed in the deflection which takes place, and which is proportional to the amount of the strain. Adhering to the principle we have adopted hitherto in these articles of first deducing a general formula, and then demonstrating its application to particular examples, instead of assuming, as is usually done, an especial case, and leaving the student to discover, in the best way he can, the solution of other practical examples to which the one generally selected bears no analogy whatever, we now proceed to the determination of the strains upon horizontal girders. The theory of all horizontal girders, as distinguished from that of the arch and suspension principle, is based upon the lever, the laws of which they rigidly follow. Let W in fig. 1 represent a weight placed at any point of an iron cantilever, and let it be

FIG. 1.

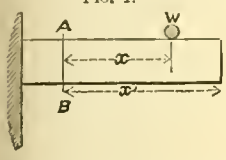
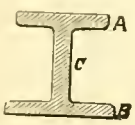


FIG. 2.



required to determine the strain resulting from the weight W on either the top or bottom flange at A B. Fig. 2 is a section of the cantilever, and A and B are the flanges respectively, the intermediate part C being usually termed the web. From what has been stated previously, it is unnecessary to remark that the weight is transferred to the support, where a vertical reaction takes place, and calling this resistance R, we have R = W. If we imagine the weight to travel or flow along the cantilever, until it is met and resisted by the support, we must also imagine the reaction to be propagated in a similar manner, but in a contrary direction. To find S, expressing the tensile strain in the top flange or the compressive at the bottom at A B, we must find the moment tending to break the beam at that point, then its resistance, and equate the two for the value required. Putting D to represent the depth of the girder, we have, upon the principle stated above, $W \times X$ = the force tending to fracture the beam at A B, and $S \times D$ = the resistance at the same point. Equating we find $S = \frac{W \times X.}{D}$ If W be situated at the extremity of the cantilever, calling X′ the distance from the end to the point A B, we have $S = \frac{W \times X'}{D}$, making L the length of the cantilever, the limits of the values of X′, are X′ = O and X′ = L. In the former case we have S = O, and in the latter $S = \frac{W \times L.}{D}$ The strains upon a beam fixed in this manner, and loaded at one extremity, increase from zero at the free end to their maximum value at the support, which is given by the equation $S = \frac{W \times L.}{D}$ As a practical example, let us take a wrought-iron cantilever, 15ft. long with a weight of 10 tons at the end. What is the ratio of the maximum strain to that at a distance of 10ft. from the end, where the weight is placed, supposing the uniform depth to be 15in. On comparing the two formulæ it will be seen at once that the ratio is as $\frac{L}{X'}$, or as 3 : 2. The number of square inches required in the flanges will be easily found from the equation $N = \frac{S,}{C}$ where C may be taken equal to 5 tons, and the respective areas of the cantilever at the support, and at 10ft. from the end are obviously in the same proportion as the strains.

It is manifest that these strains increase regularly, that is, by multiples of any given unit of distance, from the free to the fixed extremity or support; if the cantilever be 10ft. long, the strain at the latter point is ten times that at a distance of 1ft. from the former. There are, therefore, two methods of proportioning the strength of the beam to the varying character of the strains, and, as they apply to all horizontal girders, we shall designate them as uniform depth *versus* uniform section,—that is, we may either keep the depth constant and vary the section, or keep the section constant and vary the depth. As both forms have their own advantages, we shall consider the two descriptions. Whenever headway is desirable, the cantilever, with a varying depth, is the more suitable, and, also, should, in our opinion, be always employed where any attempt is made at designing an ornamental structure. The other form has the advantage, however, of simpler workmanship, and could, probably, be turned out of the workshops at a slightly lower cost. Maintaining the depth constant, as in fig. 1, it will be seen that A, the area of the flange at any point, varies simply as X′. In practice it would be impossible to make the sectional area follow the variations of the strains too closely, so that there must be some loss of metal in a cantilever where the depth is constant. The question of the form or shape given to cantilevers depends also, in a great measure, upon the materials of which they are constructed. Neglecting the case of timber as scarcely suitable, upon a large scale, to the modern requirements of architecture and engineering, we may consider the choice to lie between cast and wrought iron, and may assume that, where the former material is employed, the form given to the cantilever will possess a uniform section, so far as mere thickness of metal is concerned, but have a varying depth. Before treating in detail of cantilevers of wrought iron, we shall investigate the conditions attending those constructed of the older, though less reliable, material under certain circumstances. At the same time we are far from agreeing with the general opinion entertained, and in the almost universal condemnation bestowed upon cast iron since the introduction of its more elastic rival. Anyone who regards for a moment the number of cast-iron bridges erected over our thoroughfares by the earlier railway companies must be aware that, when the constructions are skilfully designed and properly proportioned, there is not the slightest fear of their failing. The truth of the matter is that the present distrust manifested by most engineers and architects with respect to cast iron is based upon the failures which have undeniably attended the employment of that material in large and important structures. But with the amount of prejudice and unfairness usually displayed upon such occasions, they seldom inquire whether those failures were the result of weakness and unsoundness in the material itself, or rather due to the want of skill and judgment in those who subjected it to the strains and conditions for which it was not adapted. Many of the failures were undoubtedly due to one and sometimes to both causes. Cast iron, by the early railway engineers, was, most unadvisedly, placed in positions and submitted to strains which, by its nature, it was not calculated to adequately withstand, and for which it was much too weakly proportioned, owing to the ignorance, in those times, of the strains acting upon large structures, and of the proper amount of sectional area to be given to them at the different points. Cantilevers of cast iron are usually, for the sake of appearance, constructed with the under side of a curvilinear or parabolic form, as represented in fig. 3. It is evident

FIG. 3.

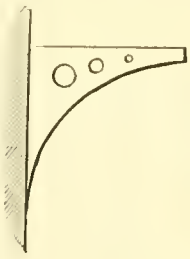
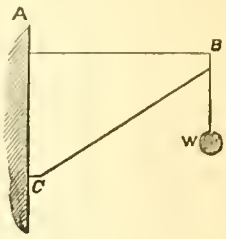


FIG. 4.



that it is a very simple affair to cast a beam of that shape, supposing the thickness of the metal to be constant. Practically, there are many objections to making any great difference in the thickness of the same piece of casting, owing to the varying rate of cooling, and the chance of a sudden brittleness occurring at any particular point.

From what we stated with respect to the employment of cast iron, it must not be presumed that we advocate its use indiscriminately. On the contrary, there are certain positions in which it would be most injudicious to employ it, especially where a heavy rolling load, in comparison to the weight of the structure itself, was to be provided for. At the same time, it is equally incorrect to place an expensive and awkwardly-designed wrought-iron beam in a situation wherein, if upon no other score than that of economy, a plain, cheap cast-iron girder would answer the purpose equally well. Similarly to all beams supporting a load, there are two principal conditions attending the loading of a cantilever. The load is generally either at the extremity (as in a crane, for example), or uniformly distributed over it, as when it supports a balcony or gallery. It has already been shown that when the depth of a cantilever is uniform, and the weight placed at the end, the expression for the strain at any point is $S = \frac{W \times x^1}{D}$, where x^1 is the distance from the free end to the point, W the weight, and D the depth of the girder. The value of S, therefore, varies inversely as D, or, $S = \frac{1}{D}$. Consequently, if we vary the depth, and cause it to increase in proportion to the strain, which attains its maximum at the point of support, the strains upon the flanges will be uniform throughout the whole length of the cantilever. Whether a cast-iron cantilever be subjected to a uniformly distributed load, or one place at its free extremity, it is usually, in both instances, made of the form shown in fig. 3. Strictly speaking, this form is suited, as will be explained hereafter, only to the case of a load uniformly distributed, and not to that which we are now considering. In this instance, where the weight is either placed upon or suspended from one end, as represented in fig. 4, the proper form for the cantilever to ensure an uniformity of strain in the flanges is that in which the depth regularly increases from the free end to the fixed one. Having, therefore, determined the greatest strain, by the equation $S = \frac{W \times L}{D}$, where L is the length of the cantilever, and D the greatest depth, or that at the supported end of the beam, all that remains is to draw a line C B to the free extremity, and the geometrical outline is

obtained. Theoretically speaking, the strain upon the lower or inclined flange B C, in fig. 4, will be slightly in excess of that upon the upper or straight one A B, but in practice this difference may be disregarded. The ratio or difference between the strains is in proportion to the respective horizontal lengths of the flanges, and it is manifest that this is very slight. In proportioning the area of the flanges, due regard must be had to the different strength of cast iron in resisting a tensile and compressive strain, which is about six to one. In our next, we shall investigate the conditions of a load uniformly distributed over a cantilever, and point how they affect the strains and proportions of the several parts.

THE BUILDERS' BENEVOLENT INSTITUTION.

THE twentieth anniversary festival in aid of the funds of the above Institution was celebrated on Thursday evening, 31st ult., at Willis's Rooms, King-street, St. James's. W. R. Rogers, Esq, president of the Institution, officiated as chairman, and about 200 gentlemen were present. After the loyal toasts were drank, the chairman proposed "Prosperity to the Builders' Benevolent Institution." He said that most of those present were aware that the Institution had been established more than twenty years, for the purpose of giving relief and granting pensions to unfortunate members of every branch of the building trade, as also to their widows, and during that period a vast amount of good had been done, owing to the very great judgment exercised in conducting and managing the affairs generally. The desire still was to increase the Society's sphere of usefulness by increasing the number of pensioners. He found that they had put by sums of money every year which were invested in the public funds, and he had no doubt, when he had addressed them, there would be a good deal more. He found that they had in stock £13,000; then there was the interest to be added to that amount, and also the new donations and subscriptions, which, without going into details, he might say that they would be considerably over £1,000. The £13,000 mentioned was not of itself entirely for the pension fund, for out of that sum £2,900 had to be set apart for a special fund for building purposes. He would not, however, go further into that question, but call the attention of the gentlemen present to the number of pensioners then upon their books, namely, 45, and he would also say that at each election several of the candidates who were unsuccessful had to wait for a second, third, or even a fourth time. And then, again, in order that the candidates might be eligible to the rules, they must be 65 years of age. That was not what the builders of London would be content with. No person, according to the rules of the Institution, could be eligible to the benefits until they reached the age of 65, and then, having been elected, their enjoyment of the pension could only last for a few years, say, as he understood was about the average, ten years. He wished to alter this, and for the purpose more funds were required; that was the way it was to be remedied. He was of opinion that they should receive the benefits of the Institution before they reached so advanced a period of life. He would make 60 instead of 65. He was very glad to find such sympathy among them. The question then was, how it could be done? There was only one way. There were 1,300 builders in the metropolis, besides a vast number of other persons connected with the different branches of the trade, from many of whom who were prosperous and wealthy, an annual subscription had not been obtained. If they were to subscribe, the funds of the Builders' Benevolent Institution would be greatly enhanced, and the desired aim could be attained. When he (the chairman) became their president, his first effort was to endeavour to raise the funds of the Institution. He could see that those subscribers who gave one guinea, might give two, or even three guineas, even if they made a slight sacrifice, for, really, it was no charity to give away that which they did not want themselves. If they had any doubt as to whether it should be two, three, or five guineas, all he could say would be "give the Institution the benefit of the doubt." He called their attention to the vicissitudes by which their trade was surrounded. Any master builder might be taken by misfortune, through no fault of his own, and become so reduced that he might be necessitated to seek relief from that Institution, and he mentioned that for the purpose of showing how needful it was that they should look after their unfortunate brethren. A very distinguished architect upon whom he (the chairman) had called, gave a good subscription, but he was surprised that the builders were not able to help themselves. He (the chairman), since he had become connected with them, had felt a great interest in the Institution, and had collected a considerable sum. He would tell them what that sum amounted to—it was £1,000. He had done that with a motive. He thought the building trade should have ample funds to relieve their distressed brethren. He wanted to increase the number of pensioners, and he wanted to increase the amount given. At present, they gave £24 to the men and £20 to the women per annum; but how much more satisfactory it would be if they could give them £30 and £25. He was quite content to believe that ample funds could be obtained for such purpose, for there was no want of sympathy. The want was—more funds, more subscriptions, to make the declining years of their unfortunate brethren happier; and to obtain such result he suggested that each well wisher of the Institution should call upon his friends and obtain their subscriptions, for means they required, and he was sure that if sought for the efforts would be crowned with success. He had obtained ten subscriptions of £100 each, and he was sure that if applications were made, that such examples as those he had just mentioned would be followed. They would give a subscription, they would give something in proportion, so that their own Institution should be first supported before going to another.

Other toasts were drank and spoken to by Mr. Geo. Plucknett, Mr. Thos. Cozans, Mr. Ben Hannen, the late President, and Mr. A. G. Harris, honorary secretary, who announced that the donations and subscriptions up to that evening amounted to £1,321.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE first ordinary general meeting of the institute was held on Monday evening at the society's rooms, Conduit-street. The chair was taken by Mr. C. Barry, in the absence of the president, who was suffering from indisposition Amongst the deaths of associates which had taken place during the past year was that of Professor Faraday, respecting whom a short memoir was read by Mr. Seddon, one of the honorary secretaries. The next business was the proposal of new members, of whom three, proposed by Professor Donaldson, were distinguished architects of Vienna—namely, the Chevaliers Ferstel and Schmidt, and M. Carl Hasenaur. The mover stated that he had seen the drawings of those gentlemen at the Paris Exhibition, and had been struck with their science, thorough acquaintance with the subject, and artistic execution. Especially had he admired the design of M. Carl Hasenaur for the restoration of the cathedral at Florence. Mr. Godwin seconded the motion, and the gentlemen above-named were elected by acclamation. Mr. Donaldson next announced an intended expansion of the library, and read a letter from Mr. Beresford Hope, dated Cannes, in which that gentleman expressed a hope that he should be shortly restored to health, and offered a donation to the library of £100. Mr. Godwin announced that Sir John Lawrence, the Governor-General of India, had taken steps for the preservation of the architectural remains of that country, and Mr. Donaldson expressed a hope that some one would take a similar step with regard to the architectural antiquities of England. He had recently visited the castles of Conway, Beaumaris, and Harlech, and had found them all in a perfectly ruinous condition. Struck with the circumstance, he, Mr. Donaldson, had corresponded with the Government, and had been informed that Conway and Beaumaris were in private hands, but that Harlech was still Government property, and should be looked after. In consequence of the information he had thus obtained it was his intention to get Mr. B. Hope and Mr. Tite to move in the House of Commons for returns respecting those three ancient historical castles, so as that the public might know how it was that they were allowed to fall to ruin. Mr. Godwin then read a memoir of the late associate, Mr. Fowler, which had been compiled by Professor Donaldson, and shortly afterwards the proceedings terminated.

THE CATHEDRAL OF WORMS.

ONLY a few years ago the beautiful and historical Cathedral of Worms threatened to become a mass of ruins. But as the falling east end of Ely was once screwed and pushed back into its place by machinery designed by a village carpenter, so at Worms the structure has been once more firmly compacted and all its parts reunited by means as ingenious as they are cheap. Worms has thus preserved the only monument of its former greatness. As a city, it is now one of the most insignificant in Germany; but in historical recollections it is one of the richest. Charlemagne singled it out as his chief residence, and under him it became the most important of German cities and the centre of the Empire. When the palace was burned in the winter of 796, Worms lost the honour of being the Imperial residence, and the new palace built at Frankfort was in a manner the origin of that city. At that time the Cathedral of Worms was merely a wooden building. In 872 it was fired and completely destroyed by lightning. In 996, eighteen years after the foundation of the Cathedral of Mentz, Archbishop Burkhard began to rebuild that of Worms in stone. The unfinished structure was consecrated and dedicated to St. Peter, in the presence of the Emperor Henry II., in 1016. Bishop Eppo (1105) continued the building, which was completed by Bishop Conrad in 1181, when it was again consecrated in the presence of the Emperor Frederick I. The main parts of the existing cathedral belong to the twelfth century, except the vaulting and the western choir, which belong to the thirteenth, and the upper part of one of the towers, which dates from 1474.

The importance of Worms culminated in the early part of the sixteenth century. In 1521, the date of the Diet at which Luther appeared, it contained 80,000 inhabitants, 100 strong towers, and 10,000 men capable of bearing arms. No town suffered more severely from the schism and war which that Diet announced. During the storm, the Cathedral of Worms had suffered much, but its walls were still erect. After the peace of 1648 and the reconciliation of the contending parties, the restoration of the cathedral was one of the first works to be done. But a new evil swooped down on the land. In spite of the truce concluded at Nimeguen for twenty years, the French armies entered the Palatinate, and, it is said, reduced some 1,200 towns and villages to ashes. Worms was among them. The Bishop, John Charles von Frankenstein, then eighty years old, had to be carried out of his burning palace. The citizens had been assured that the cathedral should be respected. Thither, therefore, they fled with their valuables, but only to afford to the enemy a more compendious opportunity for plunder. Everything was rifled and destroyed. The very tombs were broken open, the monuments mutilated, the walls of the cathedral mined, and a train laid to blow it up. But the catastrophe was averted by the news of the arrival of German troops. In the desert to which the Palatinate had been reduced, the Cathedral of Worms was one of the few monuments still unchanged; and it yet remains a matchless example of pure and harmonious Romanesque architecture. After the peace of 1697 the inhabitants of Worms returned to rebuild their town, and to restore their cathedral. The Bishops, Francis Lewis, afterwards Elector of Mentz, and Charles Frederick, put it into a complete state of repair. But the French Revolution once more gave it over to profane purposes. Afterwards the general impoverishment of the country, and the insignificance into which Worms had fallen, were such that it was difficult to collect money enough to restore it to Divine worship. But in 1860 a plan was devised by which, with incredibly small expense, the walls were riveted and bolted with iron ties, and completely solidified, and the half ruinous roofs of the nave and eastern apse removed and restored.

Worms Cathedral is a structure of much the same character as that of Mentz. Its architecture is commonly called Lombard, for the Lombards in the sixth century first introduced into Germany the Romanesque architecture, which had been formed upon Roman models and developed in Lombardy. Its ground plan is essentially the same as that of Mentz. Its nave is divided from its aisles by piers and arches of the same solid kind, though its aisles are proportionately much lower than those of Mentz. Both churches have their east and west choirs, two cupolas, and four towers. Worms, however, is smaller than Mentz, and, being without the grand central tower, pro-

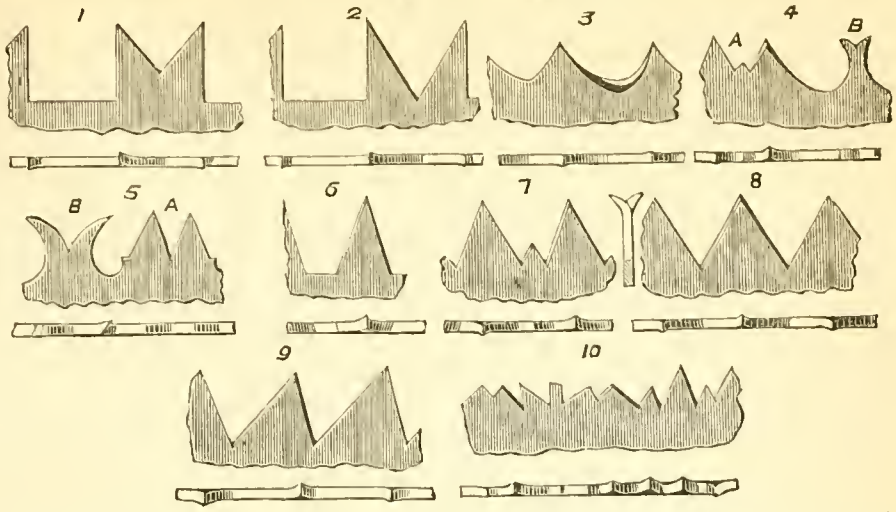
duces far less effect. But with its superior proportions, with the rich arcades of its eastern façade, its western choir, its two cupolas, and its western towers, it must be pronounced to be the purer and completer example of the style. Its east end is peculiar. Instead of the ordinary apse, it has a rectilinear façade pierced with three large round-headed windows, over which is a covered gallery with eight columns, standing on grotesque figures, which grin over the architrave. The pentagonal western choir appears deficient in harmony, owing to the arbitrary manner in which its wheel-windows are disposed. The tone of the building is massive and simple. But the capitals of the columns in the arcades, in the north porch, and especially those under the cornice of the nave, are executed with great delicacy, and exemplify the last and most perfect stage in the development of Romanesque ornamentation. Carvings of this kind are generally executed *in situ*. For this reason we find some of the capitals left in the state of rough square blocks, while those which are finished were executed at different periods—a fact which has misled many critics, who have forgotten that the date and style of a building can only be determined with certainty by its general structure, and not by an accidental ornament or moulding. The two western towers have beautiful arcades which give a rich effect to the whole building. In Worms, as in Mentz, the side walls of the nave were broken through in the fourteenth century, in order to add chapels. Here, however, there are only three, one on the north and two on the south side. These chapels, with the baptistery and so much of the cloisters as the French left standing in 1793, are Gothic. The south portal is a grand example of this style, and in its stone pictures the chief events of the Old and New Testaments are represented. Among the figures is one which was once a favourite type, the best specimen of which is to be seen at Basel. It represents Sin, in the form of a smiling woman decently dressed in front, but behind exposing her naked limbs to be gnawed by serpents and horrible worms. Over the entrance is Christ crowning the Virgin, with St. Peter and St. Burkhard on either side. In the gable of the portal the triumph of Religion is typified by a crowned woman riding on a beast with the four heads of the symbols of the four Evangelists. This portal, with its clumsy and plebeian conceptions, seems to exhibit the commencement of the deterioration of allegorical symbolism.

The interior, like that of Mentz, is harmonious in style; but at Worms the proportions of the various linear dimensions are finer. We know of no church where the happy mean has been so successfully touched. The monuments were all destroyed by the French in 1688. The only one now in the cathedral was brought later from a neighbouring convent. It is said to represent three Frankish princesses martyred by the Huns. It is of the thirteenth century, and valuable as a work of art. Since the happy repair of the walls in 1860, the restorers have proceeded to decorate the interior. Two vaults, that of the eastern choir and that of the south transept, have already been painted. As in Mentz the effect is spoiled by the dark blue of the ground, so here it is equally injured by the light grey, while the narrow marginal gold stripes look very poor and modern. An unworthy deception, quite contrary to the spirit of the architecture, though it may be defended by the examples of Cimabue and Giotto at Assisi, has been attempted, by painting the plain vaulting ribs so as to look as if they were covered with ornaments chiselled in stone. Models of good ornaments of every stage and era of art are to be found; and judicious selection is better than originality when the problem is to decorate a noble and historical edifice in accordance with its style and general spirit.—*The Chronicle.*

CHEQUER-ALLEY.

IT would be difficult to find a more uninviting neighbourhood, even in London, than the labyrinth of courts at the back of Bunhill Fields. They seem to combine in themselves every unhealthiness and inconvenience which bad building and bad planning, or, rather, the absence of any plan, can secure. They are dirty, dark, and gloomy. Every provision of the Building Act seems to have been set aside in their construction; and worst of all, every bad principle which we can trace in the wretched tenements which compose them, seems reflected in the squalid inhabitants. They look haggard and anxious, not exactly sickly, but of a low tone of constitution. All robustness seems to have left them. The police, it is to be feared, could tell a sad story of the lowness of the moral tone of these byways. A short time since, two wooden cottages, a cow-shed, and a pig-stye, occupying together the angle where Chequer-alley and Pump-alley—two of the principal thoroughfares in this quarter—cross each other, were bought, with the land on which they stood, by a body of trustees. On this site a Wesleyan chapel, capable of seating 200 persons, has just been erected. In connection with this chapel are schools, and a house for the porter. The cost of these buildings amounted to £1,500. Mr. G. Hoole, of Craven street, was the architect. Stock brick and Bath stone were the materials employed. The design is of the plainest and most unpretentious character; for in a thoroughfare only 6ft. in width, not a great deal of the enclosing structures can be seen at a time, and architectural effect is impossible. Precautions were taken to insure thorough ventilation, and at the same time to exclude external noises, which last are rather prevalent in these parts, as may be supposed. Both schools and chapels are opened, and the trustees have the satisfaction of seeing them filled with the inhabitants of the miserable dens which surround them. The Earl of Shaftesbury laid the first stone. Mr. Hobson, of the Adelphi, was the builder.

VARIOUS FORMS OF SAW TEETH.



MR. S. W. WORSSAM, jun., King's-road, Chelsea, gave, a few nights since, an interesting and instructive paper on mechanical saws. After glancing at the history of the saw, he gave the following information on saw teeth.

The subjoined technical terms, said he, are those generally employed by the saw maker in spacing out the teeth, and are required to be known to fully appreciate the remarks on this branch of the subject:—1. The space is the distance from tooth to tooth, measured at the points. When this interval is exceedingly small, as in the rip, panel, tenon-saw, &c, the saws are said to have so many points to the inch. 2. The pitch is the inclination of the face of the tooth up which the shaving ascends, and not the interval from tooth to tooth, as in wheels, &c. 3. The set of the saw signifies that the teeth are slightly bent to the right and left alternately through the agency of a saw set, or are upset successively by the hammer or crotch-punch, in order that they may cut a groove so much wider than the blade as to lessen its friction and allow it to work freely through the kerf made by itself. Some saws, such as hack-saws for metal, and those for ivory, &c., are usually made taper from the tooth to the back edge, so as to clear themselves without setting, as this would be a very tedious process with saws having perhaps fifty points to the inch.

The rules for regulating the forms of saw-teeth must necessarily be arbitrary, as much depends upon the nature and quality of the wood, and the direction in which it has to be sawn. In cross-cutting, the object is to sever every fibre or thread, and as the material in this direction is almost non-elastic or unyielding, teeth of an acute and nearly lancet shape must be employed, so that, acting like a series of knives in rapid motion they cut the threads asunder rapidly and sweetly, the saw-dust produced having a fine granular appearance. On the other hand, in ripping or cutting with the grain, the desideratum is to separate the texture, as it were; and as in so doing the teeth do not meet with so much resistance and resilience from the filaments as in cross cutting, they may be made much larger and coarser, thereby producing small shavings or chips, rather than sawdust. The nature and quality of the material to be sawn has considerable bearing on the figuration of the teeth, which, following the general law of cutting tools, and agreeably to common usage, have to be more obtuse or acute according to the disposition of the substances opposed to them. Soft and pliable woods, such as pine, willow, alder, limes, &c., permit the service of large teeth with acute points and considerable pitch, whereas hard woods, or those of a tougher and denser consistency, as oak, mahogany, rosewood, &c., compel the adoption of teeth of perpendicular pitch and diminished space. Certain woods, for instance, yellow deal, pitch pine, larch, &c., are of so gummy and resinous a character, that the teeth require not only more set, but the blades themselves have to be smeared with oleaginous matter, to keep them cool and decrease the friction arising from the adherence of the resin during motion. Similar results are experienced in working soft woods; the teeth become choked by the damp consolidated sawdust, and obstinately refuse to perform their duty without extra force and persuasive application.

The diagrams are not drawn to any definite scale, being merely to illustrate the form, and not the dimensions of the teeth, which vary considerably with the material to be operated upon, some being finer and others coarser, according to circumstances. The faces, backs, or tops of the teeth are expressed in angular degrees, measured from the line running through the points of the teeth or cutting edge of the saw. The angle of the point itself is found by subtracting the angle of the back from that of the face of the tooth, or the less from the greater of the first two numbers.

The varieties of teeth, as above illustrated, are employed for cross-cutting, and formed so as to cut in both directions, the angles of the faces and backs being analogous. Figs. 1 and 2 represent the M-teeth, so named from their resemblance to that letter. They are rarely employed, as the work produced is not commensurate with the expense of sharpening, &c. Fig. 3.—The half-moon or crenate teeth are adopted in South America for cross-cutting green timber after it has been felled, and bear some resemblance to our pruning and grafting saws. Figs. 4 and 5.—This saw is an importation from the United States, where it appears to be warmly advocated, notwithstanding the expense of keeping it in order. The two knives or fleams *a* penetrate the wood, and are followed by the hook or chisel *b*, which, after producing small chips or shavings, carries them along and discharges them below the timber. The action bears some resemblance to a carpenter's dado-plane, only it cuts in both directions. This saw is said to work with freedom and smoothness, and is superseding the old kind in localities where it has been introduced. The cutting chisels *a* are first filed up square, and the hooks or scraping tools are left nearly a sixteenth of an inch shorter, that too much stuff may not be cut out at once. After the cutters and hooks have been made to the proper lengths, the former are filed extremely beviling, so as to bring them to an edge only at

the extreme point of the tooth. Figs. 6 and 7 illustrate the fleam or lancet-tooth. Saws of this order are commonly reciprocated by steam power, the depth of the teeth and the intervals betwixt them absorbing more force than can be reasonably obtained from manual labour. The faces of the teeth are filed with a double-edge mill-saw file, which leaves small triangular pieces in the spaces; these are usually filed out; some people, however, leave them in (see fig. 7), as no advantage accrues from their absence. Figs. 8 and 9 show the ordinary dog tooth for hand cross-cuts. The teeth of the first diagram, fig. 8, from presenting equal angles on each side are said to be of upright or perpendicular pitch. By reason of the simple angular teeth being filed with the two sides of an equilateral-triangular file, the points assume the same angle as the spaces, or 60 deg. The teeth of fig. 9 are inclined about 15 deg. from the last, and are called slight-pitch; they are in requisition for small cross cuts; joiners and ivory cutlers use them; the latter stretch the blade in an iron frame to give it rigidity and tenseness. Fig. 10.—This diagram is taken from "Holly's Art of Saw-Filing," and typifies a class of saw known by the euphonious and expressive title of the "too common saw;" the teeth are ranged in charming irregularity, and appear to be only dependent on the vagaries of the operator.

CHURCH RESTORATION.

WE have just received a pamphlet published by Messrs. Pawson and Brailsford, of Sheffield, on Church Restoration. The pamphlet consists, chiefly, of articles and letters which have appeared in the BUILDING NEWS and "Times." It is dedicated to "Northern Vandals" in general, and to Mr. Rollinson, of Chesterfield, Mr. Dykes, of Hull, Mr. Shaw, of Rotherham, Mr. Teale, of Doncaster, and Mr. Perkin, of Leeds, in particular. The pamphlet treats of the restorations of Bolton-on-Deane, Conisbro', Penistone, Darfield, Darton, Rotherham, and Beighton Churches. There can be no doubt that much mischief has been done, and that it is now too late to repair it. This, however, is not altogether the case with Beighton Church, near Sheffield, to which we called attention a fortnight since. The following extract from the pamphlet shows that what "Tombstone" then said was not exaggerated:—

"Tombstone's" account of the doings at Beighton is not one half severe enough. If Beighton Church is allowed to be pulled down, it will be a lasting disgrace to all concerned. A prettier picture than it makes as one walks up from the station cannot be imagined. The new church is to stand on precisely the same site as the old one now does, so the excuse of want of room cannot be pleaded here. The plan is the same as "Tombstone" states, except that he has omitted to give a beautiful little chantry, communicating with the north aisle, and opening by an arch into the chancel. This chapel would have stood till doomsday. All the reason that could be got at for its destruction was "twas'nt int' plans." A few hundred pounds would easily convert this church into one of the best in these parts. The nave is very fine, being extraordinarily broad for the length of the church. Accurate drawings have been made, so that, although great part, or even, the whole, may be destroyed, they will be able to be brought forward in proof of these statements, if required. It will hardly be credited, but it is no less true, that the architect, Mr. Rollinson, of Chesterfield, has reserved to himself the beautiful oak roof carvings! Without any doubt, a more thoroughly shameful piece of work than this "restoration" was never heard of.

The following extract from "The Church Builder" will show the spirit in which restorations ought to be carried out:—Any well-qualified architect, versed in the mediæval styles, would at once suggest the most correct way of treating an old building according to its peculiarities, and it is of the greatest importance for the preservation of our ancient churches, that when alterations are contemplated, immediate recourse should be had to some competent authority before an ill-advised scheme, wanting, perhaps, in all the conditions essential to good church architecture, gets circulated, and biasses the minds of those possessing influence, who would exert their interest correctly if only put in the right way. The first desire in altering an old church should be to preserve all features of antiquity as far as may be practicable; they are so many links in the chain of architectural history. Beginning with the wall surfaces, it will generally be found that they are covered with thick coats of whitewash. This should not be hacked off carelessly, but removed cautiously. Sometimes traces of wall decoration belonging to two or three periods may be discovered under successive coats of limewash. Not unfrequently pictorial illustrations of scriptural subjects or legendary history are discovered, and often very beautiful foliated ornamentation remains upon the mouldings, sunk members of the window-jambs, arches, &c. These coloured fragments are of great value; they afford excellent hints, and should be religiously preserved. It is too often the case that promoters of restoration, whether clergymen or laymen, are more bent upon carrying out new works than preserving old; it cannot, therefore, be too strongly insisted upon, that in dealing with an ancient church the object should be not simply to put the building in good repair, but to preserve and perpetuate an authentic specimen of the ancient arts of our country. Every old building has an historical value, and it should be remembered that its value is gone when its authenticity is destroyed; the duty, therefore, of all these having charge of ancient buildings should be, not so much the renewal of what remains as its preservation, and to keep uninjured every portion of mediæval work which it is in any way possible to save, remembering that new work is of no value, excepting so far as it serves to preserve the ancient design, and that no interest will ever be attached to it unless original parts remain to attest its authenticity.

ROAD FOUNDATIONS AND SURFACES.

THIS question has certainly not received the attention that it ought, and we willingly give currency to any useful suggestion likely to promote an improvement in our street and road foundations and surfaces. Mr. W. Bridges Adams asks are we prepared with any mechanical structure as a covering adapted for permanence? We have had wood, and stone, and iron, and broken stones, and asphalte, and asphalte and stone, and big stones, and small stones, but we have had nothing that, under heavy work, lasts more than a year or two. The reason for this is that they have no foundations worthy the name; the surface is relied on both for strength and wear. Sometimes concrete is applied as a foundation, but too thin to resist, and therefore breaking, as each stone is rammed down in succession, like a row of nails, by passing wheels.

Now suppose our great London Ædile, Sir John Thwaites, should, for once, take it into his official head that there ought to be, and should be, laid down a sample London road, and say, *sic volo sic jubeo*, there is an admirable site at hand, and under his control, in the Thames Embankment, as yet guiltless of underground tubes save the brick tunnel.

Sir John Thwaites will therefore reason thus:—"A good road must consist of two parts; a solid, firm, but still an elastic foundation,—a substructure with a superstructure on it for the purposes of wear. It is well known that a surface of broad flag-stones is much less liable to disturbance than one composed of small stones, and the great size of the stones was the reason why the ancient Italian roads have descended to us undisturbed by time, though worn into gullies by the wheel tracks. Upon new embankments concrete is apt to settle and break. We want, therefore, a substance that will not settle and break. This is to be found in timber. But timber is apt to rot. But timber creosoted is not apt to rot, and is very durable. A creosoted timber floor, then, is the thing to aim at, but not an ordinary floor of boards laid down on joists."

Sir John will say, with sound, common Saxon sense, "Let us lay down the rules after the fashion of Mrs. Glasse":—

"Take a sufficient number of the common deals of commerce, 9in. wide and 3in. thick, and saturate them thoroughly with creosote, then level the surface of the projected road, and lay down on it the deals side by side, then cross these deals with others at a right angle, till a double floor is formed, which will not require any fastenings but the curb stones to keep them in position; the road proper is thus complete, and only needs surfacing. A very good surface could be made by laying down kentledge, or ships' cast-iron ballast, measuring about 2ft. in length by 4in. square; if objected to as too heavy it might be cast in the form of hollow boxes, or hollow cubes in ridges might be applied, or stone cubes made to fit accurately to each other and on to the planking, every side being square and smooth, but with the edges arrised for horses' foothold. In this mode the road might be made nearly flat. If rough cubes were used they would need to be grouted with hot lime grout.

"Such a road would at all times preserve an even surface, and blows from horses' feet and wheels would be distributed over a large space through an elastic medium, which, while modifying noise, would greatly diminish resistance to traction, and prevent breakage of the surface as well as wear. It would be like travelling over a large sheet of ice. The road might be more costly at the outset than other roads, but it would be infinitely more durable, and upon the whole it would probably be cheaper than the sham structures now passing under the name of roads. It would, moreover, be most rapidly laid down and renewed, and be perfectly free from dust and nuisance, and very easily cleansed on the surface; and would be highly appreciated by the public using it. On the whole, therefore, it is decidedly a proper thing for the Board of Works to set so good an example."

Building Intelligence.

CHURCHES AND CHAPELS.

Earl de Grey and Ripon presided at a meeting held last week at Huddersfield for the purpose of raising the sum of £5,000 to complete the restoration of Ripon Cathedral. Nearly £200 was subscribed at the meeting.

On Wednesday, the 30th ult., the memorial stone of a new Methodist chapel at Sheffield was laid by Sir Francis Lycett. The building is in the Early English style, and will seat about 1,000 persons. The cost will be about £3,500. The architects are Messrs. Wilson and Crossland.

Hardwick Church, near Wellingborough, has been restored at a cost of about £1,000 under the direction of Messrs. Slater and Carpenter. The style is Early Decorated, the old church having been built in the reign of Henry III.

The church of St. Nicholas, Twywell (Northampton), was reopened last week, having undergone restoration at the cost of not quite £1,000. The contractor was Mr. Stephen Brown, of Kettering. The bishop commented upon the fact of neither architect nor clerk of works having been employed in the restoration, a thing which he could not generally recommend, although in this instance it had not been productive of any harm.

St. Peter's Church, Arnesby, near Lutterworth, has been reopened after a thorough restoration, at a cost of £1,450. The architects employed were Messrs. Millican and Smith, of Leicester, and the contractor Mr. Loveday, of Kibworth. The church is an interesting specimen of Gothic architecture, varying in the time of its erection from the Norman to the Perpendicular period.

The foundation stone of a new Congregational chapel at Chard, Somerset, was laid on the 31st ult. It will be in the Early English style, built of native stone and flint, with Bradford stone dressings. Mr. W. J. Stent, of Warminster, is the architect, and Mr. Hawker, of Chard, the contractor.

A new Free Barony Church, lately erected at Glasgow, was opened on the 31st ult. The church is seated for 1,000, and has large side rooms adjoining capable of holding an additional 500 or 600. The cost has been about £10,000, inclusive of sites. The architect was Mr. Honeyman, of Glasgow.

The re-arrangements of Saint-Mary-le-Bow Church, Cheapside, are now completed, and have been carried out by Messrs. Browne and Robinson, the contractors, from the designs and under the superintendence of Mr. James L. Pedley, architect. The alterations have been of a most extensive kind.

Saint Peter's Church, Dublin, was opened on last Friday with great ceremony. It has been closed during the alterations, nearly two years. Two transepts and an eastern end have been added to the old church, which like many others in Ireland still existing, was a pile of "carpenter's Gothic." Mr. Carson, of Hare-court-street, was the architect, and Mr. John Brittle, of Rathmines, the contractor.

The chancel of St. George's Church, Orleton, Herefordshire, was reopened on the 24th ult., after thorough restoration. The whole church is now complete, the nave having been restored two years ago.

A new church has been consecrated at Thorncombe, Dorset. It is in the Perpendicular style, the windows being especially characteristic of the period. The cost is about £4,000. Mr. J. M. Allen, of Crewkerne, was the architect, and Mr. Davis, of Langport, the contractor.

A new Welsh Calvinistic chapel, recently built at Wrexham, has been opened. Messrs. W. and G. Audsley are the architects. The style of architecture is Romanesque, and the material employed is brickwork, with moulded stone dressings and more important parts. The cost is about £5,000, and the chapel will seat 800.

Springfield Church, Essex, is undergoing restoration. It is a small low building, of nave and choir, with red brick tower. A small circular-headed window, supposed to be Saxon, has been brought to light in the north wall. A triagonal bearded roof has been disclosed hidden by the old ceiling. Concealed in the roof was found a missal, which has been restored at Cambridge, and is now in the possession of the rector.

A small chapel has been erected in the cemetery presented to the inhabitants of Beer, Devon, by the Hon. Mark Rolle. It is constructed of blue stone, with freestone facings, and is in imitation of the Decorated style. Mr. Kingdom, of Budleigh, Salterton, was the architect. The cost of the chapel and cemetery, in addition to the value of the land, is £1,200.

A Congregational Church in Malmsbury, Wilts, was opened on Wednesday, the 30th ult. It is built in the Early English style. The architect is Mr. W. J. Stent, of Warminster; and the contractors are Messrs. Light and Smith, of Chippenham. The Bath stone dressings are of Box groundstone.

A meeting was held on Friday last at the City Chambers, Edinburgh, the Lord Provost in the chair, for the purpose of considering the propriety of renovating the interior of St. Giles Cathedral in the style of the cathedral at Glasgow. The Lord Provost in his opening speech gave a very interesting *resume* of the history of the erection and desecration of the building and the pseudo restorations of 1828-30, and stated that Mr. R. Matheson, of the Board of Works, had prepared designs showing the choir cleared of its present cumbersome galleries and pews, and with the proposed new arrangements. Sir George Harvey made some very *apropos* remarks on the subject of stained glass. A church, he said, was not a building merely erected for the exhibition of fine windows—fine windows were merely what beautiful ornaments on a lady's breast were: they heightened her beauty a little, but did not and should not engross all the attention of the beholders. The architecture of a church was the principal thing, and anything which interfered with the architecture was objectionable. He strongly deprecated the adoption of the description of stained glass in Glasgow Cathedral, and condemned the colours employed in the windows there as flaring and meretricious. The feeling of the meeting appeared to be entirely with the Lord Provost in his proposed scheme, and he was requested to name a committee of seven persons, with an acting secretary, for the purpose of further considering the matter.

BUILDINGS.

The foundation stone of a co-operative store at Silverdale was laid last week by Mr. T. Hughes, M.P. (Tom Brown). The building is designed by T. Lewis, architect, Newcastle, and the contractors are Messrs. W. and J. Webb, of Silverdale. The cost is £1,050.

It is rumoured that a new theatre is to be built in Southwark on a vacant plot of ground facing the police-court at Stone's end.

The house, No. 86, Oxford-street, one of the first erected some few years past having any claim to architectural pretensions, has lately undergone considerable internal alterations, to render the premises applicable for the purposes of a first-class "Confiserie Française," similar to those tasteful establishments of the Rue de la Paix and the Boulevard des Italiens. The front has been decorated in the Pompeian style; the want of flat surfaces on which to execute the delicately designed running ornaments of the style rendered the treatment somewhat difficult. We have here the pure French element of shop fittings and decorations. The *tout ensemble* has a pleasing effect; the colouring has been kept to the same tone as the furniture and fittings, and is relieved by the judicious introduction of contrasting colours used in small quantities in their original intensity. The works were carried out by Messrs. Finch, Hill, and Paraire, who, to meet the views of their client, desirous of preserving the French element, had part of the furniture executed in France. The decorations were executed by Mr. Hommann, who is, we understand, carrying out the decorative work at the mausoleum, erected by Her Majesty to the late Prince Consort.

TO CORRESPONDENTS.

NOTICE.—The "BUILDING NEWS" is now Published at the NEW OFFICES, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—J. H.—E. W. P.—H. H.—E. W. G.—Rev. J. C. J.—D. S. and O.—J. H. S.—D. S.—T. S.—J. H.—S. P.—J. K. C.—Dr. C. D.—W. T.—G. H. G.—V. K.—E. B.—D. J. B.—H. T. M.—D. R.—V. K.—J. J. H.—V. P.—J. C. J.—W. J. E.—V. K.—J. G.—C. G.—T. B.—E. A. S.—J. H.—W. B.—E. W. G.—W. W. B.

A SUBSCRIBER (Batley).—Consult advertisements.

E. A. H.—The drawing of schools to hand

W. H. T. (Ramsgate).—Rather too ritualistic for our pages.

X. Y. Z.—Your letter is too full of algebraic formulæ to be of general good.

W. T. THOMAS.—Condense your remarks and we will publish them.

T-SQUARE, writing from Lincoln, says that the architects of Retford Town Hall are Bellamy and Hardy, not Bellamy and Pearson. We took the names as they appeared in the "Illustrated News."

D. S., with drawings for farm buildings.

Intercommunication.

QUESTIONS.

[643.]—SMITH'S POKER PICTURES.—Can any of your correspondents give me any information respecting the works of art, known as Smith's "poker pictures," when the artist lived, and how he worked, &c. The pictures, or rather the only one I have seen, is burnt in upon wood with a hot iron. The subject is the Centurion sending for Cornelius. I have heard that one of these poker pictures is in the possession of the Queen, and that they are of considerable value, being rare. Do many or any others exist?—MILES.

[644.]—FOUNDATIONS FOR A TOWER.—I am about laying the foundation of a tower. Can anyone tell me whether I should have the scarcement or foundation courses with 2¼ offsetts to every course, or should I do it 2¼ offsetts to every two courses? Would the bond not be better as last mentioned, and stronger when it is carried 16ft. below level of floor?—INQUIRER.

[645.]—FRENCH GOTHIC ORNAMENT.—Where in or about London is to be found a good structure on which the carving may be put down as a fair sample of what can be produced in conventional foliage? Is there anything to rival the work upon Mr. Goldie's church of St. Wilfred's, York, Mr. Godwin's Townhall, Congleton, Mr. Hayward's Museum, Exeter, or the new offices, Dale-street, Liverpool? There is a beautiful fountain at the corner of Great George-street, Westminster, and no doubt a deal of excellent work somewhere, but the "finding out" is the difficulty. Will someone enlighten A PROVINCIAL ARCHITECT'S CLERK.

[646.]—DILAPIDATIONS.—I shall be really obliged for answers to the following questions:—Lessee holds by parole agreement for three years certain, there being no expressed contract that the tenant should keep premises in repair, nor expressed exemption from liability to repair. Therefore, tenant is liable under the "implied covenants" of the law only. Such being the case, am I bound (being employed as the surveyor for tenant) to make him renew paint either externally or internally, where it has been fairly used but has worn off, it having been in bad condition at the time of demise? The external plastering has completely crumbled away from the walls during the term, in consequence of the badness of materials. Can the tenant be compelled to re-plaster? I pretty well understand the law of dilapidations, but find it very difficult to apply it practically for want of experience. Perhaps some surveyor who has had experience and who knows the law will kindly give me an early answer.—S. T., November 3.

[647.]—SMALL ANTS.—Having arranged to travel abroad for twelve months, I last year housed my furniture in one of the great depositories in this metropolis, and upon having it out again, I find that the drawers, chiffoniers, sideboards, and other wooden articles, are inhabited with thousands upon thousands of small ants, which overrun the place, and especially certain articles of food, in such myriads, that it is almost impossible to make a meal without swallowing some dozens of them. Indeed, I may truly say, as the cheese eater of old did,

"Like Samson, I my thousands slew,
And with the self-same weapon too."

If any of your readers can put me in possession of an effectual method for clearing the furniture, cupboards, &c., of these intruders, and so of making the house comfortable, I should esteem it a very great favour.—A CONSTANT SUBSCRIBER.

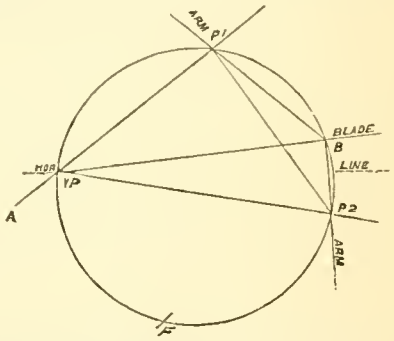
[648.]—MEASUREMENT OF MASONRY.—Will some of your correspondents clearly define to me the difference between splayed work, sunk splayed work, and sunk and splayed work?—X. Y. Z.

[649.]—ROAD TRACK.—Will you, or any reader of the BUILDING NEWS, kindly inform an old subscriber what is the best form of iron road track or gutter for ordinary horse carts and waggons to run upon? I have a quantity to lay down, and am anxious to have the best system in use.—S. S., Kendal.

REPLIES.

[566.]—CENTROLINEAD.—If "E. L. G." will lay a piece of tracing paper on my diagram, page 676, trace the stock and blade—producing the line of the latter downwards to form a radial line—and will then pass the tracings over the points P1, P2 in the manner of a centrolinead, he will find that the blade line will radiate from VP, and not from the centre of the circle passing through VP, P1, P2 as he states, page 694.

At page 658, "E. L. G.," after referring to his diagram, reply 384, page 605, states that a centrolinead is "merely the two straight edges EB BD of the board there represented, with the addition of a ruler containing the line Bb or bB, to or from the centre of curvature, instead of this:—The ruler or radial line will always converge to, or radiate from, that point in the circumference of the circle which it touches when projected from the angular point B, whether equally or unequally inclined to "the two straight edges."



Let VP be the vanishing point, P.1 — P.2 the pins. Draw a circle passing through these points. Draw the line P·1 VP, prolonging it. Draw VP. P2. — VP. B —B.P1 — B.P2 — prolonging them. Connect P1. P2 —.

Make a tracing of the lines representing the arms and blade of the centrolinead, pass it over the points .P.1 P2., and the blade line will radiate from VP. Apply the tracing of the arms to the angle A. VP. P2., and they will be found to be "set" in accordance with my diagram, page 676. Apply the blade and arms to the lines indicated in "W. Penstone's" diagram, page 729, and they will agree with these also. It will thus be seen that the ruler or blade radiates from a point on the circumference and not from the centre of the circle passing through VP. P1. P2—that the angles formed by the blade with the two arms may be unequal—that the angles formed by the line P1. P2 with the lines VP. P1 and VP. P2 may be unequal; and, further, that the angles VP. and B. are together always equal to two right angles.

By reversing the construction of the diagram, taking P1. B. P2. as three given points, striking a circle through them, the connecting lines again representing the arms. If the ruler or radial line be drawn from B to any point on the circumference, as F, and the tracing be made and applied as before, the radial line will always pass through F.

The diagram, page 676, may be worth remembering, as it illustrates one of the leading principles of the centrolinead; but for all practical purposes that by "W. Penstone" is superior. It is the method given by Peter Nicholson, which the querist "S. T." found some difficulty in understanding.—W. J. E.

[611.]—ESTIMATING CARPENTERS' WORK FROM HEWN AND CONVERTED TIMBER.—The most sensible reply to this question is the short explanation by "A. H." There is no doubt many of the architects of the present day are ignorant of the value of carpenters' work or the method of computing the value of material in a specified quantity of work, but no man having the experience usually possessed by a "surveyor" in the times when "measure and value" was the order of the day, could be proved guilty of such a charge. Mr. Stevenson has evidently not given the matter sufficient attention, or he would have shown a more satisfactory explanation.

We will take, first, his statement as to the trouble required in properly estimating the value of scantlings per foot cube in a building from deals and timber. Any person of moderate experience could fix an average standard of proportion, say two or three deals to one of timber, as the principal scantlings in the building happened to be of large or small dimensions; if small, they would be principally from deals, or, if large, from timber. Until this experience has been acquired nothing could be more easy than noting in the dimension book whether "out of deals" or "out of timber," and abstracting the same in two items instead of one. It should be understood that the valua-

tion of builders' work is, to a great extent, a matter of average. There is the average of material from careful observation and calculation during years of practice, and the average of labour, not from the test of one man's labour, but from an average of the time of a number of men employed on similar work and taken at the current rate of wages in the district.

Next is the computation of the value of timber, in which I think Mr. Stevenson is as much at fault as those he condemns.

We must first look to the "specification." Most London architects prescribe that "the scantlings shall be cut square and be of the full dimensions enumerated." This, then, would call for the following estimate:—

		s.	d.
Scantlings from deals.	First cost of deals per standard		
	Cartage in and out of yard, including labourage		
	Sawing average		
	Waste in saw kerfs		
	Waste in cutting to lengths required in work		
	Profit		
	Equal to cubic feet at (say)	1	9
	Labour and nails per cubic foot.....	0	6
		2	3

		s.	d.
Scantlings from hewn timbers.	First cost of timber per load of 50ft.		
	Cartage, &c.		
	Sawing average		
	Waste by saw kerfs and slabbing.....		
	Waste in cutting to lengths required in work		
	Profit		
	Equal to per cubic foot (say)	2	0
	Labour and nails	0	6
		2	6

A PRACTICAL MAN.

[573.]—PERSPECTIVE.—In spite of "L. S." knowing the names of two books, I maintain that from no other line of his long reply (p. 729) could "S. B. F.," or any inquirer, get ought but error and mystification, or from his rejoinder (p. 765) anything at all. The inquirer at least knew the meanings of his own words—the difference between parallel and angular perspective. Of course, my illustration from tailoring was to show him that as no garment can be made without both cutting and sewing, no picture can be complete without both linear and aerial perspective; whereas, if there were "two descriptions of perspective," as "L. S." called them—and as parallel and angular perspective are—no object could be represented in both "descriptions of perspective" at once.—E. L. G.

[600.]—FLOW OF WATER.—If "T. W. H." would just look at the page he comments on, he would see that it was not "E. L. G." who proposed any mode of answering this question, "simple" or otherwise. As the querist spoke of the stream's depth and velocity without saying whether he meant mean or maximum depth, mean or surface or middle velocity, I trusted to his common sense to tell him the mean of each was necessary, and carefully avoided assuming anything he had not stated.—E. L. G.

[627.]—GREENWICH HOSPITAL AND ST. JOHN'S CHURCH, WESTMINSTER.—Considering the various accessible means of obtaining information on subjects such as the above, it is surprising that one answer only should have been given to the question of "T. R. F. J.," and that is not accurate. The architect of the above church was Thomas Archer, according to the "Dictionary of Architecture of the Architectural Publication Society," son of Thomas Archer, M P. for Warwick; and the edifice, begun in 1721, consecrated June 24, 1728, is said to have cost upwards of £40,000. It was originally executed with columns to support the ceiling, but at the reinstatement of the interior of the church, after the fire in 1741, the columns were removed. Galleries were added in 1758, and increased in 1821 by William Inwood. It would appear that Archer was a pupil of Sir John Vanburgh, and he has been subject to much ridicule from the severe criticisms of Walpole and Dallaway. In the exceedingly full notice of his works in the same publication, I do not find any mention whatever that Hawksmoor designed or had anything to do with St. John's Church, but as regards Greenwich Hospital it is stated that he (Hawksmoor) was "clerk of the works from 1698 and deputy surveyor after 1705 (when he was succeeded by J. James, and in 1736 by Isaac Ware). During this period he conducted the works for completing the west side of the north-west (or Charles) block, from Jones's design; the opposite (or Anne) block, 1698-1728; the south-west (or William) block, 1698-1703; and the west front of it under Sir J. Vanburgh, 1726; the colonnades on both sides and the commencement of the south-east (or Mary) block from 1735. This block was not completed till 1752."

The facts as to the architect of Greenwich Hospital are—J. Webb, a pupil of Inigo Jones, was architect to the eastern portion of the north-west block, from a design attributed to his great master. The remainder of the building was carried forward to a considerable extent by Sir Christopher Wren, and continued by Sir John Vanburgh. "Athenian" Stuart completed the interior of the chapel.—W. W.

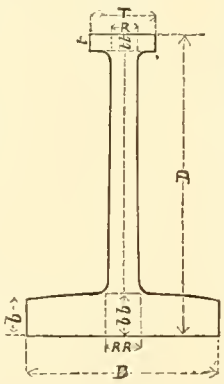
[629.]—ACID TO WASH PAPER.—If "A Designer" washes his paper with a little benzine it will become transparent, and soon after assume its original condition. As benzine dries very quickly, it should be applied gradually, and not the whole surface of the paper covered at once.—L. L.

[629.]—No acid so applied would do anything to paper but destroy it. Benzole or benzine, which is a hydrocarbon extracted from coal, has the effect described. Being dangerously inflammable, it must be used with care, or rather not by night at all.—E. L. G.

[631.]—TIE BEAMS.—If "A Doubtful One" will refer to your articles on Iron Roofs he will there find the strains which come upon the ties investigated, and if a tie beam of timber acts as a tie only, and has no ceiling or floor to carry, the strains upon it will be similar to those upon the iron ties alluded to, and the consideration of these will indicate the best position for scarfing a tie beam—namely, in the part or parts where the horizontal strain is least, and this will generally be found near the centre of the truss. The power to resist the strain is much diminished in tie beams scarfed in the ordinary manner, though doubtless abundant strength is usually left. If the scarf can be made as strong as any other part of the beam, as supposed by your correspondent, its position is, of course, immaterial.—E. S.

[632.]—PRESSURE ON ROOFS.—"H. W" will find the downward pressure by a horizontal wind reaches a maximum when the pitch is 54¾ deg., and each way from this pitch it diminishes so slowly that I apprehend the maximum is reckoned by Tredgold in all cases, without consideration of pitch.—E. L. G.

[633.]—CAST-IRON GIRDERS.—The tables of cast-iron girders in "Weale's Price Book" seem to be compiled from "The Engineers', Architects', and Contractors' Pocket Book," by the same publisher, wherein is an explanatory section of a girder (as marginal sketch), showing the parts indicated by the letters at the heads of the several columns of dimensions. The tables appear to be computed by the formula $\frac{ad}{l} = p$, where a = area of bottom flange, d = depth of girder, both in inches; l = length in feet, and p = permanent distributed load in tons. Then when the length and load are given $lp = ad$, and this product of the area of the bottom flange by the depth is called in the tables the multiple of those dimensions. When the length, depth, and area of bottom flange are given to find the load, $\frac{ad}{l} = p$. And when the length, load, and depth are given, to find the bottom flange $\frac{lp}{d} = a$.—E. S.



[639.]—ASSOCIATED ARTS INSTITUTE.—This institute may be called an amateur art debating society and nothing more. Its object is "to deliver addresses and hold debates on questions connected with the fine arts, to exhibit sketches, and to promote social intercourse among young artists." Its meetings are held every Saturday evening, at 8.15, at 11, Conduit-street. The entrance fee is 5s., and the annual subscription 5s. Its secretary is Mr. F. S. Potter, 12A, Grove-place, St. John's Wood.—J. H. S.

WATER SUPPLY AND SANITARY MATTERS.

At Sandown, Isle of Wight, the sewage is conveyed in pipes clear of the town into cess-pits, where it is filtered and deodorized by a chemical process. The clear portion finds its way into the sea, miles away from the town, and the solid residue is mixed with ashes and road sweepings, and forms good manure.

The South Shields corporation is at last alive to the neglected state of East Jarrow. The sanitary condition of the place has been quite disgraceful, and the complaints of the inhabitants were loud indeed. However, the order has gone forth that East Jarrow shall be drained in a proper manner. The Town Improvement Committee are advertising for tenders to lay down a complete plan of sewerage, so that the present complaints of pools of filth, &c., being allowed to accumulate in the back streets, will shortly be no longer called for.

In spite of the opinion of the guardians, based on the clearest evidence, that the generally defective drainage and want of pure water are the causes of a malignant fever that has for some time past prevailed in the district of Glascote, near Tamworth, and has attacked no less than 127 persons out of a population of 485, the ratepayers, by a large majority, have negatived a proposal to form Glascote into a special sewerage district, and to take steps for procuring a supply of pure water. The matter remains *in statu quo* at present. It is not likely, however, that it will long be suffered to remain so, as the want of sanitary measures is daily becoming more apparent in the district.

The Home Secretary has sanctioned the borrowing of £3,000, on the security of the general district rates, by the local authorities of Rugeley, for the construction of the sewerage works. Messrs. Smith and Son, of Newcastle, are the contractors, and are to be bound to complete the works by Midsummer next.

WAGES MOVEMENT.

The joiners of Accrington have given their masters notice that they will require an advance of from 2s. to 3s. per week, to commence next spring.

Trade is becoming very dull in the Potteries, and it is probable that the master joiners and carpenters will find it necessary either to reduce the number of men employed or to shorten their hours.

STAINED GLASS.

The first light of a memorial window, dedicated "To the glory of the Triune God and in memory of the Holy dead who once worshipped in St. Andrew's Church," has been inserted in the large chancel window of St. Andrew's Church, Smethurst, Birmingham. Mr. T. W. Camm, is the artist.

A stained window by Messrs. Hardman has been erected in Gloucester Cathedral to the memory of the late Mr. Francillon. The chief part is divided into six lights. The subject of three of these is the Saviour rising from the tomb, and in the other three the Angel addressing the three saints who brought spices to the sepulchre.

STATUES, MEMORIALS, ETC.

Miss Edmonia Lewis, a coloured girl, sent to Rome two years ago by anti-slavery friends in Boston, has completed and sent to America a marble bust of Dr. Dio Lewis, which is on exhibition at the gallery of Messrs. Childs and Jencks, in Boston.

LEGAL INTELLIGENCE.

COMPENSATION FOR DISCHARGE WITHOUT NOTICE.—The following case was recently tried at the police-court at Wolverhampton:—James Preston, a journeyman plasterer, in the employ of James Roberts, builder, summoned his master for 4s. as compensation for loss of time for being discharged without notice. The complainant said that on Monday week last, about half-past twelve, his master told him not to go on with his work any longer until some sand came. He understood that to mean that his master had no more work for him to do, and he therefore obtained employment elsewhere. Roberts now said that the usual dinner hour of the men was from one till two o'clock; but on the day in question, as he did not expect any sand until half-past one, he told the men, including the complainant, in order that time might not be lost, to go to their dinners at half-past twelve, and come back to work at half-past one o'clock. He did not mean what he said to Preston to be understood as a discharge. Several of his men proved that what their master had said was correct, and that they commenced work again at half-past one o'clock. Complainant, however, denied that his master told him to return. Defendant was ultimately ordered to pay the amount claimed, without costs.

SHAMEFUL NEGLECT.—At the Worship-street police-court, last week, Mr. Samuel Cooper was summoned, at the instance of the vestry of Shoreditch, for having no less than thirty houses in a dirty state, the rain coming through the roof, the drains defective, the closets overflowing, and the whole unfit for human occupation. The defendant had had several notices served upon him, of which he had taken no notice. Several cases of fever had taken place in these houses. The last excuse was that the freeholder was on the Continent, and a delay was sought until his return. Mr. Knox very properly considered that the fact of the freeholder being absent, amusing himself on the Continent, was no reason why poor people should be exposed to fever any longer in such loathsome dens. He made an order that the houses be closed forthwith, and repaired within fourteen days.

SUEING THE WRONG MAN.—(MOORE *v.* ELLIS.)—This was an action tried before the County Court at Rochester, last week. The plaintiff, in May, 1866, lent a quantity of scaffolding to a man named Jennings, who was building some cottages for the defendant. Subsequently, the scaffolding was used by Ellis on some work at Faversham, where it had been removed, and was being used by defendant. Moore declared that Ellis said he would pay a reasonable price for the hire of the scaffolding. Defendant put in an agreement between him and Jennings, showing that the latter was to have hired the scaffolding. The scaffolding which he sent to Faversham belonged to him and not to Moore. The Judge said there appeared to be no privity of contract between plaintiff and defendant. Moore had evidently sued the wrong man. Judgment for defendant.

REFUSING TO PAY FOR PAVING AND FLAGGING.—On Saturday, at the Middlesborough Police Court, Mr. John Calvert, of the firm of Messrs. Powton and Calvert, builders, Middlesborough, was summoned by the corporation for refusing to pay £1 6s. 7d., his proportion for the paving and flagging of Fleetham-street, in which he had some property. Various technical points were argued, and the case occupied several hours. The magistrates ordered the amount, with costs, to be paid. Messrs. Powton and Calvert were next called to answer a summons for refusing to pay £4 19s. 11d., their proportion for paving and flagging in Fleetham-street. They agreed to pay the amount.

WESTMINSTER ABBEY.—An important question respecting the safety of Westminster Abbey was raised on Tuesday week at the Westminster Police Court. Mr. J. Tolley, the district surveyor, summoned Mr. Tyler, of Wood-street, and Mr. H.

Poole, of Sutton-street, for neglecting to give him two days' notice, according to the Act, before commencing certain work in the close of the Abbey. The circumstances which had given rise to the complaint were fears that the safety of the venerable pile might be endangered by carrying a pipe within four inches of the roof of the Jerusalem Chamber, and with laying pipes for heating the Abbey at a less distance from the woodwork than required by the Metropolitan Building Act, but the facts of the case were not gone into, the whole question discussed being one of law involving much technicality. Mr. Richards, who appeared for the defendants, cited various authorities to prove that the Abbey was exempt from the Act in virtue of its being a building in the possession of the Queen, and employed in her Majesty's use and service, and said the Dean and Chapter had so large and efficient a staff as not to need interference from any other quarter. Mr. Tolley had no feeling in the matter, but believed he was only doing his duty. He met Mr. Richards' assertion by a long argument, supported by a number of authorities, and stated that on the two occasions when the Abbey was nearly burnt down it was through plumbers engaged on the roof, and he was anxious to prevent the possibility of injury to the time-honoured structure. Mr. Arnold adjourned the matter in order to obtain time for consideration, and for the production of the copy of the grant to the Dean and Chapter and other papers to be submitted.

General Items.

A correspondent says that the mortar with which the houses at York-road, Battersea, were built, and which recently fell down, was of the most shocking description, and he attributes the fall of the houses solely to the mortar. Surveyors in future will have something to do if they put in force the authority with which the new Building Act will invest them.

A meeting of the Birmingham Architectural Society was held on Thursday last, at the Town Hall Chambers, Mr. J. J. Bateman, President, in the chair, when the session was opened by an address from the President. Amongst the members present were Messrs. J. R. Botham, Thomas Plevins, J. A. Chatwin, F. B. Osborne (hon. secretary), Yeovil Thomason, Corser, Nicholls, A. B. Phipson, Veale, Williams, and Allen E. Everitt. It appears that this society, to the discredit of Birmingham architects, is not in a very flourishing condition, as we find the President stating that only four meetings were held during last year, and at these no papers were read. He thought it was much better to disband the society altogether.

A correspondent says—An experiment in house building is to be tried in Edinburgh shortly, having as one of its recommendations the indestructibility of the material by fire. The proposal has been made, I believe, by an American gentleman who takes an interest in the social elevation of the poor of large cities, and who suggests the use of the new building material as a solution of the difficulty of building houses which can be let at low rents. The material is concrete, and it has many recommendations. It is greatly cheaper than brick, immeasurably cheaper than stone, and can be erected with a minimum of skilled labour. It is fireproof: there need be hardly any wood in the houses built with it, except the doors, windows, and rafters.

For once the traffic of London will not be so much interrupted as usual on Lord Mayor's Day. It is at last decided that the procession is to be considerably shortened and the old coach is to be left at home. The hour of starting is changed from eleven in the morning to 2 p.m. There is a rumour that the carriage is to be sent to the South Kensington Museum, possibly on the recommendation of one of the aldermen, who at a recent meeting turned art critic, and discovered many beauties in the paintings and carvings with which the unwieldy machine is adorned.

A project has been set on foot for building an iron bridge across the Neva, between Old Saint Petersburgh and the Field of Mars. This, if completed, will be the second iron bridge across that river.

The Czar has presented the splendid gallery of paintings which belonged to the late M. Pranishkoff to the Moscow Museum. The collection is an almost complete illustration of Russian art.

A correspondent from Nottingham says:—Blue Warwickshire stone, for contrast with Red Mansfield, looks well; Forest of Dean is better. Neither are so well or so durable for building or for pavements as the buff coloured stone from Mansfield Woodhouse. In Nottingham we have tried many stones in contrast with Red Mansfield, but none harmonize so well as the yellowish stones from its own neighbourhood, and they last so well together. The Ancaster stone agrees very well, and is much used, from the ease with which it is worked, and the stone is quarried there much better than it used to be.

On Tuesday last, Archdeacon Trollope read before the Leeds Philosophical and Literary Institute a paper on the Norman Sculptures of Lincoln Cathedral. He ascribed them to Remigius, the first Norman Bishop, and gave a detailed account of the subjects treated, illustrated by photographs and sketches.

In countries where timber is scarce, as, for instance, on the immense prairies of Illinois, and other North American States, straw, a novel material for construction, is largely employed, forming most comfortable "fixings" for the shelter of farm stock and implements. Strong, light, and tight, shutters and doors are made of straw woven on substantial wooden frames, and afford capital protection from frost and cold, the inside being generally plastered with mud to prevent the animals from literally "eating themselves out of house and home."

The Americans are about to build a monster suspension bridge to connect New York and Brooklyn. The bridge will have a clear span of 1,600ft., besides the approaches, and its estimated cost is £1,500,000. Mr. J. A. Roebling is the engineer engaged.

A Canadian project contemplates the construction of a ship canal, which, starting from Nottawasaga Bay, on Lake Huron, shall pass through Lake Simcoe, and thence, availing itself of the natural configuration of the country, effect a direct communication with Lake Ontario. Should the project be adequately supported, there can be no doubt that it would open up a vast territory, and afford extraordinary facilities for conveying to the St. Lawrence and the seaboard the varied products of Lake Huron and of all the north-western provinces of Canada.

The Egyptian Government is going to have some very curious postage stamps engraved. They will represent the Pyramids, Cleopatra's Needle, Pompey's Column, the Sphinx, &c.

The materials of the old chantry at Exeter have been sold by auction, and the building is about to be demolished.

Three varieties of Trinidad asphaltum were shown at the Paris Exhibition. The Pitch Lake of Brea, one of the greatest curiosities of Trinidad, covers 100 acres, and yields inexhaustible supplies of asphalte, which, though largely sent to Europe and America, has not met with the attention it deserves. Lacquer pitch, found in the vicinity of the Pitch Lake, is recommended as an ingredient entering into the composition of dark-coloured varnishes. The export of asphalte from Trinidad in 1865 was 17,700 tons, principally to Belgium, France, and England. One company in the island has entered into a contract to supply, 1,500 tons yearly of asphalte, in blocks fit for paving, at nine dollars the ton, delivered on board. The same company has engaged to furnish a house at Antwerp with 20,000 tons at 50s. per ton to extract oil from.

The works of art at the National Exhibition at Leeds, next year, will be distributed as follows:—1. Three galleries of oil paintings by the old masters, and a collection of their drawings and sketches. 2. Two galleries of oil paintings of the English school by deceased and living artists. 3. A gallery of oil paintings by modern foreign artists. 4. A gallery of English water-colour drawings. 5. A gallery of portraits of deceased Yorkshire worthies. 6. A collection of miniatures. 7. A gallery of engravings, etchings, &c. 8. An Oriental museum. 9. A museum of ornamental art, from the earliest British period to the close of the eighteenth century, including furniture, tapestry, china, glass, metal work, &c. 10. A collection of marble sculpture.

The highest number of the houses in the Broadway, New York, as we learn from the publication of that name for this month, is 1,516. Architecturally, the street does not rank very high. The city hall in the park is a sham, inadequate, structure, with a veneered front of marble, looking to the lower part of the city, and its back, painted or whitewashed, turned towards the upper. Besides this, there is in progress of construction a court house of marble, which, if ever finished, will be an imposing affair, though it should have presented its front, instead of one of its ends, to the great street. Many of the shops or stores are built of a marble as pure as that of Carrara, hewn from the quarries of Westchater, within a convenient distance of the city. Ground being of such value, it has been necessary to economize space; the lots, therefore, are very narrow, and the buildings are exceedingly deep and lofty. Many of them start two or three storeys below the ground, and rise five, six, and eight storeys above. These subterranean compartments, by careful construction, the skilful use of cement, and the ingenious contrivance of the side walks of iron and glass which roof them, are rendered as dry, light, and habitable as the storeys above ground.

The number of fires in London in the year 1840 was 681, one to every 2,800 inhabitants, one to every 379 houses. In 1850 the number of fires had increased to 868, one to every 2,673 inhabitants, one to every 347 houses. In 1850 the number was 1,056, one to every 2,613 inhabitants, one to every 335 houses. In 1865 the number was unprecedented—namely, 1,502, one to every 1,900 inhabitants, one to every 250 houses. In 1866 the number of fires fell to 1,338. Captain Shaw states that the average sum spent upon a fire in London has for many years been about £18, but he is informed that the expenditure in America is far greater—in Brooklyn, £35; in Baltimore, £90; in Boston, £157; in New Orleans, £172. He has compiled a table showing the causes of the 29,069 fires which occurred in London in the 33 years 1833-1865. Candles caused 11 per cent. of these fires, curtains nearly 10 per cent., gas nearly 8 per cent., flues nearly 8 per cent., sparks from pipes 4½ per cent., children playing 1½ per cent., lucifer matches 1½ per cent., smoking tobacco 1½ per cent., stoves 1½ per cent., spontaneous ignition not quite 1 per cent., other known causes 19½ per cent., unknown causes 33 per cent.

MEETINGS FOR THE WEEK.

TUES.—Institution of Civil Engineers.—Discussion upon Mr. Bryne's paper, "Experiments on the Removal of Organic and Inorganic Substances in Water," 8.

SAT.—Associated Arts Institute.—"The Influences of Art," by Mr. Adolph Lauber, 8.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

822. J. A. LIMBERT. IMPROVEMENTS IN MACHINERY OR APPARATUS FOR RAISING, LOWERING, AND MOVING HEAVY BODIES. Dated March 21, 1867.

Among the features of this invention are the following:—For a simple form of pulley block the patentee fixes one or more pins or axes to a spocket wheel at a suitable distance from the axis of the pulley, upon which axis such spocket wheel revolves, and upon such pins or axes he mounts two toothed pinions connected together, the pitch circles of which are of different diameters; the teeth of one of these pinions take into the teeth of (by preference) an internal stationary wheel, fixed by any suitable means to the frame of the block, so that, on turning, the spocket wheel with its pinions, such fixed wheel will cause the pinion in contact with it to revolve, and with it the other pinion connected to it; this other pinion will give motion at a very reduced way of speed (more or less according to the difference of the diameters of the pitch circles of the pinions) to an internal toothed wheel (by preference loose on the axis of the pulley block); the exterior of this wheel may be so formed with chambers or recesses to receive the links of a chain to give motion thereto to raise or lower heavy bodies that may be attached to it, or it may be formed into a drum around which a rope may be coiled for similar purpose; or a drum may be attached to it suitable for either chain or rope. In constructing punching "bears" according to this invention, he employs a similar arrangement of gearing to that employed in the pulley block first described, the fixed toothed wheel being keyed or otherwise secured to the body of the punching "bear," whilst the other toothed wheel is keyed to the stem or shaft of the punch, such punch being formed with a screw taking into a female thread formed in the body of the punching "bear." A handle is provided to give motion to the gearing, suitable means being provided for disconnecting the gearing when it is desired to raise the punch quickly after it has performed its work, the handle before referred to being at the same time connected by any suitable means directly to the stem or shaft of the punch. For screw presses he employs similar arrangements of gearing to those previously described, and provided with bevilled wheels to communicate motion from the loose toothed wheel to the screwed stem of the plunger in a similar

manner to that described for the screw jack, or that of the punch "bear," the loose wheel being used as a nut for the purpose of raising or lowering the screw stem. *Patent completed.*

831. P. DICKENSON. IMPROVEMENTS IN THE CONSTRUCTION OF FENCES, HURDLES, AND GATES. Dated March 22, 1867.

This invention has for its essential object an improved mode of securing together the horizontal and vertical bars of fences, hurdles, and grates, and consists in forming two projecting teeth on the horizontal bar at the places or intervals where the vertical bars are situated when the fence, hurdle, or gate is put together, the space between the teeth being equal to the thickness of the vertical bars. When in their places, a wedge is driven in between the horizontal bars and one side of the hole in the standards through which the horizontal bars pass, and by this means the whole is tightly and rigidly held together. *Patent abandoned.*

844. R. DUNCAN. IMPROVEMENTS IN CRANES. Dated March 23, 1867.

This invention relates to cranes of the kind in which a vertical swivelling pillar, mast, or upright to which the jib is connected by a joint at the bottom, and by a chain or rods at the top is held in position by two inclined stays placed in vertical planes at right or other angles to each other, and the features of novelty in these improved arrangements are, first, the making one of the stays with an opening and movable connections, so that the jib can be swung over the space between the stays, which space has hitherto been unavailable; and, secondly, and alternately, the fitting of the crane with two jibs, one to work on one side of the stays, and the other on the other side. *Patent completed.*

657. J. TURNER. AN IMPROVED COMPOSITION FOR COATING OR COVERING THE SURFACE OF IRON, WOOD, BRICKWORK, AND OTHER SUBSTANCES OR MATERIALS TO PREVENT OXIDATION AND DECOMPOSITION. Dated March 8, 1867.

The following are the ingredients, matters, or substances the inventor proposes to employ for effecting the objects of this invention—namely, resins, gums, copal, mastic, sandarach, shellac, or other gums, or matters possessing similar properties thereto. He takes one or other of the above ingredients, and having first dissolved them in methylated or other suitable spirit or solvent, proceeds to mix therewith any metallic oxide or metallic or mineral substances, in such proportions as will enable the composition to be applied freely by a brush to the surfaces to be coated or covered therewith. It is simply necessary to scrape or otherwise clean the surface of the material before coating or covering the surface with the aforesaid composition. *Patent abandoned.*

664. S. HAWTHORN. IMPROVEMENTS IN CHINA AND EARTHENWARE KNOBS FOR LOCKS AND LATCHES. Dated March 8, 1867.

This invention consists in making the roses of china and earthenware knobs for locks and latches in one piece with the knob, instead of making the rose loose and separate from the knob as usual. *Patent abandoned.*

683. M. CAVANAGH. A NEW OR IMPROVED SASH-FASTENING. Dated March 11, 1867.

This invention consists of a metallic case (fitting a mortice in the sash) in which a quadrant headed bolt, mounted upon a centre bearing, is caused to move outwards from an opening in the surface plate through the medium of a link follower working within a niche in the heel of the same, actuated by a key, employing in connection therewith a locking plate on the opposite sash for receiving the bolt, by which arrangement the said sashes may be locked or unlocked as desired, in lieu of the ordinary fastenings. *Patent abandoned.*

722. W. E. NEWTON. IMPROVEMENTS APPLICABLE TO THE VENTILATION OF LARGE BUILDINGS. (A communication.) Dated March 13, 1867.

The method by which these improvements are effected is by the aid of sponges, wool, horsehair, or other suitable porous substances. The apparatus may be constructed in the following manner:—Within a box or framework is placed a wire cage, the interstices of which are sufficiently large to admit of the free passage of air. This cage is filled with sponge, wool, or other suitable substance, which is kept saturated by means of water or other liquid conveyed to the cage (and allowed to spread itself over the sponge or other substances) by means of perforated tubes. On the opposite side of the cage is fixed a fan for the purpose of exhausting the air from the cage, and thus keeping up a current of air. This fan communicates with the cage by means of a branch pipe. In order to prevent the sponges from settling down and lying flat, they are kept in their places by means of coiled steel springs. The liquid to saturate the sponge is supplied from a reservoir or cistern placed above the apparatus, so that when a cock is turned on the water or other liquid will naturally force itself through the sponge or other suitable substance. *Patent abandoned.*

Trade News.

TENDERS.

BROMLEY.—For building house, shop, and dairy, Whitethorn-street, Bromley, Middlesex, for Mr. Sharpley. Mr. Arthur Harston, architect:—C. Brown, £837; Hearle, £715; J. Allen, £664; Golding and Son, £660; W. Allen, £655; Salt (accepted), £535 10s.

BRISTOL.—For the erection of a Fever Hospital in connection with the Bristol Union Workhouse. Mr. Clark, architect:—Brown, £5,998; Foster, £5,509; Bennett and Mitchell, £5,507 4s.; Hibberd and Long, £5,500; Wilkins and Sons, £5,440; Hatherley, £5,355; Heal and Marsh, £5,290; Dimont, £5,283; Harding and Vowles, £5,264; Banner, £5,221; Davis and Son, £5,185; Humphries, £5,112 10s. 6d.; Thorn, £5,104; Kingston, £4,960; Easterbrook and Son, £4,932; Stevens, £4,890; Yalland, £4,800; Sommerville, £4,760; Storkey, £4,400; Saunders, £3,865 6s. The decision has been deferred by the Board of Guardians. The architect's estimate was £2,500.

CHISLEHURST.—For the erection of a pair of villas at Chislehurst, for Mr. D. Chattell. Mr. Joseph S. Moye, architect:—Grover (accepted), £2,100.

CHISLEHURST.—For the erection of a villa residence at Chislehurst, Kent, for Mr. J. Howard. Mr. Joseph S Moye, architect:—Walton, £1,342; Payne and Balding, £1,250; Stoner, £1,235; Grover (accepted), £1,026.

CHATHAM.—For the drainage, south high-level intercepting sewer. Messrs. Gotto and Beesley, engineers:—Contract No. 2—Stiff, £5,940; Smith and Co., £5,785; Crockett, £5,400; Girdler, £4,314; Naylor, £4,078; Ball and Co., £4,017; Beard, £3,900; Potter, £3,740; Goodwin, £3,733; Bugbird, £3,588; Moxon and Mutton, £3,420; Clements, £3,350; Hubbard, £3,215; Coker, jun., £2,814.

ENFIELD.—For converting twelve cottages at the Highway, Enfield, for Mr. B. Mitchell. All bricks supplied. Mr. J. Cushing, surveyor:—Patman, £1,497; Bayes, £1,428; Saunders, £1,275; Biggs, £1,255; Field, £1,190.

HYTHE.—For the schools in connection with the New Congregational Church:—

	Church.	Schools.	Total.
Adcock	£2,135 14	£698 14	£2,884 8
Unwin	2,156 7	709 9	2,865 16
Bowley	2,229 0	700 0	2,929 0
Waddell	2,192 17	652 2	2,844 19
Petts	1,977 14	668 14	2,646 8
Hazell	1,925 0	625 0	2,550 0

KINGSTON.—For completing the carcases of four houses at Kingston-on Thames, for Messrs. Dowsett and Chattell. Mr. Joseph S. Moye, architect:—Walton, £1,557; Stoner, £1,450; Grover, £1,446; Rudkin (accepted), £1,200.

LIMEHOUSE.—For alterations to the Vulcan Tavern, Salmon-lane, Limehouse, for Mr. J. S. Easy. Mr. Arthur Harston, architect:—Heiser, £1,331; Hearle, £1,257; Johnson, £1,233; Palmer (accepted), £1,215.

LIMEHOUSE.—For alterations and reinstatements after fire at Vulcan Cottage, Frederick-street, Limehouse, for Mr. Easy. Mr. Arthur Harston, architect:—Clemmans, £228; Allen, £204; Heiser, £199; Hearle, £165; Bullock (accepted), £145.

LONDON.—For additions to the Lichfield Ale Stores, Frederick-street, Hampstead-road. Mr. W. F. Potter, architect:—G. Ashley (accepted), £230.

LONDON.—For alterations to 18, Great Portland-street, for Messrs. Heggie and Co. Mr. W. F. Potter, architect:—J. H. Tozer, £187 10s.; Stephens and Watson, £178; W. R. Gill, £170; R. Perkins, £156; G. Ashley (accepted), £150.

LONDON.—For new shop front, No. 26, Down-street, Piccadilly, for Mr. S. Benjamin. Mr. Joseph S. Moye, architect:—Walton, £237; Bywater, £178; Barnett (accepted), £170.

LONDON.—For building new casual wards for the City of London Union. Messrs. Tress, Purchas, and Willis, architects. Quantities by Mr. G. P. Raggett:—Wood, £3,860; Ramsey, £3,840; Holmes, £3,651; Garrud, £3,600; Stangle, £3,336; Marter, £3,207; Egg, £3,140; Lacey, £3,110; White, £3,066; Crook, £3,010; Langley, £2,996; Turner, £2,990; Sheffield, £2,989; Hall, £2,980; Wilt and Son, £2,924; Mote, £2,913; Perkins, £2,890; Cooper, £2,890; Bland, £2,889; Wyatt and Son, £2,849; Henshaw (accepted), £2,768.

SOUTHWARK.—For alterations to 91, Union-road, Newington-causeway, for Mr. J. J. Conway. Mr. W. F. Potter, architect:—F. Sage, £163; R. Perkins, £120; F. Honour, £115; J. H. Tozer, £112 10s.; F. Vincent, £85 9s.; C. Houghton (accepted), £81 10s.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots also Cost for Transit to any part of the United Kingdom furnished on application to Bath Stone Office, Corsham Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Thomas Huddlestone Hodgson and David Nicholas Coulson, Chancery-lane, surveyors, November 13, at 2—William Littlefield, Sussex-place, South Kensington, paperhanger, November 13, at 2—George Mugridge, Prince of Wales's-avenue, Haverstock Hill, builder, November 18, at 2—Charles Barnes, Blyth-lane, Hammersmith, builder, November 25, at 12.

TO SURRENDER IN THE COUNTRY.

John Danson, Birkenhead, painter, November 12—John Edwards, Eglwysilan, Glamorgan, mason, November 12—Edward Jenkinson, Skelton, Yorkshire, brick manufacturer, November 12—John B. Piercey, Brighton, builder, November 18—Joseph Russell, Birmingham, bricklayer, November 22—T. Siminson, Great Grimsby, builder, November 13—John Twamley, Yoxall, Staffordshire, joiner, November 8—W. Woodruff, Buxton, painter, November 10—Henry Clay, Wednesfield, joiner, November 25—L. L. Grant, Ventnor, Isle of Wight, plumber, November 16—Matthew Hodgson, Wakefield, carpenter, November 19—Thomas Jones, West Derby, near Liverpool, marble mason, November 18—Andrew Napier, Warrington, joiner, November 28—Robert Ridge, Godstone, carpenter, November 15—Charles Varndell, Cocking, Sussex, carpenter, November 15.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

December 3, A Brown, Fugglestone, St. Peter, builder—December 6, J. Hopkins, Norman-road, New Wimbledon, carpenter—December 11, J. Stanford, Tweed-street, Battersea, architect—December 4, H. G. Cope, Bedfordbury, Chandos-street, carpenter—December 4, H. M'Calla, Westbourne-place, Eaton-square, architect—November 22, G. and R. Sugden, Barnley, timber merchants—November 30, W. Cooper, Kingston St. Michael, Wiltshire, stonemason—December 9, H. Williams, Oswestry, builder—November 21, J. Best, jun., Seaforth, Lancashire, joiner—November 22, J. M. Smith, Blackpool, Lancashire, builder, —November 13, E. Roberts, Llanfihangelytraethan, Merionethshire, joiner—November 21, D. Heard, Oorleston, Suffolk, carpenter.

PARTNERSHIPS DISSOLVED.

Whitland Abbey Slate Company—A. Hodge and R. G. Burslem, Horsham Brickfield, Upchurch, Kent, brickmakers—T. Bedford, H. Parker, and W. Burley, Marsh, near Huddersfield, joiners.

SCOTCH SEQUESTRATION.

Paterson Brothers, Leith, engineers, November 6.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9 0	£10 10	Archangel, yellow ..	£11 10	£13		
Quebec, red pine	3 0	4 10	St. Petersburg, yel...	10 10	11		
" yellow pine..	2 15	4 0	Finland	8 0	9		
St. John N.B. yellow	0 0	0 0	Memel.....	0 0	0	0	
Quebec Oak, white ..	5 5	5 10	Gothenburg, yellow	6 10	10	1	
" birch.....	3 10	4 10	" white	6 0	9		
" elm	3 10	6 0	Gefle, yellow	9 0	11	0	
Dantzic oak	3 10	6 0	Soderham	9 0	10	10	
" fir	2 0	3 0	Christiania, per C.,				
Memel fir	3 0	3 10	12 ft. by 3 by 6 in.				
Riga	3 0	3 5	yellow	16 0	22		
Swedish	2 0	2 5	Deck Plank, Dantzic,				
Masts, Quebec red pine	6 0	7 0	per 40 ft. 3 in.	0 15	1	4	
" yellow pine..	5 0	6 0	PUMICE STONE pr ton	6 0	6	0	
Lathwood, Dantzic, fm	4 10	6 0	OILS, &c.				
" St. Petersburg	6 10	7 10	Seal, pale....per tun	40 0	49	1	
Deals, pr C., 12 ft. by 3			Sperm body 112	0 0			
by 9 in., duty 2s per			Cod	36 0	0		
load, draw back 2s.			Whale, Sth. Sea, pale	39 10	40		
Quebec, white spruce	13 0	19 0	Olive, Gallipoli.....	70 0	0		
St. John, white spruce	13 10	16 10	Cocoanut, Cochin, ton	56 0	57		
Yellow pine, per reduced C.			Palm, fine	41 0	0		
			Linseed	37 0	0		
Canada, 1st quality.	17 0	18 10	Rapeseed, Eng. pale..	40 0	0		
2nd do.....	11 10	12 10	Cottonseed.....	34 0	40		

METALS.

IRON:—					
Welsh Bars in London .. ..per ton	6 7 6	6 10 0	3		
Nail Rod ..... do	7 10 0	7 15 0			
Hoops ..... do	8 10 0	9 0 0	2½		
Sheets, Single ..... do	9 15 0	10 0 0			
Staffordshire Bars ..... do	7 10 0	7 15 0			
Bars, in Wales ..... do	5 15 0	6 0 0	3		
Rails ..... do	6 5 0	0 0 0	net		
Foundry Pigs, at Glasg. No 1 .. do	2 15 0	3 5 6	2½		
Swedish Bars ..... do	10 5 0	10 10 0	net		
STEEL:—					
Swedish Keg, hammered .....per ton	15 0 0	15 10 0	2		
Swedish Faggot ..... do	10 10 0	12 10 0	2		
COPPER:—					
Sheet & Sheathing, & Bolts ....per ton	84 0 0	0 0 0			
Hammered Bottoms ..... do	93 0 0	0 0 0			
Flat Bottoms, not Hammered .. do	88 0 0	0 0 0			
Cake and Tough Ingot ..... do	74 0 0	75 0 0	3		
Best Selected ..... do	81 0 0	83 0 0			
Australian ..... do	84 0 0	89 0 0			
Y L Metal Sheathing & Rods ....per lb	0 0 7	0 0 0			
TIN:—					
English Block .....per ton	96 0 0	0 0 0			
do Bar ..... do	97 0 0	0 0 0	2½		
do Refined ..... do	99 0 0	0 0 0			
Banca ..... do	94 0 0	95 0 0	net		
Straits ..... do	89 10 0	90 0 0			
LEAD:—					
Pig, English .....per ton	21 15 0	0 0 0			
" Spanish Soft ..... do	19 15 0	19 10 0	2½		
" hot, Patent ..... do	23 0 0	0 0 0			
Sheet ..... do	20 15 0	0 0 0			
White ..... do	30 0 0	31 10 0	5		
SPELTER:—					
On the Spot .....per ton	21 0 0	21 2 0	net		
ZINC:—					
English Sheet .....per ton	26 10 0	27 0 0	2		
Devaux's V. M. Roofing Zinc .... do	28 10 0	0 0 0			
* And 5 per cent. discount if laid upon the new system.					
QUICKSILVER .....per btl	6 17 0	0 0 0			
REGULUS OF ANTIMONY					
French .....per ton	28 0 0	0 0 0			

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THE BUILDING NEWS.

LONDON, FRIDAY, NOVEMBER 15, 1867.

COMPETITION DRAWINGS FOR PARISH CHURCH, RYDE.

RYDE, with its sea-fronting terraces, esplanade, and splendid pier, cannot boast of its churches, which are few in number, and belong to a bygone phase of modern ecclesiastical art. The designs just sent in for the new parish church, the invitation for which lately appeared in the BUILDING NEWS, may afford the people of Ryde an opportunity of somewhat redeeming this want. The instructions issued to architects were liberally framed, at least as regards cost and conditions, though we think another premium besides the one offered would not have been too liberal a bestowal in a competition numbering 56 competitors. For a church to accommodate 900 adults and 200 children the stipulated sum of £8,000 is handsomely sufficient, but we fear the few really adaptable designs are in excess of this amount. The site selected is a good one, of commanding elevation, and possesses two capital frontages, and we hope the selected plan will be one worthy of it. On the whole, the designs submitted are sufficiently important, numerous, and varied in style, for a reviewer to descant upon the present and future of ecclesiastical architecture, if he were so minded; but we will here content ourselves with the less dignified task of pointing out deficiencies and merits.

The requirements of a town parish church present a problem to the architect often strangely misinterpreted or overlooked. The picturesque type of edifice of unpretending height, unlevel eaves, inequality of gables, timbered porch, and shingle spire is quite out of place in a town, however suitable it would be for a village, for as well might we put up a thatched cottage in a street. On the other hand, a dwarf cathedral, with its complement of central spire and western towers, is equally inappropriate for a parish. In the designs under review, it is amusing to see the latitude allowed in this respect, some giving us an English cathedral or an Italian duomo, others a village church; for we find both these extreme cases—all the ostentation of the one, and all the rusticity or affected artlessness of the other. It would be impossible, if it were not profitless, to notice all the designs brought together, and for that reason we shall simply notice those which, either from merit or defect, demand attention. The designs divide themselves broadly into two classes distinguished either for their English or foreign treatment of style. The plans exhibit an uniformity of type, being generally the old basilican three-aisled arrangement, sometimes broken up by a transept. A few only show the simple cross plan without aisles. Indeed, for picturesque interior and grouping, single-span or nave churches cannot compete with this time-honoured and symbolic form; and whatever advantages the Greek cross and uninterrupted plans of rectangular or polygonal form may possess for modern Anglican worship, this triple arrangement has kept its own, probably from the constructive difficulty of wide spans, as well as the force of ritualistic custom.

"Art" shows a well-drawn design in the English Decorated style, spoilt by a pretentious proclivity to crocket, boss, and pinnacle. The huge, meaningless pinnacles at east end dwarf the chancel, while the large and hideous gurgoyles, like winged dogs, that jut from angles of tower show a depravity of taste hardly conceivable in an age of enlightenment. The plan is defective in having seats behind the pulpit and reading desk, an arrangement noticeable in other plans, but highly destructive to the convenience of the clergyman and the proper appointment of a church. Except a few open benches for the choir, we think the whole space eastwards or behind the officiating desks should be left entirely unobstructed by seats. How the clerestory buttresses are supported in this design unless corbelled out is not apparent; and this remark will apply to other designs in which projecting buttresses crop out over aisle roofs apparently without foundation. "Oberon" is from one who, contrary to common sense, reverses the fitness of materials, putting his red brick and tile in exposed labels and roof cresting, and his stone and slate in walls and roof surfaces. "Ps. xcvi, 8 v.," and "Vectis" may be ranked together as variegated brick designs, one a pretentious jumble of plan and features, flat-pitched roof, and grotesque spire; and the other a notched and striped attempt, characterized by an overdone effort to foliate the roof trusses. "Sabrina" is a long-drawn and preposterous design; serrated eaves, wheel windows, and triplets, diapered slating, and over-heavy bell gable, give this design the merit at least of eccentricity.

Some authors betray a *penchant* for lofty naves, but even for town churches this can be carried to a ridiculous excess. "◯ A" shows such a proclivity. The plan has a good arrangement for a baptistery; but the disengaged tower connected to the aisle only by a porch is objectionable, and the affected variety of window tracery is childish.

"Simplex" and "Trefoil" show very dissimilar ideas; the first is unadapted, and has two perspectives thrown away upon it; while "Trefoil" has merit at least in its plan and general grouping. Possessing an English stamp, a well-considered plan, and dignified proportions, it has some of those qualities that are requisite for a town parish church. A sombrely coloured perspective, conforming to the conditions, accompany this design, though, taking the proportions on the geometrical elevations, the spire is drawn considerably attenuated. The author seems to have made the trefoil the keynote of his design; the trefoiled roof trusses, however, are somewhat too heavy, and the same excess is shown in absurdly large labels over interior arches of nave. The detail generally, and the panelled buttresses, detract from the merits of an otherwise good plan and design. "Fides" has several defects. A grotesque tower, low windows, and weak arches between aisles and transept, are prominently conspicuous; the roof treatment, showing perforated spandrels between pointed ribs and collar, is good. "Speed" has a plan too long, though redeemable in showing sounding boards or partitions obliquely placed across the eastern bays or chancel aisles, one being used for organ chamber, and the opposite one for children or choir. Otherwise, with the exception of a well-contrived roof with means of ventilation along its centre, the design has too many of those freakish whimsicalities that constitute the fashionable style of the day. Cardboard tracery, a chancel arch, carried on slender shafts, resting on corbels, canopied buttress tops, and general weakness in construction, are the salient peculiarities of the style adopted. Some authors indulge in the flimsy and worn-out features of post-Gothic. "Fiat Justitia," and "Veritas Vincit" both show that the spirit of Gothic art is sadly misunderstood. Pinnacles, parapets, and crockets, are redundant, whenever there is a lack of the essential qualities of art; and some of the designs exhibited show such a profusion of puerile ornament and ridiculous excrescences as to create a doubt whether art as practised by some is anything better than the practice of thoughtless or scrapbook jumble. Some have a *spécialité* for "bits," and hence we have windows that have been stuck in their places at random, regardless of general composition, and roofs, towers, and spires of every shape and clime.

Nothing can be more hideous than the turned bedpost ties and king-posts that are now generally seen in roofs of buildings of the French Gothic stamp. In "Esto Perpetua" we see this caprice, for it can be called nothing else, prominently developed; and though it is illustrated by a vigorously etched interior view, and an exterior perspective of faulty drawing, these crudities of design are too clearly brought out, as also the same flimsy plate tracery; and aisle arches thrusting last piers of nave evidence little study upon constructive features, as the above-named ties and king would readily suggest. "Incognito" shows an artistically sketched design, like a time-worn church, but its low gables and overdone pinnacles render it, we are sorry to say, ridiculously "modern" in conception. "In te Domine speravi" embrace nearly all the defects of Continental Gothic; here again the clerestory buttresses are unsupported. "Faith" has a better plan, and a well-drawn interior view.

Passing over some rubbishy ideas, we will at once draw attention to a few plans and exterior designs that merit the notice of those interested in this collection. Drawings bearing motto of a red Maltese cross show a good plan of nave, aisles, and transept, while the design generally is well considered, of tolerable English Decorated or Middle Pointed character, and improvable.

In "Soli Deo Gloria," we have before us a well-drawn and worked-out design of an Early Pointed type, and of dignified proportions; but we consider the plan defective. Here, as in some other arrangements, nearly one-third of the seating or congregation is behind the officiating minister. We do not see why the pulpit and desk could not have been placed one bay further eastwards, or, if that were all, the central tower, too; as it is the children are seated at sides of chancel, a decided mistake in arrangement. With this rather essential drawback the design has merits of a high order. The windows are simple but effective lancets, and the details are boldly conceived and well drawn. We think, however, the squat spire, though perhaps characteristic, could have been a little loftier, and a little less profusion of detail at broach would have been better. It puts one in mind of one at Oxford. Altogether, we think a little too much severity of treatment has been adopted, and the over long rectangular plan and unbroken eaves increase this effect. A slight projection of transepts would have been a great gain, and have helped to resist thrust of tower arches a little more satisfactorily, for there is a weakness apparent here. "Benedicamus Domino" has a better plan than the above; the tower is placed over chancel, but the old treatment evince the same hand as the last. It has the same lengthy proportion of plan, the same squat tower and spire, and the east end view is dwarfed to nothing by its overpowering size and height. There is a quiet dignity almost refreshing about these drawings that contrast with the sensational mixtures around. We think the apsidal termination preferable to the square east end; and we noticed the clerestory buttresses were not shown in the section, but appear unsupported, as in other instances. The etched perspectives of interior evince both correctness of drawing and detail, but we question the effect of the banded angle shafts in first design. Passing "Dum Spiro Spero" with the remark that it is of Early Decorated character slightly continentalized, is shown by bold etchings, and betrays a few defects, such as a poor wooden waggon vault relieved by stencilling, sham triforia, and wire-drawn shafts from floor to ceiling, squat gables, and a few good features, as broached spire, in which the junction is cleverly managed by open angle pinnacles and hipped spire light gablets,—we come to a

design having a considerable amount of merit under the motto of "Proportion" (on equilateral triangle). The plan has nave, aisles, and slightly pronounced transept, and circular apse filled with lofty lancets. The north-east bay is the organ chamber, over which a lofty tower is crowned by an overdone spire of a continental stamp—a feature much destructive to the simplicity of the design. The proportions of plan and gable ends are all that can be desired, and the connected ranges of lancet lights, and circular gable windows, are happily proportioned to the elevations and well combined. A quiet tastefully toned interior view shows richness of effect without multiplicity, well designed detail, a groined and decorated ceiling of carton pierre, between which an outer cross-braced roof large space is obtained for ventilation. The design shows interior bands of coloured brick relieved by marble. An Early English character pervades the design, which is marked by a dignified height and treatment. "Bid Temples worthier the Faith ascend," is another well conceived design of an Early French Gothic treatment, and has a good plan with a sort of triapsal termination. There wants, however, the quiet dignity of the last, the exterior being overdone with gablets and wheel windows. An open campanile showing bells is noticeable. "Servum Corda," by the same hand, is far better. Of Early Pointed character, it is a well studied, simple, yet suitable design for a parish church. It has a good plan, unbroken by transepts, with a triapsal end, the side aisles terminating semicircularly; the south-east end is devoted to a circular baptistery—a position we think eminently convenient, though perhaps not strictly symbolic. The tower and spire has a majestic loftiness, and occupies the north-west angle. The apsidal and side, as also the west elevations, possess dignified elegance, and are relieved by circular windows and triplets. The organ chamber is in the tower.

There is another design, with the motto "Vorwärts," in which the author has worked out a good plan, relieved by short transepts with a triapsal east end in the Rhenish Romanesque style, for which he appears to have a leaning. The baptistery occupies a similar position to the plan last noticed, and there is a general similarity of drawing and feeling to that which cannot be mistaken. There is a central circular lantern at intersection, and two western towers, which gives this design the pleasing grouping seen in the Romanesque churches of Germany. Indeed, there is much both in plan and treatment that we may derive from this style, which seems to us more in unison with secular wants; at any rate, the two western towers shown in the exterior perspective are quite beyond the requirements of the present case, and the brick groining, if we have not misinterpreted the section, is certainly unjustifiable; however, it may be carrying out the Romanesque character. The sepia views are effectively drawn. We doubt very much if this design can be carried out for £8,000.

A few other good drawings, though of inferior merit as designs, we leave unnoticed, though we may refer to them in another article, upon the subject for which we shall reserve any further remarks. The plans we have just indicated, more or less, possess merits and excellencies of design, and they appear to us all characterized by an English feeling, rather than an overstrained effect, or by the adoption of foreign features or novelties. In nearly all of them the plans seem to have been carefully studied; the pulpit and prayer desk are placed entirely beyond the mass of the congregation, and the tower, at least its ground floor, has been utilized as an organ chamber, or otherwise. We trust the selection will be influenced by no other motives than that of the strictest regard to obtain the combination of the best arrangement and general design, not overlooking the question of cost, we fear more than a little transgressed in one or two instances.

METROPOLITAN BUILDINGS AND MANAGEMENT BILL.

THIS bill, which was introduced last session by Mr. Tite, was ordered to be printed July 31. It is, in some respects, an improvement on the old Act, but is still in a very imperfect state, being fraught with sources of litigation and inconvenience to the public, and vexation to the district surveyors. The general opinion of district surveyors is that there is no need of the sweeping changes proposed by the Bill, which enters into matters of too minute detail, and which embraces some clauses which will be found practically inoperative, and others in which the detailed regulations are practically and technically obscure. In consequence of the report of Captain Shaw, the Superintendent of the Fire Brigade, important alterations have been made in the Bill, but, for many reasons, further careful consideration is required. Sufficient distinction is, for instance, not drawn between materials that are *incombustible* and those that are *fire-resisting*, nor between the construction of ordinary dwelling-houses and buildings of the warehouse class. The Board have now the extinction of fires in their own hands, and though they have, in this Bill, done much to make the risk of fires less, they have done it in a manner utterly regardless of the damage they inflict on property generally. It appears as though their chief aim was to benefit themselves, the insurance companies, and a few of the monopolists who are exempted from the action of the Bill.

Besides objections to the portion of the Bill relating to fire-resisting material and construction, others, equally grave, may be taken to certain clauses, which render many persons liable, *nolens volens*, to highly penal enactments. Inasmuch as builders—and especially those of the speculative class—owners of property, warehousemen, wharfingers, and all persons possessing household property of any description—even occupiers—are included, it will be seen that there is no class who are not affected by its provisions. It should also be remembered that this Bill is designed as a sort of master act for all the larger towns of the country, although, at present, many of the parishes in the neighbourhood of the metropolis, where large building operations are going on, are not included. It is proposed to divide the Act into eighteen parts, commencing with "Preliminary" and ending with "General Provisions." To follow this Bill through all its clauses is not our intention; we prefer to give a general idea of it.

Clause I.—Part 1, which is preliminary, merely states that the Act shall be divided into parts, enumerating them, to which reference will hereafter be made. Clause 5, &c., defines the limits to which the operations of the Act are confined. Clause 6 consists of "Terms," and their definitions, and here the Act begins to flounder into difficulties, several important terms being but loosely defined, while, contrary to the usual practice of legal enactment, it legislates for "intentions." The term "owner" is held to mean any person occupying for a longer period than from year to year. A clause sufficiently obscure is added, defining what is called "fire-resisting material." This concludes the important clauses of the first part. In the second division the officers are dealt with, and the district surveyors effectively disposed of. Their duties, *status*, remuneration, and tenure of office, being now in the hands of the Board, what the powers of the Board are may not be an uninteresting subject for inquiry. The Board may dismiss or suspend any district surveyor—the Act specifies no cause whatever for dismissal—other than those appointed previous to the constitution of the Board, whose dismissal must be approved by one of her Majesty's Principal Secretaries of State. There are special clauses providing for the clerks immediately under the Board, but the favourable consideration which applies to the clerks, servants, messengers, and porters is not to be extended to the district surveyors, who, it will be seen, may be dismissed at will, and without cause shown.

Part III. commences with a statement of "what is comprised in the term building." The definition is so loose that an ordinary four-legged table comes strictly within the term, as it is "an erection defined by posts, and has a roof or other covering." Passing over a dozen clauses that will be hereafter noticed, we learn by clause 46 that any trade building pulled down within 10ft. of the footings, cannot be rebuilt of a greater height than 60ft. where the road is less than 40ft. wide; and where more than 40ft. wide, it cannot be more than 65ft. high, without permission of the Board. Those who know the dodgy way in which buildings are pulled down and rebuilt simultaneously, so that they cannot be condemned, will appreciate the practical advantage of this clause.

Part IV.—This part is divided as follows:—Subdivision 1. Buildings not public or of warehouse class. Subdivision 2. Buildings of warehouse class. Subdivision 3. Cross walls. Subdivision 4. General provisions respecting thickness of walls. Here it appears that the classes of factories and warehouses are not subdivided. As regards the thickness of walls, it seems to have been adopted solely with the view of their being able to stand alone after a fire has destroyed the cross-walls and timber ties. This balancing feat is not of sufficient importance to call for special legislation. By clause 77, we perceive that although our improved manufacture produces excellent hollow bricks and flat tiles of an almost unlimited length, bricks are nevertheless restricted to 9½in. in length, though a better bond may be made with bricks of larger dimensions.

Part V.—Construction in General.—This part contains some useful enactments for improving the general security and healthiness of houses, although the extra cost involved, which will take the shape of extra rent, will force our imperfectly housed population to crowd even closer than at present. No doubt a damping course of slate laid in cement or asphalte is desirable, and a foot thickness of concrete over the entire ground surface or site of every dwelling-house will contribute to the health of the inmates, other things being equal. In clause 81, the words "solid ground" may admit of technical objections, and in cases where the ground has lately been made 20ft. or 30ft., it seems doubtful whether a builder may not be required to carry piles or concrete down to the virgin soil, or even to the hard. No provision is made for using burnt ballast for mortar, though, to the consternation of builders who have been in the habit of using garden mould, calling it road scrapings, a clause is inserted requiring them to use clean sharp sand or grit, and good lime in proper quantities. The clause referring to openings in external walls and walls of separation, is contradictory and unintelligible, while clause 85 is so framed as to prevent the erection of stables in buildings of one storey, and shops in buildings of two storeys. Of course this was not the intention of the clause, but so it strictly reads. This part of the Act forbids the use of stone for corbels carrying beams, girders, and the like, substituting vitrified stone. Templates of stone built into, and flush with, the walls are permitted. It seems, by Captain Shaw's report, that stone tailed into walls, either in the form of corbels or steps, is very unreliable, the action of cold air or water on the heated stone causing it, in almost all cases, where subjected to great heat, to break off close to the wall. The clause 96, which states that the "plane of the surface of the roof of a warehouse shall not incline from the external or party walls upwards at a greater angle than 47 deg. with the horizon," is unreasonable; and the next clause, that "in a building wholly or in part used as a dwelling-house, there shall not be more than one storey of rooms constructed

wholly or partly in the roof," is useless. How many storeys are there in the roofs of the new buildings now erecting on the Marquess of Westminster's property! How many in the mansards of Paris? This is a case of excessive legislation. Access to the roof, by means of a dormer or other sufficient means, is very properly insisted on; but where the houses are isolated, or have dripping eaves, the provision is simply useless, and in the latter case cannot be complied with. There is a provision made that yards shall not contain less than 100 square feet, and that there must be 15ft. between the next house if the house is two storeys; 20ft., if the house is three storeys; and 25ft., if more than three. This is all very well if it can be carried out, but the difficulty of making yards is already sufficiently great. As the Act reads, the yard might be 1ft. wide only, provided it contained 100 square feet. This part of the Act contains some good provisions against fire, amongst others a clause that "no woodwork shall be placed within 2in. from the face of the stone or brickwork of a flue." Penalties of £20 are to follow a summary conviction for all offences against the fire clauses. There is one clause, 124, which certainly demands revision. It requires that "no part of the woodwork of a shop front shall be fixed higher than 18ft. above the level of the nearest public way." This is an arbitrary enactment, the use of which it is difficult to perceive.

Part VI.—Party Structures.—The alterations to the old Act here contemplated are the making good all internal finishing and decorations of an adjoining owner's premises, where a party wall has been pulled down, because such party wall was not thick enough for the uses to which the building owner would put it. The notice by building owners relative to the exercise of his rights to a party wall is reduced from three months to two. The building owner may also enter on the premises of the adjoining owner, "removing furniture or doing any other thing necessary," and the adjoining owner may not let or hinder him, under a penalty of £10.

Part VII. relates to buildings exceeding 216,000ft. of cubical contents. These are factories, warehouses, &c. Part VIII. treats of public buildings. Part IX. fire-resisting buildings. Here there seems an excess of thickness in the arches for support of floors. The brick arches now in use for heavy warehouses, 200cwt. to the foot, are from 4½in. to 6in. at crown, which is all-sufficient. Part X. embraces special buildings. It is advisable that the Board should have discretionary power in the case of workshops where the material worked up is not combustible, and such workshops should not necessarily be themselves fireproof. Part XI. relates to the supervision of buildings by the district surveyor. Part XII. embraces clauses referring to storing inflammable materials. This part wants great revision. The articles stored should be divided into those that are explosive and those that are purely inflammable. The former should be stored in light iron buildings, where the damage will be trifling; the latter should be placed in buildings made in the "tank" form, so that the burning liquids may be contained therein, and not be allowed to run elsewhere.

Part XIII. refers to dangerous and noxious businesses. It is desirable to prevent the rebuilding of such buildings by giving powers to the Board to pay for compensation. Existing gas works are exempted. Part XIV. relates to dangerous structures. There is much room for improvement in the present regulations. Dangerous structures are under the supervision of the police commissioners, but, as a rule, no policeman will interfere or report on the dangerous condition of any portion of a building unless such condition jeopardizes the lives of persons in the streets. A dangerous structure in a passage or back yard is viewed by them with complacency which would be amusing if it did not contain a tragic element. Part XV. has to do with exemptions. This part contains a list of the buildings exempt from the provisions of this Act. Amongst others, we notice that "buildings belonging to any canal, dock, or railway company, distant 50ft. from the public street, and 50ft. from the nearest building." Considering that some of the docks on the south side of the river contain warehouses entirely constructed of wood, this exemption is to be regretted. Part XVI. relates to streets. This portion of the Act is unsatisfactory. While dealing with public streets it seems to be overlooked that there are in the metropolis scores of private streets, which, although full of dwelling houses, can be made of any width. Already in various districts the Board have permitted blind alleys to be made, although the Building Act, to which they may be said to owe their existence, was expressly framed to prevent such things.

Part XVII. provides for sewers and drains. These do not properly belong to a building act. Part XVIII. refers to general provisions. These are various, and, on the whole, good, but the power given to the Board of making by-laws carrying all the force of the Act is most objectionable. It must be obvious that when the Act is once obtained the Board may make what by-laws seem good to them without any opposition, or, indeed, without anyone being the wiser. A clause stoutly debated and rejected by the House may be slipped in afterwards in the form of a by-law from which there is no appeal. The proposal to refer "Differences" to the district surveyor is also objectionable. He is not the proper person to settle such disputes. His interest is, of course, to recommend everything the least defective to be pulled down and rebuilt in the best manner. This would not in all cases be fair, as between the building owner and the adjoining owner, although that particular district where the practice prevailed would certainly be in better repair than any other. These are the prominent features of the Bill; at least, as much of them as space will permit us to give. The Bill itself we propose to examine more fully on another occasion.

PUGIN *v.* BARRY.*

Mr. Pugin's promised pamphlet is printed, and, in a few days, the public will be able to judge for themselves how far its author was justified in starting this controversy. Mr. Pugin says, page 2, "that circumstances have forced" him into his "present position," the "circumstances" being, as he puts it—1. A remark in the review of the Law Courts in the "Westminster Gazette."† 2. A review of this review in the Building News.‡ 3. A correspondence in the "Standard." And 4. A question put by a writer in the "Pall Mall Gazette." ‖ As to the part imputed to us, we emphatically repeat what we said in our impression of June 14, for we maintain that neither the Houses of Parliament, nor the late Sir Charles Barry, nor the late Mr. Pugin, nor "the lamentable gables" on one side, nor "the glorious efforts" on the other, have anything whatever to do with the designs for the Law Courts. And that when the reviewers of the latter digressed so far as to criticize the dead fathers of two living architects, only one of whom was engaged in the competition under review, it looks as if his object was that which has been more or less attained by the publication of this pamphlet. We shall not, however, pause to discuss with Mr. Pugin the whys or the wherefores. We shall say nothing of the manner in which this controversy has been conducted; and we shall say nothing of Mr. Pugin's argument, standing as yet alone, to which Mr. Barry has not yet replied. That a cause is often weakened by undue reticence is very true. That it is weakened by an over-anxiety to speak or prove too much is equally true. And this suggests the question—What is the cause? It is simply and briefly the cause of artists *versus* surveyors when one architect seeks the assistance of another for any special work. If it be for anything more than mere drawing, the object sought must be one of two things—1, to secure some special art power greater than his; or 2, to obtain more knowledge of the requirements of the special case in arrangement, construction, &c., than he possesses. In the first case, the art part of the work is the assistant architect's, however much it may be concealed from the public, and the nominal architect has to subside into the plotter or surveyor. In the second case, of course, the parts are simply reversed, the assistant takes the plotting and surveyor's part of the work, and the architect remains, what he should ever be, the artist. Now, we see no harm in either of these arrangements, provided only the whole thing be fairly and freely recognized, treated as consultations, paid for as such, and nothing concealed. Help and advice in this way would, we are sure, result in a much truer and honester practice of architecture. That this should be boldly done by practising architects ought to be evident to every honest practitioner; but we go further, and say that it should be also the practice between architects and their salaried assistants, *i.e.*, if architects purchase from their assistants that knowledge which they profess to possess themselves. When Mr. Dickens drew the portrait of Pecksniff, he drew no uncommon architectural character. Everyone who knows much of English architects knows that there is scarcely a country town in the kingdom that does not possess its Pecksniff. Indeed, so wide-spread and deep-rooted is this principle of brain-conveyance (brain-stealing unwise people call it) that, as many successful men owe their success entirely to it, it will be a hard matter to root it out. Nevertheless, it is just one of those plants we hope to dig out, and we ask help in our work from every architect *in esse*, and every architect *in posse*, who is, or hopes to be, worthy of the art he follows.

In the case now immediately before us the division of labour seems to us very clear. Sir Charles Barry laid down the arrangement of the rooms, passages, halls, and staircases of the different floors of the Houses of Parliament. No one disputes this. He might have even planned all the projections and all the fenestration. He might have said we will have a tower here of such a height, a tower there of another height; a fleche here and pavilions there; he might even have sketched out a diagram design of the river front. But to have done more was just as impossible for the late Sir Charles Barry in 1835 as it would have been for the late Mr. Pugin to have made such a design as that by Mr. Burges for the Law Courts. Modern architecture has not yet given us any evidence of genius. The best amongst us have been simply trying back. And any one who is not blinded by partizanship can easily see that the good Gothic architects of the first half of the nineteenth century were always the men who had extensively sketched, measured, and studied the works of the middle ages—men who kept a large book of patterns always by them, or stored in their memory, and to which recourse was had whenever a "new" thing was wanted: the most faithful copyist (faithful in detail, construction, method of working, &c.) being the best architect. That Augustus Welby Pugin evinced more knowledge of English Gothic architecture in 1835 than any or all of his cotemporaries is a fact so patent to every one who knows anything of the modern science of archæology that it would be unnecessary to discuss it in these columns. What Sir C. Barry did not know of Gothic art is also equally patent; and had the Houses of Parliament depended solely on their nominal architect they would not have had even the few admirers they have. All this, we should have thought, was so self-evident as to

* "Who was the Art Architect of the Houses of Parliament?" London: Longman and Co.
† March 2. ‡ June 14. ‖ August 5.

require no documentary evidence to substantiate it. But modern architects are eminently jealous; the successful man in groove No. 1 is jealous of his successful brother in groove No. 2, and so on. Sir C. Barry was just as successful an architect in his revival of Italian Renaissance as Pugin was in his revival of the Gothic of the fifteenth century. Had Pugin accepted the commission to design an Italian club-house, and sought Barry's assistance, no amount of talk would have persuaded us that Pugin was equal to the occasion. For, be it remembered, that those were the early days of revival, and the works of that period show clearly enough that men could not do even the most mediocre work out of their special groove. The documentary evidence which the pamphlet contains supports this view, although it would not much matter if it did not, for the principle of buying and selling has gone to such a length in this shoppy country of ours that not only are a man's hands and brains marketable commodities, but his zeal, his aspirations, and his hopes can be measured, and valued, and bought. The fallacy of supposing that everything for which we pay money *is in its fulness ours*—that the design for our house, the pictures on its walls, the sculpture over its gateway, are all ours, to do what we like with if we have paid for them, is one of the greatest and cruellest fallacies of a money-making age. We should not, therefore, have been surprised to have found that Pugin, in his zeal for his favourite style, had utterly forgotten *himself*. To a great extent—to the extent of making such a controversy as that now before us possible—he most certainly did himself an injustice, and solely for the sake of Gothic art. Nor does Pugin stand alone. We could give other examples if there were any need to do so. The culminating point of this injustice was in signing the letter dated September 3, 1845—a letter manifestly concocted. Had Pugin nothing whatever to do with the original or any designs for the building, we know enough of his blunt honesty to feel sure that he would have said so in so many words. "Mr. Barry's own designs," as Pugin called them, Mr. Barry had paid for, and they were his by virtue of purchase. This Pugin possibly felt, for other architects and assistants have so felt, and have had to try hard sometimes to persuade themselves of the existence of such a thing as self-respect. It seems to us Mr. E. Pugin has rendered the profession and the public a service in publishing portions of his father's diary, and certain letters, first, from Sir C. Barry to his father, thirty-nine in number, four ranging from September 23, 1836, to April 17, 1837, the rest from September 3, 1844, to February 23, 1852; second, from undoubted personal and intimate friends of his father. The diary extends over the months of April, May, June, August, September, October, November, 1835. From August, 1836, to February, 1837, there are two entries of a subsequent date. From this diary alone the story seems tolerably plain. On April 1, 1835, Pugin sent away some of Graham's drawings; on the 15th he left Sarum for town, dined with Barry on the 18th, started for Ramsgate on the 21st, and there, after a little breathing time, "began Mr. Barry's drawings" on the 28th. Ten days after he leaves Ramsgate for town, and on May 10 met Mr. Barry. On the 14th left for Sarum, and the very next day set to work on Barry's drawings. His time for the rest of 1835 seems to have been divided between London and Sarum. He runs up to town June 9, and returns on the 14th; again on August 4, returning on the 16th. Mr. Talbot Bury comes to Salisbury: began to assist on September 11. On October 3 Bury is paid, and leaves. October 11, Pugin again goes to town, working at Barry's. He returns on the 18th. On November 2 Barry goes to Sarum, and leaves on the 9th. On the 19th Pugin visits Barry, and works in town for the rest of the month. We leave it to our readers to fill in this framework as they please, and we refrain from making any estimate of its value. With the statements and counter-statements, assertions and denials which this question has raised we have nothing whatever to do. But we should certainly like to see the correspondence between Barry and Pugin prior to September 23, 1836—that is to say, the letters which passed between these two architects during the time the competition drawings were being prepared, but we suppose they are all destroyed. The question has been raised publicly, and the building about which the controversy arose is a national work. Barry and Pugin—both public men—are both beyond our reach, and cannot be affected one way or the other. Luckily, the gift of architecture, or any other art, is not hereditary, however much some people would wish it to be; the sons cannot suffer in public estimation except by their own acts. And as to sentiment, we do not believe in any such thing when it stands in the way of truth. It appears that the 76 letters, about which so much has been said, are not in existence. It would have saved trouble and many hard words if this fact were stated before. The letters, assuming that Mr. E. Pugin's statement be true, are probably destroyed. If so, why? This is not a new controversy. It was commenced more than twenty years since, and it is not likely that letters which contained evidence in favour of Barry would be purposely destroyed by any member of his family. The letters, on the other hand, might have been unintentionally destroyed, or they may be in existence in some unknown corner. It is quite certain that there must have been a great deal of correspondence between Pugin and Barry, and it is indeed singular that so little of it has seen the light, or can be consulted. We should suppose that Mr. Pugin, judging from the length of his pamphlet, which contains upwards of 130 pages, does not intend to submit the matter to any number of men who may be selected as arbitrators, and that he prefers to leave it to the judgment of the public. What that judgment is likely to be we cannot tell until we see what the Messrs. Barry may have to say on the other side.

GLAZED CERAMIC SURFACES.

IN our last number we gave our readers the benefit of Mr. H. Conybeare's remarks on the use of glazed ceramic surfaces. That gentleman has entered into a calculation of the price of this material if extensively used in London. Mr. Conybeare says:—The superior economy of the glazed ceramic surface can be demonstrated by comparing the cost per square yard of a facing of glazed bricks with that of the ordinary facing of London houses of brick, covered with painted stucco. Glazed bricks can be delivered in London at £6 10s. per 1000; and one of the principal manufacturers informs me that were there a large demand, they might be supplied very much cheaper. In the present comparison, however, I will adopt the price of £6 10s. 1000 bricks at £6 10s. will suffice to face 18¾ square yards; the cost per yard will be, therefore (neglecting on both sides of the comparison the cost of laying the facing bricks), 7s. 1d. per square yard. The cost of the ordinary facing of brick, covered with painted stucco, would be as follows:—The same number of facing bricks will be required as before, but the cost will be only £2 10s. per 1000, instead of £6 10s. This will make the cost of the facing bricks 2s. 9d. per square yard; to this has to be added cement stucco, 2s. 6d. per square yard, making a total of 5s. 3d. per square yard, and the painting. The rate for painting "from a ladder" is 1s. per square yard; but as it has to be renewed every three years, it may be taken as 4d. per square yard per annum, which is interest at 5 per cent. on 6s. 8d.; and this swells the actual cost of the usual facing of London houses to just 12s. per square yard, or nearly double that of a facing of glazed bricks, which has been shown to be 7s. 9d. per square yard only. There are about 150 square yards (deducting openings) in the front of a London house, of the class usually occupied by professional men (a house, that is, of—say 26ft. width to the street, with three windows in front drawing-room, and two floors of bedrooms over.)

In giving a ceramic surface either to an old house or a new one built of concrete, tiles must be used instead of glazed bricks. I have before me the catalogue of one of the principal manufacturers of wall tiles, in which the prices (with and without fixing) are stated as follows:—

White glazed, wall tiles, 6in. square, 3rd quality, 3s. 6d. per square yard at the works, or 7s. 6d. fixed complete.

6in. square, 2nd quality, 5s. 3d. per square yard at the works, or 10s. 3d. fixed complete.

6in. square, 1st quality, 6s. 9d. per square yard at the works, or 11s. fixed complete.

6in. hexagons, 6s. 9d. per square yard at the works, or 11s. 6d. fixed complete.

6in. octagons, and blue dots, 8s. 9d. per square yard at the works, or 13s. 6d. fixed complete.

Coloured 6in. tiles would be 3d. per yard more than white ones—*i. e.*, 7s. per yard, instead of 6s. 9d., the fixing being the same. This makes the cost of fixing with porcelain tiles a good deal more than that of operating with glazed bricks; but I am assured, that were the demand largely increased, the cost of tile surfacing would be very materially reduced.

PUBLIC MUSEUMS AND FREE LIBRARIES ASSOCIATION.

AN association has been formed under the auspices, and in connection with, the Working Men's Club and Institute Union, for the further establishment of public museums and free libraries, and to give the masses access on the week day evenings to the National Art and Science Collections. This latter project has already been emphatically sanctioned by a Select Committee of the House of Commons which sat in 1860. If any proof were wanted of the utility of the measure, and the extent to which it would be appreciated by the working classes, the South Kensington Museum would be amply sufficient. Every week it is thronged by thousands of interested visitors. Who can doubt that a similar result would be speedily obtained at the great centre of art and natural history, the British Museum? There is in reality only one argument against the project that needs combating for a moment, only one danger that needs guarding against—that of the possibility of damage to these treasures by fire. With the improved lighting arrangements at our command at the present day, and our appliances for detecting and extinguishing fire, this can cause but very little real apprehension. That the establishment of local museums and free libraries may become powerful aids in the cause of technical education, is proved by the fact that the already existing institutions of this class, few as they are, are thronged by working men. Working Men's Exhibitions, imperfectly organized, and indifferently arranged, as many of them have been, have attracted, some their tens of thousands, and others their hundreds of thousands of visitors. It is, therefore, certain that the attainment of the objects of the Association would be fraught with advantage to the community. We therefore recommend them to the cordial support of all who desire the intellectual improvement and social elevation of the people.

TECHNICAL EDUCATION.

THE very important subject of technical education of workmen seems to be about to receive attention from an unlooked-for source. A committee of the Working Men's Club and Institute Union held a meeting at their offices, 150, Strand, on Tuesday evening last, to consider the subject—Mr. Herbert in the chair. Mr. Lacham, the printer to the University of Oxford, who has devoted considerable attention to the subject, attended and gave some valuable suggestions. Mr. Howell stated that in his trade there was, as far as his experience went, a total absence of any sound practical and cheap work from which information might be derived. He believed joiners were in this respect better off. Mr. Paterson, a cabinet maker, and one of the assistant secretaries, suggested that practical men in the various trades should be invited to assist in the compilation of standard manuals, to be supplemented at intervals by any fresh information obtainable on the subject to be gleaned from the various trade organs, such as the "Mechanics' Magazine," the BUILDING NEWS, and other reliable sources. It was finally suggested by the chairman, and duly proposed and carried, that meetings be held to

·eceive the opinions of representatives of the dif-'erent trades on the sufficiency or otherwise of .he present existing literature on the respective ıubjects, to the extent to which any new manuals ıre likely to be supported by the trades they re-›resent, and to gather general information on the ıubject. The first meeting is to be held on De-:ember 12, at 8.15 p.m., to receive opinions from .he representatives of the cabinet makers' trade. This certainly seems a step in the right direction, nd the Working Men's Institute deserves credit or its action in the matter. If properly conducted he inquiry seems likely to materially contribute o the important object of enabling our workmen ffectually to compete with those of other ountries.

BRASS PLATES.

AYS the "Pall Mall Gazette," the foundations of the Herbert Hospital at Woolwich have iven way, and for some months past the opera-on of underpinning that enormous building has een in progress. It was at first stated that the ›st to the public would be but £1,500; but since ıe job has been commenced, it has been dis-›vered that it is a much worse job than was at rst supposed. What the ultimate expense will s nobody knows, if, indeed it be not found neces-ıry to abandon the building as a total loss. On Iay 21, 1823, the Duke of Wellington—being at ıe time Master-General of the Ordnance—issued he following order:—

As the recent arrangements and regulations of the Treasury have imposed upon this department the execution of l buildings and repairs of buildings under the Government in all parts of the empire, the Master-General and oard desire to call the attention of the officers of Engineers to the increased trust reposed in their skill and eir attention to their duty. The Master-General and oard are desirous of having some lasting record of these ualities in the officers of Engineers, and they are pleased ›order that whenever any public building may be erected ıder the direction of an officer of Engineers, a brass plate ıay be affixed in some conspicuous part of it, stating its mensions, the amount of the estimated expense, the nount of the cost, the date of the commencement and ıat of the conclusion of the work, and the name of the ficer who has executed or superintended it. The same to › done in case of any repair exceeding the sum of £1,000; ıd in case any repair should be given to any public build-g, the expense of which does not exceed £1,000, a parti-lar description of it and statement of its expense are to › recorded in the books of the engineer's office at the ace at which that repair has been executed, with the ıme of the officer who executed or superintended it. order that the Master-General and Board may at all mes in future know who are the officers who have ecuted the public works carried on under their direc-ons. WELLINGTON.

In a letter to General Mann, to be found at page l of the second volume of the series of the Duke's Supplementary Despatches and Papers," now in ›urse of publication, his grace explains that this ›neral order has been called forth "in conse-ıence of the number of public works, buildings, c., now useless or going to decay on account of ıeir having been constructed with bad or impro-›r materials, or badly, or upon insufficient founda-ons, or in a manner not calculated to ensure the ırposes for which the buildings were intended." s observes that, in case of having to find fault ith him, a private individual can dismiss his chitect or builder, but that the public cannot ›miss the whole corps of Engineers, and that, as ıe sense of responsibility is the most powerful otive to induce men to do their duty, he thinks necessary to adopt the plan sketched out in his der for attaching to individual officers the credit › be obtained, or the blame to be incurred, for ıe good or bad performance of public works. In ıe Duke of Wellington's opinion an officer who ight, and, probably, would, overlook a defective lan or defective work by a contractor, or by work-ıen employed under his directions, would think vice before he would pass over such defects if he ıew that his own name would go down to pos-rity "as the constructor of a barrack, for in-ance, uninhabitable because the mortar with hich it is constructed was made of sea sand; of tower costing more than its value in repairs be-ıuse its foundation is insufficient or injudiciously id; of a magazine unfit to contain powder from ımp; or of storehouses tumbling down as soon as uilt for want of sufficient foundation."

PROPOSED TRADES UNIONS' ACT.

THE Conference of Amalgamated Trades have distributed a number of copies of their raft bills for legalizing trade unions, and with ich a circular asking the favourable consideration f their production. Delegates from the Societies of Engineers, Ironfounders, Carpenters, Bricklayers, and Vellum Binders, compose the conference, and they claim to represent about 60,000 operatives. The preamble proposes that some existing acts shall be partly repealed, and this enactment substituted in their place. There seems to us a want of clearness in the clause which treats of trade offences. It says in substance that a penalty of imprisonment, for a term not exceeding three months, shall be incurred by any one who, by "act or threat of violence to person or property," or by the commission of any "offence punishable by statute," shall force or endeavour to force any person to depart from or refrain from accepting employment, to subscribe to a club or fund, to pay a penalty for breach of rules, to alter his mode of conducting business, or to limit the number of his apprentices. Now, surely, the authors of the bill do not mean that every act of violence is to escape with the slight punishment of three months' imprisonment because it is committed in furtherance of trades unions' interests. Murders, such as those perpetrated by Broadhead and Crookes, are only aggravated "violences to person," and "offences punishable by statute." Three of the clauses provide that all cases of trade outrages shall only be heard before a judge of the superior courts, and by a jury selected by ballot from the register of Parliamentary electors for the borough or county in which the trial is held. The reasons for this, as stated by the explanatory circular, are—because the cases are often of considerable difficulty and importance; and the impossibility, under the present system, of obtaining a jury not entirely composed of the middle class. We can see very little force in the reason for the adoption of the first proposal. We do not think that the ends of justice would be better met by sending every trumpery case of assault or violence to the assizes, solely because it had arisen from a trade dispute, and therefore hold that the lower tribunals may be safely left to the exercise of their discretion, as at present. With regard to the juries, while we see no objection to its adoption, we do not think the plan will materially alter many verdicts that might have been given under the present system. We entertain the opinion that Englishmen, of whatever class, as a rule, do not allow their prejudices to excuse perjury in the jury box. We do not see that the last clauses are wanted at all. We refer to those which provide for the punishment of any officer who shall embezzle the property of a society. The punishment provided, viz., two years' imprisonment, or, for heavy offences, a period of from five to fourteen years' penal servitude, seem heavy compared with the very light one for what is quite as heinous an offence. Once legalize trades unions, and concede to them the right to possess property, and there are existing statutes and penalties against larceny and felony quite sufficient for the punishment of offenders.

THE MANCHESTER TOWN HALL COMPETITION.

ON Saturday last, at a meeting of the Manchester Town Council, the town clerk read a memorial on this subject, of which the following is a copy.

To the Worshipful the Mayor, Aldermen, and Common Council of the City of Manchester.

We, the undersigned President and Council of the Manchester Architectural Association, venture to address you upon the question of the site for the proposed new town hall. In doing so we have to express our regret at having heard that you are still inclined to adhere to the shape and extent of land as indicated on the plan supplied to architects, in the recent sketch competition, by the city surveyor. We have hitherto hesitated to express our professional opinion upon this question, as we trusted you might perhaps be induced to reconsider the proposed site, especially after having examined the sketch plans submitted in competition. We, as architects, have never entertained a favourable opinion of the shape of the site as decided upon; but, after a careful examination of the competition plans, we are more than ever convinced of the unfitness of the site for the purpose of a town hall for this city, and our object in thus addressing you is to entreat you to reconsider your decision while there is yet time. We feel that we are only echoing the opinion of the majority of our professional brethren who supplied sketches in the recent competition, and we know of instances where men of talent and high reputation in the profession have thrown up the competition on account of the inappropriate nature of the site as regards its form. With its position no fault can be found, and in many respects it is admirably adapted for a fine architectural display; but we respectfully ask that the boundary lines of the plot may be altered so as to form right angles, and thereby render the site more available for the production of a good and convenient plan. And we venture to suggest that the plan proposed by Mr. Councillor King is well entitled to your careful consideration, and would better secure the desired end than any plan as yet proposed. We would, however, suggest the following modification of Mr. King's plan, viz., to dispense with the idea of connecting Albert-square with Oxford-street, and to square the site as now proposed by tracings herewith enclosed. We are of opinion that this plan would cost less than Mr. King's, and would only add one acute angle in the surrounding property. In thus addressing you we are solely actuated by a desire to see a building which shall do honour to your honourable Corporation and the city over which you preside, and also that we may have the satisfaction of knowing that we have recorded our professional opinion upon a matter which cannot fail to be of great interest to this important and mercantile borough.—We have the honour to remain, most respectfully,

LAWRENCE BOOTH, A.R.I.B.A., President.
CHARLES CLAY, M.D., Vice-President.
ISAAC BLACKWELL, M.A.A.,
JOSEPH BATTYE, } Council.
PETER B. ALLEY, Jun.,
ALFRED DARBYSHIRE, A.R.I.B.A., M.A.A., Hon. Sec., No. 7, St. James's-square.

October 22, 1867.

Alderman Clarke and Alderman Heywood moved and seconded that the memorial be received, which was adopted.

Mr. King expressed his gratification at the memorial. He could assure the council that the Association was constituted of half the architects in Manchester. He was quite satisfied with the progress of public opinion in the matter. The mayor appeared to be very anxious that the Architectural Association should not be mistaken for the Manchester Society of Architects. The memorial, he said, did not come from that society: it came from an entirely different body, with regard to the respectability of whom he had not a word of disparagement to say; but they were not the men who did the architectural business of Manchester.

Our readers will see by reference to a leading article in our issue of October 11 that we advocated a similar view to that expressed in the memorial.

THE NEW ALEXANDRA PALACE.

THE building known as the Alexandra Palace, at Muswell-hill, is at length approaching completion. It was commenced in 1863, by a company formed to remove thither the Exhibition building at South Kensington, which Parliament declined to purchase, but they becoming financially involved in difficulties, a second company obtained possession, and will, doubtless, in the course of three or four months, complete both park and palace. The park is an estate of some 200 acres, and commands a fine view north, east, and south. It can be reached from London by the Great Northern Railway from King's Cross; this is, in fact, at present the only direct route. The Great Eastern, the Midland, and the North London lines, however, all approach it within short distances, and probably only await the inducements of customers and competition to encircle it with as complete a network of railway communication as surrounds its more southerly rival the Crystal Palace. The length of the building as now erected is about 300 yards. It faces the south, looking over Old Hornsey town. One of the large domes, formerly at South Kensington, forms the centre of the building, but is now partly cased with masonry, and is surmounted by a circular balustrade. The ground plan consists of a nave extending the whole length of the building, crossed by three transepts, the two end ones not quite 300ft. each in length, and that in the middle not quite 350ft. Smaller domes surmount the two end transepts. A quantity of stained glass gives the building a somewhat ecclesiastical appearance. Rich frescoes will adorn the walls, cornices, and interiors of the domes, the iron columns which support the building being surmounted by Corinthian capitals coloured blue and red. On the south side of the building a race course forms a novel and, as we are inclined to think, a very objectionable feature of entertainment in a "People's Palace." Provision is being made for evening entertainments by a thorough distribution of gas pipes over the building, and if the gas cannot be obtained from some local establishment, it is to be manufactured on the estate. It is hoped that the Princess of Wales will open this palace which bears her name early in the ensuing year.

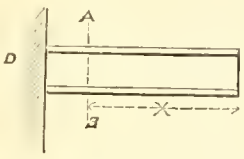
We are glad to see that a special effort is being made to increase the library of the Institute of Architects, and Mr. Tite has contributed £100 towards the object. It must be admitted that the library at Conduit-street is scarcely worthy of the position and importance of the Institute, and it is hoped that the President's example will be extensively followed.

ELEMENTS OF ENGINEERING.

CANTILEVERS.—II.

HAVING discussed in the previous article the question of a cantilever loaded at the extremity, or at any one particular spot, and subjected to the action of a single weight collected at that point, we have now to investigate the conditions attending the effect of a load uniformly distributed over the entire length of the beam. If we imagine fig. 1 to

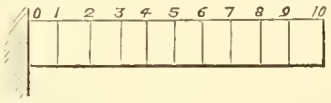
FIG. 1.



represent a cantilever, with a load spread uniformly over its upper surface or flange, and that it is required to determine what is the amount of the strain upon either the top or bottom flange at any point A B, the simplest method will be to proceed as before, and find the moment of the breaking force, subsequently that of the resistance, and equate the two. In the first place, it is quite evident that the portion of the total weight resting upon the girder, between the line A B and the support or fixed end D, produces no effect whatever towards exerting any strain at the line A B; and all, therefore, that we have to consider is the weight resting upon the cantilever between A B and the free extremity, or what is usually termed the end. Let this distance equal X. Then, if we supposed the whole weight along X to be divided into so many units, the moment of the strain of each respectively round the point A B, would equal their weight, multiplied by the distance of their centre of gravity from that point; consequently, the moment of the strain, produced by their sum of the total weight, is the product of that weight into the distance of its centre of gravity from the line A B, or from whatever point at which the strain is required. Calling this weight W′, the distance of its centre of gravity from the line A B, will equal $\frac{X}{2}$, and putting M for the moment of the strain, we obtain $M = \frac{W' \times X}{2}$. The moment of resistance, or the force exerted by the cantilever, using the same notation as in our previous article, is $S \times d$, so that, equating these two quantities, we finally have for the amount of the strain at any joint A B, $S = \frac{W' \times X}{2 \times d}$. This is the general equation for the strain upon the top or bottom flange of a cantilever at any point, when it is submitted to the action of a load uniformly distributed over its whole length. To find the greatest strain, which, it will be seen, occurs at the support or fixed end, similarly to the case of a single load at one extremity, which we have already examined into, we put L = the total length or span of the beam; and making X = L, and W the total weight, we obtain the equation for the maximum strain $S = \frac{W \times L}{2 \times d}$.

The equation obtained, and the amount of the strain in the former instance, where the cantilever was only loaded at the extremity, was given by the rule $S = \frac{W \times L}{d}$, and we, therefore, perceive that in the one case, with the same weight in both, the strain is only half what it amounts to in the other. In other words, it is a law in mechanics that where a cantilever is loaded with a weight, uniformly distributed over it, the maximum strain at the support is only half that produced by the same weight acting at its free extremity. The same relation, it may be remarked, prevails in horizontal girders, supported at both extremities, and loaded respectively uniformly over the whole span, and only in the centre. Let us take a practical example before proceeding further. What number of square inches should there be in the top flange of a wrought-iron cantilever at its fixed end, having a length of 10ft., a depth of 1ft., and loaded uniformly with a weight of 10 tons, taking the safe strain of wrought iron per square inch at five tons. If N represent the number of square inches, then $N = \frac{S}{5}$, but from above $S = \frac{W \times L}{2\,d}$. Substituting for the letters their assigned values we obtain $N = \frac{10 \times 10}{2 \times 5 \times 1} =$ 10 square inches. In designing cantilevers for supporting uniformly distributed loading, we may proceed in the same manner as before, and adopt one of the two courses open to us in the case of where the load is applied at the free extremity; that is, we may either keep the depth constant and vary the sections of the flanges, to correspond with the increasing strain towards the fixed end, or keep the flanges constant and vary the depth in an increasing ratio towards the support. Supposing, for the present, that we choose the former of these two methods, there is a difference to be remarked in the manner in which the strains increase towards the fixed end. Instead of augmenting in a regular progression, as in the case of a cantilever loaded at one extremity, they increase in the ratio of the squares of the distances of any given points from the free end. The following simple rule will therefore be of use in calculating the strains upon the different parts of the flanges of a cantilever, having once ascertained from the concise formula we have given the maximum or greatest strain at the support. Let us take the example already cited, and determine what will be the amount of strain upon the beam at every foot from the fixed end. Divide the girder into ten parts, and number them consecutively from 0 to 10. From the principle

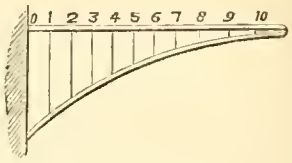
FIG. 2.



already laid down that the strains vary as the squares of the distances from the free end, supposing the strain at the fixed end to be equal to unity, we can easily deduce a series of numbers, which will represent the proportion existing between the strains at the different points required. Commencing with the divisions from 1 to 10, these numbers are respectively—0·81, 0·64, 0·49, 0·36, 0·25, 0·16, 0·09, 0·04, 0·01, and 0·00. The maximum strain at the fixed end is obtained from the formula $S = \frac{W \times L}{2\,d}$, and is equal to $\frac{10 \times 10}{2 \times 1}$ = 50 tons. Multiplying this strain by the numbers given above, we readily obtain the strain acting at every foot run of the cantilever; and to find the number of square inches required in the flanges at the corresponding points, bearing in mind that the depth or the value of d is constant throughout, all that is necessary is to divide the strains so found by five for the top flange, and four for the bottom.

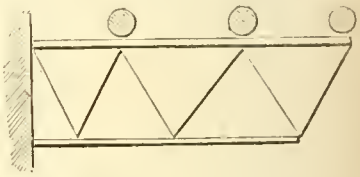
Turning our attention now to the other form of design, where the sectional area of the flanges is maintained uniform, but the varying strains compensated for, and duly resisted by a varying depth, there is no difficulty in perceiving that if the depth be increased from the free end to the support, in accordance with the proportionate numbers already found, the correct geometrical outline of the cantilever will be arrived at. Fig. 3 represents the outline of girder so designed, which will consequently allow of a uniformity of strain in the top and bottom flanges, omitting all notice of the difference of length in the top and bottom, owing to the curved shape bestowed upon the lower. Manifestly, cases may arise very different from the two general ones we have investigated, but they would be rare, under any ordinary conditions of loading; moreover, it is quite impossible to give

FIG. 3.



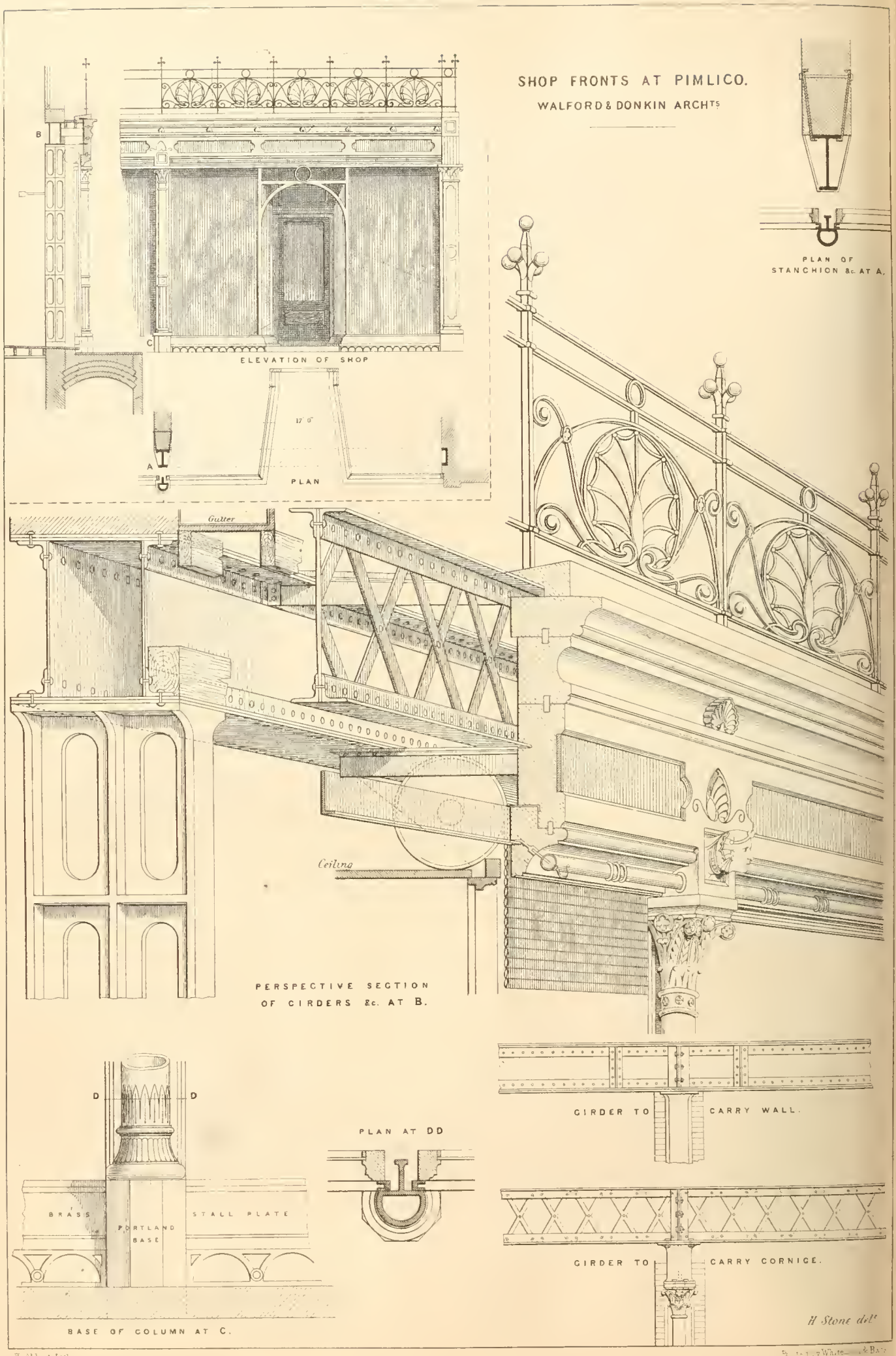
examples and rules for every special case that might be brought before the notice of the professional man. Only general rules and guiding principles can be laid down, and the skill of the designer must deal with each particular example, as the attendant circumstances demand. In fact, it is in the manner in which these special cases are dealt with, that displays the practical ability and knowledge of the engineer and architect. We have as yet said nothing about the web of the cantilever, or the duty it has to perform, for in cast-iron girders the exigencies of manufacture and the margin of safety generally demand that not only a sufficiently but an excess of material must be placed in the web. It is in reality only in braced or trussed cantilevers that the designing of the web requires close calculation, but at present we do not intend entering upon the subject of open web girders. Their general appearance is shown in fig. 4, and the weights are usually regarded

FIG. 4.



as concentrated upon the apices of the triangles formed by the intersection of the diagonal bars of the web with the top and bottom flanges. Where the load is attached to the free extremity of a cantilever, the amount of material required in the web, when the depth is constant, varies with the product of the weight and the distance or length of the span, and the same conditions hold in the case of a cantilever with a load uniformly distributed. Although theoretically the strains diminish, or, so to speak, dwindle down to nothing at the free extremity, yet it would be extremely injudicious to reduce the sectional area, either of the flanges or the web, to nothing at that point. It would be impossible to predict that a small strain, perhaps a heavy sudden one, might not be brought by accident upon that part of the girder, and it would be bad economy to imperil the whole structure for the sake of effecting an insignificant saving of material.

Mr. Joseph Grove, honorary secretary of the Palestine Exploration Fund, in a letter, says:—Lieutenant Warren has established by actual demonstration that the south wall of the sacred enclosure, which contained the Temple at Jerusalem, is buried for more than half its depth beneath an accumulation of rubbish—probably the ruins of the successive buildings which once crowned it, and that if bared to its foundation the wall would present an unbroken face of solid masonry of nearly 1,000ft. long, and for a large portion of that distance more than 150ft. in height; in other words, nearly the length of the Crystal Palace, and the height of the transept. The wall, as it stands, with less than half that height emerging from the ground, has always been regarded as a marvel. What must it have been when entirely exposed to view? No wonder that Prophets and Psalmists should have rejoiced in the "walls" and "bulwarks" of the Temple.


SHOP FRONTS AT PIMLICO.
WALFORD & DONKIN ARCHTS
ELEVATION OF SHOP
PLAN
PLAN OF STANCHION &c. AT A.
Gutter
Ceiling
PERSPECTIVE SECTION OF GIRDERS &c. AT B.
PLAN AT DD
GIRDER TO CARRY WALL.
GIRDER TO CARRY CORNICE.
BRASS
PORTLAND BASE
STALL PLATE
BASE OF COLUMN AT C.
H Stone del.

Ely · Cathedral.

SHOP-FRONTS AT PIMLICO.

SHOP-FRONTS, as a rule, receive but little consideration from architects, and that, we suppose, for two reasons—namely, they get but little remuneration for their labour, and tradesmen, in this matter, are very difficult to please. The tradesman has an absorbing ambition for glass. He seems to count his squares as a farmer would acres—the greater the number the larger the harvest. Not an inch must be lost; columns are only obstructions; arches must have spandrels; and sash-bars cannot be tolerated. One of our lithographic sheets this week illustrates a shop front (with details) recently erected at Pimlico, from a design by Messrs. Walford and Donkin. Though it possesses no striking originality, its general treatment is not without character and merit. Its principal features consist of a stone cornice of great length, panelled with marble, supported at either end by pilasters of a similar character, and in the middle, at intervals, by two ornamental iron columns. The whole is surmounted by an iron railing. The style is Classic, but French in feeling. As regards construction, the difficulties generally attending a stone cornice of long bearing has been met, with some originality, by the introduction of a lattice girder, as shown in the drawing. The columns which support the ends of these trusses are fluted, and, although light and pretty, are open to criticism in point of general harmony. The iron railing is good, so also is the sculpture, as executed by Mr. Earp. The establishment consists of the adaptation of three separate houses. These, with the exception of the party walls, have been cleared throughout, the front and back walls of each house being carried on iron box girders. On the first floor are the work-rooms, libraries, and sitting-rooms for the assistants belonging to the establishment; above this again are the bedrooms, the dining-room being at the top, and provided with a lift. Mr. Gorringe is the proprietor of the establishment. The contractors were Messrs. Newman and Mann. The total outlay was £4,500.

THE ARCHITECTURAL MUSEUM.

WE have more than once called attention to this museum. That there is an urgent necessity for it no one disputes, and that advantages will flow from it when it is established every one believes. It is satisfactory to feel that so much progress has been made. It was expected in the first place that £2,000 would have been sufficient. That sum having been nearly raised, tenders were invited, and the lowest sent in is £2,970. Another £1,000 is, therefore, needed to complete the work, and make it worthy of the architectural profession. Mr. Joseph Clarke, the honorary and, we say, the indefatigable secretary, in a letter to us says—"Now, professional gentlemen have so heartily responded to our appeals for aid that surely our architects and others to whom our museum may prove so valuable, will come forward with more contributions. I do not think that the aid from the profession and the art trades allied to it has been as general as we had reason to expect." It is not too late to remedy this defect. If gentlemen like Mr. Ruskin and Mr. Charles Buxton will subscribe liberally, it is not too much to expect that men engaged in architectural pursuits will show their appreciation of the museum, and help to establish it. We are rather surprised to see the absence of the names of our great building firms from the list of subscribers. They, more than any other body of men, reap advantages from the improved art taste of the times. These improved tastes create a demand for new and expensive buildings, and it is well known that builders and contractors are not the worst paid in their erection. The contemplated architectural museum will materially assist the art revival of the age, and it has, consequently, a claim on our great builders. We hope, therefore, the council will not neglect this fruitful part of the field in their efforts to secure the additional necessary £1,000. The same may be said of our large art manufacturing firms. Certainly, when the object is so good, the advantages to be derived so certain, and the ability to aid so abundant, this appeal of the council of the architectural museum will not be made in vain.

ELY CATHEDRAL.

ELY Cathedral, of the west front of which we this week give an illustration, was commenced (A.D. 1082-1094) by Simeon, first Norman abbot of the great Benedictine monastery, at that time adjacent, and which was founded about 970, by Athelwold, Bishop of Winchester, on the site of the convent of St. Etheldreda, which had been destroyed by the Northmen. His successor, Abbot Richard (1100-1107), so far completed the building as to render it fit to receive the remains of St. Etheldreda, to whom, with St. Peter, it was dedicated; and they were consequently removed thither, from the Saxon church of the monastery. Bishop Riddell (1174-1189), further completed the work to its western end, together with part of the tower. The galilee or western porch was built by Bishop Eustace (1198-1215). The old Norman choir was pulled down and rebuilt by Hugh de Norwold (1229-1254). Abbot Simeon's central tower falling in 1322, it was replaced by the octagon, commenced in the same year, and finished in 1328; and the lantern above it, begun in 1328, was completed by 1342. The Lady Chapel was mainly built by John of Wisbech, one of the monastic brethren, from 1321 to 1329, and chantries were added to the eastern ends of the choir aisles by Bishops Alcock and West (1486-1553).

Possessing in itself a very large amount of beauty, it is peculiarly interesting to the architectural student, from the fact of its containing (as will be seen by the above dates) examples of the different periods of Gothic architecture from Early Norman to Late Perpendicular. And these examples are equal in importance and beauty to any in existence elsewhere. The galilee and the eastern portion of the choir are among the very best works of the Early English period; and the octagon, the western choir, and the Lady Chapel, are perhaps the finest examples of pure Decorated in England. The dimensions of the building are as follows:—

	Ft.	in.
EXTERIOR.		
Total length from east to west	535	0
Length of great cross or transept, north to south	190	0
Height of four stone turrets on western tower	215	0
Height of lantern over the dome...	170	0
Height of two towers of south-western transept	120	0
Height of eastern front to top of the cross	112	0
INTERIOR.		
Total length east to west	517	0
The galilee or western porch	40	0
The western tower	48	0
The nave	203	0
The choir	122	6
Retro-choir	31	6
Length of transept from north to south ...	178	6
Height from floor to centre of lantern ...	142	0
Height of the vaulted roof of the choir ...	70	0
Height of walls of the nave...	72	9

The work of restoration, commenced a few years back by the late Dean Peacock, and continued since, has considerably added to the beauty of the cathedral, exhibiting in their original grandeur the details for which it was always famous, and adding thereto the richly decorated ceiling of the nave, and the reredos designed by Mr. Gilbert Scott.

The west front, given in our illustration, represents the principal features of the church. "It was," says Rickman, "when complete, of great magnificence, differing from all those now remaining; and, though its effect is greatly injured by the mutilation on the north side, is still imposing." Bishop Riddell, or Ridel, built the lower portions of the tower and wings, his work probably extending as high as the clerestory, where the transition Norman arches are replaced by Early English. The upper portion, as high as the first battlements, is supposed to have been added by his successor, Bishop Longchamp. A spire of timber, covered with lead, was added to the western tower about the middle of the thirteenth century, but afterwards removed. The upper portion, in the Decorated style, was then added, and again surmounted by a spire. These additions considerably weakened the structure, and probably caused the fall of the north-western transept, or, at least, were the cause of so much injury as to necessitate its removal.

The galilee is entered by a main arch, which circumscribes two smaller ones, springing from a central group of shafts, both foliated, and the spaces between them and the large arch filled with tracery. The porch comprises two bays, simply vaulted, the wall of each divided into two storeys by blind arcades. All the shafts were originally Purbeck marble, the ribs of the vaulting freestone, but the vault itself is "clunch," a soft white stone, not much known out of the neighbourhood. The floor consists of tiles, and was relaid a few years back.

The interior of the tower has been restored since 1845, and considerably improved by the removal of a floor above the lower arches. The beautiful painted roof, designed and executed by Mr. H. L. S. Le Strange, was then inserted. The north-west transept, as before stated, fell (the date is uncertain), and remains in a ruined condition. The south-west transept has been restored. The walls are lined with a double arcade. A modern font of Norman character has been placed in the transept.

The nave, built about 1174, is Norman, and originally comprised thirteen bays; one of these is now included in the octagon. These alternate in design, as at Norwich. The roof until lately was open, but a painted ceiling, designed partly by Mr. Le Strange, who died in 1862, and completed by Mr. T. Gambier Parry, has now been finished. The subjects, by Mr. Le Strange, commencing at the west end, are—The Creation of Adam, the Fall, the Sacrifice of Noah, Abraham and Isaac, Jacob's Ladder, Marriage of Boaz and Ruth. The remaining six, by Mr. Gambier Parry, are—Jesse, represented asleep, after the ancient manner; David, the Annunciation, Christ's Entry into Jerusalem, the Sepulchre, and the Majesty.

The octagon, the beautiful peculiarity of this cathedral, has been characterized as "perhaps the most beautiful and original design to be found in the whole range of Gothic architecture." It was commenced on the fall of Abbot Simeon's tower in 1321-2, and finished in 1342, at a cost of a sum supposed to be about equal to £60,000 of our present money. It was erected under the care of the Sacrist Alan, of Walsingham. The entire roof above the piers forms the only Gothic dome in existence. The vaulted roof has been very effectively coloured.

The choir is divided from the octagon by a modern oaken screen, with brass gates, designed by Mr. Gilbert Scott. It consists of seven bays, the four easternmost of which (as well as the two forming the retro-choir) were erected about 1229-54, and the three western, in which are situate the stalls, about 1345. The difference of the styles of these two portions is strongly marked. The eastern division is reached by an ascent of two steps. It is a fine example of pure Early English work. The piers are of Purbeck marble, octangular, the capitals of the ringed shafts attached being enriched with leafage, and knots of foliage between the bases of the shafts. Bosses of foliage adorn the intersections, and in the spandrils are large open trefoils. Carrying the vaulting shafts in triple groups, are long

corbels of leafage, extending to the bosses at the intersections rising to the level of the clerestory, where they terminate in capitals of leafage, from the top of which spring the ribs of the vaulting. The triforium extends backwards over the choir aisles. In the two western bays, however, it has been removed altogether, and the inner arches transformed into windows. This was probably done to give additional light to the altar and to the shrine of St. Etheldreda, which stood between these two bays. In the tympanum above there is an open quatrefoil; pointed quatrefoils also appear in the spandrils. The clerestory windows are triplets, set flush with the outer wall. A gallery is formed by an inner open arcade which rises above the triforium. The roof is simply groined, the vaulting ribs being in groups of seven. The arrangement of the three western arches harmonizes, in point of elevation of their parts, with the four eastern. The lower arches, and those of the triforium, have square bosses of foliage attached to their mouldings. The tracery of the triforium and of the clerestory windows is very rich and graceful. The bosses of the lierne vaulting of the roof have been gilt, and the ribs coloured red and green. The corbels of the vaulting shafts are blue, with white and gold-tipped leafage. All the clerestory windows on the south side, and one on the north, have been filled with stained glass by Wailes, representing doctors and martyrs. The organ projects from the triforium of the third bay on the north side. Its hanging case is of carved oak, partially coloured and gilt. This is modern.

The altar rises five steps from the floor, the inlaid mosaic and encaustic tiles of which are very fine. The altar-cloth is a good specimen of modern ecclesiastical embroidery. The reredos consists of five compartments, immediately over the altar, filled with alabaster sculptures representing Christ's Entry into Jerusalem, Washing the Disciples' Feet, the Last Supper, the Agony in the Garden, and Jesus Bearing his Cross. Above these rises a mass of rich tabernacle work, crowded with figures of angels bearing instruments of the Passion, and medallion heads in relief. Four of these, on the north, represent four Jewish prophets, and those on the south four saints. Each compartment terminates in a gable in the centre, and highest of which is the Saviour, with Moses and Elias on either side. Above this is a medallion of the Annunciation, and on the highest point a figure of Our Lord in majesty. The side gables are surmounted by figures of the four Evangelists, and spiral pillars between them by figures of Justice, Prudence, Fortitude, Faith, Hope, and Charity.

The retro-choir behind the altar is part of Bishop Hugh's work. The eastern end is filled with two tiers of windows, set back within an arcade supported by shafts. The stained glass in this part is the best in the cathedral. The Lady Chapel is situate at the north-east corner of the north transept, and, since the Reformation, has been used as a parish church. When perfect it was an elaborate example of the Decorated period, but it was terribly mutilated by the Puritans. The various monuments are well worthy of longer notice than our space will admit. The principal are those of Bishop William, of Louth (1298); Bishop Barnet (1373), (the brass of this has been destroyed); John Tiptoft, Earl of Worcester, who was a Yorkist, and was beheaded in 1470, after Warwick's great victory; Bishops Hotham, Redman, Patrick, and Allen. That of Bishop Allen was erected since 1845, and is a slab of rich Alexandrine mosaic. It cost £1,000, but is more elaborate than beautiful. On the floor of the north choir aisle is a brass to the memory of the architect Basevi, who was killed by falling from the western tower in 1845.

The exterior of the east end of the cathedral is a fine specimen of Early English. On either side of the three rs of windows rise buttresses, with hes and canopies. The west front, the subject of our illustration, may be well left to describe itself.

Our illustration is engraved from a photograph taken by Mason and Co., of 28, New Bond-street.

CORROSION OF MARBLE.

A SHORT time since we gave an extract from "Notes and Queries" on this subject. From the same source we take the following:—During the combustion of coal or coke, sulphuric and sulphurous acids ascend together with much aqueous vapour, and condense on the cold polished surfaces of marble, &c., but most on those which are turned downward or are vertical, because these catch the vapours most readily and retain them longest. When the marble has carbonate of lime for a main constituent, this is decomposed by the more powerful acid and converted into sulphate of lime, which encrusts the corroded surface. The corrosion of the magnesian limestone of which the Houses of Parliament are built is mainly due to this cause, and the scrapings of the stone taste of sulphate of magnesia, or "Epsom salts," resulting from the action of the sulphuric acid or the carbonate of magnesia in the stone. Mr. Spiller has drawn particular attention to this in a paper read at the recent meeting of the British Association at Dundee. He states that a ton of coal evolves during combustion the astonishing quantity of 70lb. of oil of vitriol, so that we need not be surprised at the injury to stone and other things effected by the sulphurous vapours of smoky towns, especially where there are extensive vitriol works. I may state, however, for the benefit of the latter, that I know of a large town in which there was a remarkable immunity from infectious diseases in the neighbourhood of the vitriol works, although no plants would grow there. Mr. Spiller recommends the application of a solution of superphosphate of lime to porous building stone likely to be corroded, having found by experiments that it hardens and protects the surface.

The fine sandstone which is the chief building material in the great manufacturing districts of Yorkshire is never corroded by the smoke, being of a siliceous nature, and containing no lime or magnesia in any amount to render it susceptible to any injury.

There is in the new chapel here a sumptuous and stately reredos constructed of alabaster and other "pleasant stones," with sculpture in Caen stone. While the chapel was temporarily heated by brasiers, the polished surfaces of marbles having carbonate of lime for their basis were quite dimmed by the Acherontic fumes that ascended from the open coke fires, and the gas standards of "birnist lattoun" were so blackened that they had to be "purifyit" and "polist" over again. The alabaster, fluor spar, lapis lazuli, &c., were not affected in the slightest degree.

The polish of the injured stones was restored, and in some measure protected, by a slight application of turpentine and wax, if I remember rightly; but they do not look so well as some which have been added since the building has been heated by hot water pipes. Had the more primitive method of warming been continued, one of the finest works of the kind ever erected would have been completely spoiled.

I have often seen coloured marbles in monuments so corroded as to look like common stone, but have not observed the preservation of upturned surfaces mentioned by "J. H. B.," though I think I can easily understand it, and shall look for it in future. J. T. F.

The College, Hurstpierpoint.

Carbonic acid would not affect marble, as that is already a carbonate of lime. Coke contains generally a considerable quantity of sulphur, which in the process of combustion becomes converted into sulphurous acid, which has an immense affinity for water, and in consequence combines freely with any damp it encounters. Water absorbs thirty-three times its volume of this acid at natural temperatures. All aqueous solutions of sulphurous acid pass into sulphuric acid when exposed to the air. This again has great affinity for lime, and will convert any carbonate into the sulphate (gypsum), which is to a certain extent soluble in water. A very curious circumstance occurred to my father in connection with this subject, but I must defer an account of it till next week. It is probable that if wood charcoal was employed instead of coke the mischief would not be so serious, if it was not entirely prevented.

GEORGE VERE IRVING.

IRON PRESERVATIVES.

THE *Engineer* has an article on this subject, which contains some valuable information on the structure of iron and the composition of paints. As, says that journal, iron is entering more and more into construction, both at home and abroad, so that it behoves us to look well to it, that our iron buildings are not allowed to suffer for want of appropriate means of preservation. It is also important that we see to our ironwork being properly protected against atmospheric influences before erection, for it often happens that the seeds of decay are sown between the time of the iron leaving the works and being erected. This is, perhaps, a point which is of no great moment at home, but abroad it is of vast consequence, involving the safety of the whole structure. A plan which has recently been adopted, is to dip the ironwork in hot boiled oil before it leaves the factory, and the plan works well, on the whole, in the midland districts at home. But it is when we come to send iron to the sea coast or abroad—to India, for instance—that its protection from oxidation requires more particular attention. Here the boiled oil process is put to the test, and it is within our knowledge, that some ironwork lately shipped to India, has failed in this respect. The oil was insufficient to protect the iron from the atmospheric and other influences incidental to a sea voyage, and the consequence has been that many tons of iron ready for erection were found to be in a woeful state of rust on reaching their destination. The circumstance of the failure to which we have referred, naturally leads us to look for a remedy, and to discover one, we must examine into the characters and compositions of the material to be protected, and of the substances to be applied as the protecting media. Taking, in the first place, iron in its present form, or native iron, we find that it is produced by the decomposition of a portion of the oxide in which it is embedded—a change which may have been brought about by electro chemical agency. Professor Phillips, in his metallurgy, tells us, that the whole, or a portion of the iron, formerly existed in the form of iron pyrites (bi-sulphuret of iron), which, becoming oxidized, not only produced a certain amount of the soluble sulphate of iron, but also generated by chemical action an electric current of sufficient power to precipitate a part of the iron in the metallic form. From this we gather the affinity of the ore for its oxide, and experience has proved that iron cannot have a better protective covering than a composition having its own oxide as a base. It will, of course, be understood that so far we have been alluding only to the natural oxides as found surrounding the ore.

We now come to another class of paints having iron for their bases, and these are the red hematite paints. Hematite ore is of two kinds—the black band or grey hematite, and the red hematite. The latter only is used in the manufacture of paint; it contains a little oxide of iron, although in an impure state, and it is to this paint we would direct special attention; it also contains from 50 to 80 per cent. of pure iron. Now, as this iron will not fuse or blend unless subjected to a white heat, it is impossible to expect it to possess any preservative properties. A material that will not amalgamate with the ironwork it is to cover unless it is subjected to such a heat as would destroy all the other constituents of the composition in which it is conveyed is not likely to prove very efficacious as a preservative. The duration of such paints is simply to be measured by the duration of the material used to give them adhesion; in other words—those of an analytical chemist who reported favourably upon one of these compounds—"it would last as long as the oil in which it was conveyed would last."

There is another point in connection with these paints which we cannot pass by without notice—that is their liability to discolouration when used in such situations as may bring them into contact with strong gases. On examining gasworks, railway stations, engine sheds, and the like buildings, it will be found that the lead paints turn a blackish brown, and zinc will discolour variously from a bluish grey to a greyish black. The gasworks at Cheltenham afford a curious example of these results. We cannot leave unnoticed the extensive adulteration now carried on in the manufacture of some iron and zinc paint, with which chalk is largely mixed. For white lead, chalk and barytes are much employed, especially the latter article,

which carries with it the recommendation of a specific gravity approaching to that of lead itself. For many other paints, the softer Bath stones ground down, Venetian red and earthy ochres, enter not a little into their composition, as analysis will prove. The deductions to be drawn from the foregoing remarks are that the best preservative of iron is its natural oxide, and this is exactly the material from which the best Torbay iron oxide paints are manufactured. These paints, properly prepared, are found to be far superior to any others for adhesiveness and affinity, while their sufacing properties have been proved to be in the ratio of more than 3 to 1 as against ordinary paints. An examination of the new iron screw pile at Herne Bay, and the pier recently opened at Teignmouth, will prove the resistance offered to sea water by their close affinity for the iron on which they are laid. The Saltash Bridge has also just been repainted with these paints. With regard to discolouration from the action of gases, we may refer to the gasworks at Greenwich, and the loop line station at the Waterloo terminus, both of which have been coated with them. The latter, with the adjoining woodwork, has been painted some time. The roof is very low and confined, and exposed to the action of the products of combustion from the locomotives, yet the colour of the paint remains unchanged. So satisfied are the Government authorities with its general qualities that they have directed the Melville Hospital at Chatham to be coated with the same material, and it is also being largely used in Woolwich Arsenal.

Owing to the peculiar nature of the material from which the iron oxide paint is made, it might be supposed that it is not susceptible of a very great variety of shades. Nevertheless, several new tints have recently been produced—amongst others some very rich blues and greens, as well as some delicate neutrals in greys and stone colours. Beyond the applicability of the Torbay paints to constructive iron, wood, and stonework, it is worthy of notice that they are found to answer well on the exhaust and feed pipes of steam engines, or in places where they are subject to extreme variations of temperature. A composition has been prepared by one manufacturer of the Torbay iron oxide paints which is based on the iron oxides, and which is used in faucets of pipes, manholes, face-joints, &c., for steam, gas, or water. This composition is said to give better results than have been obtained by the oxides of lead, which have hitherto been used exclusively in these cases.

MECHANICAL PROPERTIES OF STEEL.*

By Dr. W. Fairbairn.

THIS was a paper on experimental researches on the mechanical properties of steel in its present improved state of manufacture. The first part consisted of a condensed history of the improvements that had been made in the process of the manufacture of steel and iron, and it then went on to say that for several years past attempts had been made to substitute steel for iron on account of its superior tenacity and increased security in the construction of boilers, bridges, &c. Some difficulties, however, existed, and until they were removed, it would not be safe to make the transfer from iron to steel. These difficulties consisted in the want of uniformity in the manufacture in cases of rolled plates and other articles, which required perfect resemblance of character, and the uncertainty which pervaded its production requires careful attention. Time and close observation to facts in connection with the different processes would, however, surmount these difficulties, and would enable the manufacturer to produce steel in all its varieties with the same certainty as he formerly attained in the manufacture of iron. The author then proceeded to give tables and formulæ showing the results at which he had arrived from experiments on a selection which he had made of the different specimens of steel, in reference to which he had endeavoured to obtain such information about the ores, fuel, and process of manufacture as the parties supplying the specimens were disposed to furnish. The following was the substance of the results of the experiments under each division :—

Transverse Strain.—The deflections within the elastic limits were in proportion to the pressure. The mean value of the deflection corresponding to unity of pressure and section, may be taken as the measure of the flexibility of the different bars. In general, the least flexible bars give the highest values of E and C; and other things being the same, or nearly the same, the most flexible bars give the highest values of U, the work of deflection corresponding to unity of section. The bars of some of the experiments, with more than an average flexibility, gave very high values for C, the working unit of resistance to transverse strain showing their great value when applied to the springs of carriages and other constructions where flexibility and strength should be combined. Such bars as those of other experiments, with less than an average flexibility, gave at least an average value for C, showing their applicability to all constructions where rigidity and strength are required. And so on to other cases. In order to determine the relative value of the two kinds of material undergoing transverse strain, he then supposed two bars of the same length, one steel and the other iron, having the same strength, to be similar in their transverse sections, and showed that the cost of the iron would be $1\frac{1}{3}$ to that of the steel; and that in the case of railway bars and such constructions, besides this saving in the cost of material, it must be borne in mind that the steel rail would last four times as long as the iron rail.

Tensile Strain.—Taking the mean of the results of the experiments on thirty of the best specimens, we find the mean tenacity per square inch = 47·7 tons. Now, if we take 25 tons per square inch as the tenacity of the best English hammered iron in bars, it follows that the tenacity of these steel bars will be about twice (1·91 times) that of the iron bars.

Economic Use of the Material.—For bars of equal strength, undergoing tensile strain, the iron bar should be about twice the section of the steel bar. Now if the cost of steel be £12 per ton, and that of iron £7, then the cost of the iron would be more than 1 1-10th times that of the steel; in this case, therefore, the steel would be the more economical metal. The saving per ton of material would be 1·37, or £1 7s. $4\frac{3}{4}$d. The work producing rupture in the different specimens is very variable, owing probably to some extent to the errors arising from the determination of such exceedingly small elongations. This irregularity would have been avoided if the specimens had been of greater length, so that the elongations might have been ascertained with greater accuracy. The greatest value (6400) of this work of elongation was given in experiment 14, where the breaking strain of the specimen is below the average, being only about 40 tons per square inch. The specimen which had the greatest tenacity, viz., about 60 tons per square inch, required only 670 units of work to produce rupture; this arises from the very small elongation, viz., ·01, which the bar sustained at the point of rupture.

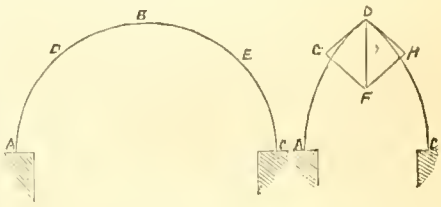
Compression.—Thirty-two of the bars supported each a pressure of 100·7 tons per square inch of section, without undergoing any sensible fracture, with this pressure. The mean value of the compression per unit of length, taken for twenty-four of the best specimens, is ·372, whilst the mean taken for the remaining specimen is ·232, giving a general mean deflection of 302. The work expended in crushing the material in short columns is remarkably large. The mean value of U, taken for 26 of the best specimens, is 41300, whilst the mean taken for the remaining specimens is 25400, giving a general mean value of 33400. If 6000 be taken as the value of U in the case of tensile strain, then the work expended in rupturing the material by compression will be $5\frac{1}{2}$ times the work expended in rupturing the material by extension.

Tensile and Compressive Resistances Compared.—Taking the mean tensile resistance to rupture at 47·7 tons per square inch, it follows that their resistance to compression is more than double—being really 100·7 divided by 47·7 : that is, 2·1. Hence it follows, that the most economic form of a steel bar, undergoing transverse strain, would be a bar with double flanches, having the area of the bottom flanch about double that of the top flanch. This conclusion is borne out by the results of experiments on transverse strain, where the strain per square inch of the material at the elastic limit is equal to 31 tons nearly, but the mean breaking strain per square inch by extension is equal to 47·7 tons, clearly indicating that the compressive resistance in the former case was considerably in excess of the tensile resistance.

* Read before the British Association.

POINTED ARCHES.

THE principles of stability of a "pointed arch" may be readily determined from those of circular arches. In the pointed arch we have removed the arc which constituted the crown of the circular arch, and in order to the equilibrium of this new system, we must have a force or forces acting in the same direction and of equal amount as the forces which were exerted upon the part of the arch supposed to be removed. According to the principle of stability of semicircular or segmental arches, we have a thrust acting through the arch stones or voussoirs, in the direction of a tangent, to the curve of the arch, at any particular point, and if we construct a right-angled triangle, having for its hypotenuse the tangent already referred to, we have the forces acting at this particular point represented, both in magnitude and direction, by the three sides of the triangle, the vertical side representing the load; the horizontal, the horizontal thrust; and the hypotenuse, the tangential thrust exerted by the load from the crown of the arch up to the point under consideration. Now, since this is also true for a corresponding point in the other half of the arch, supposing the load to be uniformly distributed, it is evident that if we suppose the part of the arch above these points to be removed, and the lower parts brought together so as to form a pointed arch, the direction at the springing at the abutments remaining unaltered, we must have a load resting upon the points of the arch equal to double of the load acting at the corresponding points in the half arches already spoken of, in order to the equilibrium of this new structure; in other words, the load to be placed upon the top of the pointed arch will be represented by the diagonal of the parallelogram constructed upon the tangents to the curves where they meet. To illustrate this :—Let A B C re-



present a semicircular arch with a load equally distributed. Take any point, D, in the arc A B, and draw a tangent to the curve at that point, as also at E in the arc B C. The vertical sides of the right-angled triangles constructed upon these tangents will represent the load between D and E. Now, let the arc D B E be removed, and we have the pointed arch A D C; and, in order to its stability, we must have a load upon D equal to twice the load acting at D and E in the circular arch, *i.e.*, equal to the diagonal B F of the parallelogram D G F H, B G and D H being tangents to the curves at the point D. The pointed arch, then, is stronger than the circular arch, in so far as with less material it is able to carry an equal load.

W. J. M.

Building Intelligence.

CHURCHES AND CHAPELS.

The parish church, Oldbury, was re-opened on the 29th inst., after undergoing important alterations, at the cost of about £1,000, under the supervision of Mr. E. Holmes, architect, Birmingham.

The parish church of Wrexham was lately re-opened, having been restored. During the process of cleaning the numerous coats of whitewash from the walls, some remains of mural painting were discovered, the colours of a representation of the Last Judgment over the chancel arch being in good preservation. An intended north chancel aisle, for the reception of the organ, yet remains to be built, owing to want of funds. Mr. Ferrey, F.S.A., of London, was the architect, and the works were carried out by Mr. Yates, of Shifnal.

All Saint's Church, Maldon, has been restored. A new reredos and altar screen have been added. The cost was about £1,200, and the church will now seat 1,000 persons. Mr. W. Adams, of Newport, Monmouthshire, was the architect, and Mr. E. Saunders the contractor. A peculiarity of this church is its tower, which is triangular at the base.

A new church has been erected at Madresfield, Worcestershire. It is in the Decorated style, and contains a chancel, nave, tower, and spire, the building being constructed of graystone, with bands of red, and facings of freestone. North of the chancel are vestry and organ chamber. There are six bells and a set of chimes. The architect is Mr. Preedy, and the builders Messrs. M'Cann and Everal, of Malvern.

Cantref Church, Brecon, was reopened last week after being restored at a cost of £700. Messrs. C. Buckeridge and Co., of Oxford, were the architects, and Messrs. Williams and Sons, of Brecon, the contractors.

Earl's Barton Church, one of the few remaining specimens of Saxon architecture, is about to be restored.

The Bishop of Brechin recently laid the foundation stone of the new church of St. Salvador, Clepington, Dundee. The building will be 160ft. in length, but the chancel for the present is omitted Mr. Bodley is the architect.

On Tuesday last the foundation stone of a new Independent chapel was laid in Approach-road, Victoria-park. It will seat about 3,000 persons, at an estimated cost of £8,000. Mr. Poulton, of Reading, is the architect.

On Monday the Archbishop of York consecrated a new church at Neepsend, Sheffield, built by the Church Extension Society of that town, at a cost of £4,500, and dedicated to St Michael and All Angels. It will afford accommodation for about 1,000 people.

A new Wesleyan chapel was opened at Wednesbury on Tuesday. It is in the Italian style, and will hold 1,200 persons. The total cost is £3,000. Messrs. Loxton, Brothers, are the architects, and Messrs. Trow and Sons the builders.

The memorial stone of the "Calne Free Church" Calne, Wilts, was laid on Tuesday the 29th ult., by R. Henly, Esq. The church is to be in the Early English style, and will consist of a nave, apsidal, chancel, north aisle, and transept, with a tower and spire. The walls are of pitched faced native stone; the inside of the walls will be faced with ashlar. The arcade between the aisle and nave will be of Farleigh Down stone, and the external dressings of Box groundstone; the two western entrances will have red Mansfield stone columns; also, the large west window will have red Mansfield and Pennant stone shafts; the roof will be open timbered; the seats will be open, and constructed of picked deal. Mr. W. J. Stent, Warminster, is the architect; and Messrs. Light and Smith, of Chippenham, are the general contractors.

A new church at Babbicombe, Devon, dedicated to All Saints, was consecrated on All Saints' Day, by the Lord Bishop of Oxford. Mr. Butterfield is the architect. For the effect which he has produced he has relied not so much on extreme elaboration of workmanship, for the details are, in fact, very simple, but rather upon the elegant proportions of the various parts, and on the warm and general effects of colour produced by the skilful adaptation and contrast of the materials which the ground immediately around the church so abundantly supply. The shafts of the columns are polished marble and of a very rich description, and the font is of the same material, after a design by the architect, which has been carried out by Mr. Blackler, of St. Mary's Church. It is inlaid with marble of different colours. The whole of the work in this church has been done by Mr. Eddles, the contractor, under the superintendence of Mr. Wheeler, the clerk of the works. From want of funds it has been found impossible to carry out the whole of the architect's designs, and therefore the chancel and the tower have been left for a future day. The sum expended on the church has been about £5,000. The architecture is that of the early part of the fourteenth century. The columns on either side of the nave are five in number, and they are composed partly of polished native marble. The walls are built of limestone and red sandstone, with Bath stone dressings. A Bath stone band, ornamented, also runs along the centre of the walls on the inside. It has an open roof of stained deal, varnished. The nave is 90ft. long by 24ft. wide and 50ft. in height, while the north and south aisles are 90ft. long and 9ft. 3in. in width. The tower when completed will contain eight bells, but is at present only erected about 40ft. high. It is intended to erect it 30ft. higher, and, to complete the whole of the works in accordance with the designs, something like £4,000 or £5,000 more is required.

BUILDINGS.

It is stated that the new Opera House building at Paris will not be opened till 1869. The workmen are now surrounding the theatre with a very heavy brass cornice. In the niches bright brazen images are being placed.

The guardians of the poor for St. Pancras, with the sanction of the Poor Law Board, are about to purchase four and a-half acres of land at Highgate, on which to build a sick poor infirmary. From £20,000 to £25,000 is to be expended upon the building, and a limited number of architects are to be invited to send in plans, under the very peculiar condition that the architect is not to make any claim on the guardians if he cannot find a respectable builder prepared to carry out the works at the sum he estimates them to cost.

A company is to be formed, with a capital of £7,500, in 1,500 shares of £5 each, for the erection of a new promenade pier at Saltburn-by-the sea.

A limited liability company has recently erected a small institute building at Greenstreet, near Faversham. It comprises a lecture-hall capable of seating 400 persons, a reading-room, and offices. Mr. B. Adkins, of Faversham, was the architect.

The restoration of the tropical department of the Crystal Palace, which was burnt down last year, is proceeding satisfactorily. The section which terminates at the end of the Alhambra Court is now nearly covered in. Though this is but a small portion of the whole department, it will afford an agreeable promenade for those who made the northern end of the palace their favourite haunt in former years. It is a remarkable fact that, though the fire by which this end of the building was destroyed raged in and on both sides of the Alhambra Court, its magnificent arabesque dome was not affected in the slightest degree. As soon as the skeleton of the section which is now being erected is completed, the work of renovating the courts within it will be commenced forthwith. These are the Alhambra, the Indian, the Byzantine, and the Naval Courts.

The new public offices at Liverpool are at length all but completed. Commenced about six years ago, until about a twelvemonth back the progress made afforded material for many a joke on the part of the townspeople and others, on the proverbial slowness of corporate bodies; but since that period a vigorous effort appears to have been made, and the building is now all but ready for occupation. The building is the largest in Liverpool, except St. George's Hall. It covers an area of 4,800 square feet, having a depth of about 196ft.; the height is 60ft. to the upper cornice, and to the roof of the pavilion nearly 90ft. From the centre a tower rises 200ft. high. The style is Corinthianesque. There are upwards of 100 rooms in the building. The cost, exclusive of site and furniture, &c., is about £100,000. The designs were furnished by the late architect to the corporation, Mr. John Weightman, modified to a certain extent, and carried out by the present architect Mr. Robson. The builders are Messrs. Holme and Nicol, Messrs. Haigh and Co., and Messrs. Parker and Son.

TO CORRESPONDENTS.

NOTICE.—The "BUILDING NEWS" is now Published at the NEW OFFICES, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—T. M'M.—C. A. T.—G. A. P.—W. P.—J. H.—P. J. and Co.—C. H. D.—P. J. and Co.—E. and J. M.—A. G. H.—Dr. C. D.—B. T.—W. S.—E. H.—E. W. P.—G. E. S.—H. A.—J. L.—T. B O.—W. A.—C. J. A.—J. P.—J. T. D.—R. W. D.—J B. R.—J. W., jun.—J. H. (Torquay), next week.—A.B & Co.

R. C.—Avoid the lawyers if possible.

"ANOTHER OLD BRICK."—See Mr. Tall's letter.

J. L. (St. Day).—Put your question in fewer words and write plainer.

J. S.—The mistakes arose from your bad writing.

"GOTH."—Write to Lockwood and Co., 7, Stationers' Hall-court.

W. T. J. (Plymouth).—Your communication is too political for our pages If we took any side in politics it would not be the side of a party who appear to feel with ecstacy on their umbs which fall from the table of their opponents.

Correspondence.

MR. STREET *v.* "J. C. J."

To the Editor of the BUILDING NEWS.

SIR,—I do not suppose any of your readers will expect me to honour Mr. Jackson with a very lengthy reply to his last epistle. In my former letter I charged him with pretending to criticize without having seen the designs he criticized; and with discoursing on old buildings without first of all taking the pains to see them. Both these charges are admitted, and Mr. Jackson's ideas of amateur criticism are now patent to everyone. His latest discovery (again his internal consciousness!) is, that I am going to build at Bristol the west front which I designed for the cathedral at Lille some ten or twelve years ago, and which at the time, if I recollect aright, did not cover me with very great disgrace. The truth is, that any two designs, new, utterly and entirely different, could not be conceived. So much for Bristol Cathedral, which it will be quite time to discuss again, with a person of Mr. Jackson's calibre, when he has troubled himself to learn at least a little as to the facts for himself, instead of inventing them, or trusting to hearsay.

As to my church in Oxford he certainly gives me my revenge by the hopeless way in which he contradicts himself. At page 771 of the BUILDING NEWS, he says that it has "a steeple copied probably" (how delightfully vague!) "from Coutances, or the later and less satisfactory examples at (!) Calvados;" whilst my simple nave and aisles are, he says, copied from the vast aisleless Dominican church at Ghent. But on the very next page I discover, to my surprise, that my so-called "Dominican" nave is attached to "a modest English tower and sanctuary!" After reading such absurd matter I can hardly be very far wrong in saying that if he sees any resemblance to the spires of Coutances, or to any in the department of Calvados, in my Oxford steeple, or any approach to the scheme of the Dominican church at Ghent in my Oxford nave, the only possible explanation is that he has never been in either Normandy or at Ghent, and is quite as ignorant of what he is writing about in this case as he was when he wrote about Bristol Cathedral. Imagine anyone calling the steeples of Caen, Bayeaux, and Lisieux late and unsatisfactory! It is too absurd.

Mr. Jackson's quotation from what I said at Durham quite expresses my views about *bona fide* amateurs. He might as well have added my statement that I sympathized with them, because they pursue their studies "from pure love of the subject, and not from mixed motives of love and interest." And I have my doubts whether Mr. Jackson could be included in this category.—I am, &c., GEORGE EDMUND STREET.

51, Russell-square, Nov. 12.

CONCRETE BUILDINGS.

SIR,—A letter appeared in the BUILDING NEWS of the 25th ult., signed "An Old Brick." As the statements and calculations of "An Old Brick" are inaccurate, will you kindly allow me to point this out. In comparing the cost of a pair of cottages in concrete and in brickwork, he adds the cost of the apparatus or plant required to build in concrete, but adds nothing for the cost of plant required to build in brick. He charges the whole cost of apparatus to the two cottages, as if the apparatus were of no further use after having built the two cottages; whereas, in fact, the same apparatus would build a thousand pairs of cottages, if required; or, if not required to build cottages, may be kept constantly at work in building any other walls, as required. I believe builders will find that, in the long run, the plant for building concrete houses is not more expensive than the plant required to build brick houses. "An Old Brick's" calculation of the expense of my patent apparatus is not quite correct. It is not necessary to have an apparatus to carry up outhouses and main buildings at the same time, as a portion of the apparatus would build outhouses after it had built the houses, and, according to my advertised price, the apparatus for this would cost only £72 18s. However, I will take the cost, as "An Old Brick" has done, for an apparatus to build the whole at one time:—Two cottages, 24ft. frontage, 26ft. depth, thus—

	ft.	in.
Front and back, 24ft. each, out to out	48	0
Two ends and one division 24ft. 6in. each in clear	73	6
Outbuilding 15ft. square, back . .	15	0
Two ends and one division 14ft. 3in. each in clear	42	9
	179	3

which, at 12s. per foot run, amounts to £107 11s. I have before said the apparatus would build a thousand pairs of houses. But I will calculate for only half that number; and I do not think that "An Old Brick" would undertake to supply plant for building in brickwork, a pair at a time, for a much less sum than £107 11s. We then find that the cost of apparatus to be added to the cost of the two cottages in concrete to something less than 4s. 6d. But concrete can afford to give "An Old Brick" very long odds, and I will calculate as "An Old Brick" has done, and charge nothing whatever for cost of plant for building the cottages in brick. We find, then, the cost as follows, using "An Old Brick's" own figures.

In brickwork—

11 rods at 13 guineas . .	£143.		
In concrete—	£	s.	d.
500 yards super, at 2s. 6d. . .	62	10	0
Royalty, fourteen rooms at 5s.	3	10	0
Proportionate cost of apparatus.	0	4	6
	£66	4	6

Giving a difference in favour of concrete of £76 15s 6d., or more than half, without saying anything of saving in plastering and fixing, both of which costs fully double in brickwork. In conclusion, I would remark that "An Old Brick" is quite as wide of the mark when he says that the superiority of concrete remains to be proved. It has already been proved incontestably that concrete is cheaper, stronger, and more durable; is damp proof, fire-proof, and vermin-proof; and if "An Old Brick" will only give it a trial, he will find it proof against the strongest prejudices he may now feel against it.
—I am, &c., J. TALL.

Falstaff-yard, Kent-street, Southwark,
November 13.

Intercommunication.

QUESTIONS.

[650.]—HERO'S FOUNTAIN.—Could any reader inform me how to make a Hero's fountain, or any other, whereby I could have a force of water obtained by hydraulic or other means on a small scale—say a fountain to contain two quarts of water?—G. W. F.

[651.]—WATER-TIGHT VAULT.—Perhaps you, or some of your readers, will kindly inform me in a future number of your paper which is the best way of making water-tight a vault which is formed in a large limestone tomb, the joints of which are too close for Portland cement, being only ⅛in. open.—P. N.

[652.]—DEAFENING PARTITIONS.—Could you, or any of your readers, inform me what is the best plan to adopt for deafening lath and plaster posted partitions? I was proposing potting narrow strips of inodorous or dry hair felt on to the sides of the posts under the lath, but am in doubt whether it would have the desired effect. Is this method of deafening ever adopted, and, if so, is there any special kind of felt or cloth manufactured for the purpose? Are cork parings ever used for deafening?—CLERK OF WORKS.

[653.]—PRESSURE ON ROOFS.—Will "E. L. G." kindly inform me where he can find a demonstration of the problem that the downward pressure by a horizontal wind reaches a maximum when the pitch is 54⅞ deg.?—H. W.

[654.]—SPECIFICATIONS.—Would you inform me which is the best plan of preparing a specification to take each trade separately throughout the whole building, or take each floor separately and describe the trades thereon?—L. L.

[655.]—TO RENDER WOOD UNINFLAMMABLE.—Can anyone inform me of any known liquid, and the cost of same, which will render wood such as flooring, roofing, &c., uninflammable, and if, on its application to timber, would it be injurious?—X. Y. Z.

[656.]—STAINING GLASS.—Perhaps you, or any reader of the "Intercommunication," would be kind enough to inform me how I can stain glass in various colours.—INQUIRER.

[657.]—STONE DESTROYING INSECTS.—We have heard a great deal from time to time about timber-destroying insects. I want to be informed about the insects which destroy stone, and particularly in sea water.—C. E.

[658.]—FLOATING BREAKWATERS.—Some years since there was a commission of inquiry to investigate the practicability of erecting in several parts of England floating breakwaters. Can any one tell me if the existence of any such breakwater, and, if so, the principle on which it is built?—J. S.

REPLIES.

[574.]—THE "LIMNER."—I should advise "E. W." not to lose his money by enclosing it for the "Limner." In June last I enclosed 27 stamps for it, but in place of the article itself I received a very polite note (on gray boll) by return of post, acknowledging the amount and advising me to obtain the "stand and wires" to complete the instrument, and for this I enclosed another 27 stamps; but from that day to this I have not received any of the articles, nor will Nash and Co. answer my letters.—JOHN KIERNAN, St. Martin's-road, Guernsey.

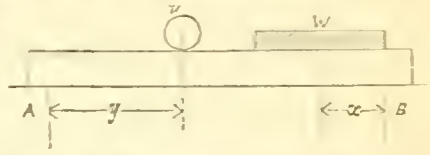
[611.]—ESTIMATING CARPENTERS' WORK FROM HEWN AND CONVERTED TIMBER.—In your last impression your correspondent "A Practical Man" asserts that the reply given by "A. H." on page 745, is the most sensible on this question. With every respect to "A. H.," who is evidently more inclined to ask than to furnish information, I fail to discover a reply. He asserts that the system of cubing every class of timber is to obtain "greater uniformity of practice." This corresponds with my remark that it "is adopted for the sake of brevity." In the observation that by following the dangerous custom of cubing every class of scantling alike, the cost of labour is more readily ascertained, we do not agree. As the question of quality of timber is foreign to the subject I shall pass it over; but to the assertion that few deals are over 12ft. long, I must respectfully say it is an oversight with "A. H." Deals 12ft. long are the rule in the Canadian ports, but there are many exceptions from the low ports, where they are shipped every imaginable length and size. As these goods are always pine, and pine is rarely used for scantling or timbering purposes, this 12ft. question has little or nothing to do with the case. The principal building timbers are the spruce deals from Canada, the red (or yellow) deals and the white deals from the Baltic. These deals are not confined to any stated lengths. Whilst writing this I have a specification of a red wood cargo from Finland lying at my side. The 3 × 11 deals range from 8ft. to 24ft. in length; to every 247 20ft. lengths I find only 48 12ft's. Again the 3 × 9 deals range from 9 to 24ft. in length; to every 170 24ft. I find 24 12ft. lengths. This being the case, what becomes of the assertion made by "A. H.," and what can be said of the knowledge of "A Practical Man," who defends it? Why does my reviewer conclude without showing in what manner I have failed to give a satisfactory explanation? He may be correct in saying that a person of moderate experience could fix on an average standard or proportion of scantlings obtainable from deals and timbers when estimating from cubed quantities; but is this any reason why every builder should be called upon to guess at the value of the most important item in the bills of quantities? I do not know what "A Practical Man" may think, but a sensible man will most assuredly discourage a system founded upon guesswork, and advocate one of solid certainty. As he refers to the average of labour, I shall claim a larger moiety for scantlings cut from timbers, as they are more unwieldily and expensive to get into place than those obtained from converted timber. This step would swell the difference at issue, which my reviewer labours in such a mysterious manner to set at nought.

I am next told that in my computation of timber I am as much in fault as those I condemn. I have computed the cost of deals at 29 per standard, and the cost of hewn timber at 1s. 4d. per cube. In doing this I fail to discover that I am condemning any one. If I am to be told my computation is wrong, I can dispose of this remark by saying I am prepared to supply any quantity of goods at these proportions. Following up his remarks, he says, "Most London architects prescribe that the scantlings shall be cut square, and be of the full dimensions enumerated." This is the very groundwork of my original remarks, and was the cause of me charging an item of 1-12th for waste by saws in scantlings cut from hewn timbers. In the blank list, submitted by my opponent, I find an item of corresponding importance charged to the account of scantling cut from converted timbers. There may be a little in this point where scantlings are cut very small; but take an average scantling, can a practical man note one instance where an architect has objected to two 5½ × 3 scantlings cut from a 3 × 11 deal, or to two 4½ × 3 scantlings cut from a 3 × 7 deal; and in like manner, to two 4½ × 3 scantlings, cut from a 3 × 7 deal? I think if he can advance an instance it would be such a rare one as not to warrant the item being placed in any practical computation of their value.

If my friend is going to treat the public to any clear and intelligent solution of this important question, I would ask him what value he places upon the items of waste in cutting to lengths required in work? He will be clever indeed if he can show the result in favour of hewn timber, and it strikes me he must do so to bring the difference of the cost of the two classes of scantlings to only 3d. per cube. Scantlings from deals can be purchased in lengths of every foot, and of regular sizes, whereas it is a somewhat rare occurrence to obtain hewn timbers the exact length required when you are tied to a given square. It is a commonthing to cut off two, three, or four feet, or to take off a slab twice as thick as you wish to d And what is the value of these slabs and ends? Those who are acquainted with a builder's yard best know the importance of this question. I make bold to maintain that the item of waste in cutting the latter class of timber to the lengths required is far greater than from the former class. It is very evident that the more I write the wider do I make the difference of cost, and the more do I crave for an intelligent composition, by "A Practical Man," of the means he has at command of contracting the difference of cost to the minor sum of 3d. per cube.—W. STEVENSON, Nottingham.

[623.]—GILT PICTURE FRAMES.—For restoring gilt picture frames, "H. D." would find ordinary soap and lukewarm water, applied with a sponge, very effective, drying them afterwards with a silk handkerchief or a soft cloth.—G. S. A.

[632.]—STRENGTH OF BEAMS.—The strain on a beam produced by a load uniformly distributed over its whole length is equal to that produced by half the weight applied at the centre; and the strain produced by a load uniformly distributed over a portion of the beam all on the same side of the centre is equal to that produced by the same weight applied at the centre of the distributed load. If several loads are applied, the strain will equal the sum of the strains produced by each load separately: thus may be found the strain produced by any combination of loads either distributed or applied at a point.



In the diagram, a beam supported at A and B is loaded with W, uniformly distributed over a portion of the beam on the same side of the centre, the centre of whose length is distant x from the nearest support B; another load w is applied at a point distant y from the nearest support A. Let d = the depth of beam, and S = the strain in the centre, then $S = \frac{Wx - wy}{2d}$, the strain at the point at which w is applied, or $S' = (\text{pressure on A} \times \frac{y}{d})$. If x and y be taken in feet, d should also be in feet, and likewise if they be taken in inches, d should be in inches. For an example, suppose a beam having a span of 16ft., whose depth is 1 foot, and let W = 4 tons, distributed over 4ft. length of the beam commencing at the support B, thus, x = 6ft., let w = 3 tons, and y = 4ft.

$$\text{then } S = \frac{(4 \times 2) + (3 \times 4)}{(2 \times 1)} = \frac{20}{2} = 10 \text{ tons,}$$

$$\text{and } S' = \left(\frac{2}{10} W + \frac{6}{10} w\right) \times \frac{4}{1}$$

$$= 2{\cdot}6 \times 4 = 10{\cdot}4 \text{ tons,}$$

or rather more in this case than the strain in the centre of beam. If a rolled iron girder be adopted the section of flange will be S' ÷ tons strain per square inch, say $4\frac{1}{2}$ = $\frac{10{\cdot}4}{4{\cdot}5}$ = 2·31 square inches, or if a cast-iron girder be adopted the section of bottom flange (straining the iron at $1\frac{1}{2}$ tons per square inch) will be = $\frac{10{\cdot}4}{1{\cdot}5}$ = 6·93 square inches, the section of top flange taken at one-third of the bottom if the load be applied on top, and one-sixth if the load be applied on the bottom flange. If a rectangular timber beam be adopted, the total sectional area (straining at 5 cwt. per square inch for oak, or about one tenth of the breaking weight) = S' in cwt. × $\frac{2}{3}$ = 208 × $\frac{2}{3}$ = 138 square inches, and breadth of beam or $b = \frac{138}{12} = 11{\cdot}5$ inches. If the beam be of elm, the strain is taken at about 3½ cwt. per square inch. Thus the sectional area = S' in cwt. × $\frac{12}{11}$ = 208 × $\frac{12}{11}$ = 227 inches, $b = \frac{227}{12} = 19$ inches, any other beam will equal this in strength when bd^2 is the same value: here bd^2 = 227 × 12 = 2724, and if d be taken at 14 inches then $b = \frac{2724}{(14)^2} = 14$ inches. This latter beam, 14 × 14 inches, is preferable to the one 12 × 19 inches in shape.—F. HOPE.

[633.]—CAST-IRON GIRDERS.—The multiple of depth and area of bottom flange is obtained by the multiplication of these quantities. In the tables, the column B is the width of flange, b its thickness at the centre, b its thickness at the edge. In the same way the column I is the width, t the thickness at centre, t the thickness at the edge, RR is the thickness at the bottom, and R the thickness at top. In the book I have this is explained at page 60, and fig. 23, plate 4.—F. HOPE.

WATER SUPPLY AND SANITARY MATTERS.

Operations have been commenced at Canterbury in connection with the new drainage works. A large staff of labourers are employed in making excavations.

The New York papers are urging that the sewage of that city and Brooklyn, which now runs to waste, shall be saved and applied to filling up the marshes which lie on the neighbouring shores of New Jersey and Long Island.

A conference of representatives of the surrounding municipal bodies and other local authorities has been held in the Manchester Town Hall, under the presidency of the Mayor of Manchester, to consider what steps should be taken when the River Pollution Commission sits in that city. The Chairman said, in his opinion nothing could meet the requirements of the Commission but the formation of large sewers, like those in London, for the conveyance of the sewage from the towns in the basins of the Mersey and Irwell direct to the sea. Any action taken in the matter by Manchester would be useless without the co-operation of the towns above and below it on the Irwell, and the works must, therefore, either be undertaken at the national cost, or shared in by the whole country. A system of using the sewage for irrigation purposes had been suggested, but he believed it to be impracticable, and he should support the plan which entirely removed the nuisance. The town clerk also remarked the irrigation plan as impracticable, and affirmed that it had not been proved that irrigation with pure water was not as beneficial to land as irrigation with sewage. It would require at 6[illegible], at a cost of £10 per house, to substitute water-closets for the present system in the 50,000 houses in Manchester. The sewage water of Manchester and Salford would amount

to fourteen million gallons per day, and where were the local authorities to dispose of so great a quantity? In the Commissioners' scale of 1 acre to every 50 persons a sewage irrigation of 7,500 acres would be required for Manchester alone. It appeared to him that that was an absurdity. Great regret was expressed that the town clerk should hold such opinions. A resolution was passed stating that the meeting was of opinion that all local authorities should combine in giving the fullest information to the Commission (who held a preliminary meeting on the 12th instant), and urging on all local bodies interested to be prepared with evidence of the mode in which sewage is at present dealt with in their respective localities, to say to what extent any system could be carried out, and generally to point out the local difficulties of dealing with the question.

WAGES MOVEMENT.

The master masons of Liverpool held a meeting last week to consider a notice received from the labourers requesting an increase of their wages in six months' time, from 18s. to 22s., and in some cases 24s. per week. It was resolved to inform the operatives that a standard rate of wages would not be conceded.

A slackness seems to be spreading in the building trade at Edinburgh. Already there is a talk of an attempt to reduce the wages, but whether this will be done by individual or united action is not yet known. Trade at Newcastle is very quiet. Some of the masters can scarcely keep going, and unless unlooked-for orders drop in short time will soon be the rule. Many of them are paying off a few men every week.

STATUES, MEMORIALS, ETC.

Mr. Theed is engaged on a bust of Mr. Tite, M.P., for the London Institution, of which the hon. gentleman was honorary secretary for forty years.

A statue of Adam Smith, the author of "An Inquiry into the Nature and Causes of the Wealth of Nations," is to be erected in the city of Oxford, for the purpose of commemorating his connection with the University. The statue, which has been executed by an Austrian sculptor, has cost £700, and is said to be an excellent likeness.

STAINED GLASS.

Two stained glass windows have been erected in Tavistock Church, near Exeter, in the north side of the chancel. Each window has two lights. The subjects are the four Evangelists, with the emblem of each for a base. The figures are surmounted by canopies of the Perpendicular order. Messrs. E. and V. Beer, of Exeter, are the artists.

LEGAL INTELLIGENCE.

INFRINGEMENT OF PATENT.—(BLAKE *v.* ARCHER).—This was an action tried before Sir W. P. Wood, at the Vice-Chancellor's Court on Tuesday last. An injunction was applied for to restrain the defendant from infringing a patent taken out in 1858 for an improved method of crushing stone for the use of roads and other purposes. His Honour found in favour of the validity of the patent, and held that the machine used by the defendant was an infringement of it.

TOWN IMPROVEMENTS.—CLAIM AGAINST THE CORPORATION OF LIVERPOOL.—On Thursday week, the assessor and a jury assembled at St. George's Hall for the purpose of arbitrating upon a claim made against the corporation by Mr. William Henry Cruse, builder, of Edge-lane, for land, &c., in Brecksfield-road North, required for the improvement of that thoroughfare. The claim comprised various items, the first, or principal one, being for 2,332 yards of land, with certain buildings, consisting of sheds, &c., £5,051 14s. 4d.; cost of excavating foundations of houses proposed to be erected thereon, £45; and compensation for compulsory sale, losses in the trade and business of a builder through the suspension of building operations, £950—making a total of £6,046 14s. 4d. The land was estimated at about £2 10s. per square yard. There was, in addition, a claim for interest on £4,709, at 5 per cent. per annum, for having, in compliance with notice of the Town Clerk, dated 30th January last, suspended business operations. After the case for the claimant had been opened by Mr. Gully, a consultation took place, and it was eventually agreed that the claimant should receive the sum of £900 for the land required to be taken by the corporation in the improvement of the road.

MEETINGS FOR THE WEEK.

MON.—Royal Academy. — "Sculpture," by Professor Westmacott, 8.

TUES.—Institution of Civil Engineers.—Renewed Discussion upon Mr. Byrne's paper, "On the Removal of Organic and Inorganic Substances in Water," 8.

WED.—Society of Arts.—Opening Address, by Mr. W. Hawes, 8.

Our Office Table.

It was stated lately by a contemporary that a chimney recently erected at Bradford was the highest in England. A correspondent writes to say that a chimney erected by him in 1857, at Messrs. Brookes' fire-clay works, Huddersfield, is 6ft. higher from the ground line than that at Bradford, and in other respects considerably larger. He believes this to be the largest and highest chimney in England. Its total height from the ground line is 102 yards.

Professor Westmacott delivered the first lecture for the season at the Royal Academy on Monday evening last. Mr. G. G. Scott will deliver three lectures on architecture during the season. The first will be given on the evening of January 23 next.

New-square, Lincoln's Inn, is to be restored to its normal appearance. Preparations are being made for the removal of the temporary building erected for the exhibition of the plans for the New Law Courts. The plans will be taken to the old Insolvent Court.

The Marquis of Abercorn has offered, through the Royal Agricultural Society, a prize of £25 for best design and specification for a labourer's cottage, the cost of erection being limited to £70 for a single cottage, or £65 each if two or more.

By an error, the sum of £10, given by Mr. Tite, M.P., was omitted in last week's announcement of donations received at the recent dinner of the Builders' Benevolent Institution.

The paintings which cover nearly the whole of the western side of the interior of the Inner Temple Hall have been cleaned and restored. The large full-length portraits of William III., Mary, and Anne have also been restored, and were each found to bear the signature of Sir Godfrey Kneller.

Mr. C. H. Wilson, of Glasgow, addresses a letter to the "Glasgow Herald," combating the depreciatory views entertained by Sir George Harvey of the windows in Glasgow Cathedral. He recommends that the Edinburgh committee for the restoration of St. Giles's Cathedral should invite one or more artists to experiment on the subject before coming to any decision.

An improvement has just been effected in the lighting of Hyde Park, by the substitution of a new kind of lamp for the defective ones lately in use. The old gas lamps were so constructed that the rays, instead of being deflected downwards were allowed to ascend, and thus a great quantity of valuable light was lost. The new lamps are so contrived that the light will be shed directly down upon the pavement beneath.

Miss Emma Hardinge who lectured some time back at St. James's Hall, on America, appeared rather disadvantageously at Glasgow on Monday. The advertisment stated that, as Miss Hardinge's lectures were professedly inspirational, the subject was to be chosen for her by a committee appointed by the audience. This was done, and she was requested to "Explain minutely, and in detail, the astronomical facts and principles, and the mathematical processes by which we may determine approximately the weight of the sun." This, however, she declined to do, stating that she had never yet been influenced on mathematical subjects. At her own suggestion the theme was changed, that of "The Philosophy of Inspiration" being substituted. The influences that regulate this subject were more propitious, and Miss Hardinge delivered a lofty rhapsody thereon.

We are requested to insert the following:—In the last number of the BUILDING NEWS there is a report of a meeting of the Birmingham Architectural Society, in which it is stated that the President, Mr. I. I. Bateman, recommended that the society be disbanded. This is incorrect, and if not explained is liable to injure the society. I forward you enclosed a report of the meeting taken from the "Birmingham Daily Post," in which you will see that it was only in the event of the members not taking a more active interest that he advised such a course. You will also see that in compliance with the suggestions contained in Mr. Bateman's address the members present consented to read papers during the ensuing sessions. —I am, &c., FRANK BARLOW OSBORN, honorary secretary.

Dr. F. Crace Calvert will deliver a course of lectures on chemistry as applied to the arts, at the Society of Arts, during the early part of the coming session.

The one hundred and fourteenth session of the Society of Arts will commence on the evening of Wednesday next, when Mr. William Hawes, chairman of the council, will deliver an address.

A correspondent sends the following:—The Royal Institute of British Architects are distinguishing themselves for liberality, for advertizing for a librarian at the extravagant salary of £70 a year. "Candidates" must be able to produce testimonials of "efficiency," and therefore must have a good education. I beg to ask the generous council of the institution whether they are much better than the butchers and bakers who compose a local board of health, and who offer £100 a year for a surveyor to fill a "vacancy."

The Caen stone of France has a rival in the stratified limestone which underlies the whole of the high prairie land of Kansas. A correspondent describes it as white, cream coloured, pink, yellow, and red, lying horizontally, and requiring no other quarrying than the use of a crowbar to lift it in blocks from its bed. So easily worked is it that he has seen it hewn into shape with a common wood axe, and mortised with a carpenter's chisel as easily and quickly as a pine beam; he has also seen it planed with a jack plane, sawed with a scroll saw into brackets and ornamental door and window caps, and cut with a buzz saw into blocks for street pavements or bricks of any size. The material hardens on exposure to air, and becomes as impenetrable as Tennessee marble.

The iron framework of the exhibition building, which is about to be sold, weighs 27,000,000lb. In the whole there are 6,000,000 rivets, for the placing of which 15,000,000 holes had to be punched.

We find in "Silliman's Journal" a suggestion respecting filters which may be of interest to our chemical readers. Professor MacDonald collects and washes small precipitates in filters made by plugging the stem of the funnel with coarsely broken glass with smaller fragments above, and a layer of finely powdered glass or sand at the top. Such a filter can, of course, be dried at any temperature short of that at which glass softens. A filter of the kind for very small precipitates can be advantageously made with a pipette, which can be closed with a cork before weighing. The kind of glass used in these filters would require attention, since many kinds are more or less soluble in water, and a loss of weight would be caused by the washing of a precipitate.

It is said that a tunnel under the Thames is in a fair way of being carried out under the superintendence of Mr. Peter Barton. It has been agreed to by the War Department at the Tower.

A reward of £20 is offered for J. H. St. Aubyn Weston, lately in the employ of Messrs. Ebles and Sons, builders, of Northwick-terrace, Maida Hill, who absconded last week, and took with him £220 of his employers' money.

Up to the present time the inhabitants of Portsmouth, Portsea, and Landport, a population numbering over 100,000, have been in much want of an open space suitable for exercise and recreation. Some time ago the civic authorities of Portsmouth represented these facts to the Government, and applied to the War Department for the appropriation, as a public park, of a portion of the glacis before the old lines of fortification, situate opposite the terminus of the railway at Landport. It is meadow land, shaded with large and beautiful elm trees, and contains fifty acres. With the consent of the Treasury, the desired space has been granted to the corporation of Portsmouth as a public park, "on payment of a rent consistent with the precedents in similar cases."

A photographic exhibition is now open at 9, Conduit street. Though the exhibition does not exhibit so many specimens as we have seen on similar occasions, it possesses several photographs which will well repay a visit. We were particularly struck with those exhibited by Mr. Adam Salomon. In fact, we may say they are the best we ever saw. The "Photographic News" is not correct in saying that they are untouched. It is evident they are, but the touching is so beautifully done, that it is difficult to see any.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

530. E. THRING. IMPROVEMENTS IN STOVES AND FIREPLACES. Dated March 2, 1867.

For the purposes of this invention the fuel to be burnt is placed in a shell or grate, circular in section, or it might be of other convenient shape, and turning on centres at its two ends; an opening is made through one side of the circular shell or grate at which fuel is introduced into it. When fuel is introduced into the shell, the shell is turned on its axis so as to cause the fresh fuel to be covered with the heated fuel previously contained in the shell, and any smoke arising from the fresh fuel will be consumed by its having to pass through the heated fuel. Air is allowed to pass to the fuel in the shell through perforations or openings formed through its bottom, as well as from the front opening, and the products of combustion escape from the shell through similar perforations or openings at the top, and pass away by the chimney. The axes of the rotating shell may be carried by a movable frame, so that it may be placed in any ordinary fireplace, or they may be carried by a frame to be fixed in the fireplace. *Patent completed.*

635. E. K. HEAPS and T. P. MOORWOOD. IMPROVEMENTS IN FIRE RANGES FOR DWELLING-HOUSES. Dated March 7, 1867.

This invention consists, first, in making fire grates or stoves such as are used in sitting or other rooms so that the bottom grating can be closed or opened so as to shut off or admit the supply of air to the fire through the said bottom grating. This the patentees propose to effect by placing a second grating (or a perforated plate) beneath the ordinary or fixed grating, such grating (or plate) being loose and mounted in such a manner that it can be drawn out or pushed in, or otherwise opened or closed so as to open or close the spaces in the fixed bottom or grating, and thus admit or shut off the supply of air through the bottom grate or grating to the fire. Second, the invention consists in placing firebrick, sandstone, or firestone upon or in place of the bottom grating of fire or stove grates or ranges, such firebrick being made either solid or perforated, as may be required. *Patent completed.*

885. R MORELAND, JUN. IMPROVEMENTS IN THE CONSTRUCTION OF FLOORS AND ROOMS FOR BUILDINGS. Dated March 26, 1867.

Among the features of this invention are the following: The patentee constructs floors in the following manner:—He takes a number of wrought-iron girders, either bow and string lattice girders, or bow and string web plate girders, and he places them at convenient distances apart, and fixes them either on main girders, if a large area is to be covered, or he builds them into the walls of the building when the area is smaller. When main girders are used he supports the bow and string girders on the upper or lower flange of the main girders. The upper flange of the bow and string girders may be elliptical, or an arc of a circle in outline; the latter is preferred; the lower flange may either be straight or curved. He prefers that it should be straight. The top and bottom flanges of the lattice girders are connected together with vertical and diagonal braces rivetted at the connections. Where main girders are employed the ends of the lattice girders may be fixed, bolted, or screwed to the girders which support them; and in some cases he uses additional tie rods to stay the supporting girders. He also places along the edges of the supporting girders and between the lattice girders, bricks, angle-irons, or other material, which he rivets or lays on the flange of the supporting girder to ensure the equal and level bearing of the edge of the corrugated iron, as hereafter described. He prefers a brick of an angular shape, showing the projecting edge corbelwise. On the upper or curved surface of the lattice girders he then lays sheets of corrugated iron or other material, in as long lengths as possible, and form them into a continuous sheet by allowing the sheets to alternate, or, as it is more commonly termed, to break joint, and by bolting or riveting the edges of the sheets together. He also secures the ends of the corrugated sheets which touch the wall by bent dog bolts or cramps, which are bolted or riveted to the corrugated iron and built into the wall between the supporting girders. The curve of contrary flexure of the corrugated iron may be varied both in shape, size, and form, so that the greatest strength possible may be produced. The corrugated iron plates may be connected to the lattice girders with rivets or bolts, but it is not usually required. He places the flutes of the corrugated iron at right angles to the lattice girders, and on the upper surface of the corrugated iron. He then lays concrete, composed either of shingle or brick rubbish mixed with lime or Portland or other cement, or brickwork in mortar or cement. He either lays the concrete level or concentric to the curve of the lattice girders (the former is preferred), and he then lays the floor with joists and flooring boards in the ordinary manner. *Patent completed.*

887. C. E. SOHN. IMPROVEMENTS IN THE CONSTRUCTION OF POSTS, POLES, AND SIMILAR SUPPORTS FOR TELEGRAPHIC, AGRICULTURAL, OR OTHER PURPOSES. (A communication.) Dated March 26, 1867.

This invention consists in employing strips or bands of sheet iron rolled into cylindrical or tubular form, either spirally, longitudinally, or otherwise, so as to admit of being held together by joints vertically, or in one piece, and formed of any required thickness and length, and subsequently coated with tar or other preservative materials—employing in like manner for gardening, decorative, or other purposes papier-mache or pasteboard in combination with asphalte or other bituminous materials, in lieu of the iron as above. *Patent abandoned.*

891. E. W SHIRT. IMPROVEMENTS IN THE MANUFACTURE OF PLANE IRONS, AND OTHER EDGE TOOLS. Dated March 27, 1867.

In performing this invention the patentee takes a piece of plate iron of any convenient length and width, and which has been previously rolled, and had one or more pieces of steel welded thereon lengthwise of the said plate, that is to say, the steel may be either welded at the middle of one side of the iron, or along each end of one side thereof. The patentee does not lay any claim to the welding of iron to steel, neither does it form any part of this invention. But this invention consists in taking a slab or plate of iron and steel combined, as above stated, and rolling the same into single or double bevilled plates, say from 8 to 20in. wide, or any other convenient sizes. When the steel is along the middle of the iron plate, he leaves such part the thickest, and tapers or bevils the iron towards the edges thereof, and when the steel is along the edges of the iron plate, he forms the edges the thickest, and tapers or bevils the iron towards the centre of the said plate, leaving the centre part of the plate thinnest. He then proceeds to cut or divide the plate lengthwise along the centre thereof, and crosswise by any suitable means in known and common use for that purpose, the width being in accordance with the plane iron or other edge tool which it is required to produce, and it is this mode of rolling and cutting up iron and steel plates that constitutes this invention. *Patent completed.*

898. S. W. WORSSAM. IMPROVED MACHINERY FOR CUTTING WOOD. Dated March 27, 1867.

This invention relates in the first place to improvements in saw frames for cross cutting timber, and consists in a novel mode of arranging, mounting, and suspending the reciprocating saw and its appendages. The saw with its bearing blocks or slides at either end are suspended by chains which pass over pulleys placed at the upper ends of the hollow standards. From the opposite ends of the chains are suspended counterbalance weights which are enclosed in the hollow standards in which the said weights rise or fall as the saw is depressed or elevated. These two pulleys are mounted on the same shaft, which extends across the machine, so that they are obliged to rotate in unison, and being of precisely the same diameter the saw is always kept in the proper horizontal position for working. By the counterbalance weights being placed in the hollow standards, the machine is rendered compact, convenient to manage, and not so liable to accident as when the weights are outside the standard. A reciprocating motion is communicated to the cross cut saw by means of a connecting rod actuated by the crank of any suitable motive power engine, and in order to produce a draw cut, the cutting edge of the saw is not only bellied or curved, but the horizontal guides are placed slightly on the incline, so that as the saw reciprocates a kind of swinging motion is imparted to it. The next improvement relates to a novel arrangement or construction of parts for supporting the timber in a "trying up" machine. The object of this improvement is to support the timber at several points, and to afford efficient support to such timber, even when the underside is uneven. To this end the supporting table is provided at short intervals throughout its length with several transverse rocking supports, which, when wedged up from below, will fit against the underside of the timber, and will take the weight of the timber at several points, whatever may be the unevenness of the underside. *Patent abandoned.*

876. W. R. LAKE. IMPROVEMENTS IN SCREWS. (A communication.) Dated March 26, 1867.

This invention consists in combining with the threads of an ordinary wood screw, and as an aid thereto in penetration, a prolongation or point which breaks away or displaces the fibres in the path of the shank. *Patent abandoned.*

941. R. CANHAM AND F. W. KREUT. IMPROVEMENTS IN MEANS OR APPARATUS EMPLOYED IN THE CURE OF SMOKY CHIMNEYS, AND IN VENTILATING BUILDINGS AND OTHER PLACES. Dated March 30, 1867.

This invention has for its object improvements in means or apparatus employed in the cure of smoky chimneys, and in ventilating buildings and other places, and relates, first, to improved combinations of parts forming caps or tops for chimneys, and for ventilating purposes, and formed of any suitable material. One arrangement consists in combining a cone or pyramid at its base with the base of an inverted truncated cone or pyramid, the upper cone or pyramid being provided with suitable apertures, and a plate or small inverted cone or pyramid in the upper part thereof to divide the upward current of smoke or air, and thereby deflect it towards the said apertures. A truncated cone or pyramid is employed to cover the apertures in the upper cone or pyramid, and the lower truncated cone or pyramid is supported at a suitable distance from another inverted cone connected at its lower end to the chimney top or ventilating shaft, a portion of such chimney top or ventilating shaft passing up a suitable distance into the interior of the parts before described. Another arrangement of chimney or ventilating cap consists in the application of suitable guides or deflectors to such caps as are formed with a series of tubes, truncated cones, or pyramids, or with openings in the sides thereof, such guides or deflectors being fixed at a suitable distance below each of the cones, pyramids, tubes, or apertures, so as to collect the wind and direct it into the mouths of the cones, pyramids, tubes, or openings. Another arrangement of chimney or ventilating cap consists in the application of one or more tubular guards to cover suitable apertures formed in the body of the chimney or ventdating cap, such apertures being in the form of narrow horizontal slits or openings, a plate or inverted cone, or other suitably-shaped deflector, being fixed within the cap just above the openings, so as to deflect the smoke thereto. The top of the cap may be surmounted by a cone or other suitably-shaped cover. Other modifications are described in the specification of the invention.

Trade News.

TENDERS.

BECKENHAM.—For building a house. Mr. James L. Pedley, architect:—Venner, £2,365; Howard, £2,093; Browne and Robinson, £1,987; Breeze and Russell (accepted), £1,688.

BRIGHTON.—For building a public-house for Messrs. Vallance, Catt, and Co. Mr. Tupper, architect:—Patching and Son, £1,045; Lockyer, £1,035; Cheesman and Co., £1,020; Anscombe and Newnham (accepted), £952.

ERITH (KENT).—For additions and alterations to the Ship public-house, for Messrs. Day, Noakes, and Sons. Mr. G. Elkington, architect:—Blofield, £560; Tarrant, £555; Willis, £540; Falkner, £530; Eustace, £493.

LEWISHAM.—For pair of houses at Hither-green, Lewisham, for Mr. G. Slader, exclusive of papering and fencing. Mr. Banks, architect:—Storey, £1,054; Bennett, £940; Wenborn, £900; Lovell, £880.

LONDON.—For rebuilding No. 54, Broad-street, St. James's. Mr. B. Taberer, architect:—W. Prince, £1,089; J. Keys, £917; G. H. and A. Bywaters, £897; W. G. Larke, £896; D. Bostel (accepted), £887.

PENGE (SURREY).—For the erection of a pair of detached country houses in Croydon-road Mr. H. Wiber Webster, architect:—Poxon and Smith, £1,992.

MUTUAL AID.

QUESTIONS.

[1.]—What book is the best authority on taking out quantities?—T. R. B.

[2.]—Where can I obtain a book called the "Young Mechanic's Instructor"?—CONSTANT READER.

[3.]—A few weeks since you mentioned that mouldings could be purchased through a Stockholm agent. Can any subscriber give me his address?—C. E.

[4.]—Can anyone inform me where I may procure a cheap book on building, &c., generally suitable for a young clerk of works, and price?—SCREW-DRIVER.

[5.]—Can an assistant to an architect, on being asked what business he followed, say (justly) he is an architect, or must he say he is an architect's assistant?—SCREW-DRIVER.

[An architect's assistant, of course.]

[6.]—Can anyone inform me who is the inventor of the flashing signal lamp, tested some months since by the Government? The flash is produced by blowing petroleum vapour into the flame of a spirit lamp.—MORSE.

[7.]—I want information to enable me to join the Royal Engineers. Perhaps some one can give me a list of some of the requirements.—A YOUNG SURVEYOR.

[8.]—Will anyone inform me where I could obtain the foreign manufactured joinery, and as to the quality of material and workmanship? I should like to make a personal inspection of any building where it has been used, if in or near London.—D. T., Nov. 6.

[9.]—CLERK OF WORKS.—Could any one of your readers inform me if a clerk of works is entitled to be paid over and above his salary for superintending workmen, ordering materials, &c., in the finishing of a contract which a contractor has thrown up; if so, what would be a fair remuneration for his extra labour?—A CLERK OF WORKS.

REPLIES.

BLUE STONE.—"W. H." can have information by writing to Whittree Quarries, Chirbury, Salop.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots also Cost for Transit to any part of the United Kingdom furnished on application to Bath Stone Office, Corsham Wilts.—[ADVT.]

PROPERTY SALES.

Nov. 5.

AT THE MART.—By Messrs. Farebrother, Clark, and Co.—Freehold two plots of building land, fronting the New-road, Hounslow—sold for £110 each.

By Messrs. Debenham, Tewson, and Farmer.—Leasehold premises, No. 48, Great Portland street, Oxford-street, let at £90 per annum, term 16 years unexpired at £25 per annum—£480.

Freehold residence known as Tudor House, situate at the corner of West Hill-road, Wandsworth, let on lease at £125 per annum—£2,200.

Freehold residence, No. 1, Lansdowne-road, Wimbledon, let on lease at £130 per annum—£2,100.

Freehold residence, No. 4, Lansdowne-road, Wimbledon, let on lease at £100 per annum—£1,450.

Freehold residence, Lansdowne-road, Wimbledon, let on lease at £105 per annum—£1,540.

Freehold residence, No. 18, Lansdowne-road, Wimbledon, let at £94 per annum—£1,300.

Freehold residence, No. 19, Lansdowne-road, Wimbledon, let on lease at £90 per annum—£1,280.

Freehold residence, No. 20, Lansdowne-road, Wimbledon, let on lease at £112 per annum—£1,680.

Leasehold residence, No. 1, Ridgway-place, Wimbledon, let on lease at £71 per annum, term 99 years from 1853 at £8 per annum—£780.

Leasehold residence, No, 23, Ridgway-place, let at £52 10s. per annum, term and ground rent similar to above—£760.

Leasehold residence, No. 3, Blessington road, Lee, let on lease at £110 per annum, term 94½ years from 1858, at £4 per annum—£1,400.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

George Dewdney, Rickmansworth, carpenter, November 27, at 11—J. Weymouth, Talbot-road, Kensington Park, master plasterer, November 20, at 11—Edwin Sayers, Lower Grove, Wandsworth, carpenter, November 28, at 2.

TO SURRENDER IN THE COUNTRY.

George Appleton, Leeds, joiner, November 20—Thomas Atkinson, Llandudno, contractor, November 20—J. Brooker, Tunbridge Wells, brickmaker, November 25—Howell Evans, Llantrissent, Glamorganshire, builder, November 20—William Edward Golliford, Barnstaple, November 22—Joseph Gubbins, Birmingham, carpenter, Nov. 22—Thomas Love, Blackpool, Lancashire, builder, No-

vember 19—Thomas Morfey, Brighton, builder, November 25—William Skelsey, Wortley, near Leeds, brickmaker, November 20—William Smith, Everton, near Liverpool, builder, November 19—George Stinchcomb, Usk, Monmouthshire, carpenter, November 20—Frederick Strong, Derby, plumber, November 21—Joseph Thompson, Middlesborough, joiner, November 25—Everard Vigis Williams, Ware, builder, November 19—W. Bradford, Eastbourne, Sussex, carpenter, November 25—W. Privett, Bishop's Waltham, carpenter, November 23—John Traverse, Hulme, Lancashire, joiner, November 23—T. Williams, Festiniog, Merionethshire, engineer, November 22.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

December 10, J. Jordan, Median-road, Lower Clapton, builder—Dec. 5, J. Rule, Kingston-upon-Thames, builder—December 5, R. Walker, New Windsor, builder—December 5, I. May, sen., Upminster Hill, near Romford, carpenter—December 10, J. Curtis, New Wimbledon, builder—December 10, J. Rider, Compton-street, Goswell-road, Clerkenwell, and Cleasby-villas, Tollington Park, timber bender—December 10, J. Archer, Shrubland-road, Dalston, builder—December 12, W. Collon, Putney-common, Putney, timber dealer—December 13, F. Springall, East Ham, builder—January 20, W. and H. Cooper, Tamworth, plumbers—December 13, G. Stanton, Birmingham, mechanical engineer—December 13, R. Wheatstone, Fownhope, near Hereford, timber dealer—December 10, A. R. Clarke, Derby, builder—December 4, J. Neill, Chorlton-on-Medlock, joiner—December 18, W. Dolphin, Brampton, near Chesterfield, mason—December 6, J. Robinson, Wetherby, Yorkshire, mason—December 16, J. Plank, Wolverhampton, carpenter—November 22, J. Banks, Bishop Auckland, shingler—November 21, G. W. Myers, Jarrow, Durham, journeyman mason—December 4, T. M. Hawke, Saint Day, Cornwall, plumber.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9 0	£10 10	Archangel, yellow..	£11 10	£13 0
Quebec, red pine	3 0	4 10	St. Petersburg, yel...	10 10	11 0
" yellow pine..	2 15	4 0	Finland	8 0	9 0
St. John N.B. yellow	0 0	0 0	Memel.....	0 0	0 0
Quebec Oak, white..	5 5	5 10	Oothenburg, yellow	8 10	10 10
" birch.....	3 10	4 10	" white	8 0	9 0
" elm	3 10	5 0	Oefle, yellow.....	9 0	11 0
Dantzic oak	3 10	6 0	Soderham	9 0	10 10
" fir	2 0	3 0	Christiania, per C., 12 ft. by 3 by 9 in. yellow	16 0	22
Memel fir	3 0	3 10	Deck Plank, Dantzic, per 40 ft. 3 in.	0 15	1 4
Riga.....	3 0	3 5	PUMICE STONE pr ton	6 0	8 0
Swedish	2 0	2 5	OILS, &c.		
Masts, Quebec red pine	6 0	7 0	Seal, pale....per tun	40 0	40 10
" yellow pine..	5 0	6 0	Sperm body .....tun	112 0	0 0
Lathwood, Dantzic, fm	4 10	5 0	Cod	36 0	0 0
" St. Petersburg	6 10	7 10	Whale, Sth. Sea, pale	39 10	0 0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.			Olive, Gallipoli.....	69 0	70 0
Quebec, white spruce	13 0	19 0	Cocoanut, Cochin, ton	56 0	56 10
St. John, white spruce	13 10	15 10	Palm, fine	40 10	0 0
Yellow pine, per reduced C.			Linseed	36 5	0 0
Canada, 1st quality.	17 0	18 10	Rapeseed, Eng. pale..	39 0	40 0
2nd do.....	11 10	12 10	Cottonseed.....	34 10	40 10

METALS.

IRON:—					
Welsh Bars in London .. ..per ton	6 7 6		6 10 0		3
Nail Rod ..... do	7 10 0		7 15 0		2½
Hoops . ..... do	8 10 0		9 0 0		
Sheets, Single ..... do	9 15 0		10 0 0		
Stafordshire Bars . ..... do	7 10 0		7 15 0		
Bars, in Wales .... do	5 15 0		6 0 0		3
Rails ..... do	5 10 0		6 0 0		nett
Foundry Pigs, at Glasg. No 1 .. do	2 15 0		3 5 6		2½
Swedish Bars ..... do	10 5 0		10 10 0		net
STEEL:—					
Swedish Keg, hammered .....per ton	15 0 0		15 10 0		2
Swedish Faggot ..... do	10 10 0		12 10 0		2
COPPER:—					
Sheet & Sheathing, & Bolts ....per ton	£80 0 0		82 0 0		
Hammered Bottoms ..... do	92 0 0		0 0 0		
Flat Bottoms, not Hammered .. do	85 0 0		0 0 0		
Cake and Tough Ingot ..... do	71 0 0		72 0 0		3
Best Selected ..... do	72 0 0		80 0 0		
Australian ..... do	83 0 0		83 0 0		
Y l. Metal Sheathing & Rods ....per lb	0 0 7		0 0 0		
TIN:—					
English Block .....per ton	96 0 0		0 0 0		2½
do Bar ..... do	97 0 0		0 0 0		
do Refined ..... do	99 0 0		0 0 0		
Banca . . .. do	94 0 0		95 0 0		nett
Straits ..... do	90 0 0		0 0 0		
LEAD:—					
Pig, English .....per ton	21 15 0		0 0 0		2½
" Spanish Soft ..... do	19 5 0		19 5 0		
Shot, Patent ..... do	22 10 0		0 0 0		
Sheet ..... do	20 10 0		0 0 0		
White ..... do	27 0 0		30 0 0		5
SPELTER:—					
On the Spot .....per ton	21 0 0		21 2 6		net
ZINC:—					
English Sheet .....per ton	26 10 0		27 0 0		2
Devaux's V. M. Roofing Zinc .... do	26 10 0		0 0 0		
* And 5 per cent. discount if laid upon the new system.					
QUICKSILVER .....per btl	6 17 0		0 0 0		
REGULUS OF ANTIMONY					
French .....per ton	28 0 0		0 0 0		

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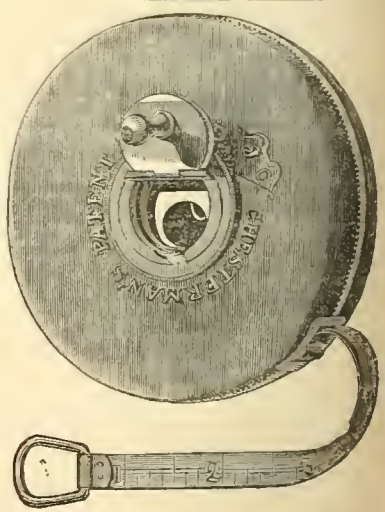

(Half size drawing of Chesterman's Patent Steel Measuring Tape, 66 feet.)

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THE BUILDING NEWS.

LONDON, FRIDAY, NOVEMBER 22, 1867.

THE FUTURE OF LONDON ARCHITECTURE.

MR. HENRY CONYBEARE is another of those examples which are the natural outcome of the lack of unity amongst artists. If modern architects had any practical idea of what art brotherhood meant; if men were contented enough and humble enough to work within given bounds; if we had one real association of architects, instead of a score or two of sham societies; if freedom had not degenerated into licence; if rule, and law, and right had any force and any home; if humbug were never allowed precedence, and time-service were regarded with as much displeasure as falls to the lot of honest unvarnished criticism, novelty manufacturers would be unknown, and Mr. Conybeare's article, in the last number of the "Fortnightly Review," would never have been written. In all ages of the world there have been men more or less given to visions and prophecies. When the subject-matter is religious, we call the men by names which are either titles of respect or the reverse. We have our patriarchs and saints. We have also our fanatics and our fortune-tellers, and of the latter there are various kinds. There is the respectable original lady, who tells you whether you are married or single, the name of your love, the colour of her eyes, &c.; that you are going a journey, that some one is very anxious about you, and that "some one" will have a family and be happy, but not for some time to come. Then there is the spiritualist shop, where you feel the hand of the ever-to-be-lamented, and hear heavenly accordions. We have, too, the political predictor, who tells us what the England of 1900 will be if such an unconstitutional measure be allowed to pass into law. Lastly, we have our art soothsayers, who count Dan Chaucer of their number, for having predicted the first Crystal Palace—Paxton's Exhibition Building of 1851. To this class Mr. Conybeare belongs, for he says, "I am confident that the time will come when concrete and fireproof construction will be adopted generally, and ceramic façades universally, and when all our long and dreary ranges of smoke-stained brick, with rectangular holes for windows, will be thus transfigured into life and beauty." There is the true soothsayer flavour about this assurance that almost takes one's breath away, and yet caution enough not to specify exact time. Will the editor of the "Fortnightly" please go a little further, and commission his art fortune-teller to cast the horoscope of this new ceramic life that is to do such wonders. We remember listening some years ago to just as confident predictions concerning iron and glass, whilst in matters of detail there are numerous Nicholases. Moses has his poet, and almost every manufactured article has its "old man." One tells us that the time will come when every moulding will be done in terra cotta. Future ages, says another, will recognize in asphalte the only material suitable for pavement; and Mr. Edmeston, if he is given to prophecy, would no doubt tell us that zinc of the Vieille Montagne quality will eventually supersede all other kinds of roof covering. In saying this we do not for a moment pretend to infer that Mr. Conybeare's article was written for any other purpose than to enlighten the public in general and architects in particular. Let us now see how he does it. Throughout the article it is assumed that London in the future must possess an atmosphere as thickly charged with soot and impregnated with acids as it has been any time these last fifty years. 2. That all architecture is, or should be, designed with reference to the conditions of winter light—"cloud-light or fog-light;" and that the other half of the year, from April to September, should be ignored altogether. 3. That architecture should always appear dressed in new clean attire of various colours. Having said this, it seems hardly worth while to go on. These are the premises upon which seventeen pages of argument are built to show that, under these conditions, the best thing to do is to build concrete walls, fire-proof floors, flat fire-proof roofs, and to cover the external surface of the walls with glazed tiles of various colours, shapes, and sizes, arranged in divers ways. This being decided, Mr. Conybeare utters his prophecy, we presume subject to the same conditions. We need hardly point out to any of our readers that these conditions are unsound and most gratuitous assumptions. But suppose we admit them to be sound. Mr. Conybeare starts with a very long and unnecessary quotation from an article by Mr. H. Merivale, which appeared in the "Fortnightly Review" for May, 1866. Mr. Merivale complained that architects were apt to forget "the condition of atmosphere through which" their works were to be seen. This is Mr. Conybeare's text. Seeing, therefore, that this atmosphere is not only foggy, but loaded with soot and various acids, the ordinary stones supplied by the country are unfit because they absorb the soot and acids, become discoloured, and sooner or later decay. To simple-minded observers the inevitable conditions of this life seem to be change and decay. Fancy a changeless fixed beauty in Nature! Having found that the state of our atmosphere is such as to ruin all architecture built of absorbent material, our guide proceeds to point out a part of the world where a method of building, or, rather, wall veil decoration, has been employed for centuries "on the grandest scale, and with magnificent effect"—"acres of façades which connoisseurs speak of in terms of enthusiastic praise." We naturally ask—are the conditions the same; is the atmosphere cloudy or foggy, impregnated with soot and acids too numerous to mention? By no means, says Mr. Conybeare; I refer to the East, to "Persia, Scinde, and India," where the buildings, standing "in a cloudless atmosphere, and under the glare of a tropical sun," are covered externally and internally with glazed tiles in mosaics of "brilliant colours." Fancy Fleet-street in a mosaic of brilliant colours! Fancy all our northern birds changed to the colour of tropical birds! Here is one of Mr. Conybeare's ideas of coloured wall veils. "Cornice and window-dressings are of red moulded brick and terra cotta, the wall-surface cream colour; but between each pair of windows there is a panel of deeper tone, relieved by white and chocolate, and edged with green." This is a specimen of what we are to do in London, taken from a terra cotta front in Pavia, only with us it is to be all glazed. But the finest joke is in the last foot-note. "One great advantage of finishing the façades of our rows and terraces in this manner is, that it would prevent the incongruities they continually present when of painted stucco, owing to the different tastes in colour of the tenants of adjoining houses." But what architect ever seriously wanted "painted stucco;" and whoever thought of measuring the art of the present, or picturing the art of the future, by the help of stucco, painted or not. It has about as much to do with the future of London architecture, or any other architecture, as the mud cabins of Ireland have. But this idea of glazed tiles of different colours preventing "incongruities" is very funny. In a row or terrace it might do so, but how about the Strand, or Fleet-street, Cornhill, or Cheapside? Every one would vie with his neighbour to outdo him, and make his own shop the most startling. If, with only two decorators or painters employed in one building, we cannot get unity or harmony of colour or form, although under one architect, imagine what maddening sights our streets would be when every building had its independent architect, and one house brought its glazed vermilion up to the chrome yellow of its neighbour on one side, and the bright blue of its neighbour on the other side, to say nothing of the patterns and the jumbles of colour on each house. The thing is eminently unpractical, to use no stronger word; for in spite of all the predictions of people who pretend to tell the fortune of London architecture, and in spite of all the writers on this subject, we are perfectly sure that glazed polychromatic architecture is utterly unsuited to the climate of England, and to the people of England, and that were it extensively introduced as a "fashion," it would be one of the shortest lived of art fashions, because so capable of vulgarization.

We have still another word to say to Mr. Conybeare. After describing three Pavian façades, he says he is not exclusively in favour of Italian architecture, because he thinks the Burgundian Romanesque of the twelfth century "is capable of a far grander exterior effect;" he would allow "mediæval architecture" an "unquestionable supremacy in the case of ecclesiastical and collegiate buildings," but for street architecture pointed arch styles must give way to round arch styles, because "the very essence of Gothic architecture is vertical composition," whilst the essence of modern building consisting in floors "the composition of the façade must be horizontal, and consequently incompatible with the very essence of Gothic architecture." This argument seems almost too much for its author, for he winds up the paragraph with—"no amount of Gothic detail can make such a front" (viz., *a house with "floors horizontally disposed one above another," as if floors were of old vertically disposed*), "genuine Gothic. The voice is Jacob's voice, though the hands are the hands of Esau." This rhapsody is too absurd even for amusement. That any man should distinguish between modern town houses and mediæval town houses by saying that the essence of the former does, should, and must consist in the floors, and that the essence of the latter is "the stoppage of all the horizontal lines by vertical ones," and is therefore not in the floors, is not an encouraging sign. One more extract, and we have done. "In interiors all will admit that to place a pointed window-case beneath the horizontal cornice of a flat-ceilinged room is productive of an unendurable discord; and why? Because the direction of the arch lines of a pointed arch implies prolongation upwards, and are thus essentially discordant with the horizontal boundary that surmounts them." So that St. Stephen's Chapel, Westminster, was "an unendurable discord." The thirteenth and fourteenth century street architecture of such places as Cluny, Cordes, Caylus, S. Yriex, Caussade, S. Antonin, Amiens, &c., are "unendurable discords," and, moreover, are not Gothic in "essence," because there is nothing vertical about them except their window jambs. So, too, most of the rooms in the great halls of Oudenarde, Louvain, Ypres, are "unendurable," and we might go on with a whole column of examples of better architecture than anything Mr. Conybeare or his Persian or Pavian worthies ever dreamt of. Mr. J. H. Parker was indeed right when he said that to the Englishman every pointed vault was a chapel; we go further, and say that to the public, and even to some architects, Gothic architecture means nothing more than a pointed arch and a pinnacle. Perhaps the class of design of the Architectural Association may be prevailed on to teach these men, by help of our next architectural exhibition, that to produce good Gothic domestic art, answering every condition of modern life, is quite possible without the use of the pointed arch, or of any vertical lines beyond those absolutely demanded by construction.

METROPOLITAN BUILDINGS AND MANAGEMENT BILL.

It may be remembered that with the view of amending the Building Act, the Board of Works invited the District Surveyors' Association to submit such remarks and suggestions as seemed necessary. The Bill does not find great favour with those who should be the best judges. They say plainly, "they do not consider that there exists sufficient reason for such sweeping changes as are proposed by the Bill, or that they are demanded by the public. They believe that it would have been more convenient to correct the known imperfections of the present Act, leaving unaltered all the parts to which no objections have been discovered." They likewise think the Bill too minute in its details. The remarks are signed for the members of the District Surveyors' Association by Mr. H. Baker, chairman, and C. Fowler, honorary secretary. Some idea of the extent of their suggestions may be formed when it is considered that the Bill is divided into 254 clauses, 80 of which the Association desire to enlarge, modify, or suppress. As might be expected, they look very sharply to definitions, and find that the terms "party wall," "wall of separation," and "party structure," are not clear when read together. In the words of the Bill, the term "party wall" means a wall used or intended to be used in any part of its height as a separation of buildings belonging to different owners, or occupied or intended to be occupied by different persons, or a wall standing (to a greater extent than the projection of the footing on one side) on grounds of different owners; and every such wall shall be deemed a party wall throughout its whole height. The term "wall of separation" means each of two walls built against one another, which, if they were not built against one another, would be external walls. The term "party structure," includes a party wall, a wall of separation, a party fence wall, a party arch, and a partition, floor, or other structure separating buildings, storeys, or rooms belonging to different owners, or approached by distinct staircases or separate entrances from without. The Association suggest an improvement in the term "builder," which will prevent the shifting of responsibility at present practicable. It is obvious that both builder and owner should be liable. The clause relating to "fire-resisting material" admits of improvement. The term "includes brickwork, constituted of bricks well burnt, hard and sound, properly bonded, and solidly put together with mortar, compounded of sharp clean sand or grit, and good lime in proper proportions, or with cement; also, oak and teak or other hard timber used for beams or posts, or in combination with wrought iron, protected by plastering in cement or other non-conducting external coating; also, elm used for upright posts or sheathing, but not for beams; also, slate, tiles, and vitrified stoneware used for coverings or corbels; also, flagstones used for floors over arches, but not exposed and self-supporting; also, concrete, properly compounded, used for filling in between joists of floors." There appears to be some doubt whether this definition excludes all other materials from being considered as fire-resisting. Having disposed of definitions, the Association very properly look after their own interests, which will be seriously compromised if certain clauses in the second part of the Bill are not modified. They assert, fairly enough, that they should not be liable to dismissal from any cause but "incompetency or neglect of duty." Clause 21 is particularly objectionable; it reads—"The Board may from time to time appoint a competent person, having the qualifications of a district surveyor, to be assistant district surveyor for a district." The surveyors "claim for their own protection, to which they are justly entitled, that the first paragraph of this clause should be reinstated as it stood in the original draft dated November 21, 1866. They submit that the unlimited and arbitrary powers proposed to be given to the Board by this clause and Clause 11 (viz., that a district surveyor may be wholly or partially deprived of his office and emoluments without any cause alleged of incompetency or neglect of duty, and without any opportunity of appeal) are inconsistent with the independent fulfilment of their duties as public officers." Clause 19 says "The Board may at any time cause to be paid to any district surveyor instead of fees a salary of such amount as they may think fit," and is commented on as "objectionable in the interests of the public." It is certainly prejudicial to the position and interest of the district surveyors. There would often be a great difficulty in adjusting the amount of salary in proportion to the income previously derived from fees.

The Association next suggest alterations in many of the clauses under the head "construction in general." They do not allow that a damping course of slate laid in cement or asphalte, or other material impervious to water, is in all cases necessary, nor do they consider it advisable, in the case of small buildings, that "the ground surface or site of every dwelling house, where not flagged over, shall be covered with good concrete at least one foot in thickness." The Board cannot mean to insist on the profuse use of so costly a material. Clause 84, "openings in external walls," provides that "in any wall the total area of the openings taken together shall not exceed one half of the whole area of the vertical face or elevation of the wall, except with the approval of the Board." The surveyors have discovered that this clause would render illegal the usual construction of stable buildings with coach-house doors, also shop fronts in buildings of two storeys only. Clause 85 is objectionable. It refers to the support of a building with open ground storey—a shop, for example. It provides that sufficient piers of brickwork, or other fire-resisting material, shall be so disposed as to carry the superstructure, exclusive of any iron supports; and in any building so constructed there shall be such a pier or piers at the corner or angle of any street on which the building abuts. The surveyors say "these brick piers will cause more evil than good; almost all the failure of new houses have arisen from brick piers. There is no reliable information as to the weight which new brickwork in mortar will support." This is perfectly true. We have no reliable information on this most important subject. The Board would deserve well of the public if they would cause experiments to be instituted embracing the strength of brickwork, especially when new. It is a source of wonder, considering the absence of information, that a much greater number of accidents does not take place than actually occurs. Clause 94—"bressummers"—contradicts Clause 85, which requires that the bressummer shall be independent of iron columns for support. Clause 85 will not work, and in practice will be disregarded. In the opinion of the surveyors the provisions of Section 15 of the present Act are better. Clause 99—"rules for inhabited rooms, ventilation, light, &c."—is framed like a lodging-house act, and is a matter of police. To ascertain whether a room shall be deemed inhabited within the meaning of this section, it would be necessary that the district surveyor should be prepared to pop in upon the owner or occupier with a bull's-eye lantern at unexpected hours. Clause 103 goes so far as to limit the dimensions of finials and other decoration. "No finial nor other decoration on an external or party wall shall be built higher above the roof flat or gutter adjoining thereto, measured from the highest point in the line of junction with the roof, flat, or gutter, than a height equal to six times the least width of the finial or other decoration at the level of the said highest point." In the case of a vase as an ornament this clause would operate strangely. Clause 121, accesses and stairs in certain buildings, leaves the public in doubt whether stone stairs will be allowed. Captain Shaw describes stone stairs as anything but fire-resisting; and, to a certain extent, actually gives the preference to wood. Discretion should be allowed the district surveyor. It is easy to conceive circumstances under which a stone staircase might be unreliable, as, for instance, in a building containing highly inflammable material; but, in public buildings, where the corridors are paved, and where the amount of inflammable material is small, there can be no possible objection to the use of stone stairs. The portion of the Bill relating to party structures appears in the main to be satisfactory, as the surveyors offer few suggestions, and those of an unimportant character. The restrictions to forming openings in party walls will fall heavily on the proprietors of warehouses, and are of questionable advantage. What is gained in increased security against fire is lost in inconvenience and ground space. We all know that it is possible to insure too highly, and where the question is merely one which involves property and not life people will be unwilling to make large sacrifices of ground space representing an annual loss of storage room, equal perhaps to an eighth or even quarter of the entire area. We cannot consider this clause, nor that which limits the cubical contents of a building, used wholly or in part for purposes of trade, to 216,000 cubic feet, unless it is divided by walls, as expedient. We are also bound to say that we see no provision for dividing trade buildings horizontally by fireproof floors. This is an important subject, and the construction should be clearly defined. Clause 149, relating to openings in party walls, is obscure, and whereas very important points are involved, this portion of the Bill, more, perhaps, than any other, requires revision.

In connection with public buildings it is suggested that no building should be used or occupied as a public building until the district surveyor has certified that it has been duly constructed in accordance with the rules of the Act, under a penalty of £30. The floors may be formed of brick, slate, or iron supported by sufficient wrought-iron girders. It cannot be meant that brick, slate, and iron are the only materials that are incombustible; even tiles are overlooked, and concrete on iron laths are not noticed. Clause 157 specifies that "the roof shall be constructed entirely of iron, with slates or tiles fastened without wood in or about the same." It is well that theatres should be constructed with especial regard to danger from fire, but many other public buildings do not require such precaucautions. Are the halls of the City companies, for example, and churches? Is there a fireproof church in London? Part XIV. of the Bill deals with dangerous structures, and is framed with judgment. Clause 225 enacts that "every new street shall, except with the approval of the Board, have, at least, two entrances of the full width of the street, and shall be open from the ground upward." This clause is very necessary, and we hope the Board will not give its "approval" to any subterfuge doing away with it or lessening its force. A provision is made that exempt buildings ceasing to be exempt shall become subject to the provisions applicable thereto, as if it had never been exempt. The Bill, however, does not state in what way the change of destination of the building can be ascertained. The only other provision of the Bill to which the surveyors object is that which states, Clause 230, that "a cornice of a building abutting on a street shall not be constructed so as to overhang the pavement to a greater extent than half the height of the cornice, and the corbelling of the brick or stonework of the cornice shall have not less than two thorough bond stones in the height thereof, except with the

approval of the Board." The provisions of Clause 232, allowing a shop front to project beyond the external wall of the building to which it belongs for 5in. in a street of less width than 30ft., and for 10in. in a street more than 30ft. in width, are exceedingly objectionable. 2in.—the traditional excess—is enough. The rest of the Bill relates to by-laws, expenses of owners, service of documents, penalties on owners' workmen, &c., limitations of actions, &c. As the Association of Surveyors find no fault with this portion of the Bill it may be concluded that they consider it unobjectionable as regards agreements and contracts previously entered into. Past compensations, however, are not interfered with, nor are the powers vested in the Commissioners of Sewers of the City of London.

Before concluding, we give one instance of the effect of minute legislation. Ever since the passing of the Act of 1855 the Board have allowed wooden eaves to be constructed, provided that they only overhang the ground of the owner and are covered with 1in. of cement, and the district surveyor was in the habit of allowing it. Within the last two years the Board has insisted that application should be made to them for permission. As almost every house in the newer districts has a forecourt and these projecting wood eaves, the applications are very numerous, vexatious to both builder and surveyor, besides involving to the former a fee of 10s. to the Board.

These are the leading features of the Bill. We learn that every proceeding of the Board will be conducted with deliberation, and no pains spared to render it worthy of its object.

COMPETITION DESIGNS FOR PARISH CHURCH, RYDE.

SINCE our last article appeared, we hear the committee have made their selection from the designs sent in for the above church. Fifty-five plans presented no easy task for discrimination, and we have reason to believe—although the plan placed first in point of merit and conditionally accepted is not, in our opinion, the best—that the selection has been made in an independent and impartial manner.

The designs that have been considered worthy of consideration bear the following mottoes:—1, "Palmam Qui Meruit Ferat"; 2, "Trefoil"; 3, "Simplex"; 4, "Faith"; 5, "Proportion." From our previous remarks our readers will see that the order of merit awarded may have been somewhat different, but, with the exception of the first and the third of the above designs, we consider the judgment of the committee a wise one. Mr. Peachy, of Darlington, is the author of the first awarded, and although that gentleman's design is superior to many noticed in our first article, we did not consider it sufficiently meritorious to justify us in ranking it among those we there enumerated as entitled to the first place. Our notes upon it were simply to the effect that it was "an over-pinnacled, though otherwise good design," and we certainly think its author could have done better by discarding useless and expensive features. As a whole, the plan has merit, though admitting of some modifications, and among them the proportion of the chancel—at present quite disproportionate to the length of church, which is 114ft. to the entrance of chancel, the latter being about 34ft., measuring from the eastern wall of transept, and 20ft. wide, the width of nave, including aisles, is 60ft. in clear, and the height to apex of nave roof, of trefoiled rib construction, 60ft. The plan comprises transepts, a south-west angle tower and spire, 177ft. in height, a north porch, an organ chamber at south-east angle or bay, the opposite side of choir having a vestry and adjacent porch rather clumsily arranged. The materials used are Binstead stone and Bath stone dressings for the exterior, and Caen for the internal work.

The style adapted is the English Decorated, but the profuse display of pinnacles and pierced parapets give a quasi-Gothic air not up to our present standard. The corbelled angle pinnacles of the tower are conspicuously defective, and do not in the least fulfil their purpose, either constructively or artistically; for, if such accessories are employed in that position they ought to aid the junction of tower and spire by lessening the sudden change and leading the eye gradually to the converging outline of spire. On the north side of chancel the arrangement is defective, and a confused and detached effect is the result. If we remember rightly, a steep truncated roof covers a protruding porch or vestry, marring the east end. If shorn of its pinnacles, and the substitution of projecting eaves for parapets made, the design would be a tolerable one; but, then, in the face of others, such a modification would be disallowable.

An arrangement of plan showing a nave and side aisles, with a square or apsidal east end, an externally defined transept, an organ chamber occupying a chancel bay, and a vestry and children's seats, on the opposite side of choir, constitute a very suitable plan, and one capable of a pleasing exterior; but when we get protruding porches and transepts, and an ill-defined eastern termination with a jumble of adjuncts on one side, the external grouping is never satisfactory, and the internal functions of a church are considerably impaired. We may somewhat illustrate our remark by referring to one church at Ryde, which a local paper has seen fit to admire, namely, "Holy Trinity," in Dover-street, and in which the long transepts are hideously connected to the gabled aisle roofs. Such a plan is not suitable for a limited area as that proposed for the new church; and, generally, a plan without transepts is infinitely superior to one in which they are of great length, sacrificing both internal convenience and exterior unity. The plans of "Proportion," "Sursam Corda," and "Vorwärts," are all conspicuous for the merit of combined effect, the transepts projecting slightly beyond the line of aisles in two of them, and not marked at all in the other.

We promised to speak of a few drawings that elicited our admiration, though inferior as designs. Among the most striking were some drawings under the motto "Designed by Vectis." The author shows two designs, one being of stone, the other of brick. The first is of unpretending character, the windows small couplets; the second is noticeable for its stilted arches, which have a harsh effect. The drawings, however, show an amount of detail and elaboration, cleverly introduced in the margin and corners, that indicate a lavish bestowal of labour—misspent to our minds. "I Keep Within" shows a few good features, a west narthex, a provision admitting of more artistic treatment than a small porch, a very fairly treated east end, and a pleasing spire springing from lofty side gablets and intermediate pinnacles. The roof is too flat, the ceiling being boarded and ribbed as a tunnel vault; the aisles also are too narrow. The same motto has a second design, noticeable for having meaningless flying buttresses at west end angles of gable; and the design has a Continental Gothic touch about it. "Hope" shows the old fault of seats behind or eastwards of the prayer desks, but the general plan grouping and geometrical window tracery are good. "P. P.," of a foreign character, has a decently arranged plan but a better roof. One design we noticed as indicating an old hand, but it was irretreviably spoilt by a profuse display of pinnacles and canopies, and was certainly behind the taste of the day, which has notably discarded the overdone detail of a late Gothic. The motto was "An Bon Droit." We cannot but again speak in terms of commendation of "Soli deo Gloria," "Benedicamus Domino," "Sursam Corda," and "Vorwärts," the first two as exhibiting a considerable amount of careful drawing and detail, the two last as well studied designs, evincing much feeling in two opposite styles, but chiefly conspicuous for the lavish bestowal of artistic labour in their production—in the last case, thrown away for a parish church. Clever and feeling drawing, however, does not compensate for the lack of constructive design and good arrangement of plan—a disregard for which is evidenced in a great many instances. A well digested plan and design can be sufficiently read in two or three drawings, and it would be as well for architects to be reminded of this, both for their own time and pocket's sake, for we have frequently seen a deal of elaborate detail and drawing thrown away upon an ill-considered design that gave the impression of being the chance result rather than the primal suggestion of the drawing bestowed upon it. In one word, design and drawing too often change places.

In our last notice we said that "Simplex" was "unadapted," and as this design takes precedence to one other—in our opinion, better—plan, we will simply add that its demerit is moderately expressed in its motto. For a village church we would let it pass. The designs we have favourably noticed admit of modifications in regard to fittings and decorative details. In one or two cases the allowance of space between the seats is deficient, being only 2ft. 6in. from back to back of framing, but as such details are easily remediable, and do not affect the general merit of arrangement and design, they cannot be regarded as valid objections. We make this comment, as a few may possess excellencies of a special and minor order that cannot claim the distinction of meritorious designs. In conclusion, we may add that a local paper ("Isle of Wight Times") has, with questionable judgment, suggested the desirability of selecting local talent, but, with a modest reservation, gives its readers to understand that it was writing upon the "spur of the moment," and in "ignorance of the conditions" of competition—a counter-assertion with which we cannot reconcile the final part of the concluding sentence, to the effect that injustice should not be done to distant competitors.

We understand that the design at present bearing the "palm of victory" is provisionally accepted: that it can be carried out for the sum of £8,000, an amount that we think inadequate to cover its extravagant appendages.

FRENCH AND ENGLISH SYSTEMS OF ART EDUCATION.

THAT the Exhibition of 1867 has been fraught with many powerful teachings, must be a fact evident to all who have visited it, especially to those who have had a practical knowledge of the fine arts, and their application to our manufactures. Our present position is far too critical to permit any feeling of national pride to bias our judgment, and so prevent us from accepting these teachings in all their true and real force. Indeed, the agitation concerning "technical instruction" plainly indicates that the mind of the nation is becoming prepared for some changes in our educational systems. The conviction seems to be pretty general that we are not so surely getting to the foremost rank as it was hoped we should do, or, as was believed, we had the power to do; and, in drawing a comparison between our productions and those of the French, especially in some of the higher branches of art workmanship, it is but too evident that there is a lesser degree of true art power and feeling possessed by British art workmen. If, then, we have now to make this unpleasant confession, what conclusion are we to arrive at concerning the influence exerted by our schools of art throughout the country? Is this defect to be attributed to our system of art instruction, or does the blame rest with our artizans and manufacturers for not availing themselves sufficiently

of the advantages offered them? With regard to our system of art education there is very much to be said in its favour, for undoubtedly it has already achieved a great work, and is still preparing the way for greater successes in future years; but, after a careful study of the modes of instruction adopted in the French schools of art, combined with a consideration of the results, as shown in the actual productions of the factory and workshop, it is but reasonable to ask ourselves the important question as to whether our scheme of art instruction can be benefited by any modification? Our method, as compared with the French, is in some respects more rational, for we commence at the beginning, and lead up to the higher branches of study by a more graduated and systematic course of work. It is also more comprehensive, for it embraces the study of several important branches of art education, which are not at all prominent, and in some cases seem entirely omitted in the French schools. Nevertheless, although we have the vantage ground in these respects, there is yet room for improvement on our part, and I believe some valuable suggestions may be derived from a careful survey of the French modes of instruction in drawing; not but what there will also be warnings given us from the same source as to errors which should be avoided, for I consider the practice of setting lithographic examples of inferior modern French Renaissance before students to copy, a great mistake in the French system; and, with this drawback, it is surprising that the French students excel so much as they do. We escape this error, and our examples in some stages of instruction are, as far as they go, of superior character, being in great measure examples from good Classic and Renaissance ornament. We are, however, somewhat deficient in Gothic examples, notwithstanding these are days of Mediæval revivalism, when such examples might be a potent means for good.

One very broad distinction between the two systems is shown by the material used by the students in their work. The French give great prominence to the use of the stump and charcoal, and the English lay great stress upon the use of the crayon point. The former method favours rapidity of work, and the latter requires a much greater length of time for its execution. Now, the French look upon their practice of rapid working as of the highest consequence, and in great measure attribute their success to it; and I am afraid that until this method of getting effects rapidly, easily, and at the same time beautifully, is introduced into this country, we may hope in vain to gain that facility of drawing, and seizing hold of the salient points of effect, which the French students so powerfully possess. Our almost exclusive practice with the crayon "point" seems to cramp a student and certainly does not encourage freedom of work. I believe it is a mistake to look for too much finish in our student's works, from the very outset, instead of encouraging a bolder and more general study of light and shade, and of form, and bearing in mind that the requisite power to produce a perfectly finished work can only come with long continued practice. I question very much, indeed, whether half-a-dozen drawings, executed with such laboured precision, give so much true power to a student, as a score of works, executed in the same amount of time, which are coarser in execution, but still true to form, and the proper relations of light and shade. At all events, the French evidently believe in and practise the latter method of working, and witness their results. Besides, in the latter mode of working, students are more likely to look upon their studies as leading to an ultimate purpose. I by no means advocate careless or slovenly work; neither do I advocate the abolition of practice with the crayon point. What we want is to have both methods, the one for quick and broad effective drawing, and still retain the point where high finish is required in small studies. One great advantage which would result from the use of the stump would be that studies would be made to a much larger scale, and therefore, with the increased size, the stumps could relatively give as much finished precision as the crayon point could to the smaller sized drawings. And we have yet to learn the good results which would also accrue from a systematic practice of "time sketching" and "drawing from memory." With regard to the former, it is practised but occasionally, and then only in certain stages of instruction; and the practice of the latter, I believe, is of very rare occurrence indeed. In every stage of a student's art-training he should be taught to exercise his powers in these two kinds of work, and thus learn to draw rapidly and at the same time intelligently.

The study of geometry, too, requires to be more fully developed than it is at present. The simple working of the problems is not sufficient in itself—it should be supplemented by ample demonstrations showing the influence practical geometry has upon ornamental design, &c., as a basis of construction. I would also suggest the establishment in every school of art of a designing club, which students engaged in our manufactures, and also others, should be expected to join, and periodically bring for the master's inspection designs for given objects which had been worked out entirely at home. This would tend to give more confidence to each student, and would develope greater individuality of design. As regards the teaching of mechanical drawing, it must be taught under different circumstances than those which at present exist before we can expect to produce instrumental drawing equal in merit to the works of that class submitted by French schools, and exhibited in the Exhibition. All who have examined these drawings must have noticed their excellence. Our system of teaching lays too great a stress upon the study of "orthographic projection." Most of our artizans, who can only devote some two or three evenings in the week to their studies, do not like to be kept at this, to them, apparently unfruitful work. After several months of study they desire to do something of a practical nature, and, if this is not granted to them, the chances are they will discontinue their studies altogether. This being the case, we must, to a certain extent, accommodate ourselves to circumstances, and I believe it is possible profitably to give a good amount of practical instruction at an early stage of this class of study. I understand that in some of the leading French schools the pupils are from the first taught to draw from models of parts of machinery, and ultimately from complete machines. It is possible to give the demonstrations in "projection" as the difficulties in drawing from the actual machine call for their requirement. The great difficulty we have to contend with is the absence of models of machinery in our schools. It would be of great service if the Department were to form a collection of models of machinery, in whole and in part, and furnish some to every school where such work was required. Arrangements might then be made by which schools could make an exchange of models, and thus the entire collection might in time be circulated throughout the kingdom. Each model should also be accompanied by any particulars or formulæ which would be of use to the students.

With regard to the system of medal awards, the British art schools compete one with another, which is more satisfactory than the plan adopted in France, where, in the majority of cases, each school competes within itself. Our universal competition tends to raise the general standard of art students' work throughout the country, but it would prove very beneficial if some changes were made as regards the awards for "designs for art manufactures." As far as figure studies, and drawings from flowers and the cast, &c., are concerned, it is easy to compare together the works of all the schools; but when we come to "applied designs" for objects so widely different in their scope and technicalities—such as metalwork, pottery, printed fabrics, carpets, and lace, &c.—and see them all classed together, we cannot but feel that the special importance which should be attached to each section of our art manufactures is considerably lessened. Would it not then be better to create a distinct set of medals, &c., for each section of applied design. By this means a direct impetus would be given to the designing for each branch of art industry in our schools. Ten sets of medals would embrace all subjects under the general headings of—1, metalwork; 2, glass; 3, ceramic ware; 4, lace; 5, printed fabrics; 6, woven fabrics; 7, carpets; 8, furniture; 9, decoration; and 10, miscellaneous.

A visitor would naturally expect, on entering a school of art, to see a number of the students' works exhibited on the walls, but, generally speaking, this will not be the case, for when drawings have been kept many months in London for examination, the students are naturally anxious to claim them when returned. It would be highly advantageous to have a perpetual exhibition of students' works in each school. This object might be attained if the Department were to purchase all the metal drawings executed in each year, and present them to their respective schools. Not only would this create in each student a desire to excel all previous efforts, but, in a number of years, the collections would be most valuable as a history of the work of each school.

One matter which requires our earnest consideration is the nature of the examples available for study in schools of art. In some sections of study the examples employed are not so numerous nor of such high merit as the necessities of the case demand. A great want is felt for better examples of plant form, shaded and in outline; shaded examples of ornament; a more comprehensive set of outline examples of ornament, &c., for freehand practice; and also some good studies of the human figure, from the antique and from the life, shaded and in outline. Doubtless good examples of these kinds are in existence, but a provincial art master has not the opportunity to search them out, so it is very desirable that lists of examples suitable for the purpose should be prepared by the Department, that, in all cases, the very best examples may be placed before a student, for it is evident that his taste must be materially influenced by the character of the examples from which he works. And if it is deemed inexpedient to send any of the paintings belonging to the national collections to art schools, let us have good copies made from some of them, and have them circulated throughout the country for the use of the more advanced students. As regards photographs from drawings by Raffaelle, Michael Angelo, and Holbein, &c., the Department has already conferred a great boon upon schools of art, and it is to be hoped that the good work commenced will be carried on to completion, thus affording a most potent means for refining and educating the tastes of our art workmen. It is also of great importance that a complete set of cheap text books on the various subjects of study should be prepared for the use of students, and also works explaining the technical processes and characteristics of all branches of art manufacture.

One other matter, too, which may be deemed worthy of consideration is the advisableness of getting a number of sets of diagrams prepared under the supervision of the Department of Science and Art, for the occasional use of the masters of art schools, which would enable them to give lectures to their students, and perhaps to the public generally, on various subjects connected with art education, as the history of art, artistic anatomy, structural botany, the styles of architecture, historic ornament, and the analysis of form, &c. It must be borne in mind that art

aasters have not sufficient time at their command to prepare such elaborate sets of diarams themselves; consequently, one very mportant channel by which instruction may e conveyed is closed. The extreme importnce of having trade and art museums established in all our principal seats of manufacure has already been largely dwelt upon in he public press. Their formation cannot be oo earnestly desired, so that we may be nabled to give our artizans opportunities for mprovement, such as those already enjoyed y their continental brethren. We have but o look at some of the great manufacturing entres abroad to arrive at a fair estimate of he value of such institutions.

Even with our present opportunities for dvancement it is surprizing that our artians do not avail themselves of them more ully than they do. There are, I may say, illions of artizans in the United Kingdom o whom a knowledge of drawing would prove f some service in their various callings. Yet ow many do we see attending our artizan lasses in art schools? The Department eport for 1867 shows that during last year he total number of *bona fide* artizans attendng was only about 10,000. In London alone, ith its great population, and its immense dvantages of all kinds, only about 2,000 rtizans attended the evening classes of its leven art schools. One reason, I believe, hy we see so few comparatively giving attenion to these studies is that art knowledge is ot sufficiently appreciated by the workers, or is it looked for as a necessary qualificaion by the employers. The great majority f the employers know nothing whatever bont drawing, although there are some irms which afford brilliant exceptions to his, and such take the high rank they eserve. A manufacturer, to be truly great n his calling, should, like a soldier, commence is education in the ranks. He should himelf know how to weave, to carve, or to chase, nd, above all, should he possess in a high egree, that art power and knowledge upon hich so much of the greatness and success f his work should depend. Therefore, more trongly than ever do we see the necessity of ntroducing the correct study of drawing into ur middle class schools, and our colleges, &c. ertainly our parochial schools are now teachng elementary outline drawing on correct rinciples, but such instruction only reaches he present rising generation of artizans; and he sons of our manufacturers and others ikely to have the future management and irection of our manufactures, are, in the najority of instances, left to the tender nercies of the false art system so prevalent n our boarding schools and commercial cademies. If landscape drawings must he aught in our middle class schools, let it rank ather as an amusement than a serious study. But, by all means, let the true study of "form" e received as a recognized necessary branch f the education of all classes. And let the apabilities for original designing be cultiated by those who are expecting to be future 'artmanufacturers," and others also, although hey may never contemplate having to design s a profession. I know there are difficulties n the way, for parents would much rather see, t the end of the quarter, a pair of nondecript crudities in water-colour, called landcapes, than a score of conscientious exercises n the true study of form. And how are we o expect to raise the standard of art manufacures in this country if we do not cultivate he tastes of those who are to be the purhasers? Not only must we infuse more aste and knowledge into the "supply," but lso into the "demand." Once raise the haracter of the latter, and, as a natural conequence, the character of the former will nake a corresponding advance.

Our manufacturers will do well to note the ignificant fact that in France it is very frequently stipulated in the indentures of an apprentice that he should attend a drawing class luring the term of his apprenticeship. If British manufacturers were to insist upon their apprentices, &c., attending art and science classes, according to their callings, and would also let their day's work end early enough for such purpose, the results would soon show how great would be the advantages gained, both morally and materially, by giving more time and opportunity for this cultivation and improvement of the mind. In comparing the state of ornamental art in France and England at the present period it must not be forgotten that where we have only given our attention to popular art education for some score of years, the French have had schools for art instruction, supported by the State, for more than a century, and therefore better results must be expected of them. We must not, however, rest contented with this thought, and simply look to the future, but we must also devote our best energies to the perfecting of our present system. And, from what our art workmen have already achieved, and if their minds would only become more fully awakened to the absolute necessity for cultivating their art powers by a severe and unflinching course of training, there is every reason to believe that our British artificers would soon become the most perfect body of the kind in the world.

Nottingham. John S. Rawle.

EDUCATION OF ENGINEERS.

At a recent meeting of the Civil and Mechanical Engineers' Society at the Whittington Club, Arundel-street, Mr. B. Haughton gave an address on "Engineering Progress." He alluded particularly to the education of engineers, and said that if engineering were placed on a level with the three learned professions, that is to say, that if the Universities and certain Colleges of Engineers were empowered to grant degrees qualifying persons to act as civil engineers, the profession would thereby be relieved of a large portion of the incapacity which now holds on by it. The public would be more certain of having their works economically and permanently executed, and in short that it would become a better educated, more select, and honourable profession. Whether or not such would become the case, I am hardly prepared to say. I am informed that in France such degrees are granted by the State Department of Ponts et Chaussées, which has produced a large number of famous engineers; but that there are also men of much ability, and who thoroughly enjoy the confidence of the investing public in that country, who are not possessed of any kind of state degree. The comparison of the profession of engineering with other professions may be productive of some advantage in discussing the subject of an engineering education; while making such, it must be borne in mind that there are many points of difference, for instance, the lawyer and the clergyman are essentially men of words—the cloister and the lecture-room are fit places wherein they may obtain titles and degrees to practise their professions. The engineer is, on the other hand, a man of action, and of deeds rather than of words. His cloister is the graving dock, the tunnel, the ship's interior, and the workshop. The canopy of heaven is the dome of his lecture-room, the rugged upturned earth, the rockshelf, and the sea-bed its floor. What corporation or university is competent to confer degrees of proficiency in such arenas as these? Here lies the difficulty; the well-educated engineer has received two educations, the one in the cloister, the other abroad and on works. This double education cannot be acquired at an university; in short, it can only be acquired by a many-sided man. I must say that I am for an university education for the engineer; let him there take a degree of proficiency in the theory of his profession, in drawing, and in the use of surveying instruments; but so far his work is less than half done. Without doubt, the most important part of it remains: the study of works and practice thereon. It must be confessed it remains yet to be discovered how the precepts of the cloister are to be given without clashing with what must ever be the mainstay of his knowledge, the precepts of nature acquired on works. It is well known that Telford frequently expressed his contempt for the mere cloister engineer. On the other hand, George Stephenson has placed it on record that the great want of his life was the want of a liberal education, and that he in consequence took care that his son should have the best education to be gotten in England. We see the result of this double education in Robert Stephenson, whose name stands proudly forth among the foremost of British engineers, yet not more prominently than those of Watt, Telford, Brindley, Rennie, Chapman, Priestley, and Smeaton, self-made men; and of Isambard Kingdom Brunel, who graduated in the famous Thames Tunnel, who, had he been consigned to the charge of the college don, would have for ever lost the golden opportunity of receiving those trumpet-tongued lessons with which rebellious nature so rudely instructed him beneath the river's bed.

In contemplating the usage in other professions, for the sake of comparison, the engineer chief would do well to take a lesson from the potentates of the professions of law and surgery. The former constantly promotes and patronizes the debating society of the juniors, and often graces their meetings by his presence. Not unfrequently a judge may be found in the chair on the occasion of a stirring debate. As for the surgeon, he is not above visiting works in company with the rising crowd of students, the works of disease! exhibited on the hospital bed. It is an encouraging and cheering prospect that of some half-dozen of hospital surgeons, entering the bedrooms of a morning, each with a tail of *aides* and pupils, visiting each case, and prescribing for it, while, at the same time, he explains its various aspects and treatment to his followers; in short, to this profession must be paid the tribute, that in none other are the magnates so ready and willing to communicate their superior knowledge to juniors. It would seem a part of the ambition of the surgeon and physician to shine as expounders of the mysteries of their craft, both at the bedside and in the hospital theatre. The result of such a system is, that professional experience is perpetuated; it becomes for ever available for the benefit of the human race.

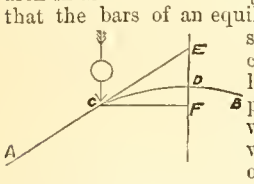
PURIFYING WATER.

The supply of pure water is daily becoming a question of greater importance. While some have carefully investigated the existence and capabilities of the natural reservoirs with which this country is blessed, and have concocted various schemes for the conveyance of the water to its required destination, others have endeavoured to purify by artificial methods the foul water. With the advertisements of the many different filters staring us in the face, it becomes a matter of no small importance to ascertain which of them really perform their advertised promises. At the first meeting of the present session of the Society of Civil Engineers, the discussion was resumed in a paper read in May last, on this subject, by Mr. Edward Byrne, M.I.C.E. The author also gave an account of some further experiments he had made on the different filtering materials, namely, magnetic carbide, silicated carbon, and animal charcoal. The results of these experiments comprised the conclusions arrived at in his paper, and were that the first of these substances was exceedingly feeble as regarded the removal of organic and inorganic impurities, and that it did not possess the property of softening the water, except to a very small extent. These powers were possessed in a greater degree by the silicated carbon and animal charcoal, but the silicated carbon quickly lost the power of softening the water, rendering it positively harder than before filtration. Both these latter were found, after a short time, to give back a portion of the organic impurity they at first removed. Mr. Byrne expressed the opinion that while filtration was valuable for the removal of matter in mechanical suspension it was practically useless as a means of removing substances in solution. He thought there was great danger in depending too much on any system of filtration, and exposed the inconsistency of bringing home foul water to undergo a supposed purification instead of procuring naturally pure water.

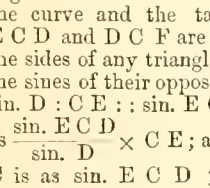
Mr. Ward, R.A., has just finished the repairing of his frescoes in the Commons' corridor, after several weeks of great care and labour. The three other frescoes which he has had a commission to paint, are completed, and are now in Mr. Ward's studio. They will not be placed in the corridor until it is ascertained whether any further decay has taken place in the works just repaired.

CONSTRUCTIVE AND ÆSTHETIC DESIGN.—No. VIII.

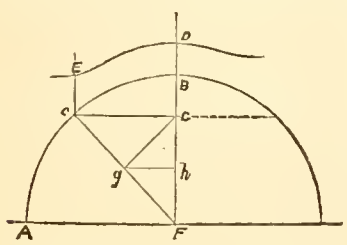
BEARING in mind the theory of the balanced arch, noticed in the last article, we will here more practically apply the principle there investigated, before remarking upon the artistic value and adaptation of the arch in architectural composition. Assuming that the bars of an equilibrated polygon are so small as to form a continuous and regular curve or line of pressure, as really would be the case with the arch stones of a large arch, it is clear, supposing A B to be such a curve and C the vertical pressure or weight, that the angle E C D is the angle of contact between the curve and the tangent, and the angles E C D and D C F are equal. Now, because the sides of any triangle are to one another as the sines of their opposite angles, therefore, as sin. D : C E : : sin. E C D : E D ; or E D is as $\frac{\text{sin. E C D}}{\text{sin. D}} \times$ C E ; and the weight on angle C is as sin. E C D × sec. D C F × sec. E C F, or, as the continual product of the sine of that angle and the secants of the sides that form it. Therefore, the load at any point C in the equilibrated curve here considered is inversely proportional to the radius curvature at that point, and directly proportional to the square of the secant of angle made by the curve or tangent and the horizontal line. Thus, as angle of contact E C D is small, and proportional to its sine, and is the measure of curvature at any point, and because the curvature there is reciprocally proportional to its radius, the vertical load at any point C is as $\frac{\text{sec.}^2 \text{ E C F}}{\text{radius}}$.



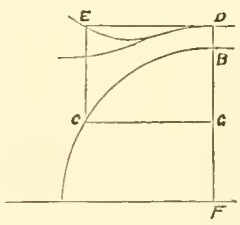
Now, in the case of an arch kept in equilibrium by the weight of a superincumbent wall or the materials over it, we may conceive a vertical load composed of a number of vertical heavy lines, acting on a small portion of curve *a b c e*, and proportional to the height c and the breadth c *e*. Hence we may deduce from our former proposition the rule that the vertical height is "directly proportional to the cube of the secant of the angle which the tangent of the curve at that point makes with the horizontal; also, directly proportional to the curvature there, or inversely proportional to the radius of curve at the same point;" or, height at point C of curve is as $\frac{\text{sec.}^3 \text{ E } c \text{ F}}{r}$, or as sec.^{3} E *c* F × curvature.* It follows that from a given curve the radius and tangent at every point will be given, and thence the proportions of the verticals; so that by assuming the middle vertical at keystone the others may be found.



According to the values peculiar to the above lines or those of particular curves, the external curve or extrados of any form of arch may be determined. To find the extrados of a circular arch:—The general value of C E = $\frac{\text{B D} \times \text{B F}^3}{\text{F G}^3}$, or as F G^3 : B F^3, or C F^3 : : D B : C E. This gives a simple geometrical means of determining. Draw *g* G perpendicular to C F, and *g h* perpendicular to G F; then, as F *h* : F C : : F G^3 : F C^3. Hence if C E be taken, a fourth proportional to F *h*, F C, B D, it will be the vertical required.



It appears from the above that a circular arch cannot be balanced by a horizontal line of wall, and therefore is not suitable for a bridge or any structure requiring such a boundary of materials, but only when its upper line can be made to bend a little below the horizontal each way, or by making C E = D G. Dr. Hutton says, that an arch of about 108 degrees is the arc of a circle that may be used with greatest success with a horizontal line at top, the thickness of the crown being nearly the sixteenth part of the span. A flat ellipse is better balanced by a straight horizontal back or wall than the circle, and this last better than the sharp ellipse, the circle being a medium in this respect between the two. The cycloidal curve is, however, the best form of arch, the extrados deviating less from a straight line than in the circular and elliptical cases. By the same application of the same theory it is found that the extrados of the parabolic curve follows the same curve as the intrados; and in the hyperbolic arch the two curves continually approach each other—*i. e.*, in the vertical distance between them. Hence, however fit they may be for crown pressure, the parabola, hyperbola, and catenary are unfit for structures requiring a tolerably straight boundary at top, the addition of any weight on their flanks being destructive to their stability.



In the case of domes or cupolas the same theory applies, viz., the height or vertical thickness over every part of a balanced shell "is directly as the cube of the secant of the curve's elevation at that part, and inversely as the radius of curvature, and as the width of dome at same part." A perfectly-balanced dome requires its curve to have its radius at vertex of great length, or the curvature there nothing. Curves of the parabolic and catenarian kind are most adapted for cupolas. It must be remembered that a dome has a constructional property that the vault has not, namely, its incapability of falling inwards. By making the joints radiate everywhere perpendicular to the face, the inside or outside contour in the vertical section can be made either straight, convex, and even concave, and thus architecturally the dome offers a wide scope for the ingenuity and artistic skill of the builder. The falling-in of a dome, supposing the base secured, can only take place when the weight at the crown is greater than the cohesive force of the cement or ties at the flanks, causing the latter to rise or spread—a tendency counteracted by horizontally hooping the dome at the base, and at different heights, a means resorted to at St. Peter's dome, round which six circles of iron are placed. A spherical dome of uniform thickness will be stable if it is generated by a segment subtending at the centre less than 51 deg. Fortunately, however, the peculiarity of the cupola is such that a theoretically-balanced one of equal thickness really gives the most pleasing shape, namely, a parabolic or prolate form, particularly when it is truncated at crown for a lantern. The supporting cone at St. Paul's enabled Wren to carry his lantern without the slightest danger, for a cone prevented from spreading will sustain any weight; and it would have been wiser if Michael Angelo or his successors had adopted the cylindrical cone within the external dome of St. Peter's to carry the lantern, and formed an inner cupola for effect.

The dome of the Pantheon, the largest of ancient domes, shows a near approach to the theoretically-balanced cupola. We find a series of steps round its external base gives it a slight concavity at outer springing; and, further, the intrados surface is brought down considerably below these. Its ribbed construction and the caissons, or sunk panels formed between the ribs, show an economical distribution of the materials, which are of bricks and rubble, the ribs and bands being of these, and the filling-in of tufa and pumice stone. The polygonal apsidal temple of Minerva Medica at Rome exhibits another instance of the same principle carried to a greater perfection. The ribs which spring over the apsidal junctions are constructed of tiles, and the interspaces filled in with lighter material banded together at certain heights by courses of tiles. Mr. Ferguson speaks of this building as being infinitely better in proportion to the Pantheon, whose internal height is deficient and depressive in effect. The Roman builders thus externally showed their domes; though in many cases spherical internally, they were exteriorly roofed as a rectilinear pyramid or cone, assuming on plan the external form of the base, which was often octagonal, as Diocletian's temple at Spolatro. The temple of Venus, near Naples, is another instance of dome-rib construction, having a circular interior plan, and an octagonal external form. The material used for the dome is tufa, and its form is still further relieved by the vaulting cells, the ribs springing a little below the window heads. As Professor Willis observes, the origin of all the component features of Middle Age vaulting is traceable to these Roman examples, and much may be learnt in going back to the incipient steps of Roman, Romanesque, and Early Byzantine vaulting. G. H. G.

* For more elaborate demonstration see Dr. Hutton "On Arches."

WAREHOUSE, SOUTHWARK-STREET.

WE this week give an illustration of a new warehouse, recently erected in Southwark-street, for Mr. R. J. Bates, of Little Knight Rider-street, Doctors' Commons. It consists of basement, ground, and three other floors. The material used is chiefly white brick, stone being only sparingly introduced, namely, in capitals and bases of piers, and principal doorway, which has double columns on each side, and stone head or tympanum. The windows are well recessed, the arches being of moulded brick, and double revealed. The front of the building is divided into eight bays. The principal entrance is in the first, and the one furthest from Southwark-street is recessed back for greater convenience, and has doors on the several floors for transmission of goods. This bay terminates above the cornice with a square tower, and has a pent roof projecting over the derrick, supported by framed brackets. Mr. Ernest Bates, of Manchester and London, is the architect, and the cost has been about £3,000.

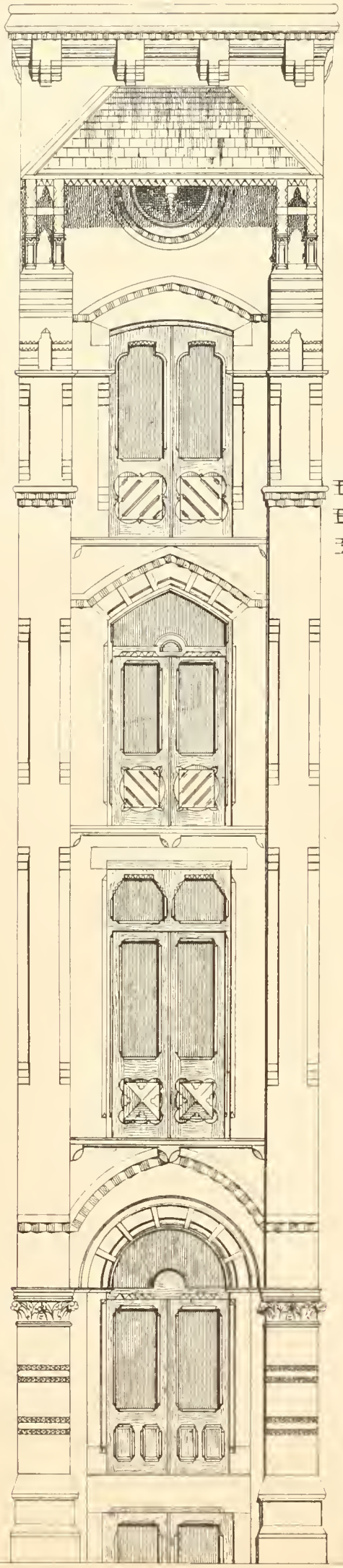
BUILDERS' BENEVOLENT SOCIETY.

THERE are two pensioners to be elected at the next meeting of this Society, to be held on the 28th inst., one man and one woman. There are four men candidates—namely, G. N. Lambert, 4, Hereford-street, Lisson-grove, aged 71, plumber and painter. This is his second application. He has polled 167 votes. Richard Burdett, 43, Exeter-street, Lisson-grove, aged 70; second application. He has polled 81 votes. Stephen Hambrook, 21, Pembridge Villas, Bayswater, aged 65, carpenter and builder; and G. M. Michelmore, 74, St. Peter's-street, Islington, aged 74.

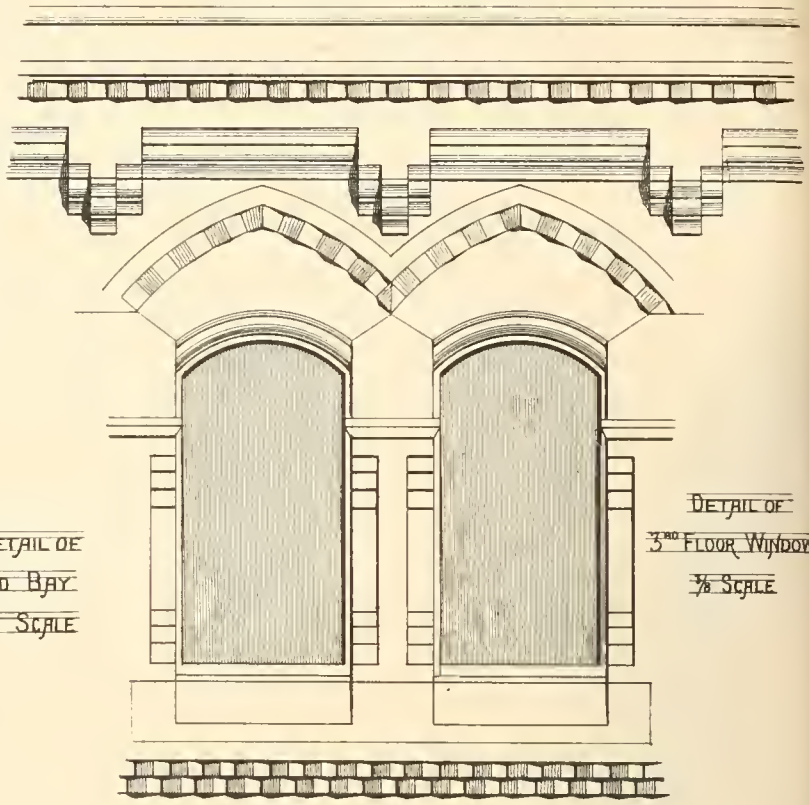
The women candidates are Maria Unwin, 4, Eden-terrace, Bridge-road, Battersea, widow, aged 66; third application. She has received 1,807 votes. Hannah Lawrence, 26, Desborough-terrace, Harrow-road, widow, aged 70 years; third application. She has received 3,495 votes. Elizabeth Ware, Bricklayers' Almshouses, Ball's Pond, widow, aged 67. She has received 1,417 votes. And Martha A. Martin, 4, Great Pulteney-street, Golden-square, widow, aged 67; second application. She has received 237 votes.

WAREHOUSE SOUTHWARK S^T M^R. E. BATES ARCH^T

DETAILS



DETAIL OF END BAY 1/61 SCALE



DETAIL OF 3RD FLOOR WINDOWS 1/8 SCALE

DETAIL OF PRINCIPAL DOORWAY 1/8 SCALE

E. Wimbridge lith

Printed by Whiteman & Bass

Ground Plan

Warehouse Southwark St Mr. E. Bates Archt

E. Wimbridge Arch

Printed by Whiteman & Bass

THE NEW LAW COURTS.

A GREAT deal has been said in the daily papers during the last week on the New Law Courts, from which we can gather no reliable hint as to the result of a final decision. We may, however, infer that no such decision is arrived at. A long letter in the "Times," on Monday, signed "Lincolnensis," goes in for a new competition. This correspondent gives very strong reasons why the designs of Messrs. Barry and Street should not be selected for the new building. Mr. M. Digby Wyatt, on the other hand, sees no reason why these two architects may not be selected to superintend its erection, and he points to the fact that Mr. Gilbert Scott and himself acted in the most perfect harmony and good understanding in the erection of the India Office, and he does not see why a prudent division of labour between Mr. Street and Mr. Barry should not result in equally harmonious action. The most important letter, however, is from the pen of Mr. E. W. Field, Secretary to the Commission. That gentleman says:—"It was and still is left entirely to the Government to appoint any architect it thought fit to conduct and design the work." Further on, he says:—"So far as this Commission goes, its work is now suspended till the Government have named the architects to be employed." As we said, a long time since, "the final decision rested with the Treasury." Mr. Field, however, does not think there is any necessity for a further competition. He says:—"I believe it will be found that in the plans, and in the written remarks which have been made on them by the judges and officers of the law and by the profession, and in the conclusions of the Commission and its committee on the points of conflict in them, there now exist ample materials from which an able architect could prepare ground and floor plans and sections for a complete final plan, and that any further competition could not materially advance that part of the work."

WORKS IN PALACE-YARD.

THE enclosing, paving, and general finishing of Palace-yard, including the arcade in connection with the new railway, is now nearly completed. The works consist of an arcade in front of the Speaker's House, leading from Star-court to a passage under the bridge to the railway station, and also of an enclosure formed by a screen of ironwork stiffened at intervals of about 18ft. by stone piers surmounted by lamps. The necessary paving is also being proceeded with. Without questioning the necessity for the arcade, and this is open to doubt, we may remark that the work is far inferior to that of the rest of the building. The proportions are extremely heavy, more fitted for a crypt than an arcade, and the parts, though near the eye, are coarse. While the rest of the building, whatever may be its faults, is characterized by an air of lightness and extreme delicacy of detail, the arcade and piers supporting the screen are clumsy and in no recognized style. It would be absurd to call them Perpendicular, as they have none of the true Perpendicular feeling; and it would be unjust to any style but the most debased German Gothic to class them in any other category. The extreme massiveness of the arcade as ill accords with the building as a waterproof cloak would with a lace shawl. There is, besides, no reason for the introduction of bands of red Mansfield stone in the interior of the arcade, still less for using three columns of the same stone at the junction of the arcade with the bridge. This junction is the worst portion of the work, and needed not the display of coloured stone to attract attention. The cause of the extreme heaviness of the arcade is very obvious; it is a repetition of the buttresses to the Star-court. These buttresses are massive, because they belong to a large building of more than one storey, and plain as compared with the Speaker's front. The circumstances do not apply to an arcade of a single storey, and it is difficult to conceive that anyone should imagine that any amount of carving, tabernacle-work, and introduction of statues could do anything but make the matter worse. It avails nothing to say that the groining requires support; it requires nothing so excessive as at present exists, and it is quite within the resources of science to counteract the thrust in a more elegant manner. In short, the subject may be dismissed with the remark that if such massiveness were really necessary the arcade should never have been erected. The very spandrels are left plain, and no attempt whatever has been made to lighten the appearance of the pinnacles. It is obvious that the necessary weight should have taken the form of a tapering pinnacle instead of a square mass of stone. The carving is well executed and worthy of a better design. With regard to the piers supporting the iron screen, too much can scarcely be said in condemnation. They are simply not in the Gothic style, nor are they in any other. The lamp with which each is surmounted is very gorgeous, consisting of a globe of glass supported by much gilt metal of good form. Having been obliged to condemn the architecture, it is a relief to be able to speak in terms of the highest praise of the metal work of the screen. It consists of work about 6ft. high, without the finials and spikes, divided into three bays vertically, and two main divisions horizontally. The lower part is filled in almost completely, and the whole is in the best taste and highest style of art. Description is impossible. We understand that Mr. Hardman, of Birmingham and London, supplied the metal work. The process of gilding the crowns, roses, &c., on the screen is now going on rapidly. This is, in our opinion, a great mistake. When we first noticed the screen a few weeks ago, it was black, or nearly so, and the effect was much better. Colouring and gilding outdoor metal work is always a dangerous experiment, and we cannot point to a single example that can be considered really successful. The carriage entrance is incomplete, and the paving kerbs, &c., are not sufficiently advanced to enable an accurate judgment of their effect to be formed. We may, however, say that two carriage entrances would, in our opinion, be more convenient. This if necessary could be done at any time.

PROJECTED ENLARGEMENT OF THE HOUSE OF COMMONS.

THE "New" House of Commons, as it is still termed, being scarcely out of its teens, has, after repeated altering and patching, been at length, by general consent, condemned as altogether unsuited to the due accommodation of members in the numbers in which they are now accustomed to resort to it; and the question is already imminent—hear it, ye taxpayers of England!—whether to submit it to a complete remodelling—a process which is estimated to occupy two or three years—or to abandon it altogether, and build an entirely new house in the open space now known as the "Commons' Court." A select committee was appointed towards the close of last session of Parliament to consider the insufficient and inconvenient arrangements of the House, with a view to devising means to render it more adapted to the requirements of the case, which, after sitting half-a-dozen times, reported the evidence received by them, without any recommendation based upon it further than that a committee on the same subject should be appointed at the commencement of next session. Only three witnesses were invited to give their opinions on the architectural part of the case, two of them, Mr. Bazley and Mr. Hankey, being members of the House, and of the committee, and the third, Mr. Edward M. Barry, the son of the architect of the building. To say the least of it, it was in doubtful taste, if not questionable wisdom, to call upon one single professional man to enlighten the committee upon a question involving past architectural failure, and its remedy, and that the very man who from his position may be supposed to entertain strong opinions on the merits of the case; and the off-hand manner in which Mr. E. M. Barry undertook to advise in the matter, is what would be amusing but for the unavoidable misgiving that a further waste of public money may come out of it. Reference having been made to various amateur propositions of Mr. Hankey, Mr. Bazley, and others, Mr. E. M. Barry is asked:—"Have you any suggestions of your own to make?" To which he replied, "I have not at present, because I rather wish for instructions as to what the committee consider desirable." The committee forthwith came to a resolution that Mr. E. M. Barry, besides making drawings of the plans of the two volunteer M.P.'s, "be further requested to prepare any plan his good sense may suggest." This was on the 2nd of July, and, on the 15th, Mr. E. M. Barry put in a collection of fourteen coloured drawings illustrative of four distinct plans, and which are all published in the committee's report, as the materials from which the committee of next session are to choose from.

We will now briefly pass in review the various projects thus offered to the option of the public through this committee. The original instructions for the planning of the New House of Commons, according to Mr. E. M. Barry's evidence, "provided for from 420 to 460 members in the body of the House, and an adequate accommodation for the remainder in the galleries." The actual conditions of the House, as it stands, provide only for 428 members, of whom 306 are in the body or on the floor, and 122 in the galleries. On the other hand, we find a pretty liberal provision for strangers, which, including peers, ladies, and reporters, extends to seats for 263 persons. Mr. E. M. Barry does not know how it happened that the original conditions in this important respect were so far departed from. He says:—"I have always understood it was by direction of the officials of the House, but I have no means of saying for certain, for I can find no data." Another example, out of many, of bureaucratic blundering and exemption from responsibility.

To cure this fundamental defect of want of space, and putting aside nice calculations, as to allowing 21in. or 19½in. per *head*, the obvious course was to hit upon a rearrangement of seats within the walls, or an extension of the area, either on the ground-floor itself, or in the galleries. Mr. Bazley and Mr. Hankey proposed plans for rebuilding the House on the present site in an octagon form, which are very similar in the main features; that of the former accommodating 548 members and 260 strangers, that of the latter 610 members and 260 strangers. We agree with Mr. E. M. Barry in doubting whether upon acoustic grounds or general convenience this form—a square with the corners cut off—would be successful.

Then, again, in view, still of retaining the House within its present lateral walls, Mr. Bazley put forth a suggestion for increasing the area in the side galleries, by knocking down the upper part of the walls and carrying the gallery seats back over the division lobbies. This would involve so perilous an experiment on the acoustic qualities of the House, at present very decently conditioned, that we cannot hesitate to concur with Mr. E. M. Barry in condemning it.

But Mr. E. M. Barry himself proposes a scheme for the enlargement of the House within its lateral boundaries, which we think open to even graver objections than that of Mr. Bazley. This plan provides for extending the length of the House 15ft. by removing the

north wall behind the Speaker's chair, the latter being thrown back to the same extent, where it would be, in fact, quite removed from the body of the House. As an almost unavoidable consequence of this arrangement, the seats of the leaders of the Ministerial and Opposition parties would have to be removed from the time-honoured "Table," mace and all, and they would now be placed in the centre of the House, with a narrow table before each, having a restricted gangway between. This scheme, which would only afford accommodation for 58 additional members (486 instead of 428, as at present), we think is utterly unacceptable. It would place the Speaker in an undignified cold shade, far away from the orators who are supposed to address him and "catch his eye." It would place the leaders of both sides in a sort of cockpit, far apart from the ensigns of Parliamentary sanction. It would, besides, lead to a disarrangement and curtailment of the already sufficiently confined offices behind the Speaker's chair, which would have to be substituted "partly by a new erection in the Commons' Court, and partly by cutting off a portion of one of the refreshment rooms." But the acoustic problem involved in such an alteration would be the most serious consideration, and as Mr. E. M. Barry has given us no proof of being an authority in this matter, we should be very loth to follow him in a "leap in the dark" experiment.

Lastly comes the modest proposal of Mr. E. M. Barry to do away altogether with his father's House, and to erect a new one in its stead in the Commons' Court, which that architect, having an eye to sanitary considerations, intended for lighting and ventilating purposes. In respect of ventilation alone, we doubt the ability of even Dr. Percy, the administrator of air, being equal to the task of counteracting the obvious danger incurred. Nevertheless, the plan of Mr. E. M. Barry, as he set it forth after only twelve days' gestation, must be considered by us. The proposed area would give about 85ft. square for the House, and Mr. E. M. Barry considers (adopting a hint from Mr. Bazley and Mr. Hankey, which he does not acknowledge) that a form nearly approaching to an octagon would be the most advisable one. The House so constructed would provide for 458 members on the floor, with the power of adding 100 in the galleries, besides 260 seats for strangers. Supposing this remarkable impromptu suggestion to be adopted, the present House of Commons, as we have stated, would be devoted to other auxiliary uses.

But connected with this plan is a scheme for dealing with the area of New Palace Yard. The project in all the length and breadth of its historical development shall be given in Mr. E. M. Barry and Sir Charles Barry's own words. Mr. E. M. Barry states :—

As regards the provision of private rooms for ministers and others, and a suggestion that has been made, that rooms should be provided in which members might meet their constituents, keep their papers, &c., and also the large and increasing demands for the accommodation of the reporters of the press, I may perhaps point out that the space now occupied by private residences for the assistant serjeant and other officers of the House of Commons, in New Palace Yard, would be very convenient for the purposes named, and that there is no necessity for all the above residences to be so close to the House. If these houses were appropriated to business purposes connected with the House, new private residences might be erected in New Palace Yard, towards Bridge-street, according to the original design of my father for the completion of the Palace. The levels of New Palace Yard must always cause it, in its present state, to present an unsatisfactory appearance, and my father's strong views as regards its architectural treatment are stated in a Parliamentary Paper, No. 333, Session 1855, from which the following is an extract:—"I propose that New Palace Yard should be enclosed on the north and west sides, and thereby form part of the New Palace, as it did of the Old Palace at Westminster, and that the principal entrance for the public should be at the north-west corner of this proposed new quadrangle: that the new building forming the west side of this quadrangle should be continued southward until it joins the existing building of St. Stephen's Porch, thereby forming a façade to St. Margaret-street and Old Palace Yard, with the convenience of a covered footway throughout the whole extent of it. By means of these additional buildings, the irregular, disjointed, and incongruous character of the present building on the land side would be removed, and a degree of unity would be given to the New Palace on that side, in harmony with that already obtained on the river side, and the principal entrance to the Palace would then be a marked and important feature of the building. The effect of these additions, also, would be to appropriate to useful purposes, the waste but valuable space which now not only produces no effect in itself, but injuriously affects the appearance of the New Palace."

Sir Charles Barry extended an "original" contract work of about £800,000 to one of upwards of £2,000,000, and he leaves to his son the potentiality of adding yet, on another job, to be mildly estimated at £500,000 more or less, which his "good sense" would be wrong not to take advantage of—if he is afforded the opportunity.

Literature.

"Memoir of Thomas Bewick." Written by HIMSELF. Embellished by numerous wood engravings. Longman.

THE fame of Thomas Bewick as an engraver on wood, and the popularity of his works, are so firmly established that it would be alike impossible for praise to increase them, or dispraise (were that possible) to lessen them. He stands alone as the great reviver of modern wood engraving, and his works are matchless. With regard to the present memoir, which is in the form of an autobiography, addressed by Bewick to his daughter, the only objection that might with any reason be urged against it, is that the lengthy reflections on the education of children, the game laws, the social evil, politics, religion, philosophy, and half-a-dozen other subjects might have been omitted with advantage to the work. For the most part, these dissertations are hardly of sufficient importance to entitle them to so large a space of the book. If they be not altogether out of place in it, their length somewhat encumbers the volume. The plain unvarnished narrative of Bewick's early efforts, and subsequent career in his profession, is exceedingly interesting. It partakes of much of the character of his drawings, being full of natural feeling, truth, and simple beauty. Bewick's was a quiet even life, having nothing at all exciting or adventurous about it. He was born on the banks of the Tyne, at Cherryburn, near the village of Eltringham, in the year 1753, in a humble condition in life. After receiving little more than a rudimentary education, he was, at the age of fourteen, bound to an engraver in Newcastle. Here he served the usual term of apprenticeship, seven years. The next two years, excepting a brief pedestrian tour in Scotland, Bewick passed at home, doing work for different employers in Newcastle. In the end of 1776 he came to London in search of work. However, notwithstanding the great kindness which he confesses to have received from old friends, who were all anxious to see him settled in the metropolis, and many offers of work, which were pressed upon him, Bewick took so great a dislike to London that nothing would induce him to remain. He accordingly returned to Newcastle in the following summer. He now set up in business for himself, and here he designed and executed all the great works with which his name is associated. This gentle genius closed his long and useful life on November 8, 1828. The last vignette ever executed by Thomas Bewick is given at page 286 of the memoir. There is a strange appropriateness in the subject. It is a view of his native Cherryburn, which he loved so well, with Mickley Bank in the distance, and a funeral procession descending the sloping pasture towards the boat, waiting to convey it across the Tyne to the last resting place of the family at Ovingham. The memoir is illustrated with a large number of these vignettes, all characterized by that charming simplicity of subject and truest feeling for nature which belonged to his pencil. An appendix contains numerous cuts, designed and executed by the author for a work on British fishes, on which he was engaged (in conjunction with his son) at the time of his death. These cuts are published here for the first time. "It may be a matter of interest to many of his admirers," says Bewick's daughter, "to learn that the whole of the woodcuts now in the hands of the family are in as good preservation as when they left the graver." This is due, we are further informed, to the well-known fact that an immense number of impressions may be taken from a wood block; and to the system, peculiar to Thomas Bewick, of lowering all the more delicate parts. Bewick's *modus operandi* is explained by himself, and as his remarks may furnish some useful hints to engravers we quote them here.

"The first difficulty I felt, as I proceeded, was in getting the cuts I had executed printed so as to look anything like my drawings on the blocks of wood, nor corresponding to the labour I had bestowed upon the cutting of the designs . . . The common pelt balls then in use so daubed the cut, and blurred and overlapped its edges, that the impression looked disgusting. To remedy this defect I was obliged carefully to shave down the edges round about, and this answered the end I had in view. The next difficulty was worse to surmount, and required a long time to get over it, and that was to lower down the surface on all the parts I wished to appear pale, so as to give the appearance of the required distance; and this process will always continue to call forth and to exercise the judgment of every wood engraver, even after he knows what effect his careful pressman may be enabled to produce from this the manner of cutting. . . . The delicate lines thus lowered so as to print pale or distant parts, and thus protected by the stronger lines left on the surface, a woodcut, with care, will print an incredible number. (As an instance, Bewick mentions a delicate cut, a view of Newcastle, which he executed as a *fac* for a newspaper, and which it was found had printed above 900,000 impressions, and continued in the newspaper for several years after.) It was protected by a strong block line or border surrounding it, within which the surface was lowered previous to cutting the view. This cut is still kept, and, except being somewhat damaged by being tossed about amongst other castaway cuts, might, by being a little repaired, yet print many thousands. This is mentioned with a view to show the great length of time that cuts done in this way will last if they are carefully adjusted to the height of the type, and kept out of the hands of ignorant rude pressmen.

"Sussex Archæological Collections." Published by the Sussex Archæological Society. LEWIS GEORGE P. BACON. 1867.

THIS, the nineteenth volume of these collections, is, on the whole, a very interesting one. It is made up of sixteen papers, most of them illustrated, with the usual complement of notes and queries by way of appendix. The longest paper of the lot, and perhaps the most important in an archæological point of view, is the introductory one, by the Rev. Edward Turner, M.A., who gives an extremely interesting account of Northeye and Hydneye, two once distinguished, but now totally extinct, maritime Sussex towns. A sketch of the ruins of Northeye Chapel forms a frontispiece to this volume. The same gentleman contributes papers on Otehall, the seat of the Shirleys, of Sussex, and at one time the country residence of the famous Selina, Countess of Huntingdon, who (it is no surprize to learn) turned the hall of the mansion into a chapel; and on the "High Roads in Sussex in the Seventeenth and Eighteenth Centuries." Dr. Wake Smart's "Notes on Worked Flints, found in the Neighbourhood of Hastings"; Mr. Roger Turner's account of the "Great George Inn," at Petworth; and the description of the very ancient church of Slindon, by Mr. T. G. Jackson, architect, evince considerable research, and possess a value and interest more than local. Other writers give much curious information on the various subjects which they handle.

"Index to Foreign Scientific Periodicals in the Patent Office Library." Vol. I., 1867.

WE are often told that it is not what a man eats but what he digests that benefits him. In like manner it is not what a man possesses, but what he rightly uses, that makes him rich. Some such feeling as this seems to have influenced the Commissioners of Patents in the publication of their new index, the reasons for the appearance of which is explained in their preface to the work. Duly impressed with the fact that a knowledge of the improvements daily taking place in arts, manufactures, as well as in agriculture and commerce throughout the world, is of "vital importance to the nation at large," the Commissioners also felt that this knowledge is diffused through

› many channels, and hidden under languages so arious, as to be difficult of access even to the ch and learned, while it is entirely beyond the each of the operative classes, to whom it would e of the greatest benefit. It was under this coniction that the Commissioners last year decided nat a translation into the English language should e made of the table of contents of each foreign ork in the free Public Library of the Patent ffice. The wisdom of this decision is at once pparent, since the library contains all the most nportant foreign periodicals. It was also decided › publish the "Index" in fortnightly numbers, : twopence. The first number was issued on une 1 last year, and we have now before us the rst volume of the work. In the indexing a threeold arrangement has been adopted. 1. A list of ie articles, with the authors' names, are given nder each foreign periodical, with the number nd date of the periodical. 2. There is an index ' authors at the head of their various subjects, ith figures of reference to the pages of Index o. 1. And 3. An index of subjects similarly assified. The amount of labour involved in his elaborate classification must have been very nsiderable, but the advantage gained by scienfic men will be still greater. To them the Index" will prove a permanent and valuable cord of the foreign scientific labours of the year, hich, but for the sensible decision of the Comissioners of Patents, and the assiduous industry Mr. Bennet Woodcroft, would have remained nrecorded, and, consequently, comparatively nprofitable, if not completely lost.

English Heraldry." By Charles Boutell, M.A., with 450 illustrations. Cassell, Petter, and Galpin. 1867.

R. Boutell confesses that he is fond of hunting it a pedigree; his readers will readily believe He writes on the subject of heraldry *con ore*. Perhaps he attaches too much importance the "gentle science," when he says that a nowledge of it ought to be estimated as a necesry element of a liberal education. We do not e that its utility is so great as all that. As a ience, as well as an art, heraldry is extremely inresting. To artists, architects, and antiarians it is to some extent necessary—more escially in connection with Gothic architecture—hich, as the author truly remarks, is essentially raldic, but by the world generally it is regarded less useful than ornamental. Probably one ason for this is that heraldry has degenerated in ese latter days, and we have no objection to see restored to "its becoming rank," as a science, ough it may be doubted if it will ever attain its early popularity." Mr. Boutell thinks otherse, and certainly his opinion is entitled to reect. He has done much to render English raldry attractive and popular. The present ok will further contribute to that end. It is a orter treatise, and more elementary in its aim d character than his well-known history of raldry. The volume, which comprises 347 ges, with well-arranged table of contents and dex, and is illustrated with 450 engravings on ood, by Mr. R. B. Utting, and most tastefully t up by the publishers.

The Life of Thomas Telford, Civil Engineer," By Samuel Smiles. New edition. John Murray. 1867.

his work calls for little comment. The life of e great engineer and most scientific road maker his day is here reproduced in a separate and eaper form, from the author's celebrated work, Lives of the Engineers." The Life is revised d enlarged, and, in addition, Mr. Smiles has ven us an introductory history of the early ads and modes of travelling in Great Britain, as so a biographical sketch of that wonderful chacter, John Metcalf, of Knaresborough. The lume is in every respect uniform with the new litions of the lives of the Stephensons and other igineers, and will probably become as popular. deserves to be. The introduction is parcularly interesting, and the engravings are merous and excellent.

The well-known church of St. Sepulchre, by e end of Newgate-street, is about to have a slice it off from the churchyard for the new street. he authorities have accordingly given notice to rsons having relatives interred there to remove em if so inclined, otherwise the parish people ll do so themselves, re-interring the exhumed mains at the City cemetery at Ilford.

THE CATHEDRAL OF SPIRE.*

The Cathedral of Spire is the latest of the three most ancient Romanesque buildings of Western Europe. It is known as the Kaiserdom, the Imperial Cathedral, and it is the resting place of eight emperors. It is situated in a large open space at the eastern end of the town, on a hill of moderate height, the base of which was in old times washed by the Rhine. Like the Churches of Mentz and Worms, but much larger than either, it is a Romanesque basilica, with a vaulted nave divided by piers from two aisles, a transept, four towers, two cupolas, a semicircular projecting apse at the east end, and at the west a narthex, looking externally like a second transept, communicating by three great doors with the nave and aisles.

The town of Spire was particularly favoured by Conrad II., whose family castle, the Limberg, was beautifully situated in the neighbourhood. Chroniclers call him the rebuilder of the city, *der Speirer*. Wishing to rival the magnificent buildings which Lombard architects had erected in Mentz and Worms, and at the same time to fulfil a vow which he had made, he laid the foundation stones of three churches on one day, the 12th of August, 1030. One was the Cathedral of Spire; another a church dedicated to St. John, on a hill N.W. of the town, which had been the site of a Roman temple to Venus; and the third, a minster at Limberg, where he had given his house to be a Benedictine monastery. The Abbey Church, a columnar basilica with a flat ceiling, was finished in eight years; St. John's Church advanced rapidly; but the Cathedral rose slowly on its deep foundations. It was meant to be the grave of all emperors who should die on this side the Alps. For this reason its crypts were made of rare beauty and size. Their vaults are higher than the highest parts of the Undercroft at Canterbury. Walls from 15ft. to 18ft. thick surround a space divided into four chambers; three of these, each 44ft. square, lie side by side; the other lies behind them, is somewhat smaller, and fits on to the choir recess, which is 17ft. deep. The vaults are plain and without ribs; the columns have Attic bases and square chamfered capitals roughly worked. The central chamber has four great and eight lesser pillars, with projecting half columns. On these the weight of the great cupola rests. A subdued light penetrates through fifteen windows. The imperial tombs are in the western wall of the crypt. There are two rows containing twelve compartments, each 8ft. long and 4ft. deep, separated from one another by a wall a few inches thick. The entrance was from above, in the "Royal choir." These compartments were all built at once, not one by one as they were wanted. The building had hardly progressed to this point when Conrad died at Utrecht on the 4th of June, 1039. His widow, and his son Henry III., took the body to Spire, where it was buried on the 11th of July. The new emperor was at first very zealous for the advance of the building; but his zeal afterwards slackened. He was dissatisfied with the sepulchral compartments, which are indeed of very modest pretensions. He built the two-storeyed chapel at the corner of the transept, which did not belong to the original design, to which, however, it is cleverly adapted. Each of the two chambers is 40ft. square; the lower one, dedicated to St. Emmeran, has a plain vault in eight bays, supported by four detached columns with antique capitals. The upper chapel, called St. Catharine's choir, after being several years in a ruinous state, was restored in 1857. Henry III. died in 1056; but the building was finished by Henry IV., and consecrated in 1061 by Bishop Einhard II., in honour of the Holy Virgin and St. Stephen.

A great fire which destroyed almost the whole town in 1127, and reached the cathedral, seems to have done it no material injury. It was equally fortunate in the fire of 1137. The year 1146 was eventful in its history. Conrad IV., who then resided at Spire, convoked a congress there to prepare for a campaign in Italy. On Christmas Eve, Bernard, Abbot of Clairvaux, appeared there as envoy of Pope Eugenius III. to preach the Crusade. The legend says that in a great procession on this occasion, after the "Salve Regina" had been sung, St. Bernard added the words, "O clemens, O pia, O dulcis Virgo Maria," which have ever since remained part of the antiphon, and are inscribed in large letters upon the triumphal arch in front of the high altar. Little as Conrad was prepossessed in favour of a crusade, the eloquence of Bernard during high mass on Innocents' Day excited him to such enthusiasm that he interrupted the preacher and asked for the cross. Amidst the acclamations of the multitude Bernard took the sacred banner from the altar and gave it to the emperor. Most of the knights present assumed the cross, and among them the Emperor's nephew, afterwards renowned as Barbarossa. After mass, St. Bernard was nearly crushed by the admiring crowds who pressed round him, and the Emperor carried him on his own shoulders out of the church. In 1159, another fire destroyed part of the upper works, and many persons were killed by falling fragments. In consequence the transept and choir were altered and restored: but the new works were in perfect keeping with the old. The damage done by another fire in 1289 was as speedily and intelligently repaired. The most considerable fire broke out in 1450, during the repairs of the organ, but it gave occasion to such a display of skill and taste on the part of Bishop Reinhard that it is known in the annals of the cathedral as "the lucky fire." The Thirty Years' War left the church unscathed. But in the war of the succession of the Duchess of Orleans, when the whole Palatinate was laid waste by the French, it was treated no better than the Cathedral of Worms. In February, 1689, the citizens were compelled by the invaders to destroy the town walls; and the Intendant, M. de la Fond, gave the inhabitants six days to leave the city. On the 31st of May, Spire and Worms were set fire to at the same hour. In each case there was a promise to spare the cathedral—which in each case was pillaged and set on fire. On the 2nd of June nothing was left of the town but smoking ruins, or of the cathedral but dilapidated walls. The French plunderers, in hopes of finding treasure, searched the tombs, and broke open two coffins—that of the Emperor Albrecht, and that of Beatrix, second wife of Frederick Barbarossa. Disappointed in their hopes of gold or jewels, they tossed the bones about among the rubbish, but forbore to break into any more coffins.

The cathedral remained in ruins till the peace of Ryswick, in 1697, allowed men to think of restoring it. Up to that time no one was permitted to set up even a cabin on the ruins of the city. From 1700 to 1714, during the war of the Spanish succession, the unhappy Palatinate was again severely visited. In 1752, the two western towers, and the cupola between them, were taken down to the level of the roof of the nave. They were considered dangerous. The eastern gable of the transept was removed, and the piers of the great cupola strengthened by casing. At the same time the flying buttress still supporting the north-west tower was erected. It was reserved for Count Augustus von Limburg-Styrum, who became Prince Bishop in 1770, to begin the active restoration of the church. As in Mentz, the work was committed to the architect Neumann. On the whole he appreciated the style of the building, a style of which the preceding century had exhibited little intelligence. But as if to compensate himself for his self-restraint, he built a new narthex in the absurdest style. With its great pyramids, it looked like a temple of Isis designed by a scene painter for Mozart's "Zauberflöte." In 1794, the French once more pillaged the cathedral, used it as a magazine for stores, and put it up for sale for 8,000 francs. It was to be demolished all except Neumann's narthex, which was to remain as a triumphal arch in honour of the *grande nation*. Here, as in Mentz, the bishop, Ludwig Colmar, interfered, and it was to his intercession with Napoleon that both cathedrals owed their preservation. The ancient building, however, remained in a ruinous state for several years more, and its restoration was not begun till the Palatinate was restored to its hereditary sovereigns. After a long interruption, divine service was celebrated in it for the first time on the 19th of May, 1822. Ludwig I., King of Bavaria, the great patron of art, undertook the restoration. After a competition, the design make by Herr Hübsch, an architect of Carlsruhe, was chosen. During the years 1854—1858 the western cupola and its two flanking towers destroyed in 1752 were rebuilt, and Neumann's narthex was removed and a better one substituted.

The east end of the cathedral is the most interesting. With the exception of a few altera-

* From "The Chronicle."

tions in the gallery of the apse dating from the beginning of the thirteenth century, the apse, the two square towers with their stone caps, each 248ft. high, and the octagonal cupola, belong entirely to the Salic period, and to the original structure. The projecting walls of the transept, erected after the fire in 1289, have large and richly-moulded round-headed windows—those in the south transept, unique for richness and beauty of cornices, string courses, and leafage. The gable ends of the transepts are, unfortunately, missing; and, as the nave with its twelve bays, showing twenty-four windows in double rows, one over the other on each side, is in its lower parts bare of architectural or ornamental features, the side views of the cathedral are far below those of Mentz and Worms. It is, however, relieved by the arcades just under the roof, which are superior to those in either place. In the west front of the new narthex the alternate courses of white and red sandstone, though not without precedent in Romanesque buildings, stand in unpleasant contrast with the uniform red wash with which this cathedral, like that of Mentz, is covered, to destroy the incongruous effect of the various kinds of stone used in it. The great wheel window over the main doorway is still less justifiable, as the building never had any round windows, except a few eylet holes, now walled up. Such holes are Early Romanesque features, while wheel windows belong to the latest period of the style, and windows with such tracery as the one in question, are peculiar to the yet more recent times of the transition. The western cupola and towers are faithful reproductions of the old ones. The restorations of the crypt and south side chapels are equally good.

Perhaps no existing church surpasses the Cathedral of Spire in the magnificence of its pictorial decorations—the ornamental paintings of Schwarzmann and the frescoes of Schraudolph. It is, however, a pity that their brilliancy is not always in perfect harmony with the serious gravity of the architecture. The decorative paintings too often are false to the style of the building; and the pictures, which are on a gold ground, sometimes look too modern and realistic, owing to the style of the landscapes and architectural views in the backgrounds. The abundance of the pictures is, perhaps, rather oppressive. But they are all beautifully conceived and admirably executed; and it would be difficult to point out any one that we should willingly lose.

ROMAN ROADS IN SUSSEX.

IN the new volume of the collections of the Sussex Archæological Society we have, among other papers, a most interesting account of the old high roads of that county, by the Rev. E. Turner. In this paper a noteworthy point is brought out in regard to the Roman mode of constructing roads. The Romans, says Mr. Turner, judging from the specimens of their ways left us in Sussex, were not superficial road-makers. Wherever, indeed, any of their ways still exist, they are, for the most part, as good now as when they were first constructed. Warton, the Poet Laureate and historian, of Kiddington, in Oxfordshire, of which he was incumbent, availed himself of a visit which he made in 1775 to Llynfold, near Horsham, through which this postway passes for a distance of about two miles, to examine its form and peculiar mode of construction, the result of which he has given in his history. He states that he saw many deep fissures made in it in a lane in this parish, and that he found the *dorsum*, which was not intended for heavy carriages, to consist of sea gravel and sea pebbles, which abound on the Sussex coast, for a depth of about 3ft., and a width of about 7 yards. "These minute materials," he observes, "which are of heavy carriage, must have been amassed with prodigious labour." Mr. Martin, however, who was intimately acquainted with the geographical structure of western Sussex, and published much upon it, thinks that the gravel of which this Roman road was constructed was not brought from the seaside, but from the gravel beds which prevail in the sandy district around Pulborough, pits of which are still worked at Coldwaltham and Coates. "This natural bed of drift," he adds, "is rare of its kind; and an object of great curiosity in what may be called the topographical geology of the weald."

Mr. Turner himself states, from personal examination, that when the old Roman road from Aldrington to London was discovered, and in several places cut through, it displayed very similar results. In this, as in many other matters of construction, the Romans carried their wonderful genius away with them. Long after they had left us we continued and were content to continue wallowing in the mud and mire physically and mentally. Indeed, it was only within very recent years—not until the great modern road-maker M'Adam set vigorously to work to apply in a modified form the old principle of the shrewd Romans, that a "good road" became something like a common luxury throughout the country. Even now, however, execrably bad roads, which are a disgrace to their custodians and the age, abound in many districts, and roads all but impassable may still be met with. In respect to its ways Sussex formerly was proverbially one of the dirtiest counties in all England. Several amusing stories are on record. For instance, it is related that the King of Spain, in a visit to Petworth House, in 1703, was six hours in travelling the last nine miles, and so bad were the roads in the eastern parts of the county that it was customary for country squires to be drawn to church on Sunday by six, and sometimes eight oxen. "Nor was it done in frolick or humour," as De Foe tells us, "but from sheer necessity, the way being so stiff and deep that no horses could go in it." Knowle is stated to have been given by Queen Elizabeth to the Sackville family, "on account of the foul ways in Sussex," which made access to Buckhurst, their Sussex residence, nearly impracticable in winter. And so late as the year 1818 (adds Mr. Turner), Bishop Buckner thought it necessary to advise a gentleman, whom he had ordained in the November of that year as curate of Waldron, to lose no time in going there, for in the course of a very short time he would find it impossible to do so. Since then, however, the good folks of Sussex have mended their ways, and a bad road is now the exception, and not the rule there as elsewhere.

Of the various interesting archæological discoveries which have been made in Sussex since the publication of the last volume only some are mentioned in the present volume. We are glad to know that others will be more fully detailed in next year's collection. These discoveries include the remarkable find of 3,000 pennies of Edward the Confessor and Harold at Washington (noticed in the BUILDING NEWS at the time), and the recently disclosed mural paintings in Plumpton Church; the discovery of Anglo-Saxon masonry in the church of Lurgashall, now undergoing preservation, and the noteworthy collection of thirteenth century pottery, lately brought to light at Horsham by Mr. Honywood. Here we have in store a treat sufficiently toothsome to make archæologists in general look forward to the publication of the twentieth volume of this important society's collections with no small interest.

THE WROXETER EXCAVATIONS.

THE excavations of the ruins of the ancient city of Uriconium, near Shrewsbury, resumed about three months ago, has again been interrupted by the exhaustion of the funds placed at the disposal of the committee. During the progress of the work, which has been carried on under the personal superintendence of Dr. Henry Johnson, the efforts of the excavators were directed towards the clearance of the ground in the vicinity of the room known to archæologists as "the enamellers' workshop," and immediately adjoining it a similar apartment 34ft. long by 32ft. wide, has been brought to light. In the centre is the base of a square column of stone and mortar, apparently the remains of a pillar which supported the roof, and in one corner are a couple of forges. The room opening out into Watling street, was entered by large folding doors, the sockets for which still remain in the walls. The floor, which has been neither flagged nor paved, is laid with fine red sand, and the numerous pieces of "slag," or iron fused with some vitrifying substance, which lie about support the theory that this, like the adjoining room, was used by its former occupants as a smith's workshop. Running parallel with the northern boundary of this apartment is the "old wall," a massive fragment of masonry, which, standing boldly out from the level ground, has for ages marked the site of the buried city. The continuance westward of this wall the excavators have laid bare to its foundation 10ft. below the surface of the earth and have revealed the fact that it served the secondary purpose of a drain, a wide hollow space being left in the masonry, with which there is every reason to believe the drain of the latrina and those of all other adjacent buildings were connected. The old wall, which archæologists agree in regarding as the outer wall of the basilica of Uriconium, is a splendid specimen of Roman masonry, being as even and finished in its workmanship in the foundation as it is in the upper portion. A large number of miscellaneous articles of property have been dug up, the latrina as usual proving the most fruitful mine. Among the treasure trove may be mentioned coins of the reigns of Hadrian, Trajan, and Constantine, a bronze fibula, portion of a sword hilt, also of bronze and cast in the representation of a lion's head, numerous fragments of a Samian wine-bowl, ornamented with curious figures in relief, hair pins, fragments of pottery, and a long slender bone, hollow throughout, smooth at the extremities and carved on the surface. What use in the domestic economy of the Romans this latter article served has greatly puzzled such *savants* as have had the opportunity of examining it, but the most probable conjecture is that it was regarded as a charm. The prize of highest value, however, was a small red cornelian stone, about six eighths of an inch in length, and oval in shape. In the centre, deeply engraved, was a design composed of a goblet, on each side of which a bird, of a species which, if faithfully represented, is unknown to modern ornithology, stood perched on a round stand. From the bill of each there issued a stream of liquid which flowed into the goblet. This treasure was placed in the Wroxeter Museum, at Shrewsbury, but it proved too much for some antiquarian more enthusiastic than honest, and to the great grief of its custodians it disappeared within a week of its being deposited there. Fortunately an impression in wax had been previously taken, and it may have been this circumstance that suggested to Dr. Johnson the idea that the stone set in metal had been worn as a signet ring.

GLASGOW ARCHITECTURAL SOCIETY.

A MEETING of the members of the Glasgow Architectural Society was held last week, in the Society's rooms, Bath-street, John Honeyman, jun., Esq., President, in the chair. The minutes of last meeting were confirmed, and several new members enrolled. Mr. Bromhead, architect, laid before the meeting a letter he had received from a firm in town, who supply upholstery, &c., for houses, in which they say "being well aware how frequently a recommendation from yourself has decided who should supply carpets and general upholstery, we ask the favour of your allowing us to send samples and estimate for any house-furnishing in which you may interest yourself. We make an allowance in your favour of 5 per cent. on the gross amount of all accounts with which you may entrust us." Several of the architects present stated that they had sometimes received similar applications, which they had always treated with contempt. On the motion of Mr. Bromhead, seconded by Mr. Alexander Thomson, the meeting unanimously agreed in expressing their unqualified condemnation of the proposals contained in the said letter.

THE INSTITUTION OF CIVIL ENGINEERS.

AT the ordinary general meeting on Tuesday, the 19th inst., Mr. John Fowler, President, in the chair, it was announced that the Council, acting under the provisions of Section IV. of the Bye-Laws, had that day admitted the following candidates as Students of the Institution:—James Abernethy, jun.; Francis Henry Ashhurst, Edward William Baylis, Edward Bazalgette, Nathaniel St. Bernard Beardmore, Henry Percy Boulnois, Edwin Lane Campbell, David Alexander Carr, Frank Cheesman, John Charles Coode, Charles Edward Cowper, John Harcombe Cox, James Murray Dobson, Edwin Noel Eddowes, John Breedon Everard, Charles Richard Fenwick, Charles Flood, Walter Foster, Thomas Robert Gainsford, John Baron Hyde Gandy, Herbert Thomas Hare, Owen Jones, William Hubert Kinch, Charles Henry Grey Jenkinson, Charles Le Lievre, Frederick Gother Mann, William Joseph Marshall, Henry Thomas Munday, John Newman, Phillip Algernon Herbert Noyes, William Partridge, George James Perram, John Kirby Rodwell, Robert Baxter Rose, William Shield, George Shortrede, Richard Rombersley Tomlins, Douglas D'Arcy Wilberforce

Veitch, William Henry Venables, Richard Warburton, Walter Frank Waterfall, Thomas Robert Watts, Hubert Frederick Eardley Wilmot, and Francis Wentworth Smijth Windham.

WATER SUPPLY AND SANITARY MATTERS.

The severe visitation of cholera from which the inhabitants of Swansea suffered last year caused them to set about a vigorous sanitary reform. The good results are already apparent. The report of the medical officer for the three months ending with September testifies to the present satisfactory state of the health of the town. The deaths registered during that period are 221 out of a population of about 50,000, giving an annual rate for the quarter of under 18 per 1,000. This, compared with the death rate of the entire town population of England and Wales—22·4 per 1,000; or, with that of the ten large English towns, 23·8 per 1,000—places Swansea in a very enviable position as one of the healthiest towns of the last quarter.

The Pollution of Rivers Commissioners paid a visit last week to Bolton for the purpose of inspecting the condition of the Croal and its tributary streams the Tong, Bradshaw Brook, Middle Brook, and others, comprising in all a water shed extending over an area of fifty square miles. Accompanied by some of the corporation they proceeded to inspect the Croal at some of its worst points. Samples of the water were taken at different places, and the party returned to the corporation offices.

MARYLEBONE.—Dr. Whitmore, in his last monthly report, says, during the past month an unusual quantity of fish, in a semi-putrid condition, has been destroyed by the Inspector of Nuisances. The practice which prevails of hurriedly selling large quantities of the cheapest kinds of fish at what are termed Dutch auctions in Billingsgate market, seems to preclude the possibility of its quality being properly inspected by the market authorities; and hence it is that in all the poorer and densely populated districts of London, immense quantities are sold altogether unfit for human consumption. I believe that a large amount of the diarrhœa which has prevailed in this parish during the past three months has been produced by stale or unsound fish, and I am fortified in that opinion by what has happened within my own personal knowledge. It may entail some additional trouble upon the authorities of the Billingsgate market to inspect the fish sold at these auctions, but a proper regard for the health of the public, more especially of the poor, renders this an imperative duty.

NOTTINGHAM.—The sanitary condition of Nottingham is improving. We find from the report of the sanitary committee, just sent to us, that the mortality has been less by 277 during the year ending October, 1867, than it was during the preceding year. Infantile diseases have recently materially diminished in the town. No doubt this satisfactory state of things is traceable to a considerable extent to the diligence of the sanitary authorities of the place. Particular attention has been paid to the removal of the night soil. Some time since we called particular attention to the mode of constructing privies and ashpits in this town. Experience has demonstrated their utility.

Building Intelligence.

CHURCHES AND CHAPELS.

Last week the foundation stone of a new United Presbyterian church was laid at Milnathorp, N.B. It is in the Gothic style, and will contain 650 sittings. The estimated cost is £2,300.

The heritors of Jedburgh are considering the propriety of building a new church. The present church occupies the west end of the nave of the abbey, one of the finest ruins of the country. The Marquis of Lothian, the proprietor of the ruins, has said that if the parish will assess itself for £3,000 or £4,000 towards the erection of a new church he will find a like sum.

The foundation stone of a new Wesleyan Methodist chapel was laid at York, on Wednesday last. The cost of the building will be about £2,000. Mr. Edward Taylor is the architect.

The church of St. Mary-le-Bow, Cheapside, was opened on Sunday last, after restoration. The alterations consist of the removal of the galleries, the re-flooring and re-pewing of the church, the re-construction and removal of the organ to its proper position at the north-east corner of the church, and the cutting down the addition made in 1705 to the reredos. The cost is about £1,800, and the church will now accommodate about 400 persons. Mr. G. L. Pedley was the architect, and Messrs. Browne and Robinson were the contractors.

The chief stone of a new church has been laid at Lee, Buckinghamshire. The plan consists of a nave 46ft. long and 21½ft. wide, chancel 21ft. long and 16ft. wide, with vestry and south porch. The contract for the first portion of the works amounts to £1,065. Mr. Augustus Frere is the architect, and Mr. James Honour, of Tring, is the builder.

A new Presbyterian church was opened at Howden (Newcastle) on Tuesday. The style is Gothic, brick being the principal material used, with stone dressings. The dimensions are, length 75ft., width 45ft., height about 23ft. The cost is rather over £1,200, and the building will seat about 400. Mr. J. Angus is the contractor.

The parish church of Whitnash, near Leamington, is being restored and altered under the superintendence of Mr. Gilbert Scott. The whole of the porch has been completed except the roof. The building is to be entirely reseated. Mr. Ballard, of Leamington, is the contractor.

The meetings of the Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels have been resumed, and the first for the present session was held on Monday, at the society's house, No. 7, Whitehall, S.W. Grants of money amounting to £678 were made in aid of various churches. It was made a matter for regret at this meeting that the finances had not been augmented, as it was hoped they would have been, during the recess, and an earnest hope was once more expressed that the forthcoming year of the society's jubilee would witness a great increase in its resources, the claims, on account of the increased growth of the population throughout the kingdom, becoming every month more urgent.

BUILDINGS.

With a view to obviating the expense and lengthened sea voyage incident to the conveyance of invalid troops from India to England, her Majesty's Government have decided to build an hospital at Suez, in the vicinity of a similar hospital already erected there by the French Government. The windows, fire-places, and woodwork are got ready in England, and transported as portable packages, so as to be fitted together on arriving at Suez with the least possible delay.

The Metropolitan Board of Works are increasing and rebuilding the Fire Brigade stations. A new station is to be erected in Southwark-street, at the corner of Gravel-lane, and another at Duffield-road, Bow.

The Town Council of Bristol have decided to adopt the report of the Improvement Committee, recommending the adoption of schemes of street improvements at a total estimated cost of £136,000.

The fortifications on the Steep Holmes, in the Bristol Channel, are in an advanced state, and operations are shortly to be commenced on the Flat Holmes. The sum of £4,000 has been granted for the construction of barracks on Brean Down. The officers' quarters in this commanding situation have just been finished, and when the barracks are up we shall have a most complete battery establishment for the defence of the Channel.

On Tuesday a large body of workmen began the construction of an incline commencing on the south side of St Peter's Church, Farringdon-road, which, crossing the new street leading to the new dead meat and poultry market, will terminate on the west side of the viaduct. The works for the construction of this great national undertaking are in rapid progress, and the workmen are engaged night and day by relays, who work at night by gaslight. The piers of the viaduct across Farringdon-street will be faced with white Purbeck stone, and this section will be ornamented by a light iron balustrade, which will give to this otherwise heavy mass of brickwork a light and handsome appearance as approached from Fleet-street or Farringdon-road.

SUDBURY.—The foundation stone of St. Leonard's Hospital, Suffolk, was laid on Friday last, November 15, by Major Parker, M.P. The building is being erected on an eminence at the entrance to the borough of Sudbury, and will command a fine view down the valley of the Stour. It will afford accommodation for twenty patients. The necessity of such a building has long been felt, as Sudbury is 16 miles distant from any general hospital. The building is faced with red bricks, and the whole expenditure, including land, is not expected to exceed £1,100, three fourths of which has already been promised. Mr. Salter, of Sudbury and London, is the architect. The hospital is named after a local charity, from which an annual income of between £40 and £50 will be obtained.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—L. and Co.—A. C. and Co.—E. W. G.—J. C. J.—W. and B.—A. C. F.—E. W. P.—T. H. L.—T. J. S.—W. S.—Dr. J. W. H.—C. A.—J. H.—M. B.—H. T. D.—T. S. M.—B. and S. M.—J. and E. G.—R. P. S.—J. R. B., send postage stamps.—J. G.—R. M. B.—J. L.—E. A. H.—R. F. E.—L. and S.—D. H. and J. N.—C. and W. W.—F. T.—E. A. H.

As "Mutual Aid" threatens to occupy much more space than we intended, we shall in future endeavour to answer many of the questions in this part of the paper.

J. A.—See [404] Intercommunication.

"ENQUIRER."—Write to the Secretary of Royal Irish Agricultural Society, Sackville-street, Dublin.

"ENQUIRER."—Write Secretary to the Royal Agricultural Society.

"A SUBSCRIBER" is informed that the articles referred to were unavoidably omitted at the date mentioned.

Correspondence.

TRINITY-SQUARE, TOWER-HILL.

To the Editor of the BUILDING NEWS.

SIR,—I know of no better medium than your columns for directing the attention of the proper authorities—whoever they may be—to the disgraceful and dangerous condition of the roadways and pavements in the above-named locality. Some years ago a thoroughfare for vehicular traffic was opened between Great and Little Tower-hills by means of a passage known as George-street, and which runs in a line nearly parallel with the ancient Postern-row. This arrangement might have constituted a great public convenience had it been properly effected. Unfortunately, however, the approaches both to Postern-row and George-street were allowed to remain, as they had been for years previously, in a state totally unfit for the transit of horses and carriages, and full of holes and pitfalls caused by the unequal subsidence of the paving. Consequences which must have been foreseen, and which ought to have been prevented by those who ordered the opening up of the thoroughfare, have followed. Accidents of a more or less serious character—and which will probably culminate one day in a fatal disaster—are continually occurring at these points.* Surely, Sir, the responsibility for this highly discreditable state of things must rest somewhere? Are there no means of affixing the blame on the guilty parties, and of compelling the reparation of these most unsafe approaches? I write principally in the interests of the public; but when I tell you that I am myself suffering severely from the effects of an accident resulting entirely from this culpable negligence on the part of the authorities to whom I have referred, you will admit that I have an especial ground of complaint on my own account against them. Returning, not very long since, in a Hansom cab, from the West-end, I was, just before reaching George street, thrown forward with great violence by the sudden fall of the horse. My head was dashed through the glass weather-guard of the cab—which was shaken down by the concussion—and fearfully lacerated. My right eye escaped being cut out by

* It is not long since that the carriage of the Prince of Wales, while conveying His Royal Highness to a Trinity House banquet, was damaged by being jolted over the paving in Trinity-square.

little less than a miracle, for a corner of the broken glass entering just above it, inflicted a deep wound of nearly an inch in length. A scar on my forehead betokens the force of the blow I received, and my right arm is still painful from its effects. The surgeon who has attended me is of opinion that I shall not gain the free use of the latter for many months to come. So far as the injuries to my forehead are concerned, the marks of them will, I am told, "be carried" by me "to my grave."

On examining subsequently the precise spot where the casualty took place, its cause was apparent enough. The poor horse had missed its footing in one of the series of basin-like hollows which abound in the locality.—I am, &c.,

JOSEPH NEWTON.

Royal Mint, November 20.

THE PALACE OF WESTMINSTER.

SIR,—In your review of my pamphlet in last week's BUILDING NEWS, I was somewhat surprised to find that you should have thought it necessary to join with the "Times" in depreciating the building to which the book refers. Such views, however much they may influence public opinion, cannot alter facts. The Palace of Westminster, as I have before remarked, is a building *sui generis*; and, with all its faults, it is, from beginning to end, an original conception. Its parts, even to the minutest details, are always portions of a whole. Harmony pervades the entire work. All that is there bears an indelible mark of belonging to itself. From base to cornice everything possesses, to the fullest extent, an individuality of its own. Can all this be said of anything we have seen lately? Can it be said of of Mr. Burges's gaudy patchwork drawings for the New Law Courts, which are, after all, nothing but a well illustrated cyclopædia of architectural falsehoods and deformities in construction, and to which your reviewer refers in such a tone of triumph? No. Since the designs for the Houses of Parliament were produced, nothing has been done to equal, or even come near, their imperfect perfection. We have had clotted reproductions by the bushel, but of pure design in any style—none.

Had my father's original proposal of raising the building to the level of Somerset House been carried out, the Westminster Palace would stand alone the most admired—as it is now the most ingenious—modern work in Europe.—I am, &c.,

WELBY PUGIN.

The Grange, Ramsgate, November 21.

ARCHITECTURAL EDUCATION.

SIR,—At the meeting of the Architectural Association, Mr. R. P. Spiers spoke on the subject of architectural education. He says: "The first year (of pupilage) might be spent in making up for that deficiency of scientific teaching so much to be deplored in our schools and colleges by following the courses of lectures at King's and University Colleges, drawing from the cast at the Architectural Museum, and—when established—attending an elementary course of architectural design. The next three years should be spent in office, learning practical work four days out of the six, the other two days being devoted to the getting out of competition drawings for various medals and prizes. The fifth year might be spent in travelling and in preparation for the voluntary examination of the Institute, which might be supposed to terminate theoretically the architectural student's education. Now, such a programme as this, which I throw out as a suggestion only, is one which is perfectly feasible in the present day." All this would be hailed with rejoicing by architectural students, and would, doubtless, be the means of raising art to a higher position, but, unfortunately for the programme, there are two parties to the question—architects as well as pupils. If architects would scarcely entertain the idea of sending away their pupils for the first year, much less would they do so the fifth year, when the pupil would be of real value and service to him. Consequently, before this part of the programme can be made practicable, we must have colleges and museums in every large town.

Before architectural education can become of much practical value it must be universal. Institutes and associations must step beyond the narrow ground of teaching London pupils only; there are ten times as many pupils in the provinces, each one of whom requires as much teaching in matters of art as Londoners, since they have not so many opportunities for self-instruction.

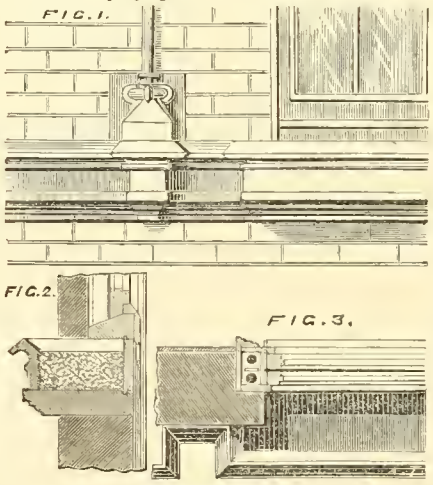
In connection with the remarks made on medals and prizes at the Royal Institute of British Architects, take the Soane medallion intended originally for the encouragement of the younger members of the profession. To compete for this, at least nine drawings must be prepared. The elevations to cover the space required must be, say, 200ft. and 120ft. long. Ten months only are given for their preparation, and that to those who can only devote their time to them after office hours. The result is there is no real competition. Those who have won the medallion have not done so in the face of the whole profession, for the very terms imposed bar out the majority. If the Institute would reduce the number of drawings to three or four, and let each subject stand on the paper for two years instead of one, there would then not be such lifeless inactivity about it.

Thus the Institute shows the amount of encouragement to be expected from it, and also by sending out a commission to enquire into and report on architectural education, the same commission never meeting at all. Architectural encouragement is quite as much wanted as architectural education; it matters little who are the patrons, and all who really desire the welfare of art cannot do better than lend a helping hand. Schools of science and art in every important town are waiting for assistance. If the "F.R.B.I.A." take any interest in architectural education, let them show it; meanwhile, no Institution or association need bend their brows and vomit indignation at the attempt at South Kensington, while they themselves do nothing.—I am, &c., J. H.

WINDOW GARDENS.

SIR,—External window gardens are now so common in England that it is time architects incorporated them in their designs for villas and cottages. At present they disfigure rather than improve the appearance of houses. If we wander through Belgravia or any modern locality we shall find at least half the dwellings with windows blocked up by rude unsightly temporary boxes, each vieing with the other for unsightliness and for blocking out the daylight. We find that the builder has gone to the expense of glazing the windows with plate glass, about a fourth of which is rendered useless by the tenant's questionable adornments to them. Provision for window gardens is, therefore, a want that should be provided by the builder. The want has been partially met by the balcony, or projecting shelf-like sill, but the same rude box is placed upon them to hide the lower part of the glass and obstruct the light.

There are various ways in which the window garden may be architecturally treated, but a hint may be gleaned from the accompanying sketch. It will be seen that the



ordinary window sill is entirely abandoned, and a box substituted in its place, running under the woodwork of the window till it meets the internal plastering, or what joiners call the window back. Thereby some of the heat of the room is imparted to the flowers, and when the fireplace is situated near the window the heat would assist to make a miniature conservatory.—I am, &c.,

T. J. S.

MR. CONYBEARE ON LONDON ARCHITECTURE.

SIR,—In reference to Mr. Conybeare's article, I beg to suggest certain queries:—Is a polished surface very pleasant to look at on a large scale? A man's eyes are polished, but how would he look if his whole body were the same? Enamelled surfaces chip and become ugly—they are also affected by London soot and dust—they do become corroded—how would they look in thirty years? After all, does anything clean more easily than red brick or good stone? As to the forms of domestic windows, there are three ways of dealing with the pointed window—1. To place the sash frame on the inside without reference to the pointed form of arch. 2. To have the top of the pointed arch filled with fixed glass, and to have the sash commencing at the springing. 3. To fill up the top of the arch from the springing with solid material. All these methods are certainly nothing but compromises. The pointed arch is only suited to church windows where the glass is fixed. The most practical forms of domestic windows are the square and segmental arches, according as you build in stone or brick.—I am, &c., A. B. C.

Intercommunication.

QUESTIONS.

[659.]—SAWFILING.—Would you, or any of your correspondents oblige me with the name of the publisher of "Holly's Art of Saw Filing," mentioned in Mr. S. W. Worssam's paper on mechanical saws?—A CARPENTER.

[660.]—DRY ROT.—A gentleman, about twelve months since, found in one of his dwelling houses the dry rot in the floors and skirtings and door-posts. Upon examination it was found that not any air was passing under the floors; immediately air openings were put in the external walls and the parts affected by the dry rot removed, but alas! the evil has again made its appearance. Can any of your many readers suggest an effectual remedy, and so oblige a suffering neighbour?—T. P.

[661.]—WARMING BY STEAM.—Will you, or any of your correspondents, kindly inform me what is the mode of calculating the length and size of pipe, or surface area required, in warming by steam any room, the external temperature of the air, and the temperature to be maintained in the building, with all dimensions being given; how will the calculation be affected by the area of glass in the windows and roof; likewise the amount of air escaping by ventilation, and how can I ascertain this amount? How is the size of boiler calculated, and what pressure of steam should be maintained in the pipes under these calculations?—F. HOPE.

[662.]—CONCRETE BUILDINGS.—I shall be glad to learn from Mr. Tall, or any other of your correspondents, what is the composition and proportions of the concrete used in building walls, what thickness is required in a wall as compared with brickwork, what experiments have been made to test its strength or power of resistance to crushing, and if it may be safely used in constructing arches, in which case, would the concrete be set in wedge pieces forming voussoirs, or the arch be made in a piece?—F. HOPE.

[663.]—ARCHITECTS' CHARGES.—What time should be occupied in travelling to entitle an architect to charge for the time so spent according to No. 9 of the Institute scale, and to be a "considerable or inconvenient distance from his office?" What distance may be considered an easy distance? Surely the time, and not the distance, is what is intended; as in some cases you can go 100 miles direct in the same time that it would take you to get 20 across country.—J. G.

[664.]—MR. BREMNER'S PONTOONS.—Can any one give me a correct idea of the late Mr. Bremner's plan of putting in the foundations of low-water piers. I have seen the plan mentioned as Mr. Bremner's pontoons.—C. E.

[665.]—COMPETITION FOR LABOURERS' COTTAGES.—Will you oblige by informing me where particulars of the competition for labourers' cottages for the prize offered by the Marquis of Abercorn, through the Royal Agricultural Society, are to be obtained?—J. B. CORBY, Stamford, Nov. 19.

[Write to the secretary of the Royal Irish Agricultural Society, Sackville-street, Dublin.]

[666.]—ST. GILES' SCHOOL, ENDELL-STREET.—A great deal has been said and written lately on Mr. Barry's schools in Endell-street, as a favourable speciman of nineteenth century Gothic. Can anyone inform me where illustrations of the same may be obtained?—J. HICKS, Torquay.

[See Number 502 of the BUILDING NEWS.]

REPLIES.

[545.]—FRENCH GOTHIC ORNAMENT.—French thirteenth century "conventional foliage" is so infinitely easier to mimic than English of that age, that of course the fashion may still be expected to set strongly against the sole thing in which our ancestors ever excelled the continent. But, for a provincial in London to seek out, for second-hand study, the present imitations of that whose inferiority alone makes it imitated, would really beat all other arguments for Darwinism or "the ape origin of man" that I have yet seen. "Conventional foliage" is that one sole matter wherein our fathers, of the grand age, even equalled—and in this they not only equalled but far excelled—the French of that time, or perhaps of any time; for as far as my observation extends, no French foliage of the thirteenth century approaches in nobleness and variety that of the fifteenth. But our English of the former age is above either in grace and sweetness, and more varied than the contemporary French. Let "A Provincial Architect's Clerk" copy nothing of this kind in London outside Westminster Abbey; and as for coming on purpose, he had far better, if equally near, visit Lincoln, Salisbury, or Ely. The second, indeed, is so independent of carving in the main body of the cathedral that the gems are hardly known. They are chiefly in the chapter house, the early bishops' tombs (of which some are reproduced at the Crystal Palace), and the north minor transept (now morning chapel) into which Wyatt removed vestiges of the stone choir screen coeval with the building. At Ely some of the finest work is external, on the east end.—E. L. G.

[566.]—CENTROLINEAD.—"W. J. E." is right, as his new diagram, p. 783, makes clear; for as all angles in the segment VP P^1 P^2 are equal (Euclid III. 21) the point B of VP B P^2 may travel round it, and the blade, if at any time directed to VP, will always be so. My mistake arose in a way that may not be uninstructive. I had used the instrument most and latest for drawing not radiated lines but circular arcs, namely, the parallels of latitude for maps. Now, all such, by whatever part of the blade described, are of course concentric with the circle of "W. J. E.'s" diagram, and I doubt if there is one of your readers who, after so employing it, would imagine straight lines drawn by it could radiate from another point than the common centre of all these arcs. It is certainly a most curious property of three straight edges thus fixed together, that, be their angles what they may, on keeping two against two pins, the third will always radiate from a third point.

Nicolson's way of setting, as copied by "W. Penstone," is, of course, the right way. There is no need for the actual VP to be marked, nor for P' P² to be equidistant from the horizon, as "W. J. E." implied. I still hold the common way of connecting the three rulers is weak, and two bars distant from from the junction would be preferable, and that the obtuse-backed T-square, figured p. 605, is, for its expense, a handier perspective instrument.—E. L. G.

[566.]—The following simple method of setting this instrument I find sufficient. Referring to "W. Penstone's" diagram, p. 729, draw AC at right angles to the horizontal line, make the points A and C equidistant from the horizon. Place the arms of the centrolinead against the points A and C, and the centre of the ruling blade along the horizontal line, then make the angle formed by the arms of the centrolinead more or less obtuse until the centre of the ruling blade radiate with A B and C D; after which remove the pins along the line A C half the breadth of the ruling blade, and the instrument would be found to work correctly. Would "E. L. G." please to state at what distance the point B ought to be from A on the line AB of diagram, p. 729, so as to work his method at page 747.—J. M. M.

[574.]—THE "LIMNER"—In referring to my books I find the "Limner" in question was ordered on the 25th of June last, and was duly forwarded to Mr. Kiernan I am not responsible for parcels miscarrying, which sometimes arises through defective addresses being furnished by my correspondents. I beg to refer your readers to a reply by "Excelsior," in your issue of Oct. 4, speaking in very different terms of the "Limner."—GEORGE BELL (late of the firm of Nash and Co.), 21, Queen Margaret-grove, Mildmay-park, London, Nov. 21.

[611.]—ESTIMATING CARPENTERS' WORK FROM HEWN AND CONVERTED TIMBER.—However ignorant architects may be of the facts adduced on this interesting subject by "Mr. Stevenson," practical builders have long been aware that converted timber is much cheaper for use in small scantlings than that cut from balks. Any person may convince himself of the extent to which builders have availed themselves of this advantage who will take the trouble to examine a row of houses, built on speculation, and in which cheapness is, alas! the first of all considerations, where I will venture to say he will find at least four-fifths of the carpenters' work cut from planks, deals, and battens. As further bearing on this question I may observe that I have found on several occasions where timbers have been specified 4 × 3, 3 × 2½, 6 × 3, and other similar scantlings, on the supposition that they would be cut from balks, builders have been willing and indeed anxious to insert those of the larger sections of 4½ × 3 × 3½ × 2½, 7 × 3, &c., cut from deals and battens, alleging that the saving in sawing, waste, labour in fixing, and general cleanness of the work, more than compensated them for the loss of the additional quantity of cube timber.

On the question of mere comparative cost there can be hardly a difference of opinion, but lowness of cost does not in this case necessarily represent cheapness, unless in combination with sufficiently good quality; and joining issue with "Mr. Stevenson," I think it is in this very question of quality that the whole gist of the matter lies. If converted timber be not as strong as hewn timber of equal scantling and as durable, "Mr. Stevenson's" calculations simply tend to prove that a bad article ought to be found less costly than a better one, a deduction not difficult to arrive at without any elaborate display of figures, and the justness of which it would be a waste of time to attempt to refute.

It is, perhaps, an open question whether really good deals do not afford as good a material for small scantlings as the stronger grown hewn timber. Swedish timber is reputed to be tougher than Riga and Memel, and therefore at least equally capable of resisting cross strain; it is straighter in the grain and more free from large knots, both great desiderata in timbers of small scantling, and both also very important considerations in relation to the question of waste. The main objection to the extensive use of deals and battens would perhaps be that they are generally cut from immature trees and, therefore, would not have attained the maximum of strength and durability. Could "Mr. Stevenson" afford any information on this question of comparative strength, &c., of hewn and converted timber? And could he also inform me if Prussia exports much timber, the growth of her own forests; and, if so, from what ports, and whether it is classed in the market with Dantzic timber or otherwise?—H. W. L.

[611.]—In my assertion referring to the reply by "A. H.," I did not profess to endorse the whole of his statement. It was short, and I took it generally. Some years ago, when in the south of England, I found that deals exceeding 12ft. or 14ft. long were rarely obtainable. This may yet be the case in some isolated districts for aught I know, but that is not the point in question; it was the proper way of estimating the value of scantlings from planks and logs. I gave the items which "Mr. S." admits are required, but I did not profess to prove that the difference in value was only 3d. per foot cube, having shown, if not all, at least the most important items to be noted in estimating the value of scantling. I leave the rest for each party to figure out according to his own particular case. My figures were a mere nominal amount to show an example, and without any "guesswork." I cannot see the impossibility of taking a fair average price for the timber in any building, according to the prevailing sizes. "Mr. S." admits there may be "something" in my item for saw kerfs in cutting small scantlings out of deals, and yet he afterwards ridicules the idea, and goes on to speak of scantlings where only one cut occurs. Now, I never attempted to show that there was any necessity for splitting straws in the matter, but I do say there is a perceptible waste in small scantlings, which, if only amounting to ½d. per foot cube, should be noted in a calculation, or the consistent valuation "Mr. S." so wishes for cannot be obtained. Then, as to waste in cutting to length, I am quite as well aware as "Mr. S." about the variety of lengths in the markets, and I still say that there is a considerable waste on an average in cutting to length scantlings from deals. Commonly you may have to cut off rafters, joists, &c., from 4in. to 8in. in length to make sizes not attainable, and, even if they were, are not at hand when wanted. But I have not professed to show that it would amount to as much as the same item from timber; I show it as an item to be taken.

"Mr. S." also claims an allowance for scantlings from timber, "as they are more unwieldly and expensive to get into place." Granted, if they are large, but that does not affect the price of the material; it comes under the head of labour, and is taken accordingly. And to those who are doubtful of their experience in taking the two descriptions conjointly, as I stated in my former note, all they have to do is to make two columns, viz., timber and deals, and in this way obtain the average of both. If the theory laid down by "Mr. S." be admitted as correct, it would be absurd to attempt a valuation of carpenters' work; and without professing to know more than my fellow-workers I have endeavoured to show those points requiring special attention in any calculation of the value of timber, as noted by me during many years of experience. I would recommend young builders to measure the quantity of scantling obtained from timber and deals for several buildings, compare the produce with the cube of the material in the rough, then take account of the lengths as they leave the yard, and after deducting for lengths returned, compare the same with their measured account of the building. This would soon give them a knowledge of the average amount of waste, and repay them for their trouble. —A PRACTICAL MAN.

[654.]—SPECIFICATIONS.—"L. L." wishes to know which is the better plan of preparing a specification, taking each trade separately throughout the building, or to take each floor separately and describe each trade thereon. Allow me to say that I think the first plan by far the better of the two, as when you are engaged upon a certain trade it takes far less time and trouble to complete it, and a specification so written is much shorter and easier of reference. Few architects, I think, now-a-days adopt the second plan, which is in very many respects clumsy. I for my part never think of doing so.—GEO. JAS. LOUGH.

[656.]—STAINING GLASS.—"Inquirer" is informed that the colours of glass are procured by metallic oxides. Gold gives the rich red seen in Bohemian glass ware, and this is one reason of its high cost. It furnishes, in combination with tin, the finest rose and purple. Oxides of iron and of chrome produce red, brown, and black; the latter is also obtained from manganese and cobalt. Oxides of uranium, chrome, antimony, and iron yield orange; chrome and copper, green; and cobalt and zinc, blue.—W. G. P.

[657.]—STONE DESTROYING INSECTS.—The insects "C. E." alludes to are known amongst naturalists as annelids, and by reading over any work upon natural history very interesting facts may be gleaned. They are marine animals, and are numerous on our shores. The fact that soft and tiny molluscs can make their way into hard limestone piers and riddle boulders and slabs on the sea shore is very remarkable. The boring qualities of annelids have been somewhat overlooked, but they are engrossing special notice at the present time with men of science. It has been suggested that these small worms manage to perforate the hard stones by means of the carbonic acid excretions from their bodies in conjunction with the mechanical action of the antennæ. Mr. E. Ray Lankester is an authority upon this peculiar subject.—W. S.

[658.]—FLOATING BREAKWATERS.—Many experiments have been made with floating breakwaters, but they have all so far failed. Some few years since there was a committee of inquiry appointed by the House of Commons, before which many suggestions were made and most interesting information given, but the Committee did not consider itself justified in recommending that the public money should be expended in any further experiments. —J. H. T.

STATUES, MEMORIALS, ETC.

A monument of the late Duke of Wellington, which is now in the crypt of St. Paul's Cathedral, the work of Mr. A. Stevens, is nearly finished, and will shortly be ready for public exhibition. The general design of the monument has been taken from those of Queen Elizabeth and Mary Queen of Scots, which fill large portions of the aisles in Henry VII.'s Chapel, Westminster Abbey.

STAINED GLASS.

A stained glass window of two lights has been erected in Stoke Prior Church, Herefordshire, by Messrs. Clayton and Bell. The subjects are the Raising of Lazarus and the Healing of Jairus' Daughter.

The design for the memorial window in Romsey Abbey Church, to the late Lord Palmerston, prepared by Messrs. Clayton and Bell, comprises three principal groups in each of the triplet lights of the large west window of the nave. Those in the central light are the "Sermon on the Mount," "The Judgment of Solomon," and "Liberating the Prisoners;" those in the dexter light, "The Tribute Money," "Daniel as a Ruler," and the "Pursuits of Peace;" and those in the sinister, "Feeding Five Thousand Men," "Joseph Distributing Wheat," and "War." The estimated cost is £1,200.

MEETINGS FOR THE WEEK.

MON.—Royal Geographical Society.—Papers to be read:—1. Letter from Dr. Kirk—Fresh news regarding Livingstone. 2. "Journey through Central China, from Canton," by Mr. A. V. Bickmore, M.A., Cambridge, U.S. 3. "Surveys in Nicaragua, by Mr. J. Collinson, C.E., 8.30.

TUES.—Institution of Civil Engineers.—Continued discussion upon Mr. Byrne's paper, "Experiments on the Removal of Organic and Inorganic Substances in Water," 8.

Common nails, heated red hot and dropped into water, will clinch and answer the purpose of wrought nails. Rusty nails may be drawn from wood without difficulty, by first giving them a blow hard enough to start them a little.

Our Office Table.

There was a sale by auction on Tuesday last of ecclesiastical vestments, at Debenham and Storr's, King-street, Covent-garden, which appeared to excite an unusual degree of interest. The vestments were hung round the room, and were closely inspected by a large number of persons who are interested in ritual development. There were chasubles, copes, tunicles, dalmatics, and almost every variety of dress used by Roman Catholic bishops and priests in the administration of the highest offices of the church, some of them of the most magnificent description, bearing in many cases, representations of the Saviour, Saints, Apostles, and Martyrs.

Seven thousand feet of inch boards clear stuff out of one tree is not bad. This was obtained according to an American paper, from one lately cut down in Ohio. It weighed 30 tons, was more than 12ft. in circumference, and was supposed to be 792 years old.

The Trades Unions Commissioners met on Thursday week to make arrangements for resuming their inquiry, but we have not heard what was the course they decided upon. It is generally understood that they will next proceed to investigate union affairs in the iron trade.

A numerously attended meeting of the Metropolitan Board of Works was held on Wednesday, Sir J. Thwaites in the chair, to consider the course to be taken in relation to the transactions between Mr. Doulton, member for Lambeth, and Mr. Furness, the contractor. Mr. Doulton made a lengthened statement touching the matters in issue, after which a protracted debate arose on the question whether evidence should be taken, and the inquiry prosecuted by a committee of the whole Board, the public to be excluded, or in public, as the inquiry had been commenced. A majority declared for the committee, mainly on the plea that evidence could be obtained in a committee that could not be secured by a public investigation. One reason perhaps that the inquiry is to be private is that other members of the Board may be mixed up with the affair.

We have been requested to make room for the following:—Sir,—I beg to inform you that Mr. Welby Pugin's pamphlet respecting the Houses of Parliament is delayed through Messrs. Barry having entered a protest against its publication until they have examined the original documents. R. F. ENGLISH, Ramsgate, November 19, 1867.

Alluding to the Pugin and Barry controversy, the "Kent Coast Times" says:—"A strange phase has just arisen, for the Messrs. Cooper, solicitors to the executors of the late Sir C. Barry, have written to Messrs. Longman and Co., prohibiting the publication of the pamphlet until they have compared the same with the original documents. We can understand the Messrs. Barry wishing to be in possession of all the facts of the case, but why they should desire to restrain the publication, if the facts are incorrectly given, is beyond our comprehension, for should such prove to be the case, their success in damning Mr. Pugin's claim would be simply proportioned to the number of copies issued." This is certainly an extraordinary proceeding, but no doubt its result will be an extra demand for the pamphlet.

Mr. B. Haughton, in his address before the Society of Civil and Mechanical Engineers, says:—The Institute of Civil Engineers is now on its trial. An aspiring and aggressive association has started up which would fain draw some of the teeth and clip the mane of the old lion of Great George-street. It has lately petitioned the Queen for a charter of incorporation, which application has been opposed by the Institute of Civil Engineers, on the ground that it has always been the recognized representative body of the profession; that the incorporation of an association carrying a title having so close a resemblance to that of the Institute, the two corporations will be mixed together in the minds of the public and of foreigners; and that the influence of the parent society will suffer in consequence. We trust that in this struggle the old Institute will be successful.

The contract question between the builders and architects of Liverpool is making satisfactory progress, and as the best feeling prevails between the parties in discussing the question there is a prospect of a speedy and honourable settlement.

The marbles of Vermont (U.S.) have become one of its chief sources of wealth. The quarries and mills near Rutland supply a large per cent. of the marble of domestic production which is used in America for statuary, monumental and other purposes where a fine grade is desired. A capital of several millions of dollars is employed in the business, and a large proportion of those who have embarked in it have been in an eminent degree successful.

Mr. Barry, of Leamington, read a paper before the Liverpool Architectural and Archæological Society, on the 13th inst.; the subject was "The Utilization of Town Sewage." He argued that sewage applied in its unconcentrated liquid state upon land is a failure both physically and financially. The land after a time will only produce very coarse rank grass of little value. But if the sewage is converted, either by filtration or evaporation, into a solid state, and then applied to land, it forms a good manure.

J. H. Weston, who absconded from Messrs. Ebbs and Sons, Northwick-terrace, Maida hill, has been apprehended. His flight led to the discovery that he has been obtaining goods by forged orders in the name of the firm.

It is a common notion in America that the grit of the grindstone has some wonderful quality of healing which does not obtain with the sediment of ordinary stones on which iron is not used, as millstones. There is reason in this opinion, as the *debris* of the grindstone is a mixture of silica and ferruginous oxide. The healing properties of the *debris* of the grindstone lie in the oxide of iron, which, in this form, in some diseases is worth many medical prescriptions.

The shells employed for cameo cutting are the cassis rufa, and several specimens of cyprea, called cowries. They are dense, thick, and consist of three layers of differently-coloured shell material. In the cassis rufa, each layer is composed of many very thin plates, or laminæ, which are perpendicular to the plane of the main layer; each lamina consists of a series of elongated prismatic cells, adherent by their long sides; the laminæ of the outer and inner layers are parallel to the lines of growth, while those of the middle layer are at right angles to them. In cowries there is an additional layer, which is a duplicature of the nacreous layer, formed when the animal has attained its full growth.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

902. A. MACKENZIE AND S. ROBINSON. IMPROVEMENTS IN APPARATUS TO BE APPLIED TO CISTERNS FOR PREVENTING WASTE OF WATER. Dated March 27, 1867.

In applying this invention to water-closet cisterns, for example, the patentees construct inside the cistern, at the lowest part thereof, a closed chamber of sufficient gauge or capacity to contain the requisite amount of water for one flushing of the closet. A small aperture which is left constantly open is made in the side of this chamber for the purpose of filling the same from the surrounding water in the cistern. At the bottom of the gauge chamber there is fitted the valve-seat and valve, opening either into the old service box, or into a supply pipe leading direct to the basin. This valve is provided with a tubular spindle, having a piston working therein, such piston being connected to a float inside the closed chamber before referred to, and on the lower part of the piston is formed a valve-cap, and on the upper part of the tubular spindle through which the piston works there is formed a valve-seat, so that when the piston is raised by the float to a given height, the second passage for water (namely, the passage through the tubular spindle) is closed, and remains closed until, by the opening of the principal valve, the chamber is emptied. This piston is further coupled by a wire to the usual overhead weighter lever, which is connected to the "pull" or handle of the closet. The object of the entire arrangement is, first, to admit the full complement of water in the closed chamber to pass down through the principal valve when opened; and, second, to permit of a certain gauged or regulated quantity of water, sufficient to fill the pan of the closet, to descend through the tubular spindle of the main valve after it has been closed. *Patent abandoned.*

Trade News.

TENDERS.

ESSEX.—For enlarging chancel and new vestry and other works at Lyston Church, Essex. Mr. H. Woodyer, architect:—

Greenwood and Son (accepted) £1,017

DEVONPORT.—For the painters' and glaziers' work required for the Royal Female Hospital, for Mr. W. Harvey, contractor. Quantities supplied by Mr. J. Harvey, Plymouth, architect:

G. H. Goss, Plymouth (accepted),..... £132 10

CITY.—For alterations and additions to No. 71, Milton-street, City. Mr. Robert Fames, architect:—

Kile	£979 0
Lamprell	698 0
Nutt and Co.	685 0
Shumer	666 0
Miller	654 0
Wilcox	654 0
Crabb and Vaughan	639 0
King	638 0
Sawyer	630 0
Brett	620 0
Peirce	611 0
Hall	584 0
T. Peirce	584 0
Vincent	578 10
Perry	577 0
Schofield	570 0
Capion	548 0
Greensword	547 10
Martiss	540 0
Waters	540 0
West	538 0
Taylor	498 0

LONDON.—For church and school buildings for the district of Christchurch, Somers Town, St. Pancras. Messrs. Newman and Billing, architects. Quantities supplied by Mr. Rickman:—

Howard	£13,890
Carter and Sons	13,480
Perry	13,317
Browne and Robinson	12,995
Coleman	12,560
Patrick and Sons	12,525
Thompson	12,173
Dove Brothers	11,925
Myers and Sons	11,630
Wells (accepted)	11,350

LONDON.—For works at 34 and 35, Monkwell-street, for Messrs. H. E. and M. Moses. Mr. N. E. S. Josephs, architect:—

Condor	£4,218
Newmann and Mann	3,993
Browne and Robinson	3,984
David King and Sons	3,766

LONDON.—For building warehouse and stables, at Roupell-street, Lambeth, for Mr. F. Bowering. Mr. James L. Stewart, architect:—

Sawyer	£2,140 0 0
Shurmur	2,110 0 0
Smith and Son	1,996 0 0
Eustace	1,268 0 0
Cubitt Brothers	1,901 9 0
Wilcox	1,875 0 0
Quennell	1,750 2 3½
Golding and Son	1,745 0 0
Pierce and Booth	1,696 0 0
Pearce	1,547 0 0
Pinner (accepted)	1,506 0 0

STRATFORD-ON-AVON.—For the erection of a storehouse for Messrs. Flower and Sons. Mr. J. Lattimer, architect:—

Marriott	£3,079
Espley	2,275
Jeffry and Pritchard	2,960
Clarke	2,930
Clarke and Smallwood	2,900
Horsman, Price, and Co.	2,841
Messrs. Callaway	2,787
Parker and Sons	2,717
Southorn	2,695
Claridge	2,690
Hilton	2,617
Naden and Sons (accepted)	2,595

WANTAGE (BERKS.).—For four new cottages. Mr. J. P. Spencer, Wantage, architect:—

Kent	£560 0
Wheeler	460 10
Haines	444 10
Partridge	382 10
Architect's estimate	440 0

BATH STONE OF BEST QUALITY.

RANDELL AND SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots also Cost for Transit to any part of the United Kingdom furnished on application to Bath Stone Office, Corsham Wilts.—[ADVT.]

PROPERTY SALES.

Nov. 13.

AT THE MART.—By Messrs. Norton, Trist, Watney, and Co.—Freehold residence, known as Gothic Cottage, situate at West Green, Tottenham, with stabling, coach-house, cottage, farm buildings, pleasure grounds, and meadow land, the whole containing 5a. 0r. 30p.—sold for £3,450.

Freehold house, shop, and buildings situate in the Market-place, Kingston, let at £96 per annum—£2,650.

By Messrs. Edwin Fox and Bousfield.—Freehold estates, known as Row Wood Farm, and Phillips Hill Wood, situate in the parishes of Chalfont St. Giles, and St. Peters, Bucks, comprising a residence with buildings, and 427 acres of arable, meadow, and wood land, of the rental value of £650 per annum—£13,650.

Leasehold residence, No. 3, Eastbourne-terrace, Paddington, let on lease at £90 per annum, term 96 years from 1842, at £6 per annum—£1,230.

Leasehold residence, No. 23, Priory-road, Kilburn, let at £80 per annum, 96 years from 1853, at £12 per annum—£860.

Leasehold premises, No. 44, South Molton-street, Oxford-street, let on lease at £50 per annum, term 90 years from 1866, at £3 per annum—£930.

By Messrs. Fuller and Horsey.—Freehold manufacturing premises, situate in Wallis-road, Hackney Wick—£5,000.

Nov. 15.

AT THE MART.—By Messrs. Norton, Trist, Watney, and Co.—Lease, &c., of the mercantile offices situate No. 1, Railway-place, and 36, Crutchedfriars, Mark-lane, City, term 16½ years from 1867, at £210 per annum—£1,250.

Leasehold two residences, Nos. 20 and 30, Albert-square, Clapham-road, producing £125 per annum, terms 99 years from 1846 at £5 each per annum—£1,300.

Freehold building land, situate fronting Wickham-lane, leading from Woolwich to Welling, Bexley, &c. Lot 1 sold for £30; lot 12, £35; lot 13, £30; lot 14, £30; lot 15, £30; lot 16, £30; lot 17, £30; lot 18, £45; lot 28, £30; lot 29, £30.

Freehold building land, situate fronting Blackthorn and Sherwood-streets, Bromley, Middlesex—lot 12 sold for £95.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Charles Barrett, Titlow, Lowestoft, plumber, December 4, at 2—Alfred Ferdinand Niud, Bedford-street, Holloway, painter, December 4, at 1—James Wesley Reed, Hornsey-rise, architect, December 3, at 12—Henry Francis Simmons, Prospect-place, Cambridge-heath, builder—Charles Fone Bishop, Lower Tooting, carpenter, December 2, at 12—James Burbage, Cambridge, builder, December 2, at 1—George Eames, Rickmansworth, builder, December 4, at 12.

TO SURRENDER IN THE COUNTRY.

George Chadwick, Leeds, joiner, December 5, at 12—James Gould, Bath, carpenter, November 29, at 11—Thomas Gould, Bath, mason, November 29, at 11—John Brown, Forcett, Yorkshire, stonemason, November 25—G. Ede and W. Pearsey, Brighton, builders, December 2—James Palmer and George Hodgkinson, Sutton Works, Aston, near Birmingham, and Sutton Coldfield, edge tool manufacturers, November 27—William Roberts, Portmadoc, painter, Nov. 29—M. Wake, Middlesborough, stonemason, November 25—William Williams, Garston, plumber, November 28.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

November 28, R. Ridge, Godstone, carpenter—December 4, G. Rees, Swansea, builder—December 13, J. Edwards, Eglwysilan, mason—December 13, G. Ellen, Faversham, carpenter—December 10, J. Newman, Reading, ironmonger—December 10, W. H. Pepper, Dover, builder—December 12, F. Pudney, Brightlingsea, Essex, builder—December 18, W. H. Mullis, St Thomas's-road and Old Kent-road, marble mason—December 11, E. Scally, Fitt's-rents, Hoxton Old Town, stonemason—December 16, G. F. Presland, Bidder-street, Canning-town, Barking-road, builder—December 12, W. Abbott, Salford, brickmaker—December 20, H. Butler, Southwell, Nottinghamshire, plumber—December 9, J. Brough, Carlisle, builder—December 2, J. Twamley, Yoxall, Staffordshire, joiner.

DECLARATIONS OF DIVIDEND.

J. Collier, Liverpool, joiner, second div. of 10d.—W. Bayliss, Hereford, plumber, second div. of 1s. 5d.

PARTNERSHIPS DISSOLVED.

Boston and Hancock, Stoke-upon Trent, joiners—G. Sheppard and T. Haylock, Bloomfield-terrace and Grosvenor-row, Pimlico, and Battersea, builders—Hodgson and Osborn, St. Lawrence, Isle of Thanet, builders—S. C. Ridley, Great George-street, Westminster, and S. L. Seckham, Westminster-chambers, Westminster, contractors for the construction of the Carnarvon and Llanberis Railway—F. W. Turner and T. Fardon, Linslade, Buckinghamshire, engineers—Chynoweth and Pratt, Aston-juxta-Birmingham, builders—Hodgkin Brothers, Sittingbourne, brick manufacturers—S. and E. Clegg, Rochdale, builders—Pownall and Young, Gower-street, surveyors—James and Price, Cardiff, builders—Taylor, King, and Co., Chapeltown, Yorkshire, mechanical engineers—Jerram and Boswell, Great Queen-street, Westminster, civil engineers—H. Taylor and J. Richmond, Cross-lane, St. Mary-at-Hill, City, painters—Liddiard and Arkell, Hastings, ironmongers.

BANKRUPTCY ANNULLED.

Daniel Evans, Liverpool, estate agent.

SCOTCH SEQUESTRATIONS.

G. Dewar, Cathcart, near Glasgow, mason, November 15, at 12—Wood and Lynch, Perth, railway contractors, November 20, at 12.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9 0	£10 10	Archangel, yellow ..	£11 10	£13 0
Quebec, red pine	3 0	4 10	St. Petersburg, yel...	10 10	11 0
" yellow pine..	2 15	4 0	Finland	8 0	9 0
St. John N.B. yellow	0 0	0 0	Memel.....	0 0	0 0
Quebec Oak, white ..	5 5	5 10	Gothenburg, yellow	8 10	10 10
" birch.....	3 10	4 10	" white	8 0	9 0
" elm	3 10	5 0	Gefle, yellow.....	9 0	11 0
Dantzic oak	3 10	6 0	Soderham	9 0	10 10
" fir	2 0	3 0	Christiania, per C.,		
Memel fir	3 0	3 10	12 ft. by 3 by 9 in.		
Riga.....	8 0	3 5	yellow	16 0	22
Swedish	2 0	2 5	Deck Plank, Dantzic,		
Masts, Quebec red pine	6 0	7 0	per 40 ft. 3 in.	0 15	1 4
" yellow pine..	5 0	6 0	PUMICE STONE per ton	6 0	8 0
Lathwood, Dantzic, fm	4 10	5 0	OILS, &c.		
" St. Petersburg	6 10	7 10	Seal, pale....per tun	40 0	40 10
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.			Sperm body 112	0 0	0 0
			Cod	36 0	0 0
			Whale, Stb. Sea, pale	39 10	0 0
Quebec, white spruce	13 0	19 0	Olive, Gallipoli.....	69 0	70 0
St. John, white spruce	13 10	15 10	Cocoanut, Cochin, ton	56 0	56 10
Yellow pine, per reduced C.			Palm, fine	40 10	0 0
			Linseed	36 5	0 0
Canada, 1st quality.	17 0	18 10	Rapeseed, Eng. pale..	39 0	40 0
2nd do.....	11 10	12 10	Cottonseed.....	34 10	40 10

METALS.

IRON:—

Welsh Bars in London .. ..per ton	6 7 6	6 10 0	3
Nail Rod ..... do	7 10 0	7 15 0	5½
Hoops . ..... do	8 10 0	9 0 0	
Sheets, Single ..... do	9 15 0	10 0 0	
Staffordshire Bars . ..... do	7 10 0	7 15 0	
Bars, in Wales ..... do	5 15 0	6 0 0	3
Rails ..... do	5 10 0	6 0 0	net
Foundry Pigs, at Glasg. No 1 .. do	2 15 0	3 5 6	2½
Swedish Bars ..... do	10 5 0	10 10 0	net

THE BUILDING NEWS.

LONDON, FRIDAY, NOVEMBER 29, 1867.

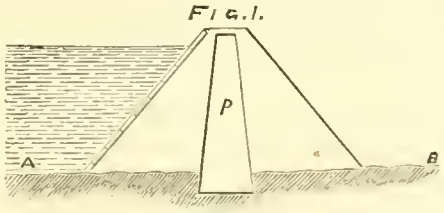
RESERVOIRS AND EMBANKMENTS.

A GLANCE at the few, but unrivalled, examples of engineering and architectural works that have partially escaped the ravages of time, and still retain some vestige of their ancient origin and pristine splendour, is sufficient to convince us that to each age belongs its special phase of superiority. To say that we "excel" the ancients in the art of construction is an improper term to employ, since no comparison can be fairly instituted where the data are not identical; and it will be found that wherever the premises were the same, the conclusion is altogether in their favour. In truth, we have retrograded in all those particular branches of æsthetical and constructive art of which the principles have been common to all ages. That we have attained to great excellence in other branches is not owing to the exercise of any extraordinary skill or ability which many fondly imagine can only pertain to a Christian era, but chiefly to the advantages which have accrued to us from the numerous fortunate and adventitious discoveries and inventions taking place in modern times. The principles of science are immutable, but their discovery is progressive, and their elucidation and practical application slow and inexhaustible. To each epoch belongs its peculiar train of progress; each age produces its own fruit, and when the maximum of excellence has been attained to, in any particular branch, it is certain to decay and be eclipsed by some succeeding rival more adapted to the exigencies of the times.

So far as engineering works are concerned it will be readily perceived that their aid was first invoked to serve the necessities of mankind, and subsequently made subservient to their interests, comfort, and even luxury. In connection with our subject is closely allied that of procuring and preserving a supply of water for districts and cities, a subject which has engaged the attention of all those "having authority in the land," from the earliest ages. The Romans are justly renowned for the stupendous works and massive aqueducts they erected not only in their own but in neighbouring countries, and numerous remarkable examples of the details of waterworks are to be encountered in various continental localities. It is, however, more especially, in those countries where nature supplies the all-important fluid with a stingy hand, or bestows it in an intermittent and capricious manner, that the most prominent specimens of embankments and reservoirs are to be met with. The country of Hindostan has been ever placed in this category, and it is therefore no wonder that for antiquity and magnitude its waterworks surpass those of all other lands. There is less to be surprised at in this, when it is borne in mind that its native princes ruled with a despotism only congenial to oriental customs, that their will was law, and that it was a matter to them of little or no moment if every stone was placed in position, at the cost of the life of one of their subjects. There are embankments in India extending for a distance of twelve miles, and storage reservoirs containing an area of upwards of thirty-five square miles, while in the adjoining island the Cingalese monarchs have displayed their engineering skill in the construction of a bank or water dam having the astonishing length of fifteen miles, and possessing a width at the base of 100ft. and at the top of 40ft.* All our reservoirs and embankments sink into complete insignificance in comparison with this gigantic specimen. If, however, size were the only attribute in which our works of this description fail, there would be little to comment upon, as the physical features of the district, in a great measure, determine the length, breadth, and height of the dam. In a country, of which the configuration is abrupt and precipitous, abounding in valleys, gorges, and ravines, interspersed with mountain streams whose waters at times are all but stagnant, and at others roll down with the irresistible impetuosity of a torrent, the works to retain a large supply of the necessary fluid must be on a scale of commensurate grandeur. But in England, where the land is more gently contoured, and the natural difficulties to be surmounted present no such arduous an appearance, the task of construction appears to be almost insuperable. Without carrying our readers so far back as the Bradfield catastrophe, we can find a notorious example in the yet unfinished works for supplying with pure water the city of Dublin. It is but a short time ago that a serious leak was discovered in the dam forming the most important and prominent feature of the whole project. Indeed, so probable has the ultimate giving way of the bank appeared to a jury that a sum of £12,000 has been awarded to a gentleman possessing property in the vicinity, as contingent damages for the injury that would accrue to him, in event of the occurrence taking place.

It has generally, but not universally, been assumed that a puddle wall should be placed in the centre of the embankment, and there is no question that, if properly constructed, it forms a most valuable accessory to the work. This construction is represented in fig. 1,

FIG. 1.



where P is the puddle wall, A B the natural surface of the hard ground or stratum; the rest of the diagram is self-explanatory. The mistake into which many engineers have fallen is that of relying nearly altogether upon the puddle wall for the strength of the dam, so that should there be any defect in this part, which evidence has shown to have been the case in the example we have quoted, it is impossible for the bank to be water-tight. Once the puddle wall fails, there is no chance of the bank remaining staunch. Mr. Jacob, in the volume alluded to, mentions that the introduction of a puddle wall in the Indian embankments is of very rare occurrence, particularly in those of an older date, and we concur with him that where good material is at hand, and where the embankment is not of a very great height, the precaution of introducing a central puddle wall is by no means necessary. In reality, the whole embankment, and not merely the central part, should be water-tight, and this is what is actually effected in Hindostan. The continual trampling of the people on the earth, as they tip it in small quantities from baskets, so thoroughly consolidates and intimately amalgamates it, that the whole embankment is one solid mass of puddle wall, totally impervious to wet. We are perfectly alive in this country to the necessity of thoroughly amalgamating and mixing the puddle, the consolidation of which is its chief point. For this reason, in specifications, the clauses are so stringent respecting the thickness of the layers in which the puddle is laid on. As a rule, in spite of all specifications and surveillance, the puddle never is properly consolidated in dams and embankments. To return to the position of the puddle wall, it does not appear that there is any particular value in placing it in the middle of the dam, as represented in the figure. It might be placed with equal, if not with greater, advantage along the face of the slope, as its object is to prevent the infiltration of the water, which could be effected by puddling the whole slope right down to the surface of the permanent stratum. It should be kept in view that the puddle wall is not required to promote the stability of the dam. Fig. 2

FIG. 2.

represents this latter description of embankment with the puddle along the face of the slope.

A very important feature in connection with the construction of reservoir embankments is the introduction of the necessary pipes or culverts to serve as the outlet for the supply to the neighbouring district. This is a question requiring some consideration, more especially as it was alleged that the putting a naked pipe through the embankment of the Bradfield reservoir contributed to the establishment of the leak. The main pipes from the Roundwood reservoir, intended to supply the city of Dublin, are laid in two large culverts built under the embankment. The difficulty to be overcome in putting either a pipe or culvert under an embankment is to connect them with the bank, so as to make a water-tight joint. If the pipe be laid in the natural ground, and the earth made good above it, there is no fear of leakage, but otherwise there is sure to be "a creep" through the embankment along the outside of the pipe, and a leak will be thus occasioned. The same results or creeping of the water would occur along the top of a culvert as of a pipe. The evil might in some instances be obviated by casting projecting flanges upon the outside of the pipes, so as to break the continuity of the joint, and in a similar manner the masonry or brickwork of a culvert might be racked back so as to bond into the material of the bank. These precautions, however, cannot be regarded as otherwise than of a mitigating, and not of a completely effective character. Considering what a large number of towns in England, including the metropolis, have to be supplied with water upon a scale of magnitude and abundance never previously contemplated, it is quite time that some measures should be taken to ensure the thorough security and *bonâ fide* nature of the work executed in connection therewith. An Act has already been passed requiring that all reservoirs and embankments should be constructed, similarly to railways, in accordance with the regulations of the Board of Trade, and to the satisfaction of its officers; but the fate of many railway viaducts and bridges have proved that this is no guarantee for the absolute stability of the works.

* See an able little work, "On the Designing and Construction of Storage Reservoirs." By ARTHUR JACOB, B.A., late Executive Engineer for Irrigation, H.M.'s Bombay Service. London: E. and F. N. Spon, Charing-cross. 1867.

WORKMEN'S EXHIBITIONS.

THE project of a Workmen's International Exhibition, to which brief reference was made in a recent number of the BUILDING NEWS, furnishes an occasion that may with advantage be used for reviewing the nature, the pretensions, and the fruits of the displays with which the public have latterly been familiarized. The primary impulse to which we owe such competitions is much older than those persons imagine who have hitherto assumed the leadership of the movement. The merit of originating the plan of the first has been variously claimed for Islington, for Lambeth, and for a Somersetshire village. A juster claim is made, however, for the "black country." There, twenty years ago, an in-

stitution that was burdened with debt was released from the incubus by the financial success attendant upon a collection of objects of art, industry, and handicraft, which the members brought together, and to which the public were admitted for a period of several months. It is doubtful whether any attempt was made by its promoters to obtain credit for having struck out a new path for labour. The most likely view is, that a bazaar was all that was contemplated; the industrial exhibition was purely accidental, and arose from the fact that mechanics and artizans gave for the purpose such gifts as were most available, viz., examples of their own skill in labour and ingenuity in designing. Whether this was or was not the case, however, it is practically certain that the success of this first exhibition was not limited to its immediate pecuniary object. Among the visitors to the collection were several men of more or less eminence in arts and manufactures, and the special skill displayed in the productions of some of the workmen attracted such notice as eventuated in permanent advantage, and the foundation of great prosperity to more than one of them. From this beginning, we are told on very excellent authority, there sprang the movement that gave the nation the first great collection at Bingley Hall, and afterwards the International Exhibition of 1851 in Hyde Park. These events mark the commencement of Mr. Disraeli's Albertine era; and to them those smaller and humbler efforts, wherein the competitors have been of the wage-paid class, owe their existence.

The theory upon which the projectors of industrial exhibitions invariably proceed involves a bold assumption. The world's fairs of London and Paris, Dublin and New York, have developed the mere shopkeeping element in its highest perfection, but have failed to exercise any marked influence upon labour; industry, unsustained by large capital, has been excluded from any participation in the competition; and invention, save where its value had been already commercially recognized, could be exhibited only at a loss. To give to labour the honours due to it, to skill its proper reward, and to invention a fair field, are the aims set forth with much plausibility by the advocates of workmen's exhibitions; and it becomes our duty, now that scarce a week passes without an exhibition opening in some one of the great population centres of the United Kingdom, to enquire to what extent these aims appear to have been accomplished. If a deeper, more thorough interest be taken by our artizans in the character of their work; if greater care be exhibited to give the finest finish of which it is capable to each object produced in our workshops; if new applications of science to the purposes of daily life, and increased facilities for acquiring proficiency in art be shown; if the faculty of invention, or keen insight into the defects of mechanical appliances now in use be fostered and encouraged by industrial exhibitions, then assuredly may they be declared to have fulfilled the more important ends of their promoters. It were a pleasant pursuit, no doubt, to preach such aims to the people wherever they can be assembled for the purpose; but, hitherto, preaching and practice on the subject have been divorced. We can ascribe no new colour, no additions to trade patterns, no original scientific process, no unusual development of industry, to any one of the hundreds of exhibitions that have been held within six years past. Indeed, the regulations of nearly all have been such as to invite results emphatically the reverse of those contemplated by the objects. Distinctions have not been duly defined between mere amateur and skilled work; and monstrosities of misapplied ingenuity, objects made without the employment of ordinary tools, productions that may be aptly described as the toys and playthings of children of a larger growth, have been singled out for reward, to the detriment of useful labour. Several causes have contributed to this condition of things. The committees of industrial exhibitions have sought practical ends bearing upon the interests of labour and commerce, but they have given us shows and collections of curiosities. The aim of pleasing the people and attracting large masses of sight-seers has superseded the more important design of improving the knowledge and skill of our craftsmen. Rewards of merit have been too liberally dispersed, so that even a silver or a gold medal cannot be viewed as the guerdon of genuine excellence. Protection has not been extended to inventions, and hence the law has operated to keep inventions out of these exhibitions. Lastly, no scheme has been devised providing for the reception and examination of complex objects, requiring the combined skill of many men. Serious as these defects, or rather vices, of industrial exhibition management unquestionably are, they are not beyond remedy. The confusion of aims would not exist if labour, and skill, and artistic power were largely and actively pressed into the service of committees. Good taste and discretion would dictate the limitation of prize-lists. Means might be found of extending, during the holding of an exhibition, and a given period hereafter, the protection of the law to exhibited inventions fully described and registered at the offices of the Board of Trade and the Patent Commissioners. The conciliation of employers and manufacturers, so as to secure their practical interest in the movement, would enable skill in combination to compete as well as individual enterprise.

It will be seen that we suggest a radical change in the mode of organizing and conducting industrial exhibitions, and the inference will be drawn that we should welcome a change of promoters. Successful Christian evangelists and popular Sunday-school teachers are generally very estimable persons, as pioneers of morality, and, we may say, civilization in the degraded quarters of our large cities; their services are of immense advantage, not to religious communities only, but to society at large; but in undertaking the regeneration of labour, and the promotion of a chivalric regard for excellence among our artizans, preachers and teachers are attempting a task which must always be to them an impossible one. The successful conduct of an industrial crusade requires that those who are its leaders should bring to their work a devotion neither subordinated to religious or social schemes now shared in by them. The foremost men of a trade can always be found with ease; the principal art workmen are seldom unknown. These are the men who should be consulted in the earlier stages of any industrial exhibition; and, if their counsels were listened to, a national or an international competition might become the germ of an institution standing towards industry in the relation which a university holds towards literature, and affording a vast impetus to the important but hitherto neglected study of technical processes.

The foregoing principles must govern any industrial exhibition worthy of the name. But to them a suggestion might be added in the case of an international display; we mean the determining the nationality of the objects brought together. A strong suspicion prevails among the artizans employed in several of our chief industries, that the palm of excellence is unfairly awarded to the tradesmen of continental cities for work that is, in fact, produced in English workshops, and purchased by the agents of foreign firms. The truth or untruth of this impression cannot be established by competitions into which employers enter in their own exclusive interests. On this point an efficiently arranged Workmen's International Exhibition may be capable of effecting great good to British industry. In its organization it must bring particulars which have been hitherto unknown relative to the nature, the magnitude, and the growth of certain leading occupations; and this feature should serve as an incentive to great caution on the part of the more active promoters of such a scheme, and at the same time bring to its support the intelligent sympathy of the lords of trade and of commerce.

ESTIMATING CARPENTERS' WORK FROM HEWN AND CONVERTED TIMBER.*

As the final solution of this question appears to turn upon the relative qualities of timber and deals, and it is the wish of some of your correspondents that I should furnish information on this head, I will consent to do so, although I am bound to remark that my previous calculations were based upon a due observance of these points. I did not include the best quality of timber, and bring to bear upon its cost the commonest quality of deals. I treated them both upon their relative value in point of quality. In reference to the question of strength, when comparing the two classes of scantlings, I would prefer timbering executed from a medium quality of deals before that from a medium quality of timber. The published schedules of the comparative strength of Baltic timber afford no reliable information, as they are not based upon observations pursued with distinct qualities of timber from a given port, nor are they compared with those of other and distant ports. I might further observe that the question of strength of hewn timber has never been pursued with any regard to converted timber, and as this is new ground it behoves everyone to tread carefully upon it.

As with other subjects which have never had a proper share of notice conferred upon them, it is natural that errors should have arisen. We find some architects specifying that their scantlings shall be obtained from hewn timber; others, that their timbers shall be Memel, Dantzig, or Riga, and their deals best Petersburg. Others will dispose of the subject by saying that "the whole of the timbers, &c., shall be of good quality, Baltic red wood." This leaves a builder free to use Russian, Swedish, or Prussian goods, and he has a field to select his goods from with a difference of nearly 50 per cent. on the first cost. Trifling as these questions may seem, they are weighty matters in the hands of cheap builders, and often explain the wide difference shown in lists of tenders received. I make bold to say that there is no subject of greater importance to the architect and builder than the qualities of timber, and there is none that has been so much neglected. Hewn timber is the primitive form of wood when our supplies were first drawn from the north of Europe. Next followed sawn deals of a rude description obtained by hand labour from squared timber. As machinery was introduced, we obtained deals from timber squared by machinery; we had thus sawn sides and edges. The old description of hand-made deals are still to be obtained at a low cost, and are the produce of districts out of the reach of modern improvements and British enterprise. Hewn timber has undergone little change except a deterioration in quality. In isolated cases they are shipped with sawn sides, the rule being that they are prepared with the axe.

Before proceeding farther, I must dispose of the question of quality between hewn and converted timber. There is a general belief in this country that the worst timber is cut up into deals and the best shipped in the form of squared balks. This is a positive mistake, and we should be nearer the truth if we reversed this order of belief, and said the best wood was cut up into deals, and the worst was shipped as hewn timber. To demonstrate this we have only to bear in mind that the most northern districts of Europe produce the best, most valuable, and close-grown timber, and the southern districts of Livonia and Prussia produce the coarsest, commonest, and

* This article was sent for "Intercommunication" (611), but is too long for that department.

most open grown. In the former case, the timber is all shipped in a converted form, whereas in the latter they are in the hewn shape. Sweden produces a great deal of hewn timber, and from the fact of its cleanness they are able to manufacture deals from the same ports. It does not rank so high in value as Memel and Dantzig timber, as it is small in size and always taper or diminished towards the top end. Running our eyes round the south-eastern shores of the Baltic, we find Stettin, an important seaport on the Prussian coast, to be the most southerly port from which any bulk of timber is obtained. It is always in the form of hewn timber of tolerable quantity, parallel in its length, but somewhat small in size. Dantzig and Pittau timber comes next on the list, and although of a coarser quality, is of more value from its superior size.

Following the line of coast, we are next introduced to Memel, the great leading port for hewn timber. Here we can obtain both size and quality, and a good hearted class of timber. Deals of superior thickness and size to those ordinarily shipped from other ports are here obtained; but the best quality of their timber, if converted into deals, would possess no special value, as it is quick grown and wide in its annular rings (or bait, as it is vulgarly called.) From this fact we are prepared for large knots and faults in the commoner class of timbers, and it is no uncommon thing to see knots, both dead and alive, in the top ends of this and Dantzig timber as large as an open hand. Deals from the port of Memel are cut from the smaller trees; they are nearly all heart deals, and sappy on the edges. Of late years, deals of the ordinary size shipped from Memel have been shipped from Gefle and Stockholm, in Sweden, and deal manufacturing in Memel is nearly discontinued. The port of Riga comes next on the list. The timber from this port is of good quality, but from its peculiar shape, being partly round, or "saddle-backed," it does not possess any special value. Here converted timber begins to form a conspicuous feature, especially in white wood, the quality of which ranks about second in the Baltic ports. As we proceed north we enter the Gulf of Finland. Here timber has considerably improved in quality; it is cleaner, closer grown, but smaller in size; it is highly suitable for converted timber, and they are the first ports we have yet arrived at where deals for wrought purposes are obtained. Narva, on the southern side of the gulf, is a port of considerable importance in the timber trade. Hewn timber here, as in the other ports of the gulf, is rarely shipped. Narva deals are somewhat coarse and wide in the grain, still partaking of the open character of the Memel and Riga timber; but if we cross the gulf to the northern side, a distance of seventy or eighty miles, the wood is much superior, being clean and closer grown. This difference in the distance of the ports, although influencing the quality of the timber in a marked degree, does not represent the geographical distribution of the timber. Deals shipped from Narva on the southern side of the gulf are obtained from timber grown hundreds of miles up the rivers. In looking over a map we might say it is obtained from the forest districts south of Lake Peipus, in latitude 57 deg. and longitude 29 deg. east; on the other hand, if we take the ports of Fredericksham and Wyborg, on the northern side of the gulf, we have timber obtained from the mountainous districts skirting the numerous inland lakes of Finland, and, although we have only a distance of seventy or eighty miles between the ports, we have timber grown at distances of 300 or 400 miles. Petersburg deals, which are shipped from the timber depôt or island of Cronstadt, are not obtained from the district of Petersburg. Petersburg is simply the outlet or mouth of Lake Ladoga, which drains an inland forest district extending upwards of 300 miles north of St. Petersburg.

The distance of the ports has little to do with the qualities of the timber. Narva is only 100 miles from St. Petersburg. This distance of itself could not influence the quality of the timber in any material degree, but through the agency of lakes and rivers they present us with timber goods obtained from forests 500 miles apart, or from the southern and northern forests of Russia. The northern forests of Russia produce a kind, clear, close-grown quality of wood; but the forests of Finland, although producing a clear close-grown quality of timber, is somewhat hard and slightly shaked. For timbering purposes it is far superior in strength to scantlings cut from either Memel, Dantzig, or Riga timbers. As the timber from these ports is clean and large enough to manufacture into deals, we obtain it largely in this form. Hewn timber is occasionally shipped from Wyborg and Ganla Carlby; but, as the size is not superior to Memel, the fact of its cleanness and close-grown texture weighs little or nothing against the extra cost of freight in shipping it to this country. Here they can make deals superior to those of Memel; hence the fact that these ports nearly wholly ship timber in a converted form; whereas Memel wholly ships the hewn class, as it would be of little or no value in the converted form when compared with deals from the Finland ports.

I find it impossible to dispose of the subject without some allusion to Swedish deals and timber. Sweden does not rank high as a district for producing large timber; it is invariably kind and close grown; on the whole, it is more sappy than the Finland and Russian timbers, and is wanting in depth of colour. The whole of the principal ports ship timber in the converted and hewn form. The northern ports produce the best, although not the largest timber. The largest and most valuable are shipped from Sundswall, Luten, Huddikswall, and Heruosand. The former description is worth about 2s. 6d. per load more than the other shipments. They are obtained of great lengths, are chopped at the ends and sides, generally having a little wane on the corners, especially towards the top ends, which run somewhat smaller than the butt ends. They are whiter, softer, and closer grown than Memel and Dantzig timber. Dead knots are not so numerous, but the live knots are smaller and paler in colour. This whiteness of the logs pervades the whole, and when opened may often be taken for white timber. The sap is generally white, and can only be detected by a very practised eye. This combined with its cheapness is bringing it largely into use. The commonest class is imported into this country for mining purposes, and this bids fair to supplant the better class of Swedish timber, as it is seized upon by builders who want long scantlings, or those which are not readily obtained from converted timber. As the sap is not conspicious this can be done with impunity, and enterprising builders are not wanting who have placed down machinery for converting, and are largely using this common mining timber. A glance at the wholesale *ex* ships' prices of the various kinds of timber will throw the best light upon the subject. Mining timber, 8in. and 9in. square, 8d. per cube; small Swedish timber, 10in. and 11in. square, 9½d. per cube; ditto, 12in. and upwards, 11d. per cube; best quality, Swedish ditto, 1s. per cube; common Stettin, per cube, 11d.; best ditto, 1s. 1d.; common Dantzig, 1s.; best Dantzig, 1s. 3d.; common Memel, 1s. 2d.; best Memel, 1s. 3d. to 1s. 5d. This statement will go far to show there are great and weighty reasons why scantlings obtained from hewn timber are not superior to those obtained from converted deals. Battens cut from small trees, against which we are raising such an outcry, are equal in quality to scantlings cut from these small sappy mining timbers; but scantlings cut from the best quality of redwood obtained from the second rate ports are superior to those obtained from the best class of hewn timber.

I wish to be clearly understood on this point. I do not maintain that it is superior in beauty or figure when under varnish, but I claim a superiority in point of strength, owing to its close grown and compact nature. Swedish deals are now forming a great element in our timber trade; their cheapness and the small cost of freight gives them a great advantage over Finland and Russian goods. The best quality of deals are shipped from the ports of Gefle and Soderham; generally speaking, 11in. deals are difficult to obtain good in quality, owing to the limited size of the timber; narrow deals, battens, and boards are the principal goods they produce. This is especially the case in the southern parts of Sweden and Norway. At Christiana there is an excellent class of wood goods, which are grown on warm slopes of the inland mountain chains, and rafted down the rivers in the summer season. They are all narrow, varying in size from 2½ × 5 to 3 × 9. Christiana wood of best quality rates very high in the market, whereas the common goods from that port rates the lowest, owing to the low rate of freight; and the open character of the port. Goods from the various ports in Norway possess no speciality, and may be classed with those of Sweden. Qualities are ruled by price, and are distinguished by marks and brands, a subject too lengthy to enter upon in this instance. I must conclude by hastily comparing the first cost of the two descriptions of best redwood:—

Best Memel hewn timber, per cube foot, *ex* ship . . . . . 1s. 4d.
Best Finland redwood sawn deals, per standard of 720ft., £9, equal to per cube . . . . . 1s. 2d.
Or nearly 15 per cent.

Nottingham. Wm. Stevenson.

GLAZED ORNAMENTATION FOR BUILDINGS.

Rambling a few days since in some of the back alleys leading from Cornhill to Lombard-street, I was agreeably surprised to find that glazed bricks and tiles had been freely used externally. Not for mere ornament, but for use, that use being the reflection of light. It seemed obvious that these glazed walls were considered rather more useful than ornamental. But why should not the two be combined? Why should these glazed or enamelled bricks and tiles be merely employed in back alleys and dark dismal lanes? Why not use them more freely in front streets, and in the principal façades of important buildings? Why keep them out of sight, and exiled to miserable *cul-de-sacs* and other *impasses* of the city? I am fully aware that the external use of *encaustic* tiles is gradually progressing, and extending to our shop fronts: more especially may they be seen let into the pilasters and other recesses of showy taverns and ambitious private houses. These, however, are encaustic coloured tiles, all very admirable in their way. But except for special cases of ornamentation I prefer enamelled or glazed bricks and tiles. They are more useful than the former, and, on the whole, quite as cheap. The latter reflect light freely, the former but slightly, and enamelled tiles have the further inestimable advantage of keeping themselves clean, for are they not washed by every shower of rain? They also exclude damp, and from their composition throw off water freely. Everyone knows that these kind of tiles are of very considerable antiquity, not only for internal but for external work. They may be found in a considerable number of old English houses, where they are commonly called "Dutch tiles," and were extensively used for the decoration of chimney-pieces and fireplaces by our venerable grandparents. These were little pictorial tiles, covered with designs of all kinds, from landscapes to caricatures. Dairies and boudoirs were frequently covered with them. Their employment seems to have culminated with the reign of King William the Third of "immortal memory," and they stood their ground

pretty well through the reign of Queen Anne and the first George. The importation of glazed tiles and "delph" ware was an important article of trade in those days. Every "lady of quality" had her tiles and delph collection. In one of the back streets leading out of Endell-street to Long-acre, existed a few years ago a tolerably fine specimen of this Dutch tile work. It was a large domed bathroom, encrusted with blue and white tiles. It was called "Queen Ann's Bath," and in its pristine state must have been a very fair specimen of this kind of internal ornamentation. It was curious to find a work of this kind in the thick of old Saint Giles's. I am not aware whether it is now in existence. I drew public attention to it at the time, and it was engraved in the "Illustrated London News." Perhaps some kind antiquarian, fond of these reminiscences of old London, may be induced to inquire into its fate.

In Portugal and Spain the internal use of enamelled tiles is of considerable antiquity. They may be found, used for decorative purposes, in many of the old weather-beaten churches and convents not only internally but externally. In the Peninsula they are called "Azulejos." There it is a common practice to cover the lower part of columns, pillars, and walls with these "Azulejos." In some instances each small tile is perfect in itself, as far as the design or pattern is concerned. Thus very often a recess will be merely covered with tiles, each of the same pattern—invariably a white tile with blue designs upon it. In other cases, the whole of the recess or part so covered with tiles will consist of a large picture or design, being made up of many tiles, each bearing its proper part of the general design or picture, such—for instance—as a Descent from the Cross, a Flight into Egypt, or any other subject. In a case of this kind it follows, of course, that after the white tiles have been fixed in their intended place, the design in blue has been drawn upon them, then glazed and burnt in, so as to complete the perfect picture. Large spaces of dead wall are often covered in this manner, and each picture is a perfect subject in itself. They are often drawn with a bold, free hand, and well coloured, as their name imports, with blue, this being the favourite colour. These "Azulejos" are often copies of well-known pictures by old masters, and sometimes are covered with designs by the makers themselves. With ordinary care they seem almost indestructible, and retain all their pristine characteristics to the last. The glaze or enamel seldom peels off, unless subjected to abuse. They wear equally well out of doors, as may be seen in many of the old churches and monasteries of Portugal.

Good examples of this mode of internal church decoration may be seen at the Se Velha, at Coimbia, in the church Nostra Senhora da Piedade, at Thomar, and also in the old church S. Joao Baptista, at the same place, where they have been freely used in the olden time, and still remain; and at Faro in Algarve. I now come to another and more important part of the matter, namely, the employment of glazed bricks and tiles on a large and comprehensive scale for the entire external facings of buildings of any kind, from the street palace to "the cottage ornée." In Lisbon these glazed tiles are now very freely and commonly used for covering the entire fronts of houses. Houses so covered abound in many of the new streets, or where rebuilding is being carried on. There these tiles form an integral part of the building, and are not used simply for mere ornament. The general effect is pleasing to the eye, and their absolute cleanliness is very striking, for they are thoroughly cleansed by every shower that falls upon them. There is no attempt made of any extravagant ornamentation—the whole design is very simple and easy of execution. The tiles are generally white, with blue ornaments; but occasionally other colours may be met with. The process of using them is extremely simple. The whole front of the house is covered with the tiles of a selected uniform pattern, and all the prominent lines, such as stringcourses, window and door heads, with their jambs, are filled in and followed round by tiles of a different pattern, and mostly darker in colour than the tiles used for the mere facing. In many cases, the window heads and door hinges have special patterns, such as scrolls and flowing lines, designed expressly for each particular case, according to the taste, or want of taste, of the owner or his architect. I have already said that the effect of these tile-covered houses is pleasing, and there can be no doubt that where a moderate additional expense is no particular object, very fine effects can be produced by very simple means. Terra cotta ornaments, such as cornices, brackets, balustrades, and other architectural details, can be designed, glazed, and coloured to agree with the rest of the glazed part of the building, and thus from these projecting parts get a greater and more striking effect of light and shade. Setting aside all considerations of ornament, the useful capabilities of tiles so employed may be safely and persistently recommended; their cleanliness is self-evident. They reflect the light and throw off the water, so that little or no absorption takes place, as is too commonly the case with brick and stucco fronts, now so miserably common in our London streets, where "compo" or "black jack" still asserts his supremacy. The example of Lisbon in the free use of these glazed tiles may be safely followed; the rainfall there is often very heavy—indeed, for days together—yet it produces little or no effect on the tiles; they resist very well the alternate vicissitudes of heat and heavy showers, to say nothing of cold, which, however, is seldom very great; but I conceive the alternate effect of heat and heavy rain is quite as prejudicial as frost in our own more variable climate. Glazed bricks and tiles must come into more general and extensive use. They possess admirable qualities for building decorative purposes; they are very durable—indeed, almost indestructible—with ordinary care; and, finally, they are not, nor need be, very expensive. Why should not our architects employ them more frequently in the internal decoration of churches; there is no need to keep to one colour—the "Azulejo" of the Portuguese. Any colour at the option of the architect may be employed.

I have seen excellent and striking effects produced in Italy by merely building the marble in alternate lines of black and white, both for the inside and outside of their churches. How much greater effect might be produced by the warm glistenings and lively light of glazed tiles arranged in masses in architectural sequence! What noble and striking contrasts could be obtained by judicious use of a material so pure and simple as coloured glaze on brick and tile! Many sensible architects now fully expose the raw material of their interior construction for the purpose of getting chromatic effect—common yellow bricks in contrast with red, blue, black, and white; even with these limited means the result is often as striking as it is pleasing to the eye. But how much grander would be the effect if these materials had their own proper colours heightened by a bright transparent glaze instead of the rough dull dead appearance of crude bricks, in which the colours are rarely brought out clear and distinct.

Red Mansfield stone is now apparently the rage with many of our architects, to contrast with the white stones used in the building. But is this contrast sufficiently marked and striking? I think not. Look at the red Mansfield stone employed for this purpose in many of our recent buildings—the new mansions in Grosvenor-place, the Grosvenor mansions themselves, and in the new cloistral colonnade of the clock tower at Westminster. The contrast sought between the red and white stone is not visible ten yards from the works, and very few passers by would be aware that any red stone had been used at all, unless very close, and their attention called to the fact.

In conclusion, it need scarcely be stated that an infinite variety of architectural moulds and ornaments can be made of terra cotta, and for decorative purposes coloured and glazed to suit any style of building, more especially where bright colour and warm tints are necessary to cheer up the "dim religious light" of too many of our modern churches. Besides, many ornaments so designed may be brightly and indestructibly gilt for special parts of the more striking portion of the intended decoration. If I am not mistaken, a gradual and progressive demand for these glazed bricks and tiles is now springing up, and will ultimately lead to the firm establishment of a very useful and extensive development of a comparatively new branch of commercial art, by far exceeding that of encaustic tiles.

Joseph Lockwood.

THE RESTORATION OF THE CHOIR OF CHICHESTER CATHEDRAL.

In giving an account of the restorations which have since 1859 been in progress, it will be unnecessary to describe the Cathedral itself in any detail, or perhaps do more than give the dates of the erection of the several portions of it in order to explain the context.

Bishop Stigand, who removed the see from Selsay to Chichester about 1070, commenced the building of the Cathedral, which being restored and continued after a fire in 1114 by his successor, Bishop Ralph, was consecrated in 1148. The building then consisted of nave, transepts, apsidal choir, with a lady chapel, and two other chapels opening out of the apse and the lower parts of two western towers. A second fire, which occurred in 1187, greatly damaged the whole fabric, and Bishop Jeffrid II. at once commenced its restoration. He altered the arcades, rebuilt the inner wall of the clerestories, and groined the whole from end to end. He also raised on the Norman arches a central tower, and continued up the western towers. There followed these works, the pulling down of the Norman apse, and the building of the presbytery, with other alterations on the plan. During Bishop Neville's episcopate, 1223—1244, a series of chapels were added outside both of the nave aisles, and, finally, towards the end of the fourteenth century, the spire was erected on the earlier central tower. After this period the Cathedral only sustained injury after injury. Windows were inserted here and there utterly regardless of the earlier architecture. The north-western tower was destroyed, and the whole building was left to go to decay. It seems however, that Sir C. Wren restored the spire, and attached to it a curious swinging platform to counteract the pressure of the gales upon it.

In the year 1846, the restorations of the fabric were actively commenced, and under the late Mr. R. C. Carpenter, the architect to the Dean and Chapter, various extensive restorations were carried out in the structure, amongst which were the new high pitch roofs of the two transepts. These and other works were executed under the immediate superintendence of the cathedral surveyor, Mr. J. Butler. But nothing was at this time done to the choir or to the tower.

In the year 1859, Mr. Slater, who was appointed their architect by the Dean and Chapter, after Mr. R. C. Carpenter's death in 1855, received instructions from them to report upon the then existing state of the choir, and as to the best mode of altering the arrangements so as to make the nave available for Divine Service. Mr. Slater's report was submitted to the Dean and Chapter in March, 1859. It is too long to quote *in extenso*, but a few extracts may be given. He writes:—The state of the choir is most unsatisfactory. The stalls, which are for the most part of Bishop Langton's time, with four added by Bishop Sherborne, temp. Henry VIII., occupy their original position (under the central tower). There are eighteen stalls, on each side eight, and returned stalls at the western end against the Arundel shrine. The bishop's throne, pulpit, stall fronts, and seats for vicar's choral and choristers, are all modern, and put in the choir about forty years since. There were galleries over the choir entrance (and for the stairs to this a part of the tower pier had been cut away); a gallery over St. Richard's shrine, and north and south galleries eastwards of the stalls, reached by wood staircases from the aisles; there also existed up to the year 1820 a gallery across the east end. The choir arches were blocked up with wood and

the stonework ruthlessly cut away, and the marble columns removed, and the carving destroyed. The organ stood on the Arundel shrine.

The plan which Mr. Slater recommended has now been carried out as far as funds have at present permitted, though much has still to be done to complete it. He recommended the removal of the Arundel shrine, which he was strongly of opinion was not in its original position, thus throwing open to the nave the whole length of the choir. He advised the retention of the original position of the stalls, where erected by Bishop Langton. The congregation, instead of sitting as they had been accustomed to do in the choir, were now to use the nave, thus leaving the choir proper so entirely free of seats as to be available for ordinations and other great gatherings of the clergy of the diocese. The works were commenced in the year 1860, under Mr. Slater's superintendence. The whole of the fittings and galleries were removed, and the Arundel shrine was taken down. The works were, however, suspended by the falling of the tower and spire in 1861, but immediate steps were taken to rebuild it under the superintendence of Mr. G. G. Scott, R.A., and Mr. W. Slater; it was completed finally in 1866.

The tower being finished, and the scaffolding removed, the suspended works of the choir were resumed under the direction of Mr. W. Slater and Mr. R. Herbert, carpenter. The whole of the stalls, with the exception of those for the dean and precentor, had been completed before the fall of the spire, as was also the marble pavement and the altar, from Mr. Slater's designs; they had been temporarily packed up in the lady chapel during the great works to the fabric. They are now fixed in their places, together with the new throne, the dean and precentor's stalls, the steps, screens, &c., and the particulars of their several designs are described at length below.

THE CHOIR RESTORATION.

Mr. Slater's original scheme for the rearrangement of the choir has now been completed in most of its essentials, though the reredos and organ case, &c., are yet to be erected. He had proposed at first to retain the returned stalls, but this proposal was abandoned, and the dean and precentor's stalls now face respectively north and south. The ancient canopied stalls of Bishop Langton have been re-erected, as before noted, in their original position under the tower. They are thirty six in number, eighteen on either side. Their design is good, and they are very interesting as specimens of a date of woodwork of which few examples are now left. They have been thoroughly restored, and as have also the chancellor's and treasurer's stalls at the eastern end of each block. These latter have bold crocketted and traceried pediments and pinnacles, and differ altogether in their design from the rest of the stalls, thus giving to these dignitaries greater prominence than the others, excepting the dean and precentor. The whole of these ancient stalls have been in modern times painted over in chocolate and gold, but on removing it traces of ancient colour were discovered, and on the chancellor's stall this ancient colour is wonderfully well preserved. The colours used were vermilion, green, blue, and gold, and both on these and on the whole of the canopied stalls. These traces of ancient colour, being of the greatest value, have been most carefully preserved.

THE PAVEMENT.

The levels of the floor and the position of the steps have been entirely changed, to suit the new arrangements. The original Norman Cathedral was nearly level from end to end, the altar being probably raised on a distinct flight of steps in the centre of the apse. In the fifteenth century this arrangement was altered, and the whole choir level raised, there being then an ascent of five steps at the entrance through the Arundel shrine. The altar is now ten steps above the nave, inclusive of the footpace on which it stands. There are four steps at the entrance of the choir, two at the eastern end of the stalls, and three at the altar rails. The stalls being under the tower the three bays of the choir are left clear, and the whole space is laid with a marble pavement, and also the space the stall floors up to the western steps. The richest portion of the floor is that immediately in front of the altar between it and the altar rails. It is entirely of mosaic patterns, difficult to be described in writing, but the general design consists of a square equal to the length of the footpace; within this is a square set anglewise, enclosing a circle in which is a cross, the spandrils being filled in with smaller circles. The cross and the borders and smaller spandrils are filled with elaborate mosaic, in geometrical and other patterns. The marbles used for this portion of the pavement are Brocatella, Rosso Moderno, Verte di Prata, Rosa, Griotte, Sienna, Irish green, and red Serpentine. The central cross has patterns inlaid with Sienna on a common ground of Verte di Prata. The spaces on each side of the central square, and of the altar, are laid with squares of Breccia, Irish green and white lias divided by mosaic borders of Rosa, Irish green and Sienna. The border which runs round the whole is of Rosa, Irish green and Sienna in geometrical patterns. The large space between the altar rails and the stalls is laid with Irish green marble and white lias, in simple geometrical patterns, with mosaic borders of Languedoc red, Sienna, Irish green, and Derbyshire fossil marbles, and white lias. The irregular spaces formed by the recess of the arches up to the parclose plinth is laid with dark Derbyshire fossil marble.

The passage between the stalls has squares set diagonally of Rosa, Babbicombe, Irish green, and Derbyshire fossil marbles, on a white lias ground. The border is of Irish green mosaic in white lias, with angle squares of green Serpentine, Girotte, and Breccia marbles, with bands of Devon black. The footpace is of red Devon marble, and the steps are of red Devon, Derbyshire fossil, and Belgian black marble. The choir aisles are laid with the black and white marble squares which formerly composed the choir pavement.

The parclose screens are of wrought iron, in delicate scroll patterns copied from the ancient examples existing in the choir. They stand in the six side arches on moulded plinths of polished Purbeck marble. The central screen on each side has a pair of gates opening into the choir aisle, which at this point is two steps below the choir level. They have been executed by Mr. Halstead.

The altar is of oak, and the top is formed by a solid moulded oak slab, with the five crosses sunk in it. The slab rests on a heavy moulded cornice, on which is carved "O Lamb of God, grant us thy peace." The columns (six in number) supporting the cornice are very massive in proportion, and slightly tapered upwards, and ornamented with carved scale patterns. The capitals represent wheat ears, with the vine, and the passion flower, and foliage arranged conventionally. On the moulded oak plinth is carved an inscription to the memory of the children of the donor, Mr. I. F. France. The altar cloth has been worked, from the architect's design, by the sisterhood at Clewer, with rich conventional scroll patterns in gold on a ground of red silk, with borders of violet silk. The central compartment of the frontal has a cross, on the four arms of which are worked the Evangelistic symbols, and in the centre the Agnus Dei in coloured silks. The cross and centre are ornamented with jewels in settings of copper gilded and enamelled, executed by Mr. Barkentin, of Regent-street.

The new stalls are the entire length of the ancient stalls, and divided by passages into three distinct blocks; an additional projecting seat and bookboard is provided in front of the central blocks for the chorister boys. The stalls are entirely of oak. It has not been attempted to copy in any way the type of the ancient work of the canopies, as, by doing so, the value of the ancient work would be spoiled, and the new stalls would not be satisfactory in themselves. The main point in their design is the carving with which every end and the long fronts towards the central passage are ornamented. The foliage is arranged in circles and panels, with carved styles between them. With the exception of some purely conventional foliage, the whole of the carving is strictly and faithfully naturalesque, disposed in form and growth to suit the spaces in which it is contained. The carvings represent every plant, flower, and herb named in the Bible. The boys' desks are open, and supported on oak moulded columns with richly carved capitals and brackets. The upper range of stalls is five steps from the choir floor level, and the boys' desks two steps. The oak curb rests on a plinth of moulded and polished Purbeck marble 1ft. high.

The dean and precentor's stalls resemble one another in their design, though the carving in each is different. They have bold overhanging canopies supported on four columns, two engaged, and two standing, but separately. The top of the canopy is square in plan, and has a cresting continued round it, inside which rises a lofty open octagonal spire, pierced, carved, and crocketted, with gables and gablets on its several faces, and surmounted with a richly carved finial; the whole height of these stalls is about 25ft. from the floor. The panels and spaces are carved in harmony with the stalls, and the plants represented are as follows:—The oak, laburnam, sorrel, ivy, bulrush and water lily, lilac and primrose, convolvulus, honeysuckle and daisy, watercress, geranium, fern and nasturtium; conventional and naturalesque foliage are introduced into the book desks of the two stalls.

The last work which has been undertaken, and which is still in some of its details incomplete, is the bishop's throne. It may briefly be described as a square arched gabled and groined canopy, supported on coupled columns at each angle, which rest on the angles of the seat and bookboard. From the canopy rises a lofty octagonal spire, the whole being about 30ft. in height, and designed in harmony with the other modern stallwork. The front of the book desk and ends of the seat are elaborately carved with delicate naturalesque foliage. The central panel will have a sculptured bas relief inserted in it. The supporting columns of the canopy have richly carved capitals and bases. The four arches of the canopy are moulded and cusped, and the pediments above them are also carved and crocketted. The spandrils enclosed are carved, and will have sculptured in them the heads of the twelve Apostles in high relief, and at each angle between the pediments is a column supporting a figure about 1ft. 6in. high, four figures in all. These are the four first bishops of the Christian Church, or rather the first four who had definite sees. S. Timothy, Bishop of Ephesus; S. Titus, Bishop of Cyprus; S. James, Bishop of Jerusalem; and S. Peter, Bishop of Antioch. On the spire above these figures stand four other figures, viz., S. Wilfred, S. Richard, S. Jeffrid, and Langton, all bishops of Chichester. The spire itself is richly carved, pierced and crocketted with carved gablets on its eight sides, with a richly carved finial at its summit.

The brass eagle stands on a marble base in the centre of the passage between the stalls. It is executed by Mr. T. Potter, and is presented to the Cathedral by Mrs. France, as a memorial to her late father.

The great gas standards in the choir have been executed by Skidmore and Co., of Coventry, from the architect's designs. They are 20ft. high, with lights in three circles; they are massive and rich in design, executed in brass and wrought iron work; they are presented by Mr. Wilmshurst.

The reredos has been designed by Messrs. Slater and Carpenter, and is now being executed by Mr. Forsyth; the principal feature in it is the sculpture of the Ascension, the figures of which are life size. The structure is of various rich marbles.

The organ case has yet to be designed, but the organ itself has been altered and re-erected over the stalls in the north arch of the tower, Messrs. Hill being employed for the work.

The whole of the stallwork and throne has been executed by Mr. J. Forsyth, and the pavement by Messrs. Poole and Son. The stall floors plinths to stalls and screens, &c., have been done by Mr. Marshall.

PRIZE DESIGN FOR LABOURERS' COTTAGES.

THE Marquis of Abercorn, K.G., has offered, through the Royal Agricultural Society of Ireland, a prize of £25 for the best design and specification for a labourer's cottage, including yard, and with the requirements of the Cottier Tenant Act (Ireland), 1856. Plans with specifications and detailed bill of particulars, showing quantities and estimated price of each item for a cottage, to cost when completely finished (with offices), the sum of £70 if single, or £65 if one of two or more. The estimate to be based on the average cost of materials and labour in Ireland. The drawings, which must be geometrical, to be made on a scale of one-eighth inch to one foot.

The following are the rules for competitors:—

1. The decision of the Council is to be final and conclusive, and the Society will not be bound to give the prize in case of insufficient merit.

2. The names of competitors shall not accompany designs, but a sealed note shall be attached to each, containing the name and address of the competitor, with a motto on the cover of the note, corresponding with the one inscribed on the design and specification.

3. The designs and specifications awarded the prize shall become the property of the Society, and the unsuccessful designs will be returned to the competitors, if called for at the office, 42, Upper Sackville street, within one month of the date of the decision.

4. The imperial weights and measures shall be used in all calculations, and no prize shall be awarded for any design which has already appeared.

The designs and specifications must be forwarded, prepaid, to the secretary, J. Badham Thornhill, 42, Sackville-street, Dublin, on or before Tuesday, the 28th January, 1868.

PROPOSED THAMES SUBWAY.

Fig. 2.

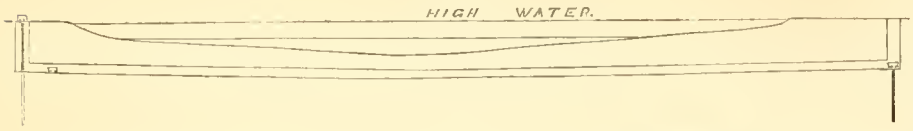
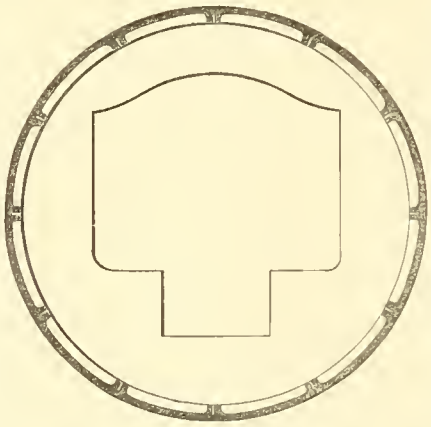


Fig. 1.



PROPOSED THAMES SUBWAY.

A QUESTION immediately demanding attention, and one which will tax all our energies to answer in a satisfactory manner, is how are we to relieve the streets of London from the pressure of the increasing traffic. An act has been lately passed for its better regulation, but the temporary relief thus obtained will soon be absorbed by the increase of trade, and some more lasting remedy must be devised. The most effectual remedy would perhaps be to widen the present streets, and to construct new ones, but this is prevented by the value of the space that would be wanted for their construction. The only other feasible plan proposed is the conveyance of passengers either above or below the streets. The overhead method has this great objection—that it occupies the surface to a great extent, and interferes with existing buildings. In the subway system no interference occurs except at the stations. We have received a pamphlet, by Mr. P. W. Barlow, strongly advocating a subway omnibus system. According to his plan, the tunnels are single and constructed in cast iron, and in such a manner that no interference is required with the surface of the ground except at the shafts; no stations are to be erected, passengers paying in the carriages as they do now in omnibuses; thus great expenditure is avoided and time saved. Locomotives are avoided by reducing the power required to an insignificant amount by making all stopping places with a fall or dip between them to obtain velocity. A company has been formed for the construction of an omnibus subway on these principles, a quarter of a mile in length, under the Thames, about a third of a mile below London Bridge. An act will be applied for this session, but arrangements for the land required are already nearly complete. The method proposed nearly resembles that adopted by Brunel in the Thames Tunnel, namely, a shield fitting the shape of the tunnel is propelled forward by screws, so that the brickwork exactly fits the excavation. The projected tunnel, however, will be constructed of iron, the shield will be surrounded by a cylinder overlapping the tunnel, and sides will always be water-tight. The excavation required will be comparatively small, not more than a diameter of 8ft., and thus the shield may be forced through the clay with very great power. The total estimated cost of the subway is £34,000, the items being 4,000 tons of iron at £7 per ton, and £6,000 the cost of excavating 10,000 cubic yards, at 12s. per yard, this being double the usual rate. Mr. Barlow thinks that, as a general rule, £60,000 per mile for single lines may be estimated, this to include the cost for the land occupied by the shafts. The omnibus will be constructed of steel, and will weigh, with a full load of twelve passengers, two tons, and, according to Mr. Barlow's calculations, the power of two men will be sufficient to propel the carriage. This appears at first rather incredible, but Mr. Barlow says "when it is considered that an ordinary omnibus with a full load, weighing double my carriage and load, is propelled on a macadamized road on inclines occasionally of 1 in 20 by two horses, it is not difficult to understand that a perfectly made omnibus of steel plates on steel rails laid with gradients especially adapted to start the carriage into velocity, will not require a greater power than one man."

The ascent and descent of the shafts is not to be made by stairs, but by hydraulic lifts, and thus, in the general application of the system, the stations are not prevented from being on a level, as these lifts will without difficulty ascend nearly 100ft.

We give an illustration of the Thames subway. Fig. 1 represents a cross section of the tunnel with that of an omnibus 10 per cent. above the ordinary dimensions. Fig. 2 shows a longitudinal section of the subway and shafts.

WROUGHT-IRON ROOFS FOR WORK SHEDS, COVERED WAYS, &c.

ONE of our lithographic sheets represents some examples of wrought-iron roofs for work sheds, covered ways, &c. The covering of these roofs may be of the following materials, to suit price, locality, or preference of the company or firm who require them. Galvanized corrugated iron of from No. 16 to 20 gauge, the sheets to run from purlin to purlin, the sizes and weights to be obtained from the merchants are :—

		Weight per square. cwt.	qrs.	lb.	Square feet. per ton
No. 16 gauge,	6ft. by 2ft. to 8ft. by 3ft.	3	0	14	800
,, 18 ,,	6ft. by 2ft. to 3ft. by 8ft.	2	1	6	1,000
,, 20 ,,	6ft. by 2ft. to 8ft. by 3ft.	1	3	6	1,250

Zinc is always attainable from the Vieille Montagne Company's agents in sheets :—

8ft. by 3ft.,	No. 14 gauge,	weighs 21oz.	13drs.	per square foot.
7ft. by 3ft.,	15 ,,	,, 24oz.	0drs.	
7ft. by 2ft.,	16 ,,	,, 26oz.	3drs.	

It may be rolled of any lengths under 12ft., but for specially rolled sheets about a month's notice should be given, and for lengths over 10ft. an additional cost of about £2 per ton is charged as extra for rolling.

In covering a roof, it should be so arranged as to be perfectly water-tight and yet free for expansion and contraction, as laid according to the methods of the company's architects. The strength allowed in large roofs for wind and snow will be always sufficient without adding anything for zinc covering. Each sheet, it should be observed, ought to be stamped with number of gauge and company's name, to ensure a good quality of metal.

All of the ironwork in principal or any portion should be submitted to such tests as the engineer may think fit to apply, and should be of the best quality and capable of sustaining a tensile strain of at least twenty tons per inch of sectional area. The length of louvres must be regulated according to the ventilation required, but in covered ways may be dispensed with altogether.

The diagram on the top of the sheet, showing a span of 15ft., is arranged to receive a covering of rough plate glass. The louvres on top need not run all along, but be of sufficient length to ventilate the building, which will vary to suit the work carried on underneath. In case of being used over a covered way, louvres can be dispensed with, as both ends being open sufficient ventilation will be afforded.

In estimating cost of ironwork an allowance of about 5 per cent. should be made for waste.

THE LODGE—TAILORS' BENEVOLENT INSTITUTION, HAVERSTOCK-HILL.

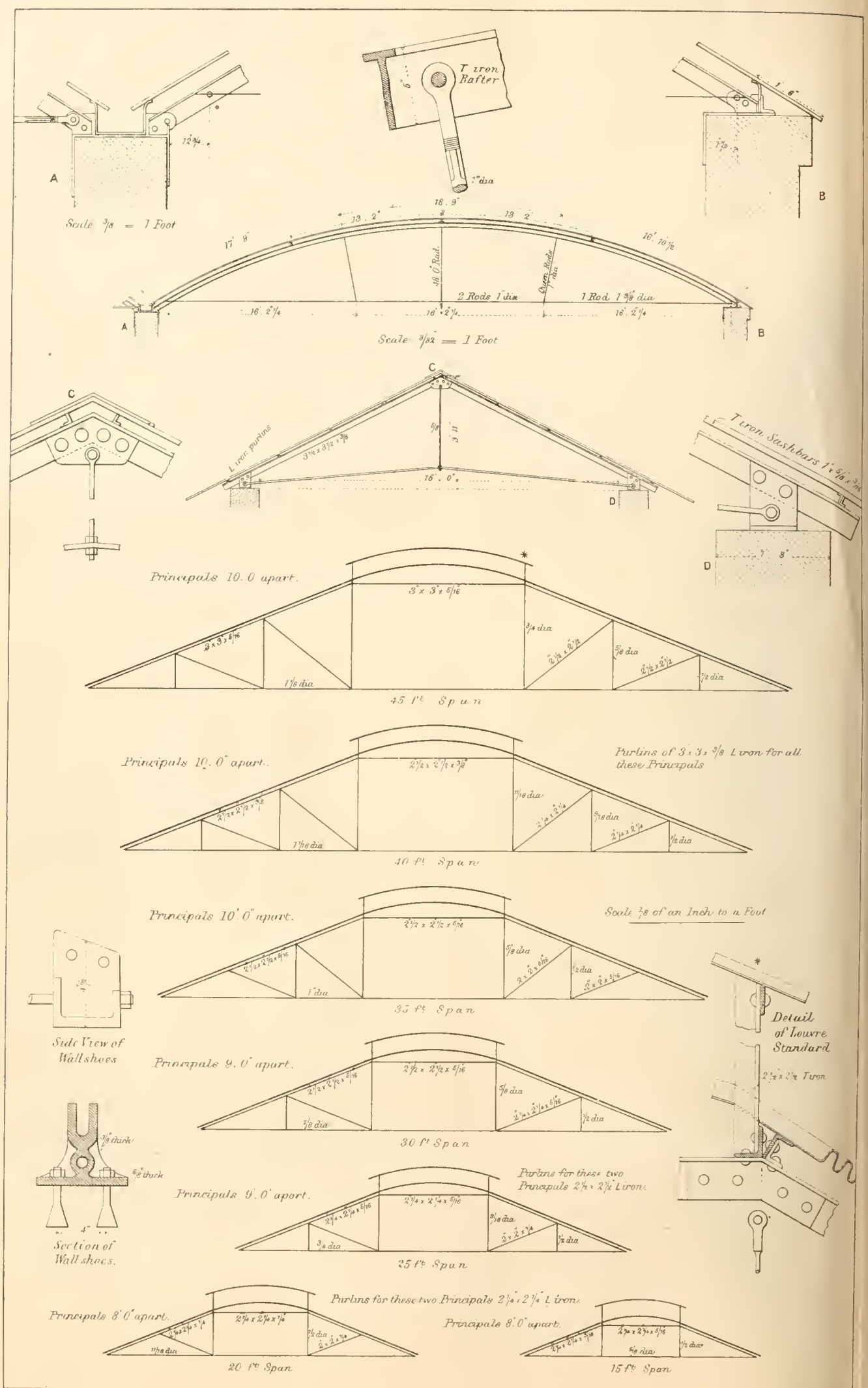
ONE of our lithographic illustrations this week represents the lodge of the Benevolent Institution for Journeyman Tailors, Haverstock-hill. It is part of a series of works carried out a few years ago by Mr. C. F. Hayward, architect. The illustration is on so large a scale that it seems hardly to require any further description, but we may remark that the Institution itself is the result of a strike which took place in the year 1836, when, after considerable disagreement between masters and men, they united in one cordial effort to establish an asylum for the aged and infirm journeymen, who should themselves have subscribed during their time of health and strength to the objects of the Institution. A better way of concluding a strike could not be devised, and such is the great success of the working of the Institution that if all strikes were attended with the same results they would come to be considered even by the masters as far from unmixed evils. We do not, however, hear of any such conclusion to the late disastrous contest between labour and capital, but perhaps if one of the great court tailors, like Stultz, in 1837, would set the example, another institution, or at least an extension of the present one, might be established. It should be observed that no master tailor can by any means participate in the benefits offered, but the candidates, many of whom are out pensioners, and can thus support themselves amongst their own families, must have been *bonâ fide* journeymen tailors. The chapel attached to this Institution is a very carefully kept little building, not without some pretence to good architecture.

MEDIÆVAL HERALDRY.

IN Gothic architecture, remarks Mr. Boutell, in his new work on this subject, heraldry is always a consistent, beautiful, and most effective accessory. Indeed, so thoroughly is the spirit of heraldry in harmony with the great architecture which grew up in the Middle Ages, that heraldry must be considered rather as an element of its nature than as an allied art. Gothic architecture is essentially heraldic; and hence, as well as from its elastic nature and its equally consistent and happy applicability to every use and requirement, it is peculiarly appropriate as our national style. From the earliest years of its existence as a definite science, heraldry is found to be most intimately associated with the Gothic architecture of England; and happy it was for the early heralds that in their days the English Gothic was at work in the full strength of its first maturity. And this alliance was never interrupted or permitted to decline from its original cordiality. As long as the Gothic flourished, heraldry held its own place in architecture. And in the finest works that exist among us, relics of the grand Gothic ages of English architecture, heraldry is ever present to adorn them with its graphic records. In the spandrels of arcades, in panels, upon bosses in vaulting, in stained glass, in encaustic floor-tiles, and indeed in almost every position in which such ornamentation could be admissible, the early herald is found to have been the fellow-worker with the early Gothic architect. Gothic architecture accordingly has preserved for us very noble collections and specimens of the most valuable illustrations of our national heraldry. Canterbury and York Cathedrals, and the Abbey Churches of Westminster and St. Alban's, with the Chapel of King's College, Cambridge, are especially rich in heraldic treasures; and Westminster Hall, and the northern castles of Alnwick and Warkworth may be specified as noble examples of secular architecture which retain their heraldic enrichments.

The Council of the Society of Arts will hold a conference at their house, in January next, to consider measures to be adopted for promoting industrial and technical education among the different classes of the community. Representatives are invited from the chambers of commerce and agriculture.

WROUGHT IRON ROOFS FOR WORK SHEDS, COVERED WAYS &c.



H. Abbott, Lith.

Printed by Whiteman & Glass

D R Warry lith

The Lodge Tailors' Benevolent Institution Haverstock Hill.

Mr C. F. HAYWARD, ARCHT

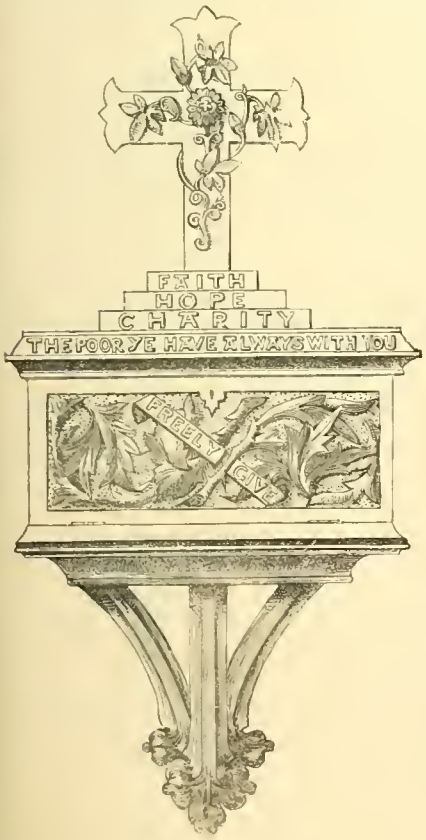
The Art Student.

WOOD CARVING.

WE recently noticed an able and interesting paper on the preservation of wood carvings, with special reference to those of Grinling Gibbons, many of whose works are unfortunately in a state of great decay. The paper was read before a meeting of the Institute of

BRACKET COMPOSED OF BULRUSHES.

Architects, by Mr. W. E. Rogers, whose labours in this direction are well known. This gentleman's son, Mr. George Alfred Rogers, artist in wood to the Queen, has just published a small work on the art of wood carving.* "With the exception of illuminating," says Mr. Rogers in



OAKEN ALMSBOX.

his preface, "and, perhaps, a few sister arts, wood sculpture or carving appears to be the most useful and entertaining recreation which has for some years been admitted into fashionable circles." This work, accordingly, is specially intended for the benefit of amateurs, to whom it furnishes a variety of really practical hints in the art. In a series of short chapters, Mr. Rogers gives his experience on the necessary tools and materials, on the choice of woods, on fixing the work, on carving in relief, on fretwork and perforated carving, on bold work, on staining, oiling, varnishing, and polishing, and on various other subjects in connection with the art. A supplementary and very interesting chapter is devoted to the "Antiquity and History of Wood Carving." The work contains twenty plates, being designs for panels, portrait, and looking-glass frames, brackets, and such like. These are executed in a variety of styles, and the design in every instance is extremely tasteful, while some of the designs are exquisite. We have selected two blocks from the work for illustration. They are among the very best things in the book. The one is a bracket composed of bulrushes; the other is an almsbox for a church, carved in oak, we believe, by a young lady, a pupil of Mr. Rogers. This almsbox, we understand, has been purchased by the churchwardens of St. Michael's Church, Cornhill.

* "The Art of Wood Carving," &c. Virtue and Co. Price 5s.

AN ART MASTER'S VIEW OF THE PARIS EXHIBITION.

THAT a love of art and appreciation of everything artistic is more general among our neighbours across the Channel than among ourselves is an undisputed fact. It is believed that as a man's conduct is considerably influenced by the company he keeps, so artistic taste is, in a manner, a Parisian's birthright, from the fact that, from his birth onwards, no matter what his sphere of life may be, all that meets his eyes, the furniture of his house within, the architectural features of his house without, the streets, the shops, the public buildings, the parks, the glorious unparalleled art galleries, imperceptibly imbue his mind with a love of the beautiful. This unconscious education of the taste bears an important share in producing the acknowledged superiority of the French art-workman over those of this country. There can be no doubt that the influence of his artistic surroundings, coupled with a clear sky and a pure atmosphere, do as much to educate the taste of the Parisian as any special efforts of an educational system. Our variable climate, and atmosphere laden with the impurities produced by our manufacturing industry, effectually depreciate anything artistic exposed to their influence. Remove the Arc de Triomphe from its present commanding site, and place it at Leeds Bridge, instead of eliciting admiration, in a month's time it would be an eyesore. Could Aladdin, with a rub of his wonderful lamp, transport the Palace and Gardens of the Tuileries, and make room for them in the midst of Manchester, he would soon feel that his property was fast deteriorating in artistic value, and would hasten to replace them before their beauty was entirely obscured. It is not, therefore, that the French art-workman is by nature more apt to receive and utilize art instruction than the British, but his opportunities are greater, and his examples more abundant. At a time when technical education is being widely advocated, when a desire to educate our workmen by a more comprehensive and effectual scheme than any yet attempted is expressed by able men, too much should not be expected of our workmen, since they lack the great influences constantly before the minds of their French brethren. It is well known that the French art-workman, with his eye and hand trained at a school of design, and his mind stored with art examples, is not only expert in the mere execution of his work, but possesses a true knowledge of and fine feeling for the design on which he may be engaged, and can, if required, originate as well as execute, which can only in a very few instances be said of the English art-workman.

A visit to the Paris Exhibition only confirms the fact of our general inferiority in the matter of artistic design, and an examination into the course of study which produces the designer is interesting, as affording us hints to pursue the same in its best features. The first general survey of the exhibited works of the students of French schools of design is in no way striking, and it is only after carefully studying the specimens hung on the walls, and looking through the many portfolios, that we can properly estimate the value of the instruction given in these schools. There does not appear to be any system of instruction common to all the schools, but it rather seems that each school follows an independent course—the system thought best by each individual master. The drawings and models exhibited by the students of the schools of M. E. Levasseur and M. Lequieu, fils, are the best shown. There are a great many drawings shown in what seems to be a favourite study, viz., chalk and charcoal drawings of heads, from copy and from life, and many really effective drawings from busts and the antique. The course of instruction pursued in the English art-schools is exemplified by the framed drawings exhibited by the Department of Science and Art, but it is to be regretted that these examples are not, like those of the French schools, the work of ordinary *bonâ fide* students, instead of that of masters or masters in training. Examples of most of the stages, the work of artizan students, might easily have been obtained from the provincial schools to illustrate the course of instruction, and would thus have afforded better and truer grounds for a comparison with the foreign schools. The system of art instruction planned out by the Department of Science and Art, and followed by all the provincial schools of art, is, perhaps, the best and most comprehensive in the world. Ranging through twenty-three stages, beginning with the mere elements of drawing, and progressing through all the stages of drawing, painting, modelling, and technical instruction, this system is undoubtedly the most excellent and complete ever devised. That hitherto it has not done more to raise the general taste of the country may, in part, be due to the fact that sufficient latitude in the use of examples and working material has not been allowed, and thus considerably shorn the system of its merits. This has been felt, and the central authorities have lately very properly relaxed somewhat in their restrictions as to the examples to be used in the schools, but there is still an adherence to certain laborious methods of producing drawings, which might be abandoned with the very best results following to the students. In this respect, a reference to the methods adopted in the French schools might be of advantage. Whereas in our schools, a student is required to shade a bust or piece of ornament strictly and entirely with the pointed chalk, producing often excellent drawings, marvels of patience and fine manipulation, but at the expense of much valuable time, the French student will sit down, and with charcoal and wash-leather, and the occasional aid of the pointed chalk, produce in a few evenings an effective drawing, in no way inferior in truth of form or delicacy of shade to the more elaborated point-work. In this matter the South Kensington authorities would do much towards the advancement of artistic power among students by taking a hint from the usages of the French schools. As the drawings produced in all the schools of art in the kingdom are annually sent to London for examination, it is natural that such works should be executed in these schools which accord in size, character, and manner of execution with the requirements of the Examiners, and therefore, so long as wash-leather and stump are tabooed, provincial masters hesitate to use them, although convinced of the saving of time and gaining of drawing power which their adoption would secure.

Another prominent feature of the French system is the great attention evidently given to the subject of mechanical drawing. The works shown comprise bold outlines of ma-

chines and details of machinery, and tinted drawings from copy and model, with the shadows carefully projected. For this study we have very few English examples to use preparatory to drawing from the machine or model, the best being the set of plates published by Blackie and Son. But, however excellent they are as exponents of the first principles of mechanical drawing, yet there is a desideratum which has again to be supplied by the French. A fine set of tinted examples of machines and details of machinery, published in Paris by Mourocq, Frères, are found to be highly useful, but a similar set of examples of English machinery and tools is much wanted, as they would be of pattern and design more familiar, and therefore more useful to students. As mechanical drawing is in many schools of art the most important branch required by artizan students, it is unfortunate that the Department of Science and Art, established for the dissemination of art knowledge among the working classes, should not encourage this branch of their system in an equal degree with the more artistic subjects. At one time as much encouragement was given to the study of mechanical drawing as to the other studies, but lately the highest rewards have been withdrawn, and it is only an exceptional case if a student gets a national reward for it. Seeing that it is so important a study in the majority of schools, it would be well if it were put on the same level with other studies, and if students to whom no other branch of drawing is of any practical value could participate in the competition for national medals and prizes.

Looking at the show of drawings of the French schools in the aggregate, and comparing it with the exhibition of selected works of all the English schools annually held at the South Kensington Museum, the palm must certainly be awarded to the latter, for the variety of art subjects represented, and the evidences of a matured and excellent system of instruction; but for true art power in the study and treatment of light and shade, the French excel us in no mean degree. If, in the production of drawings, what is lost in time be gained in finish, yet if with the saving of time there be an accompanying gaining of knowledge and power, every means should be adopted to attain that desirable result, since art knowledge and art power are infinitely more valuable than mere manipulative finish. It must be admitted that no arbitrary restrictions as to the material or size ought to stand in the way if they restrict or repress in any way the attaining of true artistic taste or feeling. With a few alterations, suggested by the examination of the drawings of the French students, the system of art education, as at present administered by the Science and Art Department, would be all but perfect. There is no doubt that this system, from its completeness in detail, and its national character, if freed from some of its present restraints, is eminently calculated to fulfil the great work of its establishment—viz., the extension of a knowledge of art among the people, and a consequent and gradual removal of the stigma of want of artistic taste.

ANDREW STEVENSON.

School of Art, Leeds.

FRENCH AND ENGLISH SYSTEMS OF ART EDUCATION.

MR. RAWLE'S observations in last week's number of the BUILDING NEWS touch some important points in our art and technical education. We have certainly to equal the French by the same means, if not to overcome them by better. One great principle Mr. Rawle has not sufficiently enforced is the study of nature, while he has dwelt much on models and drawings. Nature in every aspect, and particularly the human figure, was the lesson held forth long since by the reformers of the schools of design, and one never yet fully attended to. This is closely connected with colour, the study of which is not embraced in the valuable recommendations of Mr. Rawle. If we are behindhand in the treatment of form, we are still more behind in the treatment of colour, and yet, perhaps, this may become our strong point, for in oil and water-colour our painters yield to no modern school. There is, indeed, no inaptitude of Englishmen, either for form or colour, and for form it will be sufficient to refer to one name of European reputation—that of Flaxman. The power of dealing with form and colour, and the power of appreciating them, are necessarily connected with the cultivation of taste, in which the English public are so lamentably deficient. There is nothing like the study of nature for bringing about the desired reform, and this can be effected, for there is a genuine love of beauty in England, whether as regards still or animated nature. No where is beauty so highly prized, in its highest examples in women, as in the lower animals, as in the wide landscape, or in choice flowers which adorn it; and yet, when beauty is to be selected, not from nature, but in its artificial presentation, we are behind most of the world. This is a fault evidently not innate, but the result of training, and there must be a remedy, and that remedy within our grasp.

The practical suggestions of Mr. Rawle as to the instruments of study are most pertinent. By all means let there be the strictest training for accurate delineation, and do not let the crayon point be abandoned. But there is a stage beyond. So far as the mere copying of objects and drawings is concerned, so far as the creation of the accomplished copyist is concerned, the longer the close training is carried on the better. This, however, is not the career proposed for all, or even most, of the students in our schools. They are required to compose more or less, and it is in its application for this purpose that our way of training fails. We keep to the scheme of the copyist when we require more freely to develope the powers. The use of the stump and point, as Mr. Rawle remarks, favours rapidity of work, that is, it is useful for two things, the readier collection of examples, and the quicker realization of conceptions. The processes are, indeed, educationally distinct. "Time sketching" and "drawing from memory" are, in fact, but the application of methods familiar in other branches of education. Thus, in the lower process of dictation, and in the higher of composition, the competition against time is recognized in our schools. So, too, with the cultivation of the memory in the schools by the acquisition of tasks, and by repeating them, and in music by playing from ear, as it is called. It may be remarked that this is as much neglected in the teaching of music as in the teaching of design, and the result is similar. The pupil can only work from models, and without models can neither amuse nor instruct himself nor others.

The study of geometry gives a great power to the French, and has been neglected here. This has been long known, but has been little redeemed. I would go a step further than Mr. Rawle, because I would particularly advocate the study of the curves in their due development, as taught by the late Mr. Joseph Jopling, the architect. Geometry, when considered as limited to a few simple forms, is rather an impediment and restriction to the mind of the student, but when so applied as to show the wonderful fertility of forms it contributes to the development of creative power in art. Mr. Rawle's proposition of separate sets of medals for designs for art manufactures is almost a disgrace to us, for it is so simple and so necessary that it ought long since to have been in operation. Mr. Rawle dwells on the want of better examples of plant form, shaded and in outline, shaded examples of ornament, a more comprehensive set of outline examples of ornament, &c., for free hand drawing; and also some good studies of the human figure, from the antique and from the life, shaded and in outline. Assuredly I cannot but repeat that the want is less in these artificial and mischievous substitutes than in the want of better examples of plant form from nature, the study of ornament from plants, and, above all things, the study of the human figure, not from the antique, not from drawings, but from the living being of our own day. This is the true aim and end of art instruction, and until we come to that we do little or nothing. The learner will not appreciate the antique till he has studied the living figure as it is available to him, and seen how far nature is available in extending his acquaintance with form beyond the few set examples the antique furnishes us with. There is no child so young in our national schools that cannot be placed to draw from a natural object as easily as from a drawing, with some more trouble to a master at first, but with much greater satisfaction.

Mr. Rawle's suggestion of purchasing the student's drawings has this of just in it that it will make the schools true records of individual progress, and this of unjust that it unduly amerces the public. Surely, the student has received some benefit from the public, and it is a small thing for him to follow out the very old custom in guilds, and one observed by the members of academies, of presenting a masterpiece. The public is eternally taxed for trifles, and disgusted from providing for important objects.

HYDE CLARKE.

Mr. Rawle says, in his excellent article, that it is inexpedient to send any of the paintings belonging to our national collections to art schools. Why cannot chromo-lithography be used in the place of these pictures. There are a great many of them in existence from which the Science and Art Department might choose some that would be of use, or they could, by giving large orders, get new ones at a comparatively low price. ADELPHI.

The extraordinary talent of the Tyrolese peasants for wood carving is well known, and the work produced by them is, in some cases, of surpassing excellence. In consequence, however, of the lack of competent instructors, these self-taught artists only attain, as a rule, to a certain degree of proficiency. The director of the Science and Art Museum, at Vienna, proposes to supply this want by the formation of schools furnished with thoroughly efficient teachers, and, by this means, to enable their productions to appear satisfactorily, in the markets of Europe, with those of Holland and Bavaria, and thus open a new source of gain to the country.

ART WORKMANSHIP PRIZES.—In the annual report of the Society of Arts just published, it is stated that the Society is directing its attention to the encouragement of art workmen by offering premiums for works in wood carving, modelling, repoussé and hammered work in metal, chasing, ivory carving, painting on enamel and porcelain, marquetry, glass engraving, &c. For the present session the Society offers eighty-seven prizes, particulars of which may be had on application to the secretary. The Worshipful Company of Goldsmiths and the Worshipful Company of Salters have contributed to the prize fund. The articles sent in by competitors are exhibited in the Society's rooms, for the inspection of members and their friends.

TORQUAY.—The Torquay School of Science and Art, although only in the second year of its existence, is giving hopes of gaining a fair position, and of ultimately being very successful in the competitive examinations in connection with South Kensington. The second annual meeting was held last week at the school, which was crowded with a gay assembly, including Sir T. Lawrence Palk, Bart., M.P., and Lady Palk, A. B. Sheppard, Esq., past president, E. Vivian, Esq., president, the Rev. C. E. Strong, M.A., honorary secretary. The secretary's report was very gratifying, and showed that in the science classes (Mr. Viccars, master), 35 had gone in for examination in animal physiology, acoustics, light, and heat, of whom 27 had passed with prizes, and 6 with Queen's prizes. In the art classes (Mr. T. Holme, master), 20 had passed and 17 prizes awarded, and that some of the works had been selected for national competition. Several other prizes had also been given by friends. Lady Palk, assisted by the Rev. C. E. Strong, presented the prizes to each of the recipients, with a few congratulatory remarks. Sir Lawrence Palk addressed the students in an excellent speech on science and art education, and complimented them on their marked improvement, and was delighted at the success of the institution. The proceedings terminated with the presentation, by the students, of a very handsome illuminated and inscribed portfolio, containing some of the first fruits of the School of Art, to A. B. Sheppard, Esq., the retiring president, for his zeal for their welfare, which was received and acknowledged amidst much applause.

MURRAY v. GILES—LANGHAM HOTEL.

THIS was an action in the Queen's Bench, before Mr. Justice Shee, brought by the plaintiff, Mr. Murray, of Portman-street, against Mr. Giles, of Craven-street, Strand, for the detention of certain plans, fifty-three in number, designed for the construction of the Langham Hotel, Portland-place. It appeared in evidence that Mr. Giles was the successful candidate in a competition for the appointment of architect to the Langham Hotel Company, and was appointed, accordingly, in October, 1862; but the designs of

Mr. Murray for the interior of the proposed building being much liked, at a subsequent meeting of the directors, they arranged for the two to act as joint architects. The agreement appears to have been that Mr. Giles should receive commission on the first £75,000 expended on the building, and Mr. Murray on the second £75,000, and the commission on anything over £150,000 was to be divided into equal shares. The building in all cost £200,000. After the completion of the building, all the plans, with but few exceptions, were returned to Mr. Giles, and Mr. Murray at once claimed those which he had drawn in his own office, or those which had been done at his direction or his expense, out of his office, by persons in his employ. This request Mr. Giles declined to accede to, but offered Mr. Murray copies, or to deliver up the whole of the plans to the company, or to refer the case to arbitration. These offers were refused, and the action was brought to recover these plans. Mr. Hannay and Mr. Hume Williams were counsel for the plaintiff, and Mr. George Browne for the defendant. The counsel for the plaintiff contended that Mr. Giles and Mr. Murray were merely joint architects: whilst the counsel for the defendant said they were not only joint architects but partners in the work. This was the question which the judge left to the jury, who, after being locked up for some time, found for the plaintiff, and the judge ordered the drawings, admitted by the defendant to be in his possession, viz., fifteen in number, to be delivered up to him, and certified that he was entitled to costs.

ROYAL SCOTTISH SOCIETY OF ARTS.

THE opening meeting of this Society was held at Edinburgh on Monday week. An able introductory address was delivered by Mr. George Robertson, F.R.S.E., the President, who took for his subject "Recent Marine, Hydraulic, and Sanitary Engineering in Scotland." The following is the most interesting portion of the address:—The east breakwater, which was lately completed at Granton, has a total length of 3,170ft. This breakwater shelters 53 acres from the north-east wind, making the total area of the harbour 30 acres. A timber wharf 800ft. in length has been erected on the west side of the harbour, in immediate connection with the Caledonian Railway, and fitted up with two 20-ton cranes for shipping coal, and other cranes for general purposes, all worked by steam. Since the year 1835 the Duke of Buccleuch has expended an aggregate little short of half a million on this munificent private undertaking. The North British Railway Company are making a harbour at South Queensferry, consisting of a basin forty acres in extent, connected with sixty acres of ground for trade purposes. There are to be two piers, one for the passenger traffic across the Queen's ferry, and the other for the coal and goods traffic. These piers are about 400 yards long, and they are laid out so as to allow engines and trains from the Queensferry branch to approach all parts of them—the object being to enable large vessels to take in a cargo of coals in twenty-four hours. The new Leith dock is to be fitted up with Sir William Armstrong's hydraulic machinery for opening the dock gates and lifting the shuttles of the filling culverts. The cranes and capstans round the dock will also be worked by water power. The pressure of the water is obtained, and kept up, by means of steam power applied to pumps, which force the water, at a pressure of as much as 700lb. per square inch, through the pipes which convey it to the point of application. The superiority of this system over steam power applied directly, lies in the concentration of the steam power into one or more engines erected in places out of the way of shipping or warehouses, and consequently not likely to expose them to the risk of fire, and in the greater care with which it is managed. The value and economy of the principle consist in a large saving of manual labour, and in the rapidity with which work can be executed. The system of hydraulic machinery round a dock has, not inaptly, been compared to the circulation of the blood, in which the steam-engine represents the heart, the throbbings of which send life and energy through the arteries to the most distant extremity of the body. Most of the docks on the Thames, Mersey, Tyne, Wear, and Humber in England, as well as the Welsh docks and other places, have this hydraulic machinery; but Leith will be the first port in Scotland to make use of water power as a system. The harbour in process of construction at Anstruther is meant as a companion to the recently formed one at Dunbar on the opposite shore, both being intended chiefly as places of refuge for the boats engaged in the herring fishing about the entrance to the Forth. The eastern pier, which has to resist the full force of the sea, is to be about 1,200ft. in length, extending from the top of the beach into a depth of 9½ft. at low water. It is being constructed on a quay, with a protecting parapet 17ft. above high water. The faces of the walls are formed of freestone ashlar set on edge. The construction differs from that at Wick Harbour, chiefly in the character of the building above low water, which is all set in Roman cement. This permits of small material being used for backing, as the whole becomes a monolithic mass in a few hours after it has been built.

LABOURERS' DWELLINGS.

THE Health Committee of the town of Liverpool is at present sitting in judgment on some seventy or eighty plans which have been sent in to compete for the £200 prize offered some time ago for the most effective scheme of covering a portion of land belonging to the corporation with labourers' dwellings. The plans are now on view at the exhibition room, Old Post Office-place, where they will remain, we believe, for two or three weeks. We shall, most probably, next week give our readers an account of the exhibition in detail. For the present, we content ourselves with the following particulars which appear in the "Liverpool Mercury." The number of drawings is so great that they cover a broad space of wall in the two principal rooms, and occupy several large screens besides. There are several hundreds of them, and it has been estimated that simply to copy them would give one man occupation for something like six years. The competitors "hail" from all parts of the kingdom. From London there are numerous contributions; the provincial towns have sent several; Ireland and Scotland are also represented; and, of course, there are a good many Liverpool men in the lists. It was at the option of the competitors to give their real names or to adopt a *nom de plume*, and many have preferred the latter course. Nearly all the plans are evidently the production of professional men, but two or three bear unmistakable proof of being the work of novices. Some of the elevations are very beautifully executed, and must have occupied their authors considerable time. The following are those who have subscribed their names:—Mr. Howett, architect, London; Mr. T. Reynolds, architect; Mr. W. Cole, architect, Birkenhead; Mr. J. G. Gladwin, Stoke-upon-Trent; Mr. F. A. Sloman, Great Yarmouth; Mr. H. S. Thomas, Great George-street, Westminster; Mr. Robert Argile, Derby; Mr. Isaac Farrel, Dublin; Mr. Owen Williams, Liverpool; Mr. G. H. Rollett, Liverpool; Mr. J. S. Lambert, London; Mr. Nelson, London; Mr. G. Thompson, Birmingham; Messrs. Wadham and Turner, Barrow-in-Furness; Mr. W. G. Wallis, London; Mr. J. G. Hay, Edinburgh; Mr. W. L. Moffatt, Edinburgh; Mr. John Hall, Leeds; Messrs. Douglas and Stevenson, Glasgow; Mr. John Brown, London; Messrs. Habershon and Pite, London; Messrs. Walford and Donkin, Westminster; Messrs. Lang and Littler; Mr. Joseph Boult, Liverpool; Mr. John Glover, Liverpool; Mr. G. Ridley, London; Mr. G. Williams, Liverpool; Mr. John Reeve, Liverpool; Messrs. Reade and Goodison, Liverpool; Mr. J. G. Crofts; Messrs. Williams and Decamp; Mr. G. Northcroft, Liverpool; Mr. W. Sharp, London; Mr. W. H. Servin, Leamington; Messrs. W. and R. Duckworth, Liverpool; Messrs. Longson and Adams, Liverpool; Messrs. Green and Parsco, Liverpool; Mr. C. Cauldwell, Seacombe; Mr. J. Birch, London; Mr. A. Vacherot, London; Mr. G. Grayson, London; and Mr. Thomas Mercer, Liverpool.

A primary condition in the competition is that all plans shall be in accordance with the acts and by-laws which regulate the erection of dwelling houses in Liverpool. A copy of the acts and the by-laws bearing on the subject was sent to each intending competitor, and yet, singular to say, there is not a score in the whole collection of plans which do not violate the legal provisions in some respect or other. In some cases the departure from the statutory requirements is very trifling—as, for instance, where the party walls are not thick enough, or the timbers not stout enough—but the committee, if they insist upon compliance with the strict letter of the law, would seem to have no option but to reject these plans. The circumstance is the more to be regretted because those which are put out of court include some very clever designs. One of two inferences seems inevitable from the large number who have failed to meet the exact requirements of the law—either that fifty or sixty of the competitors have very carelessly studied what they had to do, or that the building regulations of this town are very complicated, and exceedingly difficult in their application to blocks of dwellings which come within the scope of a poor man's means. If the former inference is the correct one, the authors of the illegal designs have themselves alone to blame; if the latter, some sympathy is due to them, and it will be the business of the health committee to simplify regulations which cannot be understood, or which stand in the way of the poorer population of this town being supplied with proper habitations. The legal rocks on which the competitors have struck are numerous. Some, adopting the court construction, have not allowed sufficient width to the entrances; others have not given the required open space from block to block; a third section have sunk basement storeys below the permitted level; others have made the rooms too small; and one gentleman, Mr. Joseph Boult, has roofed over the whole area of land, so that some of the rooms have no external windows, which is in defiance of the Sanitary Act. Mr. Owen Williams is, perhaps, the only one who has erred, not from ignorance, but from design, and he avows, in a letter which accompanies his drawings, "I have sent in the plans attached to this as if no by-laws were ever passed!" It may be taken for granted that, whoever else gets the £200 prize, Mr. Owen Williams will not do so.

YORKSHIRE ARCHITECTURAL SOCIETY.

ON Wednesday, a general meeting of this society was held in the Museum, York. It was resolved that the architectural and archæological society about to be formed at Sheffield be received into union as a branch of the Yorkshire Architectural Society. Some new members of that society having been elected, a paper was read on the history and antiquities of All Saints' Church, North street, York, by the Rev. C. Kerry, in which it was stated that the authentic history of the church commenced in 1089, and the fabric was of various periods, old English, Decorated, and Perpendicular styles. Some remarks were also made respecting the magnificent windows in this church. The Rev. Canon Raine next read a paper on some early monuments at Conisbro'. He expressed the opinion that Conisbro' Castle was of Norman workmanship, though many writers had assigned the building to Saxon times, and he then made some remarks more particularly with respect to a very early sepulchral memorial within the church. This memorial had served as the lid of a stone coffin, and upon it there was a curious series of sculptures, the sculpture being strictly Norman. There were also sepulchral memorials belonging chiefly to two distinguished families, the Fitzwilliams and the Bosvills. The Rev. G. Rowe (one of the secretaries), read a paper on the contents of the Associated Societies' annual volume, after which a vote of thanks to the authors of the papers was carried.

CARVED WOOD FURNITURE.

IN the department of furniture in the late Paris Exhibition there are few objects, says the "Art Journal," more curious than the chairs and tables of solid carved wood, in the Austrian Court. The lightness and excellence of form of this furniture, combined with its great solidity, have brought it into general use, and the sale has attained such an extent that notwithstanding their vast establishments the manufacturers can scarcely execute their orders. About seventeen years back, this manufacture was set up in Vienna on a very limited scale. In 1856, a large fabric was established at Koritschan, in Moravia, and, in 1861, a second at Bistritz, in the same province. The enormous quantity of wood necessary for the production of these two fabrics exhausted the surrounding forest to such a degree, that, in 1865, Messrs. Thoret were forced to establish a third in Hungary, at Great Ugroez, an extremely wooded country. In this last fabric, the wood simply receives its bent form, and is sent in its unworked state to the workshops of Moravia, where the furniture is made. Since 1862, Messrs. Thoret have succeeded in bending massive wood for every kind of furniture, and in giving to it the most

difficult as well as the most graceful curves. From the improvements introduced, the consumption of wood has greatly increased. Last year these fabrics sent out 200,000 pieces of furniture. More than 700 chairs are made daily; more than 1,500 workmen are employed in making furniture, and three steam engines are in activity day and night For the making of this furniture only beech of the first quality can be used. Every knotted piece breaks in the bending. This manufacture, therefore, can only be carried on in districts like Moravia and Hungary, where abundance of good quality of wood are united with cheapness of labour. The consumption of pure beechwood amounts annually to above 9,000 cubic metres, because above one half of the beeches felled are not in the condition of soundness and freedom from knots necessary for the manufacture. It requires 40,000 acres of forest to supply the required amount of wood.

WATER SUPPLY AND SANITARY MATTERS.

Some interesting experiments are being made at Clichy, close to the bridge of Asnideres, on the manure waters of Paris. A field of 600 acres has been set apart for this purpose with good result, as the horticultural show in the Universal Exhibition testified. Two steam engines daily propel 500 cubic metres of the liquid, pumped from the main sewer of the city, into a reservoir placed at the far end of the field, for the double purpose of watering the various crops, both cereal and vegetable, which thrive there with astonishing luxuriance, and of being subjected to purification by means of chemical processes.

The guardians of the township of Bolehill and Glascote, near Tamworth, have communicated to the Home Office the resolution of the ratepayers at a recent meeting, not to undertake any improvements in the water supply and sewerage of the district. A letter has since been received by them from the Home Office, stating that if the vestry continued to neglect their duty, the Secretary of State would direct an inquiry with a view to a peremptory order for the immediate execution of such works as he should deem necessary. Another meeting has been held, and although the ratepayers appeared strongly inclined to adhere to their original resolution, a committee of inquiry was appointed, who are to report to the vestry within three weeks.

A striking instance of defective sanitary operations has forced itself on the notice of the inhabitants of Leith within the last few days. On the completion of the Water of Leith Sewerage Works, all the sewerage from the north-west side of Edinburgh, and from South Leith, was diverted into the large iron conduit. The refuse from manufactories further up the river was, however, not intercepted, and the stream, consequently, still carries down much organic matter. Refuse of coal tar from the Bonnington Chemical Works has found its way through the conduit into the common sewers of the town, and gas thrown off from it has risen through numerous ill-constructed drains into neighbouring houses. The Commissioners of Police are, we believe, taking steps to have the nuisance stopped.

Building Intelligence.

CHURCHES AND CHAPELS.

On the 20th inst. the foundation stone of a new Presbyterian church was laid at Methven, N.B. The edifice will seat about 300. Mr. James Honeyman, of Glasgow, is the architect.

The parish church of St. Martin's, Martinhoe (Devon), has been reopened, after restoration and enlargement, under the direction of Mr. Teulon, of London. The ancient parts have been restored, a chancel arch has been built, and a new north aisle added. The total cost is about £600. Messrs. Oliver and Sons, of Barnstaple, were the contractors.

The parish church of Witney was reopened on Tuesday last, having undergone thorough restoration, at a cost of about £5,000. Many interesting details have been brought to light under the judicious care of the architect, Mr. G. E. Street. The style is thirteenth century Gothic. The building has been entirely re-pewed, and will now seat 1,000 persons.

Many of the old City churches, it would appear, are in a most dilapidated and dangerous condition. Mr. W. H. Kemm, who has been engaged in taking down the oak carvings, timbers, &c., of St. Benet's Church, Gracechurch-street, in course of removal under the Bishop of London's Union of Benefices Act, states that he has been forcibly struck with the rottenness of the joists and rafters in the floor of the gallery, which was only held up by lath and plaster, the rafters falling to dust on being touched. He says it is fortunate that the congregations had not been large of late years, for he feels convinced that if any extraordinary weight had been placed on the galleries some deplorable calamity must have occurred. The tower was even worse. Some of the lead that covered the dome had fallen in many places several inches, and on its removal the wood on which it rested crumbled away. The men had to exercise the greatest care in its removal to prevent its giving way altogether. How it remained up so long without accident seems almost miraculous. Mr. Kemm adds that in many of the City churches much lead has been used, and that it has never been repaired since their erection.

A new Unitarian church is being built at Bradford. It is in the French Gothic style. Upton stone is being used for the exterior, and the roof will be covered with red and blue slates. The height of the nave is 50ft., and the width 40ft. The cost of the building will be about £5,000, and it will accommodate about 500 persons. Messrs. Andrews, Son, and Pepper, are the architects.

On Monday last the Bishop of Ripon consecrated the new church of St. John the Baptist, Newtown, Leeds. The style of the building is Decorated Gothic of the thirteenth century. There is a nave and apsidal chancel, with north and south aisles, and a small tower and spire at the north-west corner. The cost is about £3,000, and there are 602 sittings. Messrs. Adams and Kelly, of Leeds, were the architects.

On Sunday week the new parish church at Carnwath was opened for public worship. The new edifice occupies the site of the former church, which being damaged by lightning, and having otherwise got into a dilapidated and unsatisfactory state, was ordered to be taken down. The new church, which accommodates upwards of 1,000 hearers, is a Gothic building in the Scotch Decorated style of the fifteenth century. The church inside is 74ft. long and 41ft. broad, having a gallery on three of the sides, the pulpit being placed against the west wall. At the south-east angle are placed the tower and spire, which rise to the height of nearly 100ft. The design is by Mr. David Bryce, R.S.A., architect, Edinburgh.

The parish church of Scraptoft has been reopened after restoration. The edifice consists of a chancel and nave with aisles and a tower at the west end. The restoration has included the whole of the roof, with new chancel window, and two new west windows, new north doorway and north aisle windows, dry arena round the outside where the soil had accumulated, and a general cleaning and pointing of the stonework. Mr. W. Jackson was the architect, and Mr. John Firn, and Messrs. Sharp and Son, the contractors employed.

The foundation stone of the New United Presbyterian Church, at Milnathort, Kinross, was laid on the 13th inst. The building, which is to seat 700 persons, will be in the Geometrical Gothic style, and will consist of a single nave with tower and spire 120ft. high. There will be class and other rooms behind. The architect is Mr. W. Ingram, Glasgow.

The parish church of East Bergholt, which for the last several years has been undergoing restoration, has lately been reopened. The church was built in the sixteenth century, in the Perpendicular style. The paint has been cleaned off the columns of the nave, and the building entirely reseated.

The parish church of Shottisham has been reopened after restoration. An additional north aisle has been built, a new open roof added to the nave, and the whole church has been repaved. Mr. Hakewill was the architect, and Mr. Luff, of Ipswich, the contractor.

A new Presbyterian church was opened on Sunday last at Auchingramont, N.B. The design is Classic, and accommodation is provided for 900 persons. The extreme length is 70ft., the breadth 51ft. 6in., and the height 32ft. 6in. The cost is about £4,000. Mr. J. Grahame Peat, of Hamilton, was the architect.

Messrs. Dove Brothers, the contractors, have commenced rebuilding Croydon Church. Mr. G. G. Scott is the architect. It will be an elegant building when finished. Little Casterton freestone will be used.

The Roman Catholic Church of St. John the Evangelist, at Bath, the body of which was built about four years ago, has just been completed by the addition of a tower and spire more than 200ft. high, at a cost of £5,000. Messrs. C. F. Hansom and Son were the architects, and Mr. J. Bladwell, of Bath, the contractor. Since the church was opened there have been inserted in the side walls the fourteen stations of the Cross sculptured in Caen stone, by Mr. Bolton, of Cheltenham.

The Bishop of Carlisle has consecrated a new church, at Hayton, near Aspatria, dedicated to St. James. The cost has been £1,300, and it will seat about 250. It is built of red freestone, from the designs of Mr. Travers, of Manchester.

The new Roman Catholic church of St. Mary, at Fleetwood-on-Wyre, was solemnly opened on Sunday last, the 24th inst. The church has been erected from the designs of Mr. E. Welby Pugin. The plan consists of a nave terminating in an apsidal chancel and side aisles. The entire length is 98ft., and the width 46ft. within the walls. The whole length is divided into five bays, the eastern bay being again subdivided by intermediate columns and arches forming the divisions between the chancel and side chapels. The roof of the chancel is panelled and decorated. Internally the height of the church is 48ft., and the width of the nave 24ft. Externally the church is built of coursed parpoints, with Longridge stone dressings. The cost of the whole, we are informed, has been under £4,000. Mr. Drummond, of Fleetwood, was the builder. The designs provide for a tower and spire, which are not yet built.

BUILDINGS.

The memorial stone of the New Independent Sunday Schools, at Chelmsford, has been laid. The general character of the architecture is Romanesque. The cost, including site, is £2,300. Mr. C. Pertwee is the architect, and Mr. H. Gozzett, the builder.

The national schools in connection with St. John's Church, Bootle, near Liverpool, were opened last week. The building contains accommodation for 600 scholars. They are so arranged that the whole can be at any time thrown into one large room for the purpose of holding public meetings. The architect was Mr. J. N. Crofts, of Bootle. The amount of the contract was £1,900, and it was carried out by Messrs. James Burroughes and Son.

A new theatre, called the Prince of Wales's, was opened on Friday last, at Rochdale. The building, which is comparatively plain, is of brick with stone foundation. The length is 120ft. and the width 60ft., and it will hold 2,200 persons. Mr. Salomons, the architect of the Prince's Theatre, at Manchester, furnished the designs. Messrs. Warburton, of Rochdale, were the contractors.

The new State house, at Sacramento, California, will be a very imposing structure. It covers nearly 60,000ft. of ground, and will be 226ft. in height. The handsomest avenue in the city leads from its front to the river, and is the finest street on the Pacific coast.

A new concert-hall is about to be opened at Brighton. It is 200ft. in length, 46ft. 6in. wide, and 51ft. 9in. in height. It will be approached by four entrances—two in West-street, and two in Middle street—8ft. each in width. Mr. H. R. Goulty is the architect. The lighting and ventilation of the building is from the roof, and the building, as far as possible, is fireproof.

The concrete groyne at Brighton, which has been so long constructing, was finished last week. The top of it forms a promenade, gradually inclining down to the water. The total cost has been £5,000, or something more than double the amount of the original amount of the contract.

The concert-hall in Coleshill-street, Birmingham, has lately been re-decorated by Mr. Holland, of Warwick. The proscenium is surmounted with the royal arms between arabesque designs containing heads of Shakspeare and Milton, and between each of the circular windows of the facia are emblematic figures of the four quarters of the globe.

A new Academy of Arts is about to be erected at Dresden. Designs have been received in competition, and to Messrs. Vichweger and Perlitz, of Leipzig, the first prize has been awarded.

The re-opening of the Boatmen's Institution, Vale-street, Paddington, took place last week. The old building being in a very dilapidated condition, it was found necessary entirely to rebuild the premises. This has been done at a cost of £1,000, and several improvements have been introduced into the new building. There is now provided a chapel, on the first floor, 48ft. by 23ft., with an open roof lighted from above. On the ground floor is a school-room, 31ft. by 23ft., and infants' class-room 16ft. by 11ft. The architect is Mr. T. Heygate Vernon, of 12, Denbigh-place, Pimlico, and the builders Messrs. Scrivener and White, of Fitzroy-road, Regent's-park.

One great disadvantage that a shopkeeper occupying premises under a railway arch has sometimes to contend with is the limited extent of frontage available for the display of his goods in comparison with the internal size of his premises. Mr. Sheppard, the provision merchant, whose warehouse is under the large girder bridge spanning the entrance to the London Bridge Station, has lately had this defect remedied for him by Mr. M'Intyre North, of the Borough. A façade of wood has been erected, giving a much bolder appearance. The line of arch in the old front forms the centre of the composition, and is supported on either side by circular-headed bays, with facias, cornices, &c., to enclose cases. The arches of the bays are supported by carved panels. The whole is surmounted by the main facia and cornice. Mr. Ennor, of Commercial-road, is the contractor.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—A. S.—O. N. S.—W. H. W.—J. N.—W. C.—W. E. H.—E. W. P.—T. G. J.—S. R.—J. C. J.—J. N. C.—E. W.—O. A. R.—J. N. C.—W. H. W.—G. T.—J. T.—A. C. F.—J. F. S.—R. G.—A. B. D.—B. P. and B.—R. S.—H. H. B.—J. B.—P. J. and Co.—J. D.—C. N. B.—G. R.—J. H.—J. and E. G.—J. P. D.—T. S.—E. A. S.—W. B.—R. M. B.—W. H. T.—S. S.—W. W. (next week).—J. H. T. (too late).—J. J. (write more legibly).

A. Z.—Thanks for the suggestion.

W. H. T.—Your question as to quantities has been answered before.

"ENGINEER."—The information on prize designs for labourers' cottages in Ireland is given elsewhere.

W. T. H.—Write the Secretary of the Builders' Clerks Benevolent Society, 14, Bedford-row, W.C.

F. J.—The "Architectural Association Sketch-book" is confined to the members of the Association.

L. L.—We cannot inform you where to get evening work. Why not advertise?

W. T.—Your question on "etching" was answered in Intercommunication, No. 329.

J. THOMAS.—See BUILDING NEWS, March 19, 1865.

W. T. M. will see some good suggestions on modelling in cardboard under "The Art Student" in an early number.

W. L. Bernard, Bath.—Write the Assistant Secretary of the Institute of Architects, 9, Conduit-street.

S. LEWIS.—"The Young Mechanics' Instructor," price 2s. 6d., may be obtained through any bookseller.

W. H. G.—Paper can be made into pulp by machinery made for the purpose.

"A COMPETITOR."—For the Liverpool Labourers' Dwellings Competition look in another column. We hope to give more information next week.

"A CARPENTER."—Apply at the Orthopædic Hospital, 315, Oxford-street.

"ARCHITECTURAL STUDENT," Manchester. — Several numbers of the BUILDING NEWS for 1864 and 1865 are out of print. What remain can be ordered through your bookseller at the published price. We do not keep the bound volumes.

Correspondence.

CONCRETE BUILDINGS.

To the Editor of the BUILDING NEWS.

SIR,—Having been very much interested of late in the accounts I have heard of building in concrete, I went the other day to visit a house now in course of erection with Mr. Tall's patent apparatus, and after the designs of Mr. Blomfield, at East Sheen, near Richmond. Upon enquiry, I found that the cost of Mr. Tall's apparatus was £1,000, and the contract price for building was £2,000, or as nearly as possible 6½d. per foot, not including the cost of the apparatus. I think I can safely say that I could build the same house in brick at 7½d., or at the most 8d. per foot, which would amount to £2,500. It is true that one of the men informed me that it could be used for one hundred and fifty houses, and at the end sold for one-third its prime cost. Now, firstly, I have only the man's bare assertion for the fact; secondly, what man, except a speculative builder, would ever dream of building one hundred and fifty houses.

I think most of your readers will agree with me, when I say that a brick house is immitely superior to a concrete as regards beauty, if not as regards comfort; a house covered with plaster or cement is always at the best a gloomy-looking object; it puts one in mind of a man without a shirt on; he buttons up his coat close over him to hide his defects: so it is with a cemented building.

After what I have said, perhaps Mr. Tall or some other of your readers experienced in concrete will explain to me, through your valuable paper, where the advantage lies, for I confess I cannot see it; certainly it has none regarding cost, taking the work I have just mentioned as an example.—I am, &c., ENQUIRER.

November 25.

I enclose my card with address.

[Has "Enquirer" seen Mr. Tall's letter in the BUILDING NEWS a fortnight ago?—ED. B.N.]

MR. STREET *v.* "J. C. J."

SIR,—As I had not the opportunity of looking over my last letter (in which many misprints occurred) before its publication, I do not know whether the amusing blunder about Calvados was a slip of my pen or merely a mistake of the compositors. Of course, the sentence should have been, "the later and less interesting churches in Calvados." That the feature I mentioned was Norman-French, stuck on to an English tower—something like a dog kennel at each corner—no one can doubt who knows anything of the Normandy churches—there are several later examples from the department of Calvados in De Caumon's "Abecedaire,"—unless, indeed, we are to take the old adage "damnentur qui ante nos nostra dixerunt," or, as Mr. Puff puts it, "All that can be said is that two people happened to hit on the same thought, and Shakspeare made use of it first, that is all."

Mr. Street's art of misquotation is amusing. In his former letter, for my word plastering he substituted uncoloured plaster. In his present letter he puts "steeple" (which includes tower and spire) for my "spire," and then affects to discover a contradiction. I need not point out to any one but him that a tower may be of an Oxford type, though its spire may have a feature borrowed from Normandy.—I am, &c., J. C. J.

November 18.

[We cannot insert any more letters on these subjects.—ED. B. N.]

ARCHITECTURAL EDUCATION.

SIR,—"J. H.," in his letter last week, says that the architects would stand in the way of Mr. R. P. Spiers' scheme being carried out, and that we must have "colleges and museums in every large town" before it "can be made practicable." I should hail the establishment of such colleges and museums, but I do not see why Mr. Spiers' scheme cannot be at once carried out irrespective of the college and museum question, for why cannot parents send their sons up to London for a year before they enter the office to attend lectures at King's or University College as proposed. If men wish their sons to get on they must not grudge such little expenses at first, any more than they would grudge sending their son to Cambridge or Oxford if he were intended for the church or the bar. Parents and guardians have but little idea of the amount and variety of education required by an architect, and if the Institute would publish such hints as Mr. Spiers proposed it would open their eyes as to what is really necessary. The present system—or rather want of system—of education is most unsatisfactory, and, I fear, causes untold pain and loss every year, in that it sends forth into the world inefficient men to battle with the many and great difficulties which must beset the path of an architect. I trust that all, and especially students, interested in the education question will rally round the standard which Mr. Spiers has raised, and that this question will not be allowed to die before it has reached maturity and brought forth much fruit. We have endured the present pupilage system long enough, and now that its errors have been exposed let us be determined that we will only be silent when we have a thorough reform.—I am, &c.,

ADELPHI.

MEETINGS FOR THE WEEK.

SAT.—Associated Arts Institute.—Exhibition of Sketches, subject, "Forsaken."

MON.—Royal Institution.—General Monthly Meeting, 2.

Society of Engineers.—Adjourned discussion on paper read on 18th instant, on "The Connection Between the Shape of Heavy Guns and their Durability," by Mr. Arthur Rigg, jun., C.E., 7.30.

TUES.—Institution of Civil Engineers.—1. "Description of the Victoria-bridge, on the Line of the Victoria Station and Pimlico Railway," by Mr. William Wilson, M. Inst. C.E. 2. "On New Railways at Battersea, with the Widening of the Victoria-bridge, and Approaches to the Victoria Station," by Mr. Charles Douglas Fox, M. Inst. C.E., 8.

WED.—Geological Society, 8.

SAT.—Associated Arts Institute.—On "Design," by Mr. G. R. Redgrave.

Intercommunication.

QUESTIONS.

[667.]—REMOVAL OF PAINT.—In the number for the 4th of last month, under the head of Replies (516), there is a method given for cleaning old paint from stone by using American potash, and the price quoted for the best being 10s. per cwt. I beg to ask where it is to be procured at the above price.—HENRY HOWES, Foreman of the Works, Essex, South Weald, Nov. 21.

[668.]—UNDERGROUND TANK.—I have a large tank under ground, in the middle of the house, lined with brick and floor covered with tiles laid in cement, but the hard water from the land forces its way in. Can anyone oblige me by informing me of any way by which I can prevent the water getting in? The tank is 15ft. × 12ft. and 10ft. I have already cemented the sides, but the water forces its way through.—TANK.

[669.]—PITCH OF ROOFS.—Will anyone inform me how the pitches of all kinds of roofs are determined?—J. T.

[670.]—BICHROMATE OF POTASH. I should like to know whether bichromate of potash is better adapted for staining soft or hard woods, and whether it may be successfully used for staining boxwood?—AMATEUR.

[671.]—WOOD CARVING.—Will some reader kindly inform me the exact number and description of tools which are deemed absolutely necessary in the art of wood carving—that is to say, the number considered necessary for an amateur?—B. C.

[672.]—PORTLAND CEMENT.—Will any subscriber be kind enough to tell me the proportion of clay to lime used in the manufacture of ordinary Portland cement, the mode adopted of mixing the clay with the lime, the temperature under which it is burnt, and the time taken in burning?—T. H. L.

[673.]—LIMNER.—What is the Limner?—YOUNGSTER.

[674.]—CARTON PIERRE.—Can anyone inform me what carton pierre is composed of?—W. H. G.

[675.]—HUNGRY PUPILS.—If an articled pupil is sent by his master out surveying at a greater distance from home than will allow him to return to meals, can he legally ask for expenses?—X.

[676.]—CHOICE OF WORDS.—I should be much obliged to any of your readers who could inform me where I can find some practical and reliable information regarding the choice of words in wood carving.—F. CLARK.

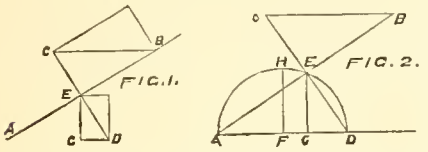
REPLIES.

[611.]—ESTIMATING CARPENTERS' WORK FROM HEWN AND CONVERTED TIMBER.—My reply, contained in your number of October 25 last, to the query of "An Estimator," asking why surveyors cubed all timber irrespective of its scantling, the reason for such a course, and imputing ignorance on the part of quantity surveyors as the explanation, appears to have been the cause of some irritation to "Mr. Stevenson," who has corresponded with you on this matter. I did not think at the time of writing my reply that so much discussion would have resulted upon the question, and I therefore made my communication a simple answer to the interrogations made. I trust, therefore, that you will allow me to go more fully into the matter, and as my business is principally in London, it must be understood that I speak only of London custom. Let me, then, say first that the use of deals and battens is in many cases no doubt cheaper than hewn timber; as to how much the one is cheaper than the other I leave that portion of the subject in the abler hands of "A Practical Man" and "Mr. Stevenson." Another important portion of the question, so far as the quantity surveyor and builder is concerned, is that the greater portion of London architects prefer the use of scantling cut out of timber to the use of cut or whole deals or battens, and the London practice is that unless the specification specially allows or directs that certain timbers are to be cut out of deals or battens, the whole are to be of Memel, Riga, or Dantzic timbers, as the case may be; therefore, whilst this custom remains, how can a quantity surveyor give the quantity of one class of wood whilst the specifications of the architect provides another. Then, with respect to the lengths of deals and battens, &c., allow me to substitute for my previous short statement the more ample one, that of the 9 × 3 deals in the London market suitable for constructional purposes in building, quite one-half are 12ft. in length, whilst all the other various lengths are included in the other half. If one requires to purchase a few 9 × 3 deals 12ft. long they are to be obtained at any timber-yard in London, but should you want any other length or any variation in scantling (except 11 × 4 planks) you may spend many days in looking for the goods you desire. This being the case, it is often really cheaper for a builder to use timbers (say for joists 9 × 3 × 30ft.—a common size in London) cut out of hewn timber, than to go all over London to get the exact length of deal he may require. In my reply of October 25, I requested to be informed the opinions of some of your readers as to whether scantlings cut from hewn timber, or those from deals and battens, were the best, strongest, and most durable for joists, rafters, &c. I am told that the smaller timber from which deals and battens are cut is neither so strong or lasting as those which are cut from timber of larger growth. "Mr. Stevenson" maintains that the relative suitableness of the two classes of timber has nothing to do with the question; it has this to do with it, that London architects believe in and provide scantlings to be cut out of hewn timber, and as long as they do so the quantity surveyor can only estimate for timber of that description. If the architects are wrong, and possibly they may be, let those discuss the question who are capable of doing so. I confess that I am not, but I should like to hear what "Mr. Stevenson" and others have to say upon this interesting subject. Perhaps they can inform your readers of the cause of the smallness of the timbers from which battens are cut; whether it is caused by the immature growth of the tree, or is in consequence of the tree growing in dense forests where it

quickly runs up to the light and grows in height, where in a different situation the tree would develope in thickness. —A. H., Westminster.

*** Mr Stevenson has sent us a communication on this subject, but it is so long, and deals with the matter in so general a way, that we have preferred giving it as a separate article in another page.—ED. B.N.

[653.]—PRESSURE ON ROOFS.—The following investigation will, I think, clearly show that the vertical pressure on a roof by a horizontal wind reaches a maximum when the angle which the rafter makes with the horizon is equal to 45 deg. In fig. 1 let A B be the slope of the



roof, draw C B parallel to the horizon meeting the roof at B; then will C B represent the direction and force of the wind. To ascertain the effect of this force upon the roof, we must resolve it, by making it the diagonal of a parallelogram of forces, into its two components C E, E B, the one perpendicular, the other parallel to the plane of the roof; then will C E show the pressure upon the roof in a direction perpendicular to its surface; the other component E B being parallel to the surface exerts no pressure upon it. Make E D perpendicular to A B and equal to C E, then E D will also equal the direction and force of the pressure last found. Resolve this pressure into two others G D, E G, the one horizontal and the other vertical; by making it the diagonal of a parallelogram whose sides are parallel and perpendicular to the horizon, as in the fig., then will E G represent the vertical effect of the wind upon the roof, and G D its horizontal effect. Also, if C B taken from a scale of parts be made equal to the force in pounds exerted by the wind per foot super, E G measured upon the same scale will give its vertical effect upon the roof in pounds per foot.

Now, to ascertain the angle or pitch upon which a horizontal wind would have the greatest vertical effect, let A B in fig. 2 represent the slope of the roof, and draw A D parallel to the horizon; take any point F on the latter as a centre, and with the radius F A describe a semicircle A E D; join D E and produce it to C, making C E equal to E D; draw C B parallel to A D, from E let fall a perpendicular to G, and through F draw F H perpendicular to A D; then will C B, as before, represent the direction and force of the wind, and E G its vertical effect upon the roof, which is required to be a maximum. Now as A E D is a semicircle, whatever the position of the apex E of the triangle A E D within it, the angle at E will always be a right angle; and by the properties of opposite triangles, C E being always made equal to E D, C B will always remain parallel and equal to A D; consequently, whatever the angle which A B makes with the horizon, C B will represent the force of the wind, E D its effect perpendicular to the plane of the roof, E G its vertical effect, and G D its horizontal effect. If, now, we conceive A B to turn upon A as a centre, it is manifest that the apex E of the triangle A E D may be made to travel through every part of the circumference of the semicircle, and that whatever its position, a perpendicular let fall from E to A D will measure the vertical effect of the wind upon the roof, C B remaining constant. It is evident from a consideration of the fig. that when the roof A B is of a very low pitch, or nearly parallel with A D, the vertical pressure E G, and the horizontal force G D, will also be very small, and that when A B coincides with A D, a horizontal wind will have no effect, as E G and G D will then both vanish. It is also evident that the point E, being always in the circumference, will, as the roof turning upon A rises to a greater pitch, continually increase its perpendicular distance from A D until it reaches the point H, after which, the motion of A B being continued, E will again gradually approach A D until A B becomes perpendicular to A D, when it will coincide with the point A, and the vertical effect E G of the wind will vanish at the same time. It has just been shown that E will attain its greatest distance from A D when it coincides with H; if, therefore, the roof A B be placed at such an angle that its plane will pass through A and H, the vertical effect of the wind C B upon it will then be the greatest possible. But H is equally distant from A and D; therefore, when E coincides with H, the angle E A D will be equal to the angle E D A; and as the angle at E is a right angle, E A D and E D A will each be equal to half a right angle; consequently, when the pitch or angle B A D of the roof is equal to 45 deg., the vertical effect of a horizontal wind or other force reaches a maximum. From the fig. it will also be manifest that G D, which represents the horizontal effect of the wind C B, is zero when the roof is flat, or coincident with A D, but that as the pitch rises, G D increases until G coincides with A; the roof A B being then perpendicular to A D, the horizontal effect G D upon it becomes a maximum, and equal to the horizontal force C B of the wind. —E. SWANSBOROUGH.

[657.]—STONE DESTROYING INSECTS.—Even solid rock is destroyed by the persevering efforts of the Pholades and Saxicavæ. The Pholas perforates wood, limestone, hard and soft argillaceous shales, clay, and sandstone. Though the Saxicavæ which attack the limestone blocks of the Plymouth breakwater do not penetrate more than half a foot from the surface, yet their holes are so close to each other as to make it easy to break off the outer portions, when a new surface is laid open to fresh attacks.—W. P.

[657.]—The animals which bore the holes so frequently found in rocks and detached stones upon the seashore are neither insects nor annelids; they are for the most part members of the sub-kingdom Mollusca, and comprise various genera, Pholas, Martesia, Gastrochina, &c., each including many species. Members of the genus Pholas, particularly Pholas dactylus, are very plentiful on the south coast of England. These bore holes in hard clay, chalk, limestone, and even soft sandstone, large enough to admit a finger, in a manner which, till a few years ago, had not been ascertained. By observing the animals at work, however, in glass tanks, it was discovered that they used the sharp teeth with which the anterior ends of the shells are covered as boring tools, the shells being made to take a kind of circular rasping motion, while at the same time, the animal's foot being protruded between the valves, takes a firm hold upon the stone, and by its muscular contraction holds these curious instruments in close contact with the surface operated upon. The Pholas, like other kindred genera, is a bi-valve; the valves or shells do not fit closely together, but have openings at both ends; that at the anterior end has been already alluded to, the other permits the passage of the posterior prolongation of the animal, which in general extends far beyond the shells to the entrance of the burrow, and is furnished with a wonderful hydraulic apparatus comprising two tubes or syphons, down one of which the water is drawn to the breathing organs, and expelled through the other, the return current also assisting in the removal of the material excavated from the inner end of the tunnel. Many specimens of the valves of these and other allied animals may be seen in the table case, No. 37, in the Eastern Zoological Gallery of the British Museum, and in case No. 7 of the North Gallery other specimens are contained.—E. SWANSBOROUGH.

[662.]—CONCRETE BUILDINGS.—In reply to inquiry made by F. Hope in your last, if that gentleman will give me his address I will supply him with my pamphlet, which will, I think, answer his inquiries. As to building arches of concrete, if they are built with wedge pieces, as mentioned by F. Hope, much unnecessary skill and labour would be required, first, in making moulds and casting, and then in setting, and then the weakest parts would be the joints. My method is to fix a close-fitting centreing, as usually employed for arches, with the addition of side-pieces to form a box, and then put in the concrete, thus casting the arch in one piece.—J. TALL, Falstaff-yard, Kent-street, Southwark, November 2.

WAGES MOVEMENT.

Slackness is prevalent at Liverpool and Birkenhead. Very few contracts have been offered lately, and few firms are doing more than keeping on a limited number of hands.

Trade in Edinburgh has not been so slack since last winter, and we fear matters are not yet at their worst. Contract work appears likely to be very scarce all the winter.

The masons in the metropolis have held a meeting about the nine hours' movement, at which a resolution was passed to the effect "That a reduction in the hours of labour from ten to nine hours during the winter months would be a great advantage to the trade, and we here express our satisfaction that 814 masons are now working the nine hours, and that we hereby recommend to all who are working ten hours to use their endeavours to get the nine."

STAINED GLASS.

Eight stained glass windows are being erected in the Ladye Chapel of Hereford Cathedral in memory of the late Canon Morgan.

The east window of the church at Barlestone, Leicestershire, has been filled with stained glass by Mr. Holland, of Warwick. The subject is the Collect for the Seventh Sunday after Trinity, emblematically represented.

The window at the west end of the nave of Kington parish church, Hereford, has been filled with stained glass by Clayton and Bell. It is of four lights, in the Early English style. It contains representations of the four greater prophets and the four Evangelists, with angels bearing scroll work.

A large Early English five-light window will shortly be placed in the church at Rhosymedre, near Ruabon. The figures are almost life-size. The subject is the Ascension, mosaic work above and below forming canopies and bases. Messrs. Done and Davies, of Carlisle, are the artists.

Another memorial window has been erected in St. Peter's Church, Newcastle. It is of three lights. The upper part represents the doctrine of the Incarnation. The subjects are the Annunciation, the Nativity, with angels adoring, and the Adoration of the Magi. In the lower part are St. John Leading the Virgin from Calvary, Jesus the Good Shepherd, and Ruth Refusing to Leave Naomi. The window is by Mr. Baguley, of Newcastle.

Four windows and a quatrefoil in the west gable of Tintwistle Church have been filled with stained glass. The style is Early English. The subjects, the Transfiguration, the Ascension, Jesus Teaching Humility, and Blessing Little Children, are framed by canopies and borders, and in the quatrefoil is the Holy Dove descending. Messrs. R. B. Edmundson and Son, of Manchester, were the artists.

STATUES, MEMORIALS, ETC.

A bust of Mr. Cobden, in pure white marble, executed by Mr. Phillips, has been placed in the Town Hall, Halifax, It is the gift of Colonel Ackroyd, M.P.

The statue of Lady Godiva, lately shown at the Coventry Exhibition, has been offered by the artist, Mr. C. M. Marshall, R.A., to the Corporation of London. It has been accepted, and their best thanks have been conveyed to him for his gift.

The series of thirty-three statues for the decoration of the chapel of St. Andrew, in Gloucester Cathedral, is now complete. The sculptor is Mr. J. Roddis, of Birmingham. The chapel is being restored under the direction of Mr. Gilbert Scott, R.A., and Mr. Gambier Parry.

On the death of the Dean of Hereford it was resolved to erect some suitable memorial to his memory. A public meeting took place, and it was agreed to erect a handsome gateway opening in the cathedral close, and Mr. Scott was invited to send in plans. He has done so, but his estimate is £1,800, and at present the amount subscribed does not reach £1,000. The scheme is, therefore, likely to remain for some time in abeyance.

LEGAL INTELLIGENCE.

CONVICTION UNDER THE SMOKE NUISANCE ACT.—PENALTY OF £10.—Mr. Charles Rice, flock manufacturer, Friar-street, Southwark, was summoned on Wednesday before Mr. Partridge for not having his furnaces so constructed as to consume the smoke, after a previous conviction. Mr. William Sandison, the Government engineer, said he visited the defendant's premises on August 29, when he found the furnace at work, and the worst of common coal being used, the smoke from which was dense and black, and must have been a great nuisance to the neighbourhood. There was no apparatus to consume the smoke, and up to the present time nothing had been done effectually. Mr. Rice informed his worship that he had used several patents, but it appeared none of them seemed to satisfy the authorities. Mr. Partridge told the defendant that there was no excuse for him, therefore he should fine him £10, it being the second conviction. He advised him to comply with the Act of Parliament at once. The next time it would be £20.

INTERFERENCE WITH ANCIENT LIGHTS.—GULLICK *v.* GREEN.—In the long vacation, an *interim* order for an injunction was obtained to restrain the defendant, who occupies a private house, No. 14, Cheyne-walk, Chelsea, from continuing to build a portico then in course of erection, and still unfinished, in front of his house, abutting on the River Thames, under these circumstances:—The plaintiff's house is No. 15, on the west of the defendant's, and separated by a wall, originally of 12ft. high, running from the houses down to the road on the bank of the river. The bill alleged that the wall was not a party wall, but a fence wall, being part of the plaintiff's premises; and that the defendant, having lowered it some 2ft. or 3ft., the plaintiff permitted him to do so, but nothing passed about building. On July 25, the defendant commenced the building of the portico, and on the 27th the plaintiff sent him written notice that the building was a serious damage to him, and unless it was removed in seven days he should take legal proceedings. The defendant desisted from building, but on August 24 recommenced. The bill was filed on the 28th, and the *interim* order obtained, and matters had remained *in statu quo* ever since. The plaintiff now moved for the extension of the injunction, on the ground that the portico would seriously interfere with the light of his ground-floor windows, which were ancient lights. The defendant disputed the plaintiff's right to the wall. It appeared by the evidence that the wall had formed a support to some other structure, which had been removed, and that the projection of the portico was 3ft. The Vice-Chancellor said that this case was a very frivolous one, and it appeared to him that the plaintiff, instead of suffering damage, had been benefited by the pulling down of the wall, to which he did not object, and the portico would only occupy the same space which the rampart formerly filled. He had not sustained a particle of injury, and the motion must be refused, with costs.

REFUSAL TO PAY FOR PAVING AND SEWERAGE.—BLACKPOOL LOCAL BOARD *v.* E. THORNTON.—An important case was heard last week before the local magistrates bearing on the question of the liability of property-owners to pay for paving and other improvements of public roads abutting on their premises. Application was made by the Board under sec. 69 of the Public Health Act of 1848 for an order to recover from Mr. Thornton the sum of £16 1s. 4d., for repaving, sewering, &c., of a road fronting his property. It appeared that due notice had been given, requiring him to execute the work, and that not being done the Board had undertaken the repairs, and now demanded payment under the powers conferred by the Act of Parliament. It was contended for Mr. Thornton that the road did not benefit his property, that part of the property belonged to his wife, and that he could not have executed the required improvements without trespassing on adjoining property. The magistrates decided that Mr. Thornton must pay the amount, but granted a case for a superior court.

The willow at Kew Gardens, which was cut from the trees surrounding the grave of the first Napoleon at St. Helena, has been demolished. The gardens have thus lost their greatest attraction to our French visitors, who were wont to stand silently before it with their heads bare in respectful homage to the great Emperor's memory.

Our Office Table.

We understand that Mr. German Reed has taken the St. George's Hall, Langham-place, in order to carry out his design of establishing in the metropolis a comic opera, derived both from native and foreign sources. We are glad the task has fallen into such able hands, for the experience of the public taste and requirements through many years, both as composer and performer, will enable him to select materials best calculated to ensure success.

Some member of the Institute of Architects has raised a subscription of nearly £90 for the purpose of purchasing a drawing of the section of St. Peter's, at Rome, made by the late Mr. J. Goldicutt, very elaborately coloured and picked out in gold, and for which the Pope presented him with a gold medal. The purchase has been effected, and the drawing presented to the Institute by the subscribers.

In response to advertisements offering premiums of £100 and £200 for the best plans of labourers' dwellings, seventy plans have been sent in to the Liverpool Corporation, and it has been arranged that they shall be exhibited publicly from the 28th inst. to December 12, in the exhibition rooms, Post Office-place, between the hours of three o'clock and nine p.m., so as to afford an opportunity of inspection to artizans.

The lake of Neusfeld, in Hungary, on the confines of Austria, is now completely drained and dried, and the land so obtained is about to be placed under cultivation. It contains eight square miles of virgin soil, and the belief is that it will prove extremely fertile.

Workmen are busily engaged in erecting an abutment on the American side of the Niagara for the new suspension bridge that is to connect the United States with Canada. It will require a span of 1,260ft., the width will be 10ft., and the height from the water, 100ft. It will only be for foot passengers, and will be constructed of the usual wire cables, resting upon wooden towers.

The Pacific Railway has been constructed across the American continent as far as the eastern base of the Rocky Mountains. The contractors will shortly cease operations for the winter. It is expected that the whole line will be completed by the spring of 1870.

The Paris Exhibition has turned out a better "spec" financially than most persons thought it would. The French papers say it is almost certain that there will be a clear gain of three million of francs, which sum is to be divided equally between the State, the city of Paris, and the Guarantee Society. The subscription of the society was twelve millions, and the profit is somewhat over eight per cent.

The Committee of Council on Education have at the present time under consideration a scheme for the formation of museums of patterns used in trade and manufactures, designed to improve the technical knowledge of workmen and employers, a project which has been advocated by Mr. William H. Ablett. Mr. Ablett has also joined the council of Public Museums and Free Libraries Association, whose proposals and aims he very heartily endorses on all grounds set forth by its promoters.

A curious fact is published, by which it appears that the hospitals of Paris have contracted for the supply of 1,081,000 litres of milk for the coming year, a litre being equal to an English quart. It has been calculated that this enormous quantity of milk would suffice to turn an ordinary mill during forty-eight hours, and would fill one of the largest reservoirs at Mevilmontant.

We notice that the works of the Thames Embankment, in the section extending from Westminster to Charing-cross railway bridge, are now complete. The space between the river wall and the old high water-mark is filled in and levelled to the east as far as Waterloo-bridge. The works are being advanced with great rapidity, the superstructure in both sections being nearly finished.

Members of the Society of Arts ought to know that neither by charter, by the byelaws, nor by custom, is there any authority for their placing the letters "F. S. A." after their names. These initials belong to the Fellows of the Society of Antiquarians, and considerable confusion has occurred from the members of the former society adopting the title.

The restoration of Madame de Sevigné's ancient residence, the Hotel Carnavalet, which has been purchased by the City of Paris for the purpose of a municipal museum, is rapidly progressing towards completion. It will not, however, be opened to the public for two years, as the City has not as yet acquired sufficient objects of historic value to form a collection worthy of inspection.

At the ordinary general meeting of the Institution of Civil Engineers, on Tuesday, the 19th inst., Mr. C. H. Gregory, Vice-president, in the chair, it was announced that the Council, acting under the provisions of section IV. of the bye laws, had that day admitted as students of the Institution:—John Simeon Bergheim; Edward Pearce Brown; Walter Chapman Burder; Charles Clowes; John Thomas Denniston; The Hon. Alan de Tatton Egerton; Thomas Charles Ellis; Tristie James Ellis; David Gravell; John William Drinkwater Harrison; Frank Livesey; Arthur Robert Lungley; William George Moore; Arthur Neame; Thomas Farmer Parkes; Howard Devenish Pearsall; The Hon. Philip James Stanhope; Clarence Edward Trotter; Arthur Joseph Waring; and Charles Stroud Williams.

The following alterations in the names of public thoroughfares have been ordered to be made by the Metropolitan Board of Works:—Belgrave-place, Belgrave-terrace, Victoria-road, Bridge-row, and Union-place, Pimlico, to be called Buckingham-palace-road; the names Upper Seymour-street and Seymour-street-west to be abolished, and the whole line of thoroughfare from Portman-square to Connaught-square to be called Seymour-street; Victoria-road, Holloway, to be called Chalfont-road; Alexandra-terrace, Limehouse, to be incorporated with Pigott-street; Providence-place to be incorporated with Stepney-causeway; York-cottages, Brompton, to be incorporated with Thurloe-place. In Bermondsey, Taylor's-terrace to be incorporated with Roseberry-street, and Edward's-cottages with Linsey-street. The subsidiary names of villas, cottages, terraces, places, &c., in the following thoroughfares to be abolished:—Woodfield-road, Westbournia; Limehouse-causeway; Southampton-road, Kentish-town; Shore-road, Hackney; Lucey-road, Bermondsey; Stainsby-road, Poplar; Brook-street, Ratcliff; Brixton-road, Brixton; so much of the thoroughfare known as St. James's-road-north and St. James's-road, Bermondsey, as lies between the South-Eastern Railway and the Bricklayers' Arms Extension Railway, to be called St. James's-road, and the subsidiary names abolished. The houses, in all cases, to be re-numbered.

A bill has been prepared and introduced into Parliament by Lord R. Montagu, Lord J. Manners, Mr. Ayrton, and Mr. Butler, to provide for the acquisition of a site for the East London Museum. The ground in question forms part of a charity site, situate in the parish of St. Matthew, Bethnal-green, and known as "The Green" and "The Poor's Land."

India rubber is recommended for mounting drawings. It is said to be the best thing to mount photographs with, as it never cockles the paper.

Mr. Flintoff is doing a useful work in agitating the gas question. In his lecture at Exeter Hall, on Monday evening, he showed that the consumer was treated unjustly. Let him get the consumers at his back, and the companies must give way.

The managing committee of the London Orphan Asylum have decided on their selection of the competition designs for the new asylum at Watford. The first premium is awarded to Mr. Dawson, the second to Mr. Robins, and the third to Mr. Watson. The thanks of the committee are offered to all the competitors for their endeavours to meet the requirements of the charity.

A Middlewich farmer, with his wife, four children, and a servant girl, were all burnt to death while in bed on Sunday morning. The farmhouse was one of those old-fashioned timbered erections which are so common in many parts of Cheshire. There was only one small door of ingress and egress, and that was situated in a very inconvenient part of the building, while the windows were so small that no one could possibly pass through any of them. At the inquest the jury drew attention to the defective and dangerous construction of the house. As many more similarly picturesque but unsafe houses exist in this part of the country, it is to be hoped that the hint thrown out by the jury will not be neglected.

A correspondent writes:—A most effectual remedy against horses slipping on hilly or inclined streets is to set the stones at an incline of about 70 deg., instead of vertically. By this method, the upper angle of each stone is raised about half an inch above the next course, and thus preventing the possibility of horses slipping. The harder the stone, the more permanent the security against accident from slipping.

Messrs. Naden and Sons, of Birmingham, have obtained by competition a contract for the erection of a storehouse at Stratford-on-Avon, for Messrs. Flower and Sons, the well-known brewers. The contract is for £2,595.

Mr. Crace lately delivered a lecture on "Colour as Applied to Decoration." The principal illustrations were given by means of the chromotrope, an instrument with a disc with a circular centre and outside border. The centre and outside border were coloured grey, and the part between was divided into radial spaces covered with the colours that produce grey. The disc is rapidly set in motion, and the whole surface then presents no other tint than grey. The lecture was well attended, and a vote of thanks to the lecturer was carried very cordially.

On Monday last, Mr. Layard, in the House of Commons, asked the Chancellor of the Exchequer if he intended during the present session to introduce any measure for the better administration of the British Museum, and other institutions in the United Kingdom, connected with science and art. Mr. Disraeli replied that he had no intention of proposing any bill for the "better administration of the Museum;" but that his mind is at present occupied with a measure for some separation of the collections. The British Museum is full even to its very cellars, so that something must speedily be done, either by enlarging the building, or removing some of the objects, to prevent the collection becoming useless. We trust Mr. Layard will not wait too long for the Chancellor of the Exchequer to unfold the measure "with which his mind is occupied." To no man, either in or out of Parliament, would the nation listen on this subject with greater interest, or trust to with more implicit confidence, than to Mr. Layard, who has done so much to enrich the Museum he seeks to improve.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

1000. G. E. VAN DERBURGH. AN IMPROVED ARTIFICIAL STONE FOR GRINDING, WHETTING, OR POLISHING PURPOSES, AND A PROCESS FOR PRODUCING THE SAME. Dated April 3, 1867.

The patentee claims, first, the combination of packets of emery or other gritty cutting materials into an artificial stone or substance for grinding, polishing, and other purposes, by the vitrifaction or partial vitrifaction of any suitable vitrescent flux previously intermingled with said particles, all substantially in the manner set forth. Second, the combination of sand or particles of emery, ground glass, or any suitable gritty or cutting particles, with an alkaline silicate, or with a mixture of clay with borax, or its equivalent, or with any other vitrescent flux for the purpose of producing an artificial grinding and polishing stone by the vitrifaction of said flux under the influence of heat, substantially in the manner set forth. Third, curing and hardening a plastic combination of gritty particles with a vitrescible flux, by first subjecting the same to a moderate heat until dry, and afterwards to the action of a higher temperature until a partial or entire vitrifaction of the flux is produced, substantially as set forth. *Patent completed.*

1006. W. HODSON. IMPROVEMENTS IN MACHINERY FOR THE MANUFACTURE OF BRICKS AND SIMILAR MOULDED ARTICLES. Dated April 3, 1867.

In the centre of an upright cylindrical casing a vertical axis is driven in any convenient manner. The clay or brick earth is placed in the casing, and it is worked downwards by blades upon the axis. At the bottom of the shaft sweepers are fixed near the lower end of the case from the axis for some distance outwards; the sweepers are so inclined as to tend to lift the material; their outer ends are curved backwards, so that as they travel round they press the material against the sides of the casing. At distances apart orifices or mouthpieces are formed in the casing, and the sweepers as they sweep round squeeze out the clay or material into the mouthpieces, which mouthpieces conduct the clay into a lubricated die, and on to the cutting apparatus and riser. The mouthpieces are lined with wood and covered with fustian or similar fabric, and lubricated with water. Cannon moulds can be fixed on the outside with sliding doors or shutters to close the mouthpieces, and such doors or shutters also carry cutting wires, so that as the door is closed, any clay or material protruding from the mouthpiece is cut off. In front of each orifice a support is fixed with a mould suitable for forming a brick or other article, and it is held firmly up to the mouthpiece; then the sliding door is removed, and the clay or material issues and fills the mould. When the mould is full the sliding door is closed, and in the same act the moulded article is cut off; it is still contained in the mould, which is removed and replaced by an empty one. *Patent abandoned.*

1029. H. WILSON. IMPROVEMENTS IN COCKS OR VALVES FOR DISCHARGING WATER, OIL, AND OTHER FLUIDS OR GASES. Dated April 6, 1867.

In performing this invention the inventor forms the key or spindle of the cock or valve with a screw of quick traverse upon it (say double, treble, or quadruple) which works in a corresponding nut fixed in the barrel of the cock or valve. On the said key or spindle he fixes one end of a helical spring; the other end of the said spring is fixed to the barrel of the cock or valve, and the pressure of the spring is so arranged as to keep the cock or valve constantly shut; and, in order to open the cock or valve, sufficient power must be applied to overcome the resistance of the spring; as long as such power is applied, the cock or valve remains open, but as soon as such power is withdrawn the cock or valve is instantly closed by the spring. *Patent abandoned.*

Trade News.

TENDERS.

BECKENHAM.—For building a house. Mr. James L. Pedley, architect:—

Venner	£2,365
Howard	2,093
Browne and Robinson	1,987
Breeze and Russell (accepted)	1,688

BISHOP STORTFORD.—For erecting a branch bank for the London and County Bank at Bishop Stortford. Messrs. Francis, architects. Quantities by Mr. Joseph Robson:—

T. Gunn	£4,845
Perry and Son	4,829
Hill and Son	4,580
Glasscock	4,550

HANLEY.—For villa residence for Mr. Thomas Worthington, Havelock-place, Hanley. Messrs. Scrivener and Son, architects:—

Matthews	£1,177
Callis and Hudson	1,100
Bowden	1,090
Woolridge	1,053
Bayley (accepted)	1,048
Barlow	1,040

HERTFORD.—For new workhouse. Mr. Peck, architect:—

Chappel	£10,500	0
Glasscock	8,500	0
Moxon and Mutton	8,400	0
Ekins and Son	8,373	0
Partinson	8,200	0
Smith	8,155	0
Saxage	7,868	0
Norris	7,847	0
Perry, jun.	7,777	0
Huddleston	7,714	3
Bland	7,685	0
Henham	7,320	0

SYDENHAM.—For a house at Sydenham-hill, Mr. George Truefitt, architect:—

Stimpson (accepted)	£4,000

SHELTON.—For wrought-iron gates for St. Mark's Church, Shelton. Messrs. Scrivener and Son, architects:—

Cottam and Hallum	£48
Brawn and Co.	45
Peard and Jackson (accepted)	42

SOUTHBOROUGH (KENT).—For building six cottages. Mr. T. K. Green, architect. Quantities supplied:—

Brett*	£2,553	0
Keys	2,453	0
Kaye	2,333	0
Coker	2,020	0
Strange and Soos	1,994	10
Nightingale	1,955	0
Wright	1,935	0
Simons and Martin	1,893	0
Capron	1,748	0
Upchurch and Hanks	1,720	0
May	1,537	18

* Applied too late for quantities.

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots also Cost for Transit to any part of the United Kingdom furnished on application to Bath Stone Office, Corsham Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Henry Alvey, Teddington, builder, December 5, at 12—Edward Branscombe, Cirencester-street, Harrow-road, builder, December 9—James Jowers, Silchester-road West, Notting-hill, builder, December 18—Edward Bampton Reynolds, Stanley-street, Chelsea, builder, December 10, at 11 D. Brooks, New-inn-yard, Shoreditch, builder, December 18, at 12—George Cockrell, Melbourne-terrace, Notting-hill, carpenter, December 12, at 12—James Drake, Addington-street, York-road, Lambeth, contractor, December 16—Walter Henry Palmer, Tysoe-street, Clerkenwell, builder, November 18, at 1—John Box Shepherd, Bucklersbury, surveyor, December 18, at 1—Joseph Watkins, Battersea, builder, December 18, at 1.

TO SURRENDER IN THE COUNTRY.

Henry Gardiner, jun., Toxteth Park, joiner, December 3, at 11—Matthew Pollard, Manchester, joiner, December 3, at 11—Thomas Bailey, Norwich, carpenter, December 9, at 11—Gawen Crone, Rock Ferry, builder, December 9, at 11—John Stafford, Dalton, Yorkshire, stonemason, December 13, at 10.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

December 13, G. Hampton, Brighton, builder—December 17, J. Towlson, Norwich, engineer—December 19, E. G. Garrard, King's-road, Chelsea, mechanical engineer—December 20, W. Littlefield, Sussex-place, South Kensington, paperhanger—Jan. 10, J. Wild, Croydon, painter—December 11, T. Siminson, Great Grimsby, builder—December 11, T. Love, Blackpool, builder—December 11, T. Atkinson, Llandudno, builder—December 16, W. Smith, Everton, builder—December 19, L. L. Grant, Ventnor, plumber—December 11, W. Woodruff, Buxton, painter—December 11, M. Hodgson, Wakefield, carpenter—December 5, W. Skelsey, Wortley, brickmaker—December 5, G. Appleton, Leeds, joiner—December 13, E. Jenkinson, Skelton, brickmaker—December 13, R. Whittington, Saltburn, contractor—December 19, J. B. Piercy, Brighton, builder—December 9, T. Pickering, Barnack, stonemason—December 11, S. Gee, Burton-on-Trent, joiner—December 18, J. Burrow, Plymouth, marble mason—January 13, J. Weymouth, Talbot-road, Kensington Park, plasterer—December 6, C. Lucas, Leckhampton, stonemason—December 12, C. Varndell, Cocking, carpenter.

PARTNERSHIPS DISSOLVED.

Segar and Fielding, Burnley, engineers—Henning and Esden, Hammersmith, builders—Spinks and Groves, Leeds, plumbers.

DECLARATION OF DIVIDEND.

L. Southern, Manchester, joiner, div. 2s. 7½d.

DIVIDENDS.

December 4, J. B. Tooge, Catletown, Staffordshire, joiner—December 4, W. Dixon, Codicote, carpenter—December 2, R. Davies, Neath, engineer—December 9, W. and E. Atkinson, Dewsbury, builders.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9 0	£10 10	Archangel, yellow ..	£11 10	£13 0
Quebec, red pine	3 0	4 10	St. Petersburg, yel...	10 10	11 0
,, yellow pine..	2 15	4 0	Finland	8 0	9 0
St. John N.B. yellow	0 0	0 0	Memel	0 0	0 0
Quebec Oak, white ..	5 5	5 10	Gothenburg, yellow	8 10	10 10
,, birch.....	3 10	4 10	,, white	8 0	9 0
,, elm	3 10	5 0	Gefle, yellow.....	9 0	11 0
Dantzic oak	3 10	6 0	Soderham	9 0	10 10
,, fir	2 0	3 0	Christiania, per C., 12 ft. by 3 by 9 in. yellow	16 0	22
Memel fir	3 0	9 10			
Riga	3 0	3 5			
Swedish	2 0	2 5	Deck Plank, Dantzic, per 40 ft. 3 in.	0 15	1 4
Masts, Quebec red pine	6 0	7 0			
,, yellow pine..	5 0	6 0	PUMICE STONE pr ton	6 0	8 0
Lathwood, Dantzic, fm	4 10	5 0	OILS, &c.		
,, St. Petersburg	6 10	7 10	Seal, pale...per ton	40 0	41 0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.			Sperm body	112 0	0 0
			Cod	36 0	37 0
			Whale, Sth. Sea, pale	39 10	0 0
Quebec, white spruce	13 0	19 0	Olive, Gallipoli.....	68 0	0 0
St. John, white spruce	13 10	15 10	Cocoanut, Cochin, ton	56 0	57 0
Yellow pine, per reduced C.			Palm, fine	40 0	41 0
			Linseed	34 15	35 0
Canada, 1st quality.	17 0	18 10	Rapeseed, Eng. pale..	38 10	39 0
2nd do.....	11 10	12 10	Cottonseed	35 0	41 0

METALS.

IRON:—							
Welsh Bars in London .. ..per ton	6 7 6		6 10 0		3		
Nail Rod ..... do	7 10 0		7 15 0		2½		
Hoops ..... do	8 10 0		9 0 0				
Sheets, Single ..... do	9 15 0		10 0 0				
Staffordshire Bars . ..... do	7 10 0		7 15 0				
Bars, in Wales ..... do	5 15 0		6 0 0		3		
Rails ..... do	5 10 0		6 0 0		net		
Foundry Pigs, at Glasg. No 1 .. do	2 15 0		3 5 6		2½		
Swedish Bars ..... do	10 5 0		10 10 0		net		
STEEL:—							
Swedish Keg, hammered .....per ton	15 0 0		15 10 0		2		
Swedish Faggot ..... do	10 10 0		12 10 0		2		
COPPER:—							
Sheet & Sheathing, & Bolts ....per ton	80 0 0		82 0 0				
Hammered Bottoms ..... do	92 0 0		0 0 0				
Flat Bottoms, not Hammered .. do	85 0 0		0 0 0				
Cake and Tough Ingot ..... do	71 0 0		72 0 0		3		
Best Selected ..... do	79 0 0		80 0 0				
Australian ..... do	83 0 0		83 0 0				
Y b. Metal Sheathing & Rods ....per lb	0 0 7		0 0 0				
TIN:—							
English Block .....per ton	95 0 0		96 0 0				
do Bar ..... do	93 0 0		97 0 0		2½		
do Refined ..... do	99 0 0		99 0 0				
Banca ..... do	94 0 0		95 0 0				
Straits ..... do	90 0 0		0 0 0		nett		
LEAD:—							
Pig, English .....per ton	21 10 0		0 0 0				
,, Spanish Soft ..... do	19 0 0		0 0 0				
Shot, Patent ..... do	22 10 0		0 0 0		2½		
Sheet ..... do	20 10 0		0 0 0				
White ..... do	27 0 0		30 0 0		6		
SPELTER:—							
On the Spot .....per ton	21 0 0		21 2 6		net		
ZINC:—							
English Sheet .....per ton	26 10 0		27 0 0		2		
Devaux's V. M. Roofing Zinc .... do	26 10 0		0 0				

* And 5 per cent. discount if laid upon the new system.

QUICKSILVER .....per btl	6 17 0		0 0 0		
REGULUS OF ANTIMONY					
French .....per ton	28 0 0		0 0 0		

C. H. DAVIES and CO.'S
GENUINE
SOLID PARQUET FLOORS
Are Greatly Superior to any hitherto Produced, being of Special Construction, Improved Design, Thoroughly Seasoned, and at
PRICES LOWER THAN USUAL.
Specimens at Architectural Museum, 23, Maddox-street, W.
AND AT
Show Rooms, Cambridge Hall, Newman-street, London.

STAIRCASE and JOINERY WORKS,
JOHN WALDEN
(Late Shop Foreman to Mr. W. SANDS, retired),
12, MAIDEN LANE, COVENT GARDEN.
Estimates on application.

UNDER THE PATRONAGE OF H.M. THE QUEEN.
THE LONDON PARQUETRY WORKS,—The first Establishment founded in England (in 1842) for the exclusive manufacture of Solid and Plated PARQUET FLOORS and BORDERS, CEILINGS, and WALL DECORATIONS; and Sole Patentees of the only system adapted to the English climate, whereby the evils of DRY ROT, SHRINKAGE, and WARPING (so common to work manufactured in foreign climates), are EFFECTUALLY PREVENTED.—For designs, estimates, and list of nearly 300 floors, &c., apply to THE LONDON PARQUETRY WORKS, Grove-lane, Camberwell, S.; or to their Sole Agents, Messrs. Gillow and Co., 176, Oxford-street.

BY HER MAJESTY'S ROYAL LETTERS PATENT.

The Gold Medal of the Paris Exhibition, 1867, has been awarded to his Imperial Majesty, the Emperor of the French, for his concrete houses in Paris, built by the Patentee's apparatus.

TALL'S PATENT APPARATUS or MOULDING MACHINE for CONSTRUCTING WALLS, HOUSES and other BUILDINGS.
With the Patentee's Apparatus, Portland Cement Concrete Walls may be built at half the cost of brickwork (in some cases less than half), being ten times as strong, impervious to wet, nearly smooth, requiring but one coat of plaster; being one solid mass completely deadening sound; requiring no bond timber for joists, neither lintels nor arches over door, window and other openings. For Gardens or Park Close Fences cheaper than wood fencing.
A Pamphlet containing full information, and explaining immense advantage of Concrete over all other wall constructions, will be forwarded on receipt of six stamps. Address,
J. TALL, FALSTAFF YARD, KENT-STREET, SOUTHWARK.

THE INTERNATIONAL PRIZE MEDAL,
AWARDED 1862,
ALSO THE DUBLIN MEDAL, 1865.
To BUILDERS, CARPENTERS, and BLINDMAKERS
JAS. AUSTIN & SON,
Manufacturers of the above Articles, particularly wish to direct the attention of the Trade to their
IMPERIAL PATENT FLAX SASH LINES,
Of which they are now making four qualities, and they strongly recommend that in all cases they should be purchased in preference to the PATENT LINES made from Jute, which Article has neither the STRENGTH nor DURABILITY of FLAX, consequently cannot give so much satisfaction to the Consumer. They also invite the particular attention of Upholsterers and Blind Makers to their Improved Patent Blind Lines, which are very much superior to anything yet offered to the trade.
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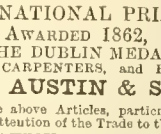
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THE BUILDING NEWS.

LONDON, FRIDAY, DECEMBER 6, 1867.

THE DESIGNS FOR THE LAW COURTS.

OVER and over again we have felt it to be our duty to protest against the conduct of this important competition. Whether we reviewed the site, or thought of the qualifications which raised the chosen twelve so far above all other architects; whether we studied the arrangements of the plans, or weighed the proportions and detail of the elevations, whether we turned the ear to the popular voice, or listened to the professional reports; in whichever direction we looked everything seemed unsatisfactory. The conduct of the judges in shirking the responsibility of selecting *one* architect, the work they were appointed to do, and in recommending *two* architects, which they were *not* appointed to do, is perhaps the most unsatisfactory feature of the whole business. And the gentle rebuke of the Treasury in sending back the recommendation was in every way admirable. Our readers will doubtless have read, in one or other of the Parliamentary reports, that on last Friday, in reply to a question of Mr. Beresford Hope's—

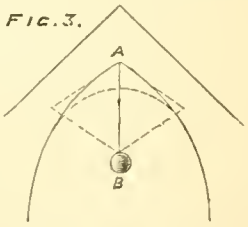
Mr. W. Hunt said the Treasury had arrived at no determination at present. The Act of Parliament provides that the plans shall be determined upon by the Treasury, with the advice and concurrence of the commissioners. Before the change of Government a committee of judges of design was appointed jointly by the Treasury and the commissioners, and shortly before the House adjourned for the recess the Treasury received a communication from the committee, stating that they had been unable to decide upon any one design, and recommending that two gentlemen might be appointed to prepare a final plan. The Treasury, however, referred the matter back to the committee, and only yesterday they replied that they adhered to their original recommendation. Under these circumstances, the Treasury propose to seek the advice of the commissioners, and as soon as any course is determined upon he would be ready to give any information on the subject.

This is the first gleam of satisfaction which the public has been able to get out of the Law Courts competition, and we sincerely trust the Treasury will continue to act with firmness, and, if needs be, do for the Commissioners what it appears they are unable to do by themselves. Judgment in the full sense of the word is what we want. It has been said that the Treasury is bound to approve or confirm the appointment of one or other of the eleven architects who have taken the trouble to prepare plans for £800, *plus* the contingent hope which accompanies all acts of competition. We think the Treasury is bound to nothing of the kind. It is not a condition that any one of the competing architects shall positively execute the work. And wisely so, for with the present fashion for limited competitions the public might otherwise be compelled to accept the maddest freaks or the commonest hotch-potch. Suppose, for instance, that either from illness or indifference, or want of time, the best half of the chosen twelve had failed at the last to send in any design, is it for one moment to be thought that the Commissioners would be bound to recommend Mr. A, B, C, or D, and that if they were so bound the Treasury was bound to approve and so saddle the public and the future with an irredeemable blunder! The whole case is precisely one which admits of an entire and complete revision—quite as much so as did the National Gallery competition. Of course we all know that just as it happened in the latter case there would be plenty of objections raised by the architects interested and their closest personal friends if the authorities were to recognize what we have all along maintained, that the invidious selection of twelve architects, six of whom were mere make-weight, was an act of injustice to the whole profession, and one which was certainly not calculated to attain the desired end. Besides, in a great national work of such wide-spread importance, it is paramount that there should be no suspicion of any influence beyond present merit. The architect of the New Law Courts should be that man whose design *as a whole* was the best in the judgment of those qualified to judge. We protest against any other principle of judgment. The superiority of one design over another in any one feature—*e. g.*, arrangement of courts, planning of staircases, grouping of towers, or placing of sculpture is not the question. The *precise* arrangement desirable may not be shown—the precise proportions we should like to see may not be given, but whatever they may be it requires but few drawings to show us, first, whether the author has power of contrivance, and, second, whether he is an artist large enough to grapple with such an immense work. It is useless for an architect to say that he has devoted all his time to perfecting his arrangement of passages, halls, &c., and that his art suffers in consequence. If he had been an artist worthy the work, it would have been just as easy for him to have drawn fit and good proportion as to have drawn attenuated or stumpy forms. And no amount of attention devoted to planning should make an architect forget the situation of his building and the nature of its present and probable surroundings. On the other hand, it is equally useless for the architect whose force proclaims itself in detail, and in knowledge of the subsidiary arts, to say that he has devoted all his time to appearances, and that if he liked he could have made his plan perfect in its arrangement. If the plans show long, dark passages, narrow internal areas, useless halls, towers so shut in that they would never be seen except from the top of St. Paul's, water-closets with no external ventilation, labyrinthine corridors, and excess of stairs, no amount of art would make such an architect a fit person to be entrusted with a building where the spirit of contrivance is so much needed. It is high time that our public buildings were entrusted to men who are artistic as well as scientific.

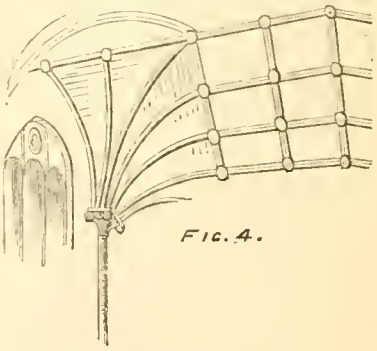
CONSTRUCTIVE AND ÆSTHETIC DESIGN.—No. IX.

THE ribless vaults of the Romans, from the dome of the Pantheon to the groined vault of the Temple of Peace, display a practical acquaintance with the theory of the arch, and, as we have seen, exhibit all the component members of the groined and ribbed structures of the Middle Ages. The Romans in their intersecting vaults generally made their crowns level, and when a wide vault was intersected by others of smaller span, the latter were generally stilted, thus making the sections of both semicircular, but of different radii. This arrangement resulted in causing the groins on plan, and, when viewed obliquely, to assume winding, irregular curves, for, according to this plan, the surfaces cannot intersect in vertical planes. In the Temple of Peace (Basilica of Maxentius), the lateral vaults are of nearly equal span to the longitudinal one,* each compartment on plan being an exact square or nearly so, and this was generally the case. Our own Norman and Early Pointed vaulting up to the thirteenth century follows this treatment more or less. Often the main vault is constructed double the span of the cross-vaults, the groin or diagonal ribs comprising two bays, and

this arrangement, termed after Dr. Whewell "sexpartite," is perhaps the most pleasing. The stilting of the side vaults was a common practice in the Early Pointed, the ridges being generally level, and the groin-ribs and ridge-ribs took the place of the massive cross-springers common in the Roman and Roman-



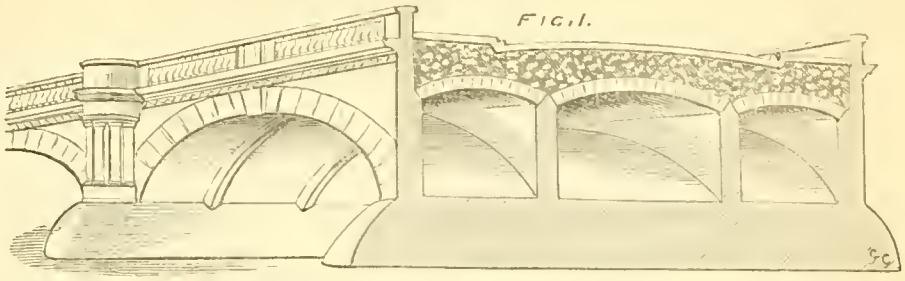
esque vaults, which were usually quite destitute of the constructional and really most effective ribbing, a fact the revivalists of the latter style would do well to consider in their modern adaptations. It may be observed, in speaking of groining, that the method we now generally adopt in profiling



a groin by ordinates from the section of the main vault leads us naturally to design this last curve first, the lateral and lesser vaults being found from it, and assuming more or less elongated or elliptical forms. It was the difficulty experienced in keeping the vertices of the vaults level, and at the same time obviating the disagreeable effects produced by stilting the reduced span cross-vaults, making, as we have seen, the groins of twisted or double curvature or plan, that led to the

* Or as four to five.

CONSTRUCTIVE AND ÆSTHETIC DESIGN.



expedient of doming the cells found in the vaultings of Germany and Italy. In these cases the groins appear to have been found first, or at least not left to "find themselves." The diagonal ribs often assume circular curves, and not the flat or elliptical profiles of vaults whose ridges are level, a domical rise of the ridges where they meet being the result. (The twisted form of groin was of course incapable of being ribbed, and hence in the Roman examples we find only arch bands).

As Professor Willis observes, if we free ourselves of the necessity of preserving the level vertices of the intersecting vaults, and preserving their cylindrical surfaces, we can vault any rectangle, and make arches and groins of any curve, as may be seen in fig. 2, of a quadripartite vault showing a central domical rise, the intervening triangular surfaces between groins and ridges being easily covered. It is clear, also, that the ridge lines of both main and cross-vaults can be made either curved or straight A B. Both the expedient of stilting employed in the Roman quadripartite vaulting, and the domical method, seen on the Continent, were adopted in the pointed arch structures, as well as in the round arched, though the distinction is observed in the latter method, being chiefly confined to the Italian side of the Alps. The same domical variety is seen in the sexpartite and other forms of vaulting in Italy, where the semicircular and pointed arches or curves are often combined.

Sometimes the lateral vaulting cells have their ridges below the ridge of the main vault, and, in some cases, instead of being level, are oblique, or enter the main vault at a lower level. An instance of such vaulting or "Welsh arching" is seen in the vault over nave of Winchester Cathedral, and though it enables the architect to obtain more rib surface over the groins, it is a plan hardly admissible constructively.

From what has been said, it is evident two plans present themselves: either to design the vaulting surfaces making the curvature of the diagonal ribs accommodate itself to them, or else to adjust the vaulting surfaces to the curvature of the ribs, which can be designed without reference to the former. In many cases the covering or filling-in was of chalk or thin slabs of light stone,* made to fit the ribs. In the complex ribbed vaulting of the Middle Ages the lattermethod appears to have been followed, and the horizontal sections of the pendentives display a variety of forms, from the simple rectangle to the perfect polygon or semicircular conoid of fan groining. As I have before said, the ribs constitute the constructive support, as they do the decorative features of a Gothic vault, the latter simply resting upon them as a surface or shell. The idea of a ribbed construction, though not so apparent in, is, as we have seen, derivable from the Roman constructions. The prodigious groined vaults over the Roman cisterns and baths—the lateral vaulting of those of Diocletian, for example—indicate a kind of sub-arches, bands, or tile ribs, that were eventually developed into the ramified decorative ribbing of the Gothic vault, which included the groin ribs, ridge ribs, and surface ribs, so beautifully displayed in our own English cathedrals, and in the intricate "stellar" vaults of Germany. I have often found it difficult to know, in looking at some of the later groined vaults, whether the ribs on the groins are really groin ribs or surface ribs, the illusion is sometimes so perfectly sustained by the disposition of the springing ribs. One peculiarity of the Roman dome vault was that it often served the purpose of an outer covering, as well as an inner ceiling, the roofing tiles being laid directly upon it, instead of upon an independent wooden framework, as adapted by the mediæval architects. The circular church at Nocera dei Pagani, near Rome, illustrated by Mr. Fergusson, displays a prolate-formed internal vault, covered by an external wooden roof, which that author considers the first instance of an outer wooden covering. St. Vitale, Ravenna, is also another well-known example of a spherical dome constructed of earthen pots and protected by a wooden covering. The pointed vaults of the South of France were frequently homogeneous coverings, and the pointed arch form fitted such a construction best. Mr. Fergusson observes the difficulty of forming intersecting vaults to these led the Roman architects to make their vaults simple tunnel ones.

The same author says the exigencies of vaulting led to the abandonment of the semicircular arch both in the East and the West. In the domical vaults of the Eastern nations, the requirements of the pendentive suggested the use of the pointed arch; the upper curves or surfaces of the round form dying away imperceptibly gave no apparent thickness nor defined form, while, by adopting the pointed shape, this weakness of effect was obviated; and upon the square ground plan, first reduced to an octagon and then to a polygon of sixteen sides, the Saracenic architects easily placed a circular dome, as at the tomb of Mahomet. In the West, the pointed arch suggested itself as a better means of constructing narrow cross-vaults by enabling the builder to throw his ridges higher up, thus superseding too much stilting. Domical construction attained its fullest perfection under the Byzantine architects. It was, indeed, the prominent characteristic of the Byzantine style; and the noble interior of the Church of Sta. Sophia, at Constantinople, exhibits, probably, the largest and most artistic application of domical vaulting. Covering a space of 229ft. by 243ft., the greater portion of which is enclosed under its expansive domes, this example is highly suggestive. The central dome, 107ft. in diameter, forms a considerable segment, and is thus infinitely more stable than a semi-sphere, while the clustering semi-domes and lateral vaults and arcades combine to give the interior a noble sequence of effect hardly exampled. The plan is most scientifically and artistically arranged, and shows how well and effectively a large area can be domed. The surrounding and galleried aisles help to resist the thrust of the domes, which are supported on eight piers only, and the gradation of parts and details is singularly effective. A similar arrangement of plan is found in the Church of St. Vitale and other Romanesque examples, all showing how clearly their architects perceived that it was not necessary to enlarge the dome to cover a large area, thus increasing constructive difficulties, but simply to form an outer space round it, the roof of which aided the stability as it added to the internal variety. The forty pierced windows round the dome of Sta. Sophia have a telling effect, though, as one author observes, give an apparent weakness.

Before concluding this article, it may be *apropos* of the subject to add that the stability of the pointed arch is deducible from the theory already described. From the property of the catenary, which is really the arch of equilibrium inverted, it is easily seen that the prolate or pointed forms of arch are best for structures in which the weight over stones of arch is evenly distributed; and that the pointed form is got by simply adding a little extra weight to the apex of arch or lowest point of the chain. This can also be proved by constructing a "parallelogram of forces" about the apex, the upper tangents or sides meeting in a point and requiring a weight proportioned to the diagonal A B, as in Fig. 3. From this it is evident the pointed form is highly adapted for sustaining triangular masses of wall—as gables—besides accommodating itself so well to the outline of such erections. The origin of the pointed arch does not concern us now; its form can be traced in Greece and Asia Minor, and even in the pyramids of Meroë, eight centuries before the Christian era; while its subsequent introduction was, according to good authorities,* made by the Saracens a few years after the Moslem rule. Fig. 1, at commencement of article, shows an original method of weighting the abutments and flanks of a flat arch by longitudinal vaults, a plan of economising material clearly suitable for bridge building.

* Earthenware pots, pumice-stone, and other light substances, are commonly and judiciously employed for the filling-in of vaulting.

* Sir G. Wilkinson and Mr. F. Fergusson.

PURE GAS AND FRESH AIR.

PRACTICAL men who have had an opportunity of examining it, speak in terms of praise of a new revolving washer invented by Mr. John Reid, engineer, and manager of the Edinburgh and Leith Gas Company, for removing impurities from gas and air. Mr. Reid described his apparatus in a paper read before the Royal Scottish Society of Arts. The leading idea of this improved washer is to substitute a horizontal instead of a vertical passage for the gas while being submitted to the action of the shower of water, whereby it should undergo a thorough shower bath from a copious stream of water jets, falling some 20in. in an elongated horizontal chamber, instead of 30ft. in height; and that this should be effected without in any way presenting obstruction to its free passage, or throwing any back pressure on the retorts.

By this contrivance it is proved that the gas is more thoroughly purified for illuminating purposes than is possible by the usual structure of washer. It has several other important advantages. The motive power requisite to lift the water about 18in. or 20in. in Mr. Reid's apparatus is less than one-twelfth of that required to lift the water 30ft. in the old form of washer. The usual method of pumping is expensive in engine power, and it is also a matter of well-known experience that all kinds of pumping machinery, requiring, as in a gas work, to act day and night without intercession, is very liable to get out of order, and unless relays of apparatus are kept in readiness against accident, it is obvious that no stoppage for repairs can take place without allowing the gas meantime to pass without the washing process. On the other hand, Mr. Reid's machine, while it requires a much smaller amount of steam power, as has been stated, can be kept in full operation by a crank handle in the hands of an ordinary labourer, when from any cause the driving power of the engine may be suspended. The washer, we are told, has been in constant operation in the gas works in Leith, day and night for nearly two years, and has never required to be stopped for repairs, or in any way gone out of the best working condition. Mr. Reid also claims for his apparatus that it may be applied for the removal of particles of dust or soot, and otherwise for the purification of common air, in conjunction with hot air stoves, which are now so extensively used for heating or ventilating large public buildings, and also in washing the air admitted into hospitals. "As a rule," he remarks, "it will be found that the supplies of air for heating hospitals, churches, theatres, and other large buildings, are drawn in from near the level of the ground, and in too many cases from the stagnant atmosphere of some back out-of-the-way court, where, in addition to its ill-conditioned state, it not unfrequently gets further polluted by gaseous emanations from cesspools and adjacent sewer gratings. But although care be taken to avoid these palpable errors in the planning of ventilating apparatus, it is quite impossible in densely populated towns and ill-ventilated localities to procure pure air for this purpose. Yet it may be practicable, with a washing of the kind under notice, to purify it before being passed into a large building. The washing liquid could be charged with disinfecting agents, to render any impurity at least harmless." If this invention really possesses

all the merits claimed for it, it ought to become a public boon. It is at least deserving the attention of medical men and sanitary reformers. The committee appointed to examine the invention—of which Dr. Stevenson Macadam was convenor—declare that "Mr. Reid's apparatus is the best arrangement which has yet been suggested for the purification of coal gas and ordinary air," and so highly do the Scottish Society of Arts think of it, that they have presented the inventor with their silver medal and plate, value five guineas.

THE FUTURE OF LONDON ARCHITECTURE.

To the Editor of the BUILDING NEWS.

SIR,—I cannot imagine any one so dull or so blind as not to be struck, on returning to London after a residence abroad, with the soul depressing dinginess and meanness of our streets as compared with those of even a third-rate continental town. My sole object in writing on the subject in the "Fortnightly Review," was to direct attention to, and to invite discussion upon the best means of remedying these defects, the existence of which I believe to be universally acknowledged, and the notices that have appeared, and the letters I have received on the subject of my article, have satisfied me (however much some of the writers may differ with me as to the nature of the remedy to be applied) that the object I had in view has been fully attained.

In that article, besides recommending the adoption of a soot-repelling surface and the accentuation of the architectural lines of the façade by colour rather than by light and shadow, I ventured to dissent from the prevailing fashion of using the pointed arch in horizontal composition. The two questions so raised are entirely distinct, and I find, as might have been expected, that many who agree with me regarding the first are of a different opinion in respect to the second. Thus the "Pall Mall Gazette" writes on the first question as follows:—In the last number of the "Fortnightly Review" is an article by Mr. Conybeare on the future of London architecture, strongly advocating the use of glazed tiles as the only fitting surface-covering for buildings destined to be subjected to the influences of London smoke. It is not many months ago that we advocated the same views with special reference to the materials to be employed in the New Law Courts; and it may fairly be hoped that after a few years spent in arguing the question, the *vis inertia* of English architects and builders may so far be overcome that they will begin to exercise their common sense, and recognize the economy, the æsthetic propriety, and the practical convenience of a method of building which was practised in Persia and Scinde with extraordinary success at the very time that European Gothic architecture had attained its perfection, and which was by no means unknown to the mediæval Gothic architects themselves. And we cannot do better than recommend Mr. Conybeare's paper to the serious attention both of the professional and amateur architect, both for its intelligent criticism and for the fullness of its details in matters of construction and cost."

As regards the second question, the reviewer remarks as follows:—"At the same time, Mr. Conybeare's singular misapprehension as to the unfitness of Gothic design for street architecture ought not to pass unnoticed. He argues against it on the ground that as houses are built in floors, and thus must require several rows of windows placed horizontally, therefore the vertical tendency of Gothic design, resulting from the use of the pointed arch, must be sacrificed to the predominance of the horizontal.

* * * * * * *

"In the northern cities of Italy numerous specimens of a similar use of the pointed arch still remain, for the delight of the critical traveller, and the instruction of the nineteenth century architect."

All who are tolerably well read in the literature of Pointed architecture must be aware that however mistaken my views on this point may be, they certainly are not singular, inasmuch as they are shared by Willis, Whewell, and Fergusson. Are there any who have written scientifically on Pointed architecture whose names are of higher authority than these, and if so, who are they? Neither am I singular in pointing out the utter failure of stone in the atmosphere of London, and in advocating the adoption of a glazed ceramic surface instead. For example, on referring to the BUILDING NEWS of June 17, 1864, I find, in a lecture of Mr. Burges', the following opinions on both these points:—"It is impossible to conceive anything more melancholy than a London brick house after it has been erected 50 years, and it becomes a most serious thing to suggest with what material our modern London buildings are to be faced; so corroding, and so black is the smoke, that positively nothing will resist it but polished granite or glazed earthenware. The latter would offer an immense field for art, in the shape of tiles of good colour, or of painted majolica." In fact, the only dissentient opinion hitherto expressed regarding my advocacy of a coloured and glazed ceramic surface has been that of the writer of the article in the BUILDING NEWS of November 23.

There were three opinions expressed by that writer that appear too extraordinary to be dismissed. In the first place, he ridicules the assumption that London is to continue as smoky as it has been during the last fifty years, but it is obvious that to build for the future on any other assumption would be simply irrational, and altogether inaccordant with the "irrefragable logic of facts," for the sootiness of London is due to the concentration of a large population of coal-consumers in a limited area, and this population is increasing at the rate of 53,000 per annum. Moreover, notwithstanding the infinite number of nostrums for the consumption of smoke that have been promulgated during the last thirty years, it is notorious that the sootiness of our atmosphere has continued to increase with the increase of the population.

The writer is, moreover, so enamoured of dirt and decay on the ground that both are incidents natural to matter, that, like the little boy in the nursery rhyme, who cried when he was washed because he did not wish to be clean, the writer objects to my advocacy of a surface that would not be liable to disintegration by the acids in the London atmosphere, and that every shower would wash clean, on the ground that such continuous freshness is non-natural, just as the said little boy might have founded his objection to being washed on the ground that dirt was an incident natural to man, while washing was proved to be non-natural by his instinctive repugnance to the process! And he forgets, in founding his objections (to the unchanging brightness and freshness of a ceramic surface) on the constant changes of nature, that such changes are merely recurrent terms in "an undisturbed vicissitude"—that winter is succeeded by summer, and night by "the beam that evermore makes all things *new*." Goethe, in the refrain of one of the grandest lyrics ever addressed to "the Great Architect of the Universe" (the chorus of Archangels in the prologue of "Faust"), reads Nature very differently: "Thy world's unwithered countenance is bright as on Creation's day."

Your reviewer objects to the precedents I cited for the adoption of polychromatic architecture in London—that because coloured architecture is pleasant to the eye in the transparent air and brilliant sunlight of Ispahan, it must necessarily appear the reverse in so sunless and smoky an atmosphere as that of London. This is an obvious *non sequitur*, for if colour is found advantageous where there is no atmospheric gloom to counteract, *à fortiori* must it be a desideratum in an atmosphere that stands in so much need of lighting up as ours. In the autumnal tints of the foliage Nature has so ordered it "That the woods wear in sunless days a sunlight of their own."

On the question regarding the adaptation of the Pointed style to the requirements of modern domestic architecture, my contention was that to place long rows of pointed windows tier above tier was not in accordance with the vertical spirit of Pointed architecture, and in refutation of this position your reviewer adduces the fine effect of the houses at Cluny! But if he refers to the fullest series of the Cluny houses that has been published (that given in "Architecture, Civile et Domestique"), he will find that there is not a single pointed window amongst them all. The various Cluny façades there engraved present, altogether, 102 openings, of which only three are pointed, and these three occur on the ground floor, in openings of exceptional width, where there were structural reasons for introducing the pointed arch quite as cogent as those which induced the Romanesque architects to resort to it in vaulting their churches. I may therefore say to my critic, as Sir Anthony Absolute did to Mrs. Malaprop, "Really you are a truly moderate arguer, for almost every word you say is on my side of the question."

I now come to the question of how far Pointed architecture is compatible with the requirements of street architecture and modern domestic life. Each style of architecture has its peculiar principles of composition, its peculiar "motif," and its strong points and weak points. In some styles, for example, in Greek architecture and its derivatives, the "motif" was to produce a maximum of external effect (for the altar and the worshippers were outside the Temple) and the composition was horizontal, that is, all the vertical lines of the design were stopped against the preponderating horizontal lines of the base architrave and cornice; while, in the Gothic, the "motif" was to produce a maximum of internal effect (the altar and worshippers being within the Temple), and the very essence of the style was vertical composition. Thus, while on the one hand, every style has its peculiar characteristics and capabilities, on the other, each class of edifice has its peculiar requirements as regards the conditions it ought to fulfil and the proper expression to be given to it; and in the face of these diversities, in the character and capabilities of the various styles, and in the requirements of the various classes of buildings, it is surely impossible that any single and particular style should be better adapted than each and all of the others *to every possible kind of building*. To believe that such can be the case is simply sectarianism. It is incontestable that the origin of Gothic architecture was not secular but ecclesiastical, and that the structural type on which the style formed itself was not an external feature, but an internal one, such type being the vault of the interior from which the style was developed till it culminated in the thirteenth century in cathedral interiors, in which architectural expression is carried to a point infinitely higher than is attainable in any other style,—interiors which have been said to impress one with the idea of "frozen music," of a "petrified religion," of "Sursum Corda done into stone." But the conditions to be complied with in secular or domestic architecture, and still more in street exteriors, differ so enormously from those which are so perfectly fulfilled in a cathedral interior of the thirteenth century, that it seems scarcely in the nature of things that the style which is so far the most appropriate in the one case, should be also better adapted than any other to requirements of so entirely opposite a character.

There is in the Gothic of the best ages an inherent expression of asceticism and self-repression, and an anti-realistic tendency which

in a great measure unfits it for domestic and secular purposes; for example, how utterly discordant a drawing of Michael Angelo's would appear in the glass of a Gothic window, or a nude Greek statue, of even so unsensuous a type as the Venus of Milo, in a Gothic niche. Pugin attempts to account for this discordance by the hypothesis that "Pagan art," as he calls it, "wished to perpetuate the human feelings and the Christian Divine," but the fact remains, that realism in art is out of harmony with the expression of Gothic architecture of the best age.

In the thirteenth century Gothic, secular or domestic architecture, in our sense of these terms, scarcely existed, and the only types extensively practised were the Castellated, the Monastic, and the Ecclesiastic, and thus it happens that when architects attempt to design a large secular building in the Gothic of that age they usually drift into one of these three channels. For example, in three of the ablest designs for the Law Courts, it was commonly said that Mr. Burges's belonged to the Castellated type; Mr. Street's to the Monastic; Mr. Brandon's, with its double apsed cathedral, doing duty as a public hall, to the Ecclesiastic.

About a century has elapsed since Horace Walpole brought Gothic into fashion, and nearly thirty years since Pugin published his "True Principles" and his "Apology for the Revival" of Christian architecture, yet, after all these years, is there a single example to be found in London—and, if so, where?—of its successful adaptation to the modern indoor requirements of domestic architecture at all approaching in fitness, in harmony, and in architectural effect to that which we constantly meet with in modern Italian interiors? Would any one think of comparing the interior of the Speaker's House in these respects to that of Bridgwater House or of the Reform Club, or Travellers' Club? Yet the Speakers' House is one of the best and most carefully finished portions of the Houses of Parliament, of which Pugin wrote as follows:—"It is the morning star of the great revival of national architecture and art; it is a complete and practical refutation of those men who venture to assert that Pointed architecture is not suitable for public edifices, for the plan embodies every possible convenience of access, light, and the distribution of the various halls and chambers." And he is still more enthusiastic about the details, which he characterizes as "most consoling." But what is the opinion of the present generation on these same Houses of Parliament? Is it not that no building has ever been erected in Europe the cost of which was so preposterously disproportioned, both as to its architectural effect and to the amount of accommodation it afforded.

No one can have a keener appreciation than myself for the beauties of the Ecclesiastical Pointed, but it seems to me that there are reasons that explain why Gothic should still remain the most perfect style of any for churches, and should, at the same time, be wholly unadapted to the requirements of modern domestic architecture. Everyone admits that the interior of a thirteenth century cathedral was the most perfect embodiment conceivable of the aspiring and "desensualizing" tendencies of the Christian faith of those who built it, and that faith being the same in the nineteenth century that it was in the thirteenth, what suited it best then suits it best now. But, as regards domestic architecture, the case is widely different, for our nineteenth century life has scarcely more resemblance to that of the thirteenth century than it has to that of the Hottentots. It has been truly said that during the middle ages "Human life was short and brutish." All the comforts and refinements, and most of the decencies of life, were then utterly ignored, and the manners at table of a bevy of knights and ladies of the thirteenth century were such as would sicken a company of costermongers in the nineteenth. Cleanliness, decency, and privacy were in those days utterly ignored. Representations, drawn and sculptured, of the most outrageous indecency were to be found even in their churches. I remember one removed in the restoration of Llandaff Cathedral of a character too vile to admit of description. Erasmus feelingly describes the horrors of the hall—this common eating and sitting room. It was strewed with rushes, which, he states, were seldom changed, and, as they formed the litter and kennel for troops of cats and dogs, and was the common receptacle for all the scraps and slops of the table, and of far worse horrors, these rushes soon became unutterably filthy and offensive. The manners of the guests at table were on a par with their swinish surroundings. The gentlemen eat with their heads covered on account of the drafts. Several contemporary directions for behaviour at table, of the fourteenth and fifteenth centuries are extant. In England there is the "Book of Courtesy," of the former date, and in France various metrical "Continances de Table," of a date a century later. Each guest, for instance, carried about with him his own knife, which he was instructed to keep clean, but there were no plates or forks, and the guests eat with their fingers, on communistic principles, for we are told—

> If the dishe be pleasante, eyther fleshe or fishe,
> Ten handes at once swarme in the dishe,

and with these same hands they cleansed their noses, for handkerchiefs were not invented. For the performance of this operation, both the French and English works give precise instructions. You are specially directed to cleanse your hand on your tippet afterwards. I have dwelt on the manners and customs of our ancestors in the Middle Ages, because one distinguished Pan-Gothicist, Mr. Pugin, argues that we should build our houses in the same style as our forefathers did, because the conditions of our own modern life are similar to those under which those ancestors lived! Had success been possible in these protracted attempts to harmonize vertical detail and horizontal composition, architects of such undoubted talent could not have failed to attain it, and I think that on referring to first principles, the causes of such failure will become very apparent, and that the impossibility of success may be almost demonstrated.

I believe it will be admitted that Gothic art culminated in the thirteenth century, and in the Continental street architecture of that date the use of pointed windows was, I believe, exceptional. In houses at Cluny, of the thirteenth, and even of the fourteenth, century, all the windows are round-headed, and in several other instances where private buildings are attributed to the twelfth century, I believe them (from the advanced character of their mouldings) to belong really to the thirteenth.

There is an obvious geometrical reason why the use of round-headed windows under an horizontal string should be more productive of "repose" than that of pointed ones—for the two circular arcs that form the latter intersect at the vortex of the arch, and the prolongations of their tangents at that point cut the string above at an angle of thirty degrees; but, in the case of the round-headed arch, there is perfect continuity without any intersection or abrupt changes of direction, and the tangent to the arch, at its vortex (where it approaches the string above most closely) is horizontal, and therefore parallel to, and coincident in direction with, the string above it.

My line of argument in the article under discussion was that the requirements of street architecture necessarily involve horizontal composition, but that horizontal composition is irreconcilable to the very essence of the Gothic or vertical style. Therefore, that the requirements of street architecture are irreconcilable to the essence of Gothic architecture. I understand the major to be admitted (at least, it has not yet been disputed), and the question is, therefore, narrowed to this, "whether or no vertical composition is indispensable to genuine Gothic?"

On this point all standard authorities are, I believe, agreed. Rickman, Willis, Fergusson, Paley (and, indeed, every scientific writer on Gothic architecture, who has really grasped the subject), have insisted on vertical composition as the very essence of the style. For example, in the article on architectural composition, in a late edition (I believe the last) of the "Encyclopædia Britannica," the writer divides the subject into "Horizontal Composition," and "Vertical or Pointed Composition." In the latter, he lays it down as the first principle that the commanding lines of every part of the composition should lead through from the summit to the base uninterrupted by crossing lines," and the article proceeds to speak of Gothic architecture as "the vertical style." Paley, in his "Manual of Gothic Architecture," lays it down that "the very first principle of Gothic composition is the decided preponderance of vertical over horizontal lines both externally and internally."

I could multiply such extracts to any extent, but I will conclude with three quotations, from Willis, Fergusson, and Whewell, as they refer to the so-called Gothic of Italy, to the beauties of which my attention has been called. Willis says:—"There is, in fact, no genuine Gothic in Italy. * * * That style was never practised there. * * * Her artists, never losing sight of the Classical structure, hoped to succeed in giving their proportions and beauties to buildings formed of pointed arches. * * *" And he goes on to say that the result "of this continued struggle between the two principles"—of horizontalism and verticalism—"was a style wanting alike the lateral extension and repose of the Grecian, and the lofty upward tendency and pyramidal majesty of the Gothic."

Fergusson says of the Italians:—"They never grasped the true principles of Gothic art. * * * Their buildings were deprived externally of all the aspiring vertical lines so characteristic of true Gothic. * * * They recurred to the horizontal cornices of Classical times. * * * The same incongruities occur in every part and in every detail. It is a style they copied without understanding, and executed without feeling."

And the late Master of Trinity writes as follows:—"The maxim of the predominant sway of the vertical lines of the structure is of a more wide and general nature than those which I have hitherto noticed. This is, in fact, the peculiar and characteristic principle of the Gothic style, and, whatever may be the details of the building, if this principle be not unequivocally and throughout enunciated, work is not genuine Gothic architecture. We may see in many parts of Europe, and especially in Italy, how inefficient pointed arches alone, and any other of the mere formalities of the style, are to convey its true spirit and character when this supreme principle does not rightly operate."

H. Conybeare.

THE LATE MR. CHARLES FOWLER, F.R.I.B.A.

In the month of September last passed away Mr. Charles Fowler, an able architect, and a good man. Professor Donaldson pays an affectionate tribute to the memory of his brother architect and old colleague, in a paper read before a recent meeting of the Institute. From this paper we derive many interesting particulars concerning the life and labours of Mr. Fowler. We learn that he was born in May, 1792, at Cullumpton, in Devon, and frequently used with great satisfaction to allude to the many noted artists of which his favourite county was the birthplace, as John Shute, architect and painter, and author of the first known work on architecture in England; Reynolds, Nollekens, Northcote, Haydon, Eastlake, Brockedon, Prout, and William Cooke, member of the Water Colour Society. Fowler gained his first professional experience in the office and works of Mr. John Powning, architect and

builder, in Exeter. On the expiry of his term of apprenticeship he entered as a salaried assistant the office of Mr. Laing, the architect of the Custom House, who had extensive practice. This was in the year 1814. While here Fowler received a medal from the Society of Arts, for a design for a new General Post Office. At that period this was the only encouragement offered to the student, besides the Royal Academy gold and silver medals, so that the Society of Arts medals were objects of some contention among the young architects. In 1822, architects and engineers were invited to send in designs for a new London-bridge, the old one being found to be insufficient for the traffic, unsound, and a very dangerous obstruction to the watercourse of the Thames. To Mr. Fowler's design, among fifty-two competitors, was awarded the first premium. He proposed to span the river with five segmental arches, in graduating widths from the Middlesex to the Surrey side of the Thames, the centre having 145ft. span, the width of the piers being 30ft., and the total width of the bridge from out to out 50ft. We agree with Professor Donaldson that it is to be regretted that the original design for this bridge cannot be found among Mr. Fowler's papers; doubtless, thinks Professor Donaldson, the drawing is among the archives of one of the City authorities. Two other drawings, however, were exhibited at the meeting, which, it is believed, were also submitted by Mr. Fowler in the competition. The ultimate decision of carrying out Mr. Fowler's design, Mr. Donaldson says, was referred to the disinterested examination of a committee of the House of Commons, a tribunal, as we know, quite as likely to be biassed by party passions, questions of interest, or the battle of styles, as not. Here it met the usual fate: a fresh competition was opened to a select number, from which the premiated author of the first competition was carefully excluded. Mr. Fowler was gifted with a practical rather than an imaginative turn of mind. There are those who are endowed with such an abundant richness of imagery as to be able to pour forth a flood of original ideas, and thus delight and astonish by the wild profusion of their thoughts. But Mr. Fowler always bound himself within the strict limits of practicability and use. Not that he was without a certain degree of fancy, and often very happily made the accidents of a plot, whether in its shape or levels, contribute essentially, not only to the immedate purposes of a building, but also to the playful arrangement of his distribution. Of this we have a striking illustration in his Hungerford Market, now destroyed to make way for the Charing Cross station. It is published in the "Transactions" of the Institute, part 1, vol. I., for the year 1836. It is stated that Förster was anxious for the market to appear in his "Bauzeitung" at Vienna, and as soon as it was published the Germans hailed it with great applause. The design was perhaps even more highly valued abroad than at home. When Stüles and Strack, the famous Berlin architects, visited England soon after, their first desire was to visit Hungerford Market, which they had seen in the "Allgemein Bauzeitung," with external walls only a German foot thick (1½ brick) carried up to a height of several storeys, a fact which they could not believe until they saw it. This reveals one of the principles of Fowler's mind as to construction. "Enough for security, and not more than enough. Extravagance is waste." This is an honest but somewhat dangerous maxim. This "enough" is a vexed question, and experimentalists vary in opinion as to what extent beyond the actual stress or pressure it is safe and wise to have the actual strength. Our friend's desire to avoid excess might perhaps induce him occasionally to venture too near the verge of mere sufficiency. Covent Garden Market was designed by Mr. Fowler in 1826. He was also the architect of the markets at Gravesend, Tavistock, and Exeter, the last being the result of a competition in 1834. In 1827, he designed and constructed the conservatory at Sion, near Brentford, for the Duke of Northumberland. The church of Honiton, in the Lombard-Norman style, was erected from his design in 1835. He also erected the chapel at Kilburn, St. John's Church, Paddington, and several other ecclesiastical buildings. Among his other works may be mentioned the Devon County Lunatic Asylum, built on the radiating principle, the result of a public competition, the London Fever Hospital, and the Wax Chandlers' Hall, in Gresham-street. Mr. Fowler was at one time master of this company, and this building was erected in 1852, and was one of his last works. Few professional men have exhibited so great an amount of perseverance. He entered upon many competitions, both open and select. He carried off the second premium for the bridge at Littlehampton; and for the Nelson Monument, Trafalgar-square, in conjunction with his friend, Mr. Sievier, the sculptor. In concluding his memoir, Professor Donaldson said: Mr. Fowler was one of the founders of the Institute, and so early as 1836 was my colleague, as one of the joint honorary secretaries, to the duties of which he devoted much attention, keeping in due order and regular method the accounts and ordinary business, which daily increased, thus greatly relieving me, my more especial division being the direction of the literary and artistic proceedings of the body. He continued to be honorary secretary for many years, and subsequently was elected vice-president. He was a man of singular method and high honour, and of great transparency of character. He had great firmness and decision of character. His yea was yea, and his nay was nay. His active mind left him no rest. If the saying of the great Roman emperor is to be admired—*nulli dies sine linea*—what shall we say of our friend, whose maxim was *nulla hora sine linea*?

BRICKWORK AND CONCRETE BUILDING IN PARIS.

THE "Times" of Tuesday last contains some suggestive information on brickwork and concrete buildings in Paris, contributed by an "Operative Bricklayer." The contribution purports to be a report on Paris and the Paris Exhibition. The writer says:—In looking over the Exhibition I was delighted to see so many works of art from different nations, but my attention was more directed towards work in my own line of business. I saw several specimens of brickwork in the park adjoining the Exhibition, such as a few cottages, a church, several high shafts (chimneys), and other pieces of brickwork, which had been built by bricklayers of different nations, and on looking well into it I found it was inferior to brickwork done in England by us English bricklayers. The bricks were not laid even or straight, and the bond was not kept true. I enquired if there were any other brick buildings in Paris apart from the Exhibition. I found there was not any built entirely with bricks—stone and marble are chiefly used. I looked over the additions now being built to the Palace of the Emperor, and the new Opera House, and several other large buildings now in the course of construction. I found there were pieces of brickwork inside the Opera and some of the other buildings—little party walls—where there was not sufficient thickness for stone, which are to be plastered over; the bricks are laid very irregular. My attention was directed to the great market place, which is built principally of glass and iron; there are a few panels of brickwork between the main supports of the building, the walls are only 4½in. thick, built with different coloured bricks, marked out in diamonds. There being no other brickwork just there, it is considered by the French tasty work, but it is nothing compared with brickwork in England; the bricks are laid what we term hatching and grining, and according to the brickwork I saw in Paris, the English bricklayers stand before all others in the world for superiority of workmanship.

I examined the bricks they use in Paris. I found they were about the same size as the stock bricks used in London and about the same in quality. I looked over the pottery ware that was exhibited, and I saw Mr. Doulton and other English potters had some of their handicraft there; and, to my mind, the filters, drain pipes, closet-pans, syphons, and stone bottles, &c., of English make surpassed those of French make. The sanitary arrangements of Paris being very imperfect, there is great necessity for many hundreds of articles similar to those exhibited by Mr. Doulton and others, and also some of the sanitary apparatus patented by Mr. George Jennings would tend to improve and purify Paris.

Some time before I went to Paris I saw accounts in the newspapers of some houses being built of concrete for the Emperor, and of course I being in the building line, when I arrived in Paris I felt anxious to see them. M. Fonche—one of the interpreters at the British Workman's Hall, to whom I am greatly indebted for the information I received, he, being a good interpreter, and having a thorough knowledge of the building operations in Paris, conducted me to the concrete buildings. I found they were being erected by an English contractor, Mr. Newton, C.E., Chancery-lane, London. I saw the foreman, and he allowed me to look over them, and also gave me some information respecting their erection. They required no skilled workmen, except one or two carpenters to fix the boards. The way these houses are built is very simple. The carpenters fix two rows of boards the distance apart they intend the thickness of the wall, 5ft. or 6ft. high or more; when the boards are properly fixed the labourers mix the gravel and cement together. After it is well mixed they shovel it into the cavity left between the two rows of boards until it is full; after the concrete gets hard, which takes two or three days, the boards are removed and the concrete left standing, which makes a very good wall. The boards are fixed again above that which is hard until they get the wall the height they require it. At the same time they keep it perpendicular, put in the irons or other fixtures for party walls, doorways and window openings.

Each of these houses is constructed to accommodate three families, each family to have three rooms as follows, one bedroom, one sitting room, kitchen and cellar. I found these very awkwardly constructed. There is a staircase in each house, which serves for each family to get in and out of their apartments. The first room from the stairs is the sitting room, then the bedroom and next the kitchen. Everything for the kitchen has to be carried through the other two rooms, which is very inconvenient. Supposing some of the family are ill, all the traffic is through the bedroom. The rooms are about the same size as the rooms in the cottages in and about London. The foreman told me the estimated cost of each house at first was 6,000f. (£240). After some of them were erected the Emperor came to view them. They had then a very rough appearance. He asked if nothing could be done to make them more ornamental. He was told they could be plastered. Now the men are plastering a thick coat of plaster of Paris (about 1¼in. thick) all over the concrete outside, and drawing it out in regular courses to imitate stone work. I learnt from the French Council that they will now cost 10,000f. (£400) each house, which is considerably more than was expected at first. The Emperor is going to present them to a society of working men, and they being away from the centre of Paris will be let out at a low rental.

I also saw some large houses being built of concrete, situate in the Rue De Miroménil, No. 98. There are 15 windows to each storey in front, and the elevation of the building is a ground floor and four storeys above. These are built on a different system; the concrete is mixed and put into a mould. The mould is like a box, 3ft. or 4ft. long, and 18in. high, and the width the thickness they intend to build the wall; the sides of the mould are greased When the concrete is set, which takes a day or two, the mould is lifted up, which leaves the concrete in a square block like a block of stone. After they get a quantity of these blocks they bed them one upon the other the same as stone, and so they erect the building. The blocks round the doorways and windows are ornamented by flowers and other devices to imitate stone carving, which is prepared in the mould the same as the square blocks, so that it may be all solid together. This building looked heavy and dull in appearance, being mixed in between some stone buildings. The French builders do not approve the concrete system of building.

PURE WATER SUPPLY.

THE question of supplying London with pure water has engaged much attention of late, and amongst others who have proposed to solve the problem is Mr. W. Austin, C.E. This gentleman's proposition deserves the consideration of the Commission appointed last year to inquire into the subject. Mr. Austin proposes to form fifty artesian wells in various parts of London, on the principle of vertebraical or locked bonded artificial stone-masonry, sunk on iron ring curb bases of varying and decreasing diameters down to such depths as shall be considered sufficient to form reservoirs. Below the rings of masonry, iron stand-pipes, or rising main-pipes and encasing, will be bored and sunk down to the fountain-springs or sources of water. The estimated cost of constructing these fifty wells is one million sterling, and it is calculated that each well will raise and distribute four million gallons of water per day of twenty-four hours. The theory is based upon the assumption that at the base of the London Basin, at a

depth of 600 yards, there is an unlimited supply of water; and also that its self-elevation, rising at the mouth of each well to a height of 100ft., depends upon the correctness of the accepted form of the basin, which is described in geological maps as made up of a series of layers underlying each other. The London Basin extends from Sevenoaks, in Kent, to Leighton Buzzard, in Berkshire, a distance of seventy miles, at which places the Green Sand crops up and receives the drainage of an extensive area.

LLANDAFF MEMORIAL CROSS.

THE accompanying illustration is engraved from photographs of a memorial cross recently erected in the burial ground of Llandaff Cathedral, from the designs of Mr. H. Conybeare, to the memory of his father, the late Dean. There is a spacious vault in the basement. The steps above are of Dundry stone (the material of which the cathedral is chiefly built). The shaft and all its supports is of white Mansfield, the same material as that employed by Mr. Scott in the Martyr's Memorial at Oxford, and it is believed almost the only English building stone the durability of which can be depended on for delicate sculpture, when exposed to the weather. As will be seen from the engraving, the capital of the cross presents two groups of sculpture; the first, of the Crucifixion, under which is inscribed, "By Thy Cross and Passion, good Lord deliver us." The scutcheon beneath is charged with the emblem of the Passion, a pelican feeding her young with her blood, the foliage being the passion flower and the sacramental emblems, wheat ears, grape clusters, and vine leaves. On the opposite side is a group representing the Resurrection, under which is the sentence from the Litany, "By Thy glorious Resurrection and Ascension, good Lord deliver us," the scutcheon below being charged with a phœnix rising from its ashes. The groups are so arranged as to admit of through openings in the back ground of each, which greatly lightens the effect of the whole. During the Middle Ages every burial ground had its cross, and to supply the deficiencies of our modern churchyards in this respect appears quite as fitting an object in a memorial to the dead as the placing of memorial windows in the church itself.

THE BUILDERS' BENEVOLENT INSTITUTION.

A GENERAL meeting of the subscribers to the Builders' Benevolent Institution was held at Willis's Rooms, King-street, St. James's, on Thursday, the 28th ult., for the purpose of electing two pensioners on the funds—one male and one female. The chair was taken by Mr. W. R. Rogers, president of the Institution. The chairman, in opening the proceedings, said there were eight candidates, and he was sorry to say that only two out of that number could be elected, owing to the want of funds. There would, however, be another election in May next, when those who were unsuccessful on that occasion would have a further opportunity of obtaining the desired result. The poll was then declared open, and, at its conclusion, Mr. T. Stirling, who acted as scrutineer, read over the respective numbers allotted to each candidate. The following were then announced as having been elected: — George Newman Lambert, plumber, painter, &c., of 4, Hereford-street, Lisson-grove, aged 71. Debility, rheumatism, and an injured arm, prevented him from earning more than a few shillings per week. Hannah Lawrence, aged 70, 26, Desborough-terrace, Harrow-road. Feeble and necessitous, and supported by her daughter, who is in service.

TRADE UNIONS AND MACHINERY.

IN the course of his introductory address, as president of the Royal Scottish Society of Arts, at Edinburgh, the other day, Mr. George Robertson, F.R.S.E., made some sensible remarks on the effect of trade unions on the prosperity of the country. It appears to Mr. Robertson that, interfering so much with individual labour, these unions tend to undo a great deal of what the introduction of machinery has done to make England great and prosperous. Machinery tends to equalize labour, and to bring it to the standard—but it is to the highest possible standard. Machinery puts the child on the level with the adult. It enables any one of sufficient intelligence to attend a machine to do as much work, and as good work, as the most skilful man. Machinery spreads a given quantity of work over the fewest possible hands. But what are the unions doing? Their object is to bring down labour to the lowest practicable standard, and to lower the work of the adult; to prevent a man of industry and intelligence from doing more than a fixed low average of work; in short, to spread a given quantity of work over the greatest number of hands. Trade unions are, therefore, antagonistic to machinery, and the introduction of the latter, instead of hand labour, into every department of industry, is one of the means of counteracting their bad effects. Mr. Robertson, however, did not consider that strikes and unions are interfering with the general progress of arts and manufactures, or the civilization of the world at large. On the contrary, their tendency is, perhaps, to benefit the general cause of civilization, by improving the resources of other countries. In many branches of manufactures England, hitherto, has had a monopoly, which she cannot hope to retain always. But now the price of labour in this country, combined with the low standard of work allowed by the unions, and the uncertainty in the labour market, which prevents manufacturers entering into large contracts with safety, must break down some of the monopoly we have enjoyed, especially in the iron trade. It is no secret to engineers that a great deal of work is at present being done abroad, which some years ago would have been done in this country. It is for the working men of England seriously to consider whether they are wise to follow a course of action which may drive away trade to countries fully prepared, by low wages, by a high standard of technical education, by the introduction of railways, and by the development of mineral wealth, successfully to compete with us in the markets of the world.

WROUGHT-IRON ROOF FOR STATION BUILDINGS, GOODS SHEDS, ETC.

BUILDINGS of this description are often roofed over with two or three spans. In such cases cast-iron columns are used between the outer walls or buildings, care being taken the castings are of sufficient strength, free from honeycomb or other defects, and the bases well bedded on good foundation stones. The wrought iron work should be of the best material, and all bolt holes drilled, no punching of holes to be allowed, which might tend to burst the metal. The louvre blades may be of corrugated iron (as shown in our lithographic illustration this week), or ¼in. slates. The roof, with the exception of those parts occupied by skylights or lanterns, to be covered with best Duchess slating (or other quality as suits the case) of an uniform and approved colour, carefully laid with 3in. lap, and each slate securely fixed to the 1¼ inch rough boarding with two stout copper nails. The lanterns are glazed with rough plate glass 1¼ inch thick, and each sheet to be well bedded in putty on the sash bars.

Gutters to be laid with 6lb. lead of such width as may be considered necessary, and the whole of the ridge to be covered with 6lb. lead also. In painting, the whole of the woodwork should be properly knotted, primed, and stopped, and then receive three coats of plain oil colours. All wrought and cast-iron work throughout to receive four coats of approved paint, the first coat to be after inspection of the materials and before they leave the maker's works, and three other coats at such times as may be directed.

COTTAGE IMPROVEMENT.

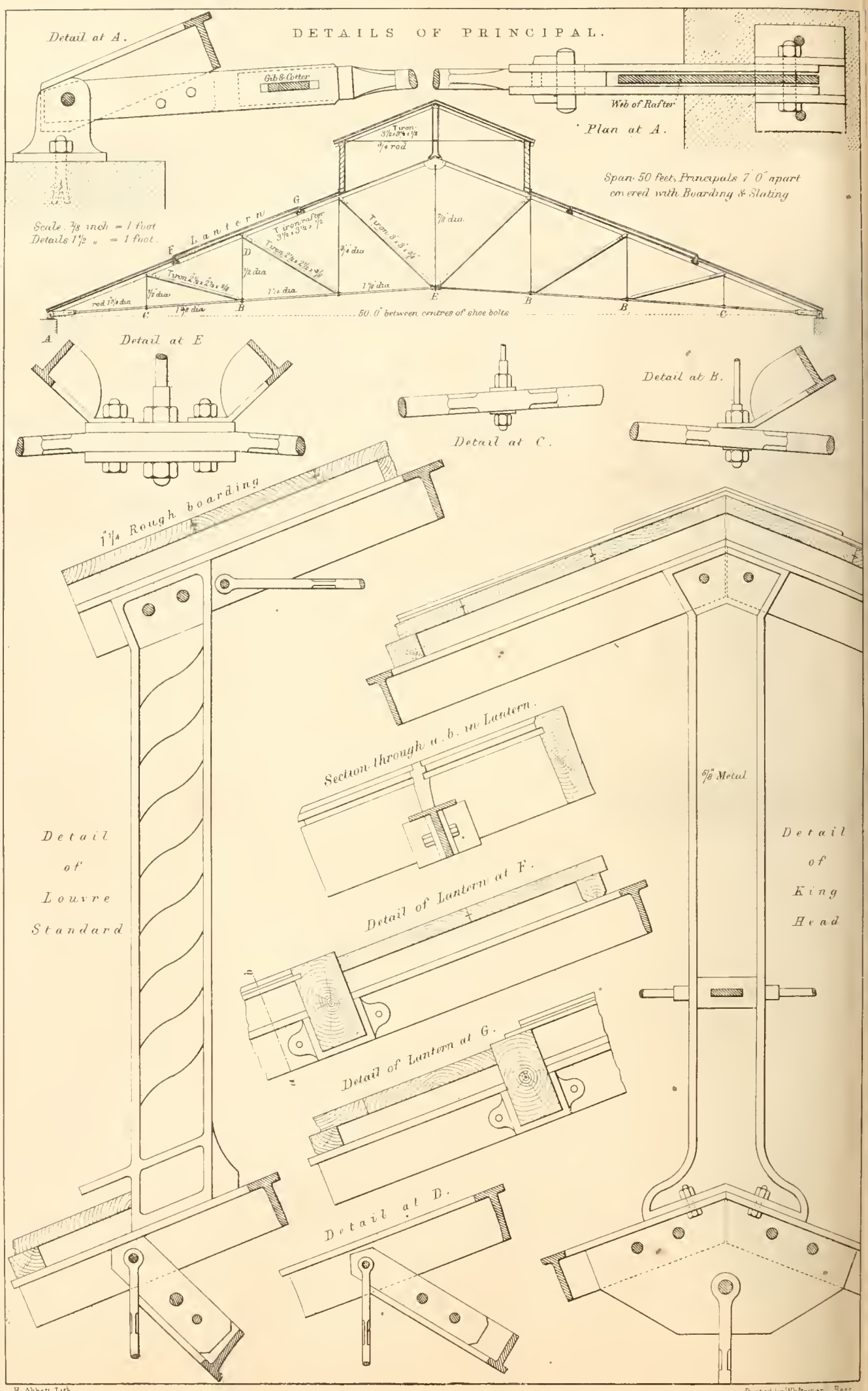
THE report of the Central Cottage Improvement Society was read at the annual meeting which was held the other day under the presidency of Mr. R. Dimsdale, M. P. The council, we learn, are gratified to report that their plans for cheapness and amount of accommodation continue to hold the first place, and that a large number of cottages built on those plans are being erected in various parts of the country. The success of the triple plan (which comprises in one building three unequally-sized dwellings, so as to accommodate families of different magnitude), the council thinks deserving of remark, as it bade fair to be one of the most useful of the society's efforts in this direction. One of the first duties devolving upon the council after the last meeting, and arising out of what was said at that time, was to take measures for procuring a first-rate single cottage with three bedrooms to be erected at a cost not exceeding 100 guineas. The result was a most interesting exhibition of plans. No less than 150 architects competed, and many admirable designs were sent in. The task of awarding the prizes would have been a very difficult one had not the council adhered closely to the conditions laid down in their advertisement, viz., that the maximum cost should not exceed 100 guineas. The first plan selected was found to be the work of Mr. William Habershon, a pupil and nephew of the honorary architect, but as the advertisement had stated that the honorary architect would not himself compete, that gentleman, in order to prevent the possibility of any charge of unfairness to others, or of favouritism, offered a third prize at his own cost, which was then awarded to this particular plan. The next two in the scale of excellence, according to the judgment of the council, were those of Mr. Smith and Mr. Gregory Gill, and to them were awarded the first and second prizes, subject to the condition that they could be erected under ordinary circumstances for the sum specified, viz., 100 guineas. The council, however, had not been able to bring this matter to such a conclusion as would enable them to issue the plans of Messrs. Smith and Gill as plans approved of by the society, and issued with its *imprimatur*, for the simple reason that, so far as at present ascertained, they could not be built for the sum specified. The council, considering the great demand there is for a single cottage plan, proposes to issue one as soon as possible, with a well arranged interior and a neat elevation, which can be erected in any ordinary locality for 100 guineas. Since the last meeting, the society had been joined by 42 new subscribers; but on the other hand it had lost 9 by death or resignation. The number of subscribers is now 120. During the last year and a-half 314 sets of plans have been issued, including those sent to new subscribers. We understand that what promises to be an interesting report upon cottage improvement, as illustrated by the Paris Exhibition, from the pen of Mr. Thomas Kibble, the honorary foreign secretary of the society, will shortly be published. The report was unanimously adopted.

AGRICULTURAL LABOURERS' DWELLINGS.

WE gladly draw attention to an announcement made by the Royal Agricultural Society of Ireland. This Society, which has for its patroness the Queen, and its vice-patron the Lord Lieutenant, has published a list of eight prizes, which they offer for competition in Ireland. The prizes are the Leinster Challenge Cup, value £140, three gold medals, two silver medals, the Associate's Gold Medal, value £10, and a challenge cup, offered by Lord Talbot de Malahide, the President of the Society, of the value of £50. These prizes are severally offered for the most approved and economically constructed labourers' dwellings in 1866—67, and for newly-erected farmhouses and offices. The conditions of competition, which vary with the value of the prize, are too long for quotation; they will be found in a statement recently issued by the Society, and which may be had on application to the secretary, 42, Upper Sackville-street, Dublin. We may, however, mention that competitors must, previous to February 1 next, send into the secretary plans of their cottages, and an account of the expenditure thereon. In awarding the medal for the building and improvement of cottages, the judges will chiefly take into consideration the accommodation with relation to the expense, the aspect, external appearance, height of the rooms, warmth, and durability. Blank forms of expenditure may be had from the secretary.

At the ordinary meeting of the Society of Engineers, held on Monday evening, W. H. Le Feuvre, president, in the chair, the discussion was continued on Mr. Arthur Riggs' paper, "On the Connection between the Shape of Heavy Guns and their Durability," read on November 18. The following candidates for election were balloted for and duly elected. As members, John McConnochie, Robert A. Wright, Thomas Chapman, and Francis J. Marshall. As foreign members, Messrs. Edmund Le Gallais, and John W. Hunt. As associates, Messrs. Charles W. Blagden, and Richard Mestayer, jun.

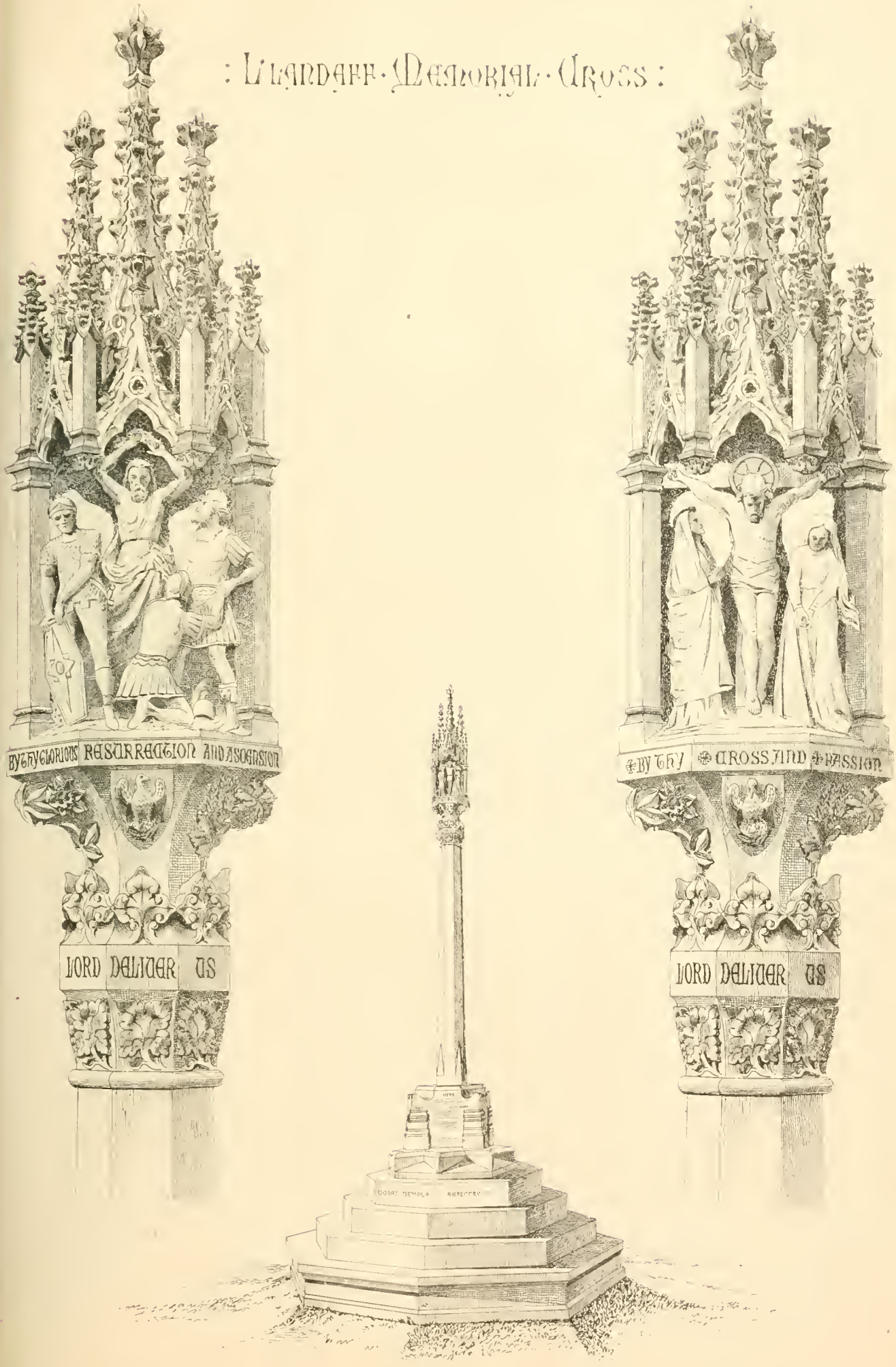
WROUGHT IRON ROOF FOR STATION BUILDINGS, GOODS SHEDS, ENGINE SHEDS &c.



H. Abbott, Lith.

Printed by Whiteman & Bass

: L'LANDAFF · MEMORIAL · CROSS :



E. Wimbridge lith

Printed by Whiteman & Bass

The Art Student.

ARCHITECTURAL MODELLING.

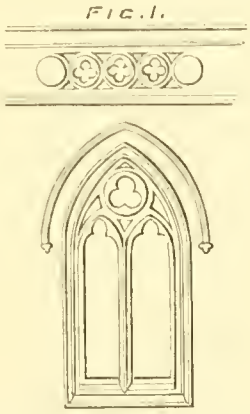
SOME years ago it was the custom when a building of any importance was designed to have the effect shown by a model. Latterly, owing perhaps to the development of perspective drawing, and to the expensiveness of models, the practice has been discontinued, and drawings are considered quite sufficient to convey an idea of the intended structure. Perspectives are notoriously "cooked"; a gable is brought out here, and a pinnacle set back there, till the pretty pictures one sees in architectural exhibitions and competitions are often anything but correct representations of the intended buildings. Besides this, perspectives at best can only give the effect from one point of view. With models the case is altogether different; they give a representation of the building from every point of view. The spectator can walk round, see it on every side, come close, and look into the little porches and recesses; go back and see the general appearance, move his eye along and judge of the effect of the altering perspective; and, if it will help him, raise himself and take a bird's-eye view of the roof. Then, again, though it is true that "cooking" is possible in modelling, as in most other things, still a delinquency in this respect is much more easily detected than in a perspective. However, for all designing purposes, perspectives are, to use a popular expression, all the go, and will probably remain so on account of their comparative cheapness. Still we would recommend the architectural student, who wishes to obtain a thorough understanding of his profession, to try his hand at modelling. Architectural models are made in wood, plaster, cork, and cardboard. Wood has been perhaps the general favourite for architects in preparing their designs, the other materials having been employed more for finished models of existing buildings. Amongst well-known wooden models we may mention Wren's original design for St. Paul's Cathedral, and the design for St. Martin's, Charing Cross, by Gibbs, both in South Kensington Museum, and both exemplify what may be generally said of wooden models, that they are coarse and unfinished, and appear more like carpenter's work than that of an artist. There are, however, many exceptions to this rule, especially in models for roofs at South Kensington, which are very numerous, and some of them very beautiful. Some of the most successful models that have ever been made are undoubtedly in plaster. There are several beautiful models in this material at the British Museum and at South Kensington.

Cork has many advantages as a modelling material, and is very easily worked, but is much more suitable for models of old buildings and ruins than for new buildings. We should not recommend it to the student, though with it he would probably have his model made in a few days, without any of that accuracy and careful attention to detail which will alone improve him. Visitors to the International Exhibition of 1862 will probably remember a series of models of the English cathedrals in this material; cork thumbs and fingers answered for pinnacles and spires, and mouldings were altogether ignored.

Cardboard is, perhaps, the best material for the student to work in. It requires less special training than the others; the modeller need not be a carpenter or a plasterer—not a workman who knows how to employ wine-bottle corks and dinner knives—to make a good model in cardboard; nor does he require a special work-room and large assortment of tools. His ordinary stock consists of a sharp pen-knife, with long, fine point; a piece of smooth, close-grained board, to cut on; half-a-dozen netting needles, of various sizes; half-a-dozen cobblers' punches, also of different sizes; and a piece of lead, to punch holes on.

Let us suppose that the student has fixed upon his subject—and this is a matter which requires a little consideration. Gothic buildings are better than Classic; they will not present so many difficulties, and will please more when finished; but the student had better not attempt too much. Don't let him begin on a cathedral, for instance; if he does, it is a hundred to one that it will never be finished. The maker of the splendid model of Milan Cathedral in the Exhibition of 1862 was twenty-one years in completing his task. And, above all, don't attempt to

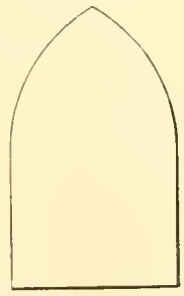
FIG. 1.



model Nature—no moss, ivy, and trees; no sanded gravel walks. Nature is inimitable, and these devices will only mar the artistic effect of the work. The next thing we would warn the student against is making his work half a model and half a drawing; it is very easy to draw the elevations of a building, with all the mouldings, canopies, &c., neatly pourtrayed in ink, and then just to cut out the window openings; but this is not modelling. In real modelling, the mouldings, the canopies, and detail must be modelled in relief, drawing being only introduced when the effect cannot be obtained in any other way. Some modellers colour the different parts to imitate the materials of which the building is composed, but nothing looks better than cardboard, left in its ivory whiteness.

A small country church, or an ancient

FIG. 2.



example in Early Decorated, for instance, forms a capital subject to begin upon. When the student has made his selection and obtained accurate measured drawings of every part, the next important thing to fix on is the scale; and here, again, if he is too ambitious, and wishes to make his model too large, he will run into all sorts of difficulties, and his work will be coarse and unsatisfactory. For a small church he will find that from 12in. to 15in. is quite enough for the total length. When this is settled, let him draw out (on paper first), each side, and every separate wall, such as the wall of a porch or the wall of a tower, will form a separate side to the scale of his model, leaving a blank for all buttresses and projections; then he will have to consider how he can best represent the windows, canopies, &c., by means of different thicknesses of cardboard, but this can be better explained by an example:—

Let fig. 1 be a drawing of a window and balustrade over, and fig. 5 a section of the arch mould. This window has to be represented with its mouldings, by different pieces of cardboard, gummed one behind the other, and each cut in a different manner. It is impossible to represent exactly the curved sec-

FIG. 3.

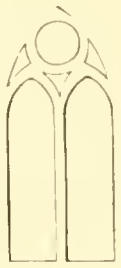
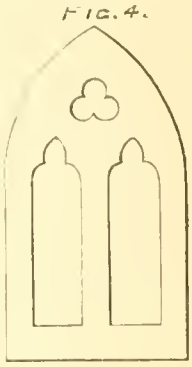
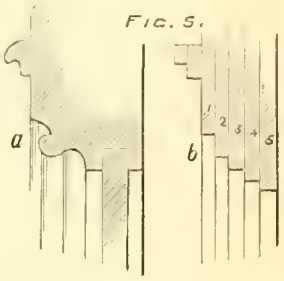


FIG. 4.



tion shown in fig. 5 *a*, which must be reduced to an angular form, similar to that shown in fig. 5 *b*, like a pattern for worsted work. The balustrade must be treated in the same way, as shown in fig. 6 *a* and *b*. The student may then be said to have settled the way in which he means to go to work. Let him take a piece of the best Bristol board, not too thick, about three thicknesses of ordinary notepaper is the best; he will next mark out pieces the size of the side he is modelling,

FIG. 5.



which will form the pieces numbered on fig. 5 *b*. No. 1 will be cut out, as shown on fig. 2. The windows will be a simple arched opening, and the balustrade a series of circular openings, cut with a splay, as shown on fig. 6 *b*. The position of the string mouldings and the label mould must be indicated in light pencil. In No. 2 the window will be cut out in a similar manner, but a trifle smaller, so as to show just within the other; the balustrade must

FIG. 6.

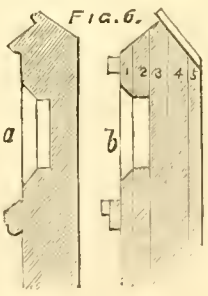


FIG. 7.

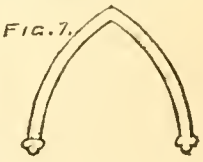
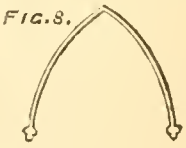


FIG. 8.



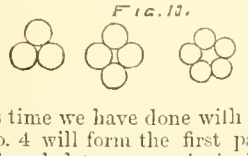
have a series of quatrefoils to show within the circles of No. 1, as shown for the tracery in fig. 4. And now the cobblers' punches will prove useful: to cut out small quatrefoils with a penknife would be very tedious, and to make them sharp and clean almost impossible; the cobblers' punches meet the difficulty. Shoemakers use these for piercing holes for shoe laces, and they vary in size from 1-16th to 3-16ths of an inch in diameter. They may be bought at an ironmonger's, and

may be obtained to screw into a straight handle, instead of set in pinchers in the usual way. Fig. 9 is a drawing of the handle and punch. If, however, these cannot be obtained, there are two or three other kinds that will answer equally as well; all that is wanted is something to punch holes of all sizes neatly in the card. In using them, place the card on a flat piece of lead, and the punch on the place where you want the hole pierced, then give the handle a sharp blow with the hammer. In the same way a trefoil, a quatrefoil, or any other cusped opening, may be made by three or four applications of the punch, as is shown in fig. 10. The quatrefoils, therefore, in our balustrade will be made by four holes close together so as to show behind each circular opening in No. 1.

FIG. 9.

No. 3 will form the solid wall behind the balustrade, and the window will be cut out the same as before, but a little smaller still.

FIG. 10.



From this time we have done with the balustrade. No. 4 will form the first part of the tracery, the skeleton or principal lines of which must be cut out as indicated in fig. 3. The cusping is cut out in No. 5, which completes this part of the window; if the heads of the lower trefoils are pointed, as shown in our example, a snip with a penknife on the punched hole answers the purpose.

The label mould will be cut out in two thicknesses, as shown in figs. 7 and 8, and long strips of different thicknesses will answer for the stringcourses, and we shall then have prepared all our materials for the chief masonry of the walls. In cutting straight lines, such as the jambs of the windows and doors, a small steel rule to guide the knife will prove a very great assistance.

We shall conclude our observations on this subject in our next number.

THE PARIS EXHIBITION AND SCHOOLS OF ART.

IN that colossal arena lately erected in the Champ de Mars, and now about to be dismantled, were collected from the four quarters of the globe every production, whether mental, mechanical, or agricultural, which could tend to instruct the mind of man, or to economize his time and labour. Thus were to be seen in abundance the most recent inventions, the latest discoveries, the most improved methods of utilizing some particular mineral, or some particular machine whose secret properties or force were either ignored or misapplied before. Amidst this display, however, of the world's greatest wonders, the art teacher or student sought in vain for methods or systems, adopted by other countries, whereby the novice could derive instruction in the rudiments of art, and be led step by step through its various stages. This is greatly to be regretted; art teachers would have derived great benefit by studying and observing the various systems employed at the schools of art throughout Europe. As France and Belgium were perhaps the only two countries in Europe where art had been to a great extent systematically taught, and where it had always occupied a place in the Code of Public Instruction before our schools of art were even contemplated, it became a great matter of surprise to those connected with the department that such a void or hiatus should ever have been allowed to remain unoccupied. It is frivolous to argue, even if necessity obliged, that students' work would pale by the side of the great masters; no more we think than the raw material lends a sickly contrast to the highly finished fabric, or the rude block of wood and rough-coated rod of iron to the smooth and faultless rifle. Practically considered, the mode of progression in art, if we may so term it, might certainly have been exhibited, not for the admiration of the idler, but for the serious contemplation of those concerned in the more arduous work of teaching. One cannot disguise the fact in exploring the numerous belts of the Exhibition, that if we keep step with our neighbours in surface design we are certainly far behind them in relief decoration, both in figure and ornament. Looking at the collection exhibited by the imperial manufactory of Sèvres and Limoges, do we not see that many of the vases and amphoræ stand unrivalled. Even when compared to the recently revived Venetian ware of M. Ginori, we must confess, that if we match them in some respects, in colour, yet in graceful composition of style they are infinitely our superiors. This excellence is not confined to ceramic art: furniture, bijouterie, architectural details alike sustain this conclusion. Perhaps this fact has greater reference to our schools of art than at first sight appears. How few of our students attend the modelling classes in comparison to those engaged upon surface design. The medium of expression to the learner may not be so agreeable, the appreciation of form also in the abstract—certainly form in relief—requires a much higher taste, study, and thought, and lacks the attraction and embellishment of colour. This year our national competition of drawings, &c., at South Kensington, betrays as usual the same fact, so much so that the examiners were unable to award the gold medal for the figure modelled from the antique. Many difficulties attend our modelling classes, especially those in smaller towns, difficulties deserving the consideration of the authorities at the Department; sometimes these are in the procuring of materials, at others the separate space and accommodation required, and in all, the greater restrictions necessarily placed upon works submitted for competition.

May it not be asked, cannot these be lessened if not removed, and something devised to stimulate to exertion and to draw the better class of pupil into this work? Why should our modelling classes, small as they are, be mainly composed of plasterers and carvers, who practise modelling principally to acquire facility in their daily work, and not for the purpose of designing? Whether, as of old in the case of surface design (Stage 22 *b* and *c*), if the geometrical or block shape of an article were furnished, the student being required to enrich it in a given style or period; and in the more elementary work (Stage 18 *c*), a flat example supplied each year to all the schools to be rendered in relief—would meet in any way the end in view is of course a question. At all events, they would be very inexpensive experiments to adopt, and many of the valuable objects in terra cotta and majolica in the museum would readily suggest fitting examples for the purpose. And where as in many of our schools a large collection of antique figures is out of the question, could not photographs of these subjects be lent to the schools, to be employed as copies for the round or relief—every school throughout the kingdom to be provided with the same examples selected by the Department for competition? This plan would, we think, test the imitative power of each competitor, and bring out any latent talent he might possess. Again, in very many of our schools of art a life class for the study of the nude model, if not impossible, is certainly impracticable. Would not photographs, therefore, from good living models of both sexes be a great boon to many of our schools, to be modelled in the round or relief? Obviously one great advantage would be, that monetary positions, positions a model could not maintain for any time might be secured; surely this would render incalculable service to designers, who are now in very many cases quite debarred from studying the living model. May not the success of the French in figure decoration be greatly attributed to the course of study pursued at the schools of design. The life class at the Ecole Imperiale de Dessin is numerously attended each day by designers, and of these by far the larger proportion are modellers. A visitor to these and similar schools in France can hardly fail to see that modelling is studied to a very much greater extent there than in England. With us it exists only in name, but with them it is a leading feature in their art studies. The collection of life studies exhibited at the Ecole Imperiale et Speciale des Beaux Arts, painted by the students from the nude model—the size of life and half length—shows the superiority of this mode of study over that generally practised at our schools, viz., the draped model or portraiture, rather than the more legitimate study of the figure.

The stranger in entering Paris cannot fail to be struck with the regularity of the streets, its spacious boulevards, lined with rows of houses displaying a taste and style of architecture not to be met with in any modern capital of Europe. Of course we are alluding to the new *quartiers* of the city, and the old ones will no doubt at the rapid strides made in the work of demolition, be soon rebuilt with a similar class of buildings. From his observation he must arrive at the conclusion that the study of architecture appears to be of general interest and to be more cultivated than it is with us. Certainly amongst the many efforts made for the advancement of architecture in Paris at the present time, the establishment of the Ecole Centrale d'Architecture occupies a prominent position. It is now in the second year of its formation. The course of study embraces three years; the pupils are placed under the direction of the chefs d'ateliers, and they receive, besides, instruction from professors in the various branches of drawing. The first year of his entrance to the school the pupil attends lectures bearing upon the sciences connected with architecture; these have a wide and general character. In the second and third years lectures are given on theoretical and mathematical subjects closely connected with his future profession. In these two years subjects are also given out monthly to the pupils consisting of written specifications of buildings to be erected or of others in which alterations, improvements or additions are to be made. Each student is expected to complete the designs on his paper in the month. This is a great feature in the course of study pursued at the Ecole d'Architecture, which from all accounts appears to be most successful; and from the wide range of subjects selected of much practical value to the student. This plan of monthly testing the powers of the pupils cannot be too highly commended. The directeur, M. Trélat, kindly showed us many of these papers comprising subjects such as a wing to be added to a mansion, stables to be attached to a chateau, market-places, and public lavatories for provincial towns, and edifices of different character suited to large cities, to be erected; in each case the requirements are stated in writing and the area of ground given. The student becomes, in fact, for the time a quasi architect, whose abilities and powers for beautifying a mansion, harmonizing different styles, or economising space are put to a practical test. The elementary work at the schools of art is necessarily of the same uniform character; examples, all being supplied by the Department, erring in this stage of work is almost impossible, but in special work might not a hint be taken from the plan adopted by the Ecole d'Architecture? This applies equally to the former suggestion, viz., specified requirements to be made by the Department; taste would directly emanate from and be directed by it. The subjects should be of sufficient variety to suit the capacities of all By these means much of the fruitless toil might be avoided, and many of the incongruous and aimless drawings and models from being perpetrated.

The important position enamel has recently taken in the decorative arts, will not be overlooked by the visitor at the Exhibition. Colour is the chief element in decoration, and colour to be brilliant must be used transparently; hence its great beauty when associated with glass. The transparent glaze upon majolica ware, della-robbia, and porcelain, is simply a coating of fused glass. This art of using colours in combination with that description of glass which may be fixed upon metals is properly enamel. Some of the various kinds of enamel at the Exhibition which deserve special notice are exhibited by M. Charles Lepec, M. Popelin, M. Barbédienne, and Elkington and Co. for England. There are few things in this *genre* more beautiful than jewels, and one of the objects of enamelling is to produce those effects of colour which we value so much in jewellery; the qualities of enamel, adapted as they are for the adornment of plate, furniture, &c., surely cannot be prized too highly by our English designers, who at present do not trust themselves sufficiently to it. The qualities, technical requirements and processes of enamelling are but imperfectly known to the majority of art students, who have not the advantage of acquiring these from personal observation. Hints, therefore, issued by the Department in this respect, we presume to suggest, would be of great service to many.—R. CAMPBELL PUCKETT, Head Master, School of Art, Bath.

WOOD CARVING—CHOICE OF WOODS.

NOT the least interesting and useful portion of Mr. George Alfred Rogers' new work on

Wood Carving, noticed by us last week, is the chapter devoted to the nature of woods. We quote the following observations, which will answer the inquiries of several correspondents who have applied to us on the subject:—It will facilitate the progress of the amateur materially if wood of a suitable nature be used to carry out his intention. With regard to this no laws can be laid down; a few instances, however, of woods which are especially applicable may be of service. Thus, lime wood was almost exclusively used by Grinling Gibbons for all his magnificent drops and festoons of fruit, flowers, and birds at Petworth, Chatsworth, Burghley, Belton, Melbury, Gatton, and the numerous other noble seats to which his genius has imparted such a charm.

Lime tree is soft and pliable to the tool, and less liable to split and splinter than almost any other wood, which qualities render it of great utility to carvers for carrying out designs when lightness and boldness are equally required. It takes a stain well, and a fair polish, or it may be varnished without greatly altering the colour of the wood, but giving to it a very agreeable boxwood appearance. As well as for large festoons, it is suitable for smaller works, such as bookstands, miniature and portrait frames, &c.* American walnut is a very good wood for amateurs, and is much in favour with them from its dark colour. It has, however, a more open grain than lime, and therefore requires more care to avoid accidents. It is used for many small works where much projection is unnecessary, as bookracks, letter-boxes, watch-stands, &c. Sycamore, holly, and chestnut are amongst the lightest of our woods: the first is greatly, and, in fact, principally used for bread plates and potato bowls and other articles, when a light tint is a consideration.

When the amateur has gained a certain proficiency in the art, harder woods may be worked without a great amount of additional exertion, as so much depends on the mode of propelling the implements. I should then recommend English oak, Italian and English walnut. The former, from its hard and enduring nature, should as a rule be chosen for executing the finials or pew heads, alms-boxes, church and Gothic work in general. It is also much used for clock and hall brackets, and for other pieces of solid furniture.† Italian walnut is a rich and beautiful wood for a variety of purposes, such as cabinets, panels, bookcases, frames, &c. It is hard, but the effect produced by its use amply repays the extra labour caused by the close texture of the material. When any very delicate designs have to be executed, and the most minute finish is required, boxwood, ebony, or any other equally hard and close-grained woods are decidedly the best to choose. Pear-tree is a pleasant wood for working, and a good piece resembles lime in its pliability. It is exteusively used in France for the same purposes for which we employ lime. Woods with ornamental grains, as bird's-eye maple, satin-wood, yew, and laburnum, &c., are not the most desirable woods for carving purposes: the grain and colour often interfere with the effect we are endeavouring to produce. Thus one of the eyes of the maple might grace the nose of a Venus, or the white stains of yew or laburnum show like deep gashes across her otherwise lovely face.

To procure good wood for our purposes the trees should be felled at a proper time and age, and the wood should be thoroughly seasoned. The proper time to fell oaks and most other trees is when they fail to increase in size more than two feet per annum. If cut down before that period of their existence the heart will not be fully developed, and will not be as hard as the other part. When oaks are about thirty years old their growth is most rapid. Autumn is generally considered the best time to fell. If wood be used in an unseasoned state it is sure to warp and twist; and when it is so used for panels fitted into loose grooves, it shrinks away from the edge which happens to be the most slightly held; but when restrained by nails, mortises, or other unyielding attachments, which do not allow them the power of contraction, they split with irresistible force, and the material and the workmanship are thus brought to no useful service. It is, therefore, very necessary that the natural juices of the tree be got rid of by seasoning it before use. After a tree has been lopped, barked, and roughly squared, it is left some time exposed to the weather, and may be soaked in fresh running water with advantage, or boiled or steamed. Any of these processes tend to dilute and wash out the juices, and the water readily evaporates from the wood at a subsequent period, and the colour of the wood will be much improved by these means. In this way fir timber, on its arrival at the port of London, is formed into rafts or floats on the Thames, and allowed to remain there for some time. When taken out it is left to dry thoroughly before its removal to the sawpits. Thin planks, if properly exposed to the air, will be seasoned in about a year, but the thicker the wood the longer the time it will take. Oak loses nearly two-fifths of its weight in proper seasoning.

TABLE SHOWING THE VARIOUS PROPERTIES OF WOODS.

ELASTICITY.
Ash.
Hazel.
Hickory.
Lance wood.
Sweet Chestnut.
Snake wood.
Yew.

TOUGHNESS.
Beech.
Elm.
Lignum Vitæ.
Oak.
Walnut.

EVENNESS OF GRAIN.
Lime.
Pear-tree.
Pine.

HANDSOME FIGURE.
Bird's-eye Maple.
Italian Walnut.
Yew.
Oak.
Mahogany.
Laburnum.
Tulip.
Satin wood.

DURABILITY.
Cedar.
Oak.
Poplar.
Sweet Chestnut.
Yellow deal.

COLOURING MATTER.
Red.
Brazil.
Cane wood.
Log wood.
Red Sanders.
Green.
Green Ebony.
Yellow.
Fustic.
Zante.

SCENT.
Camphor wood.
Cedar.
Rosewood.
Sandal Wood.
Satin wood.
Sassafras.

INSTITUTION OF CIVIL ENGINEERS.

AT the fourth Ordinary General Meeting, Session 1867-68, held on Tuesday, the 3rd inst., Mr. John Fowler, president, in the chair, the first ballot for the session was taken, when eighteen members and twenty-three associates were duly elected, including as members:—John Hallen Abbott, district engineer, G.I.P. Railway, Munmar, Bombay Presidency; Edmund Cooper, district engineer under the Metropolitan Board of Works; George Gordon, resident engineer on the Madras Irrigation Company's Works, Bellary, E.I.; Francis Hawkes, resident engineer, G.I.P. Railway, Bombay; Samuel Waite Johnson, locomotive superintendent, G.E. Railway, Stratford; David Logan, late chief engineer, Great Southern Railway of India; William Low, Wrexham; John Stevenson Macintyre, resident engineer, G. E. Railway, Metropolitan and Suburban Extensions; John Mackinlay, chief engineer and inspector of machinery to H.M. Dockyard, Bombay, and surveyor to the port of Bombay; Walter McClelland, Bombay; William Menelaus, chief engineer and manager of the Dowlais Iron Works, Glamorganshire; John Preston, district engineer, G.I.P. Railway, Bombay; Thomas David Roberts, resident engineer, Brecon and Merthyr Railway, Brecon; Anthony Sherwood, district engineer, G.I.P. Railway, Sholapore, E.I.; John Frederick Spencer, chief engineer to the North-Eastern Marine Engineering Company, Sunderland; William Henry Wheeler, engineer to the borough of Boston, and to the Boston Harbour Commissioners; John Sheldon Wilkinson, Manchester; and George Hustwait Wright, district engineer, G.I.P. Railway, Jubbulpore, E.I. And as associates:—Frederick Edward Archer, Public Works Department, Calcutta; Benjamin Baker, Westminster; Lieutenant Gordon Bigsby, R.E., executive engineer, Department of Public Works, Bengal; Herbert Bland Browning, assistant engineer, Scinde Railway, Umballah; Thomas Long Colley, Plymouth; Charles Davies, assistant engineer, G.I.P. Railway, Bombay; Herbert Louis Augustus Davis, assistant engineer, G.I.P. Railway, Hooshungabad, E.I.; William Henry Delano, Cheapside; Thomas Eastman, resident engineer, Santiago and Valparaiso Railway, Chile; John Marshall Easton, district manager for the construction of works, Jubbulpore Line, E.I. Railway, Allahabad; John Hyde Edwards, assistant engineer, G.I.P. Railway, Bombay; Captain Charles Wilson Faber, director G.N. Railway; Charles Gandon, resident engineer and manager of the Gas Works, Smyrna; John Howard, Westminster; Thomas Manson Rymer Jones, assistant engineer, Madras Railway; James Livesey, Westminster; William Luke, assistant engineer, Delhi Railway; Thomas Edward O'Brien, assistant engineer, G I P. Railway, Nassick, Bombay; Edward Charles Patterson, Westminster; William Smallpeice, Westminster; William Tijou, Great George-street; Henry Eltze Victor, district engineer, G.I.P. Railway, Nursingpoor, E.I.; and James Birdsall Walton, Westminster.

It was also announced that the Council, acting under the provisions of Section IV. of the Bye-Laws, had that day admitted as students of the Institution:—William Berrell, Jabez Church, jun., Edward Crompton, Frederick Harry Mort, Thomas Reynolds, William Tweedie, and Antonio Augusto Vieria.

Building Intelligence.

CHURCHES AND CHAPELS.

The church at Rewe, near Exeter, has been reopened after restoration. Mr. Ashworth, of Exeter, was the architect, and Messrs. Stephens and Son the builders. The amount of the present contract was £1,000, but a good deal remains yet to be done.

M. Abelard has now completed a series of New Testament illustrative carvings in the canopies of the choir stalls at Ely Cathedral. On the north side some four or five more panels are still required to complete a series of Old Testament subjects.

The new Countess of Huntingdon chapel at Tunbridge Wells has been opened. The style is Early English, and the building will seat about 700; Mr. John Wimble, of London, is the architect.

A new Congregational chapel has been opened at Bollington. The style is Early Decorated. The length is 65ft. 6in. and the width 36ft., and the building will seat 460 persons. The cost is about £2,800. Mr. Williamson, of Manchester, was the architect.

The improvements and alterations that for some months have been in progress at the church of St. John the Evangelist, Edinburgh, are nearly completed under the direction of Messrs. Peddie and Kinnear, architects.

The church of the Holy Trinity, Darlington, was reopened last week. A chancel has been added at a cost of £1,400, and about £400 more is to be spent on an organ.

The parish church of Upton, Lincolnshire, was reopened on the 21st ult. after restoration. The south wall and the chancel arch have been rebuilt, and the nave re-roofed and renewed. The cost has been about £1,000. Mr. Christian was the architect, and Mr. Clipsham, of Norwell, the contractor.

During the heavy gale of Sunday night last the whole of the gable of St. Edmund's Church, near Hunstanton, was blown down, leaving only about 6ft. of wall standing. The church, which has been built two years consists only of a chancel, and was intended to be completed when funds permitted.

The new church of St. James-the-Less, at Bristol, or the Penitentiary chapel, as it is more often called, was opened on Sunday. The building will accommodate about 300 persons, and has been erected from the designs of Messrs. Pope and Bindon. Mr. J. P. Stephens was the contractor.

On Saturday the new church of St. Andrew's, West Bromwich, was formally opened. The building will hold 400 persons, and is in the Domestic Gothic style. Mr. G. Somers Clarke is the architect.

All Saints' district parish church, Waterside, Derry, was consecrated on the 26th ult. by the Lord Bishop of Derry. It is in the Early English style, and has been erected at a cost of about £8,000. The designs were by Messrs. Lanyon, Lynn, and Lanyon, Belfast and Dublin. The contractor was Mr. A. M'Elwee, Derry.

The Wesleyan Methodist chapel at Wesley-place was reopened on the 29th ult. It is in the Italian style. Messrs. Gibson and Maude were the builders, and Mr. D. Whiteoak superintended the building, under the direction of Messrs. Lockwood and Mawson, architects, Bradford.

A new Congregational chapel was opened at Lewisham on the 24th ult. It is in the Gothic style, second period. The exterior is of Kentish Rag, with dressings of Bath stone. The length is 125ft., width 63ft., height of ceiling 46ft., of tower and spire 169ft. The building accommodates 1,100.

A new Presbyterian church at Whitehouse, County Antrim, was opened on the 24th ult. It is in the Venetian-Gothic style, and is capable of accommodating 600 persons. The designs were by Messrs. Bell and Marsh, of High-street, Belfast, and Messrs. Hill and Johnston were the contractors. The cost will be about £1,700.

The new Independent chapel at Blandford, Dorset, was opened on Tuesday last. The design is Gothic, containing school and assembly rooms, class rooms, and vestry in the rear of the chapel. It is situated nearly in the centre of the town. Mr. Stent, of Warminster, was the architect, and Mr. Walden, of Christchurch, the contractor.

* Lime wood has been famous for purposes of sculpture from very ancient times, and is mentioned with praise by more than one classic poet. It is extensively grown in this country, though practically it must be reckoned a foreign tree, principally growing in the north and east of Europe, and in Lithuania, where there are enormous forests of it.

† The wood principally used in the decorative carving of our cathedrals during the Middle Ages was the true British oak, or *Quercus rober*.

The very interesting church of St. Chad, Pattingham, South Staffordshire, has been restored by Mr. Gilbert Scott. The plan consists of a remarkably beautiful First Pointed chancel, with a large east coupl let, a clerestoried nave of two bays, with a Romanesque arcade to the north, and a Middle Pointed one to the south (the whole of unusual proportionate height), and a western tower.

At the Dedication Festival of St. Andrews, Wells-street, the lowest portion of the new reredos designed by Mr. Street was uncovered. It is said to be of great beauty, and to add very much to the appearance of the church.

The architectural movement, says the "Ecclesiologist," is rife at Cambridge. The noble tower of St. John's Chapel has reached its pinnacles. Mr. Scott is busy recasting Peterhouse to the Gothic aspect of which the mischievous activity of the eighteenth century deprived it. Queen's Hall has been decorated under Mr. Bodley's care with a chimney-piece, adorned with Messrs. Morris and Marshall's glazed tiles; and the same artists have put in an eastern window at the new church of All Saints, in close imitation of the figure glass of the latest fifteenth century. Caius College is going to rebuild its first court, including the houses at the corner of Senate House Passage and Trinity-street, from Mr. Waterhouse's designs, in Francis the First Renaissance, with a bold skyline, so as to correspond with the Gate of Wisdom.

Little Oakley Church, Northants, has been thoroughly though most conservatively restored, at the expense of the Duke of Buccleuch, under Mr. William Slater and Mr. R. Herbert Carpenter. It follows the usual type of the small local churches—a nave of three bays (with north and south aisles), Early Pointed chancel, a late clerestory being added to the nave, and windows of a late date inserted here and there. Very many of the ancient oak seats remain, with curiously carved and grotesque poppy-heads. These have been refixed in their original positions, and the new seats follow their type. In the chancel are some magnificent and valuable monuments to ancestors of the Dukes of Buccleuch. The contractors were Mr. Brown, of Kettering, and Mr. Patrick, of Geddington, and the clerk of works was Mr. W. Thompson.

The chancel of Harkstead Church, Suffolk, has been reopened, after having been nearly rebuilt under Mr. W. Slater and Mr. R. Herbert Carpenter, as a memorial to the late rector, at the expense of the Berners family. The ancient Easter Sepulchre, and two piscinæ, were the only objects of any interest in the church. The chancel walls have been refaced with chopped seaflints, with dressings of Ancaster stone. The local cement stone (dredged up from the mouth of the Orwell) had been used for a facing, and the buttresses have been rebuilt entirely. The roof is partly of oak and partly of deal; it is of hammer-beam construction, with tracery in the spandrils. There was never any chancel arch, so the western truss now forms a quasi-arch, and rests on columns of Irish green marble. A rich reredos is to be erected, of alabaster and choice marbles, and the walls are prepared for and will be decorated with fresco paintings, as well as the roof. The contractor was Mr. Cunnold, of Ipswich. The carving is by Forsyth, and the marble work by Messrs. Sibthorpe, of Dublin.

BUILDINGS.

On Friday last the foundation stone of the Abbot Memorial Orphan Asylum was laid at Newcastle. Messrs. Austin and Johnson are the architects. The building will accommodate 60 children, and will present externally the appearance of a mansion in the style prevailing in the earlier years of James I. The materials employed will be red pressed bricks and stone dressings. Mr. Walter Scott is the contractor for the works.

A new convalescent hospital is about to be erected at Cookridge, near Leeds, from designs prepared by Messrs. Nesfield and Shaw, architects. The ground floor of the building will be of red brick neatly walled upon a bold stone plinth cornice; the first or chamber storey will be of common brick, which will be faced with ornamental tiles. The cost of the building, it is stated, will be about £6,000, and the works are expected to be shortly proceeded with.

New schools have been opened at Salters' Hall, Newport, Salop. Mr. J. F. Cobb was the builder, and the architect was Mr. Edmund Kirby, A.R.I.B.A., of Liverpool.

Upwards of 300 superior dwellings for artizans have been erected at Bowling, near Bradford, by Mr. H. W. Ripley, the object of this gentleman being that the houses should be purchased by those who reside in them, and every facility is afforded for this purpose. They are fitted with water-closets, have a plentiful supply of gas and water, and each house has a private yard at the back and small garden in front, while the streets are wide, well-drained, and will be completed in a substantial manner. No great architectural display has been attempted, but even in this particular the houses are superior in style to the general run of cottage property. Messrs. Andrews, Son, and Pepper are the architects, who have also designed a capacious school-room for the use of the residents. The school building is in the French-Gothic style.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—T. S.—H. and N.—R. G.—J. W.—J. A. H.—R. H. C.—J. B.—J. T. F.—V. K.—W. G. W.—W. W.—C. G. D.—J. F. P.—A. and Co.—H. W.—T. F.—J. B.—A. M.—C. F.—G. S. C.—E. A. T.—J. H.—W. and W.—A. D.—J. D. W.—G. H. G.—N. and P.—B. J. T.—J. P.—L. A.—J. and R. F.—C. F.—W. B. T. S.—H. C.—C. J. I. and B. (Sheffield), the photograph was not enclosed.—P. B. should have enclosed stamps. R. C. P.

L. A.—The engraving of the proposed Stratford Town Hall, with plan, will, we believe, appear this day fortnight.

W. R. T. (Swansea)—Send the drawings. Perhaps so.

W. T. (Belfast).—Your question on architects' pupils has been answered two or three times.

J. B.—The cheque was sent on November 21.

W. H. T.—Too long and too full of algebraic formulæ for practical use.

The author of the design "Truth," sent to the Ryde competition, is requested to communicate with W. O. Lane, honorary secretary to the committee, West-street, Ryde.

THE RESTORATION OF CHICHESTER CATHEDRAL CHOIR.—Sir,—In your notice, the architects' names are printed thus: Mr. W. Slater and Mr. R. Herbert, "carpenter." A "carpenter" was not the architect, but the architect was "Carpenter."—I am, &c., R. HERBERT CARPENTER, 4, Carlton-chambers, Regent-street, November 29.

Just as we were going to press we have received a letter from Mr. Tall in answer to "Enquirer" in last week's number. "If 'Enquirer,'" says Mr. Tall, "had enquired of the proper party, he would have learned that the apparatus at East Sheen, so far from costing £1,000, or anything like it, would have paid me better if it had cost one-fifth of that sum." Mr. Tall is going to deliver a lecture this evening before the Architectural Association. We shall probably refer to his apparatus and building in concrete in a future number.

Correspondence.

AN ARCHITECTURAL COLLEGE.

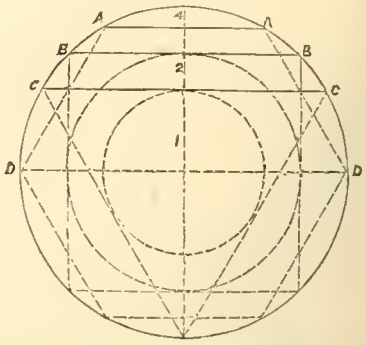
To the Editor of the BUILDING NEWS.

SIR,—Much discussion has lately arisen as to the necessity of systematical technical education, and the comparative inferiority which is likely to ensue in the workmanship and productions of our skilled mechanics in consequence of the want of a system of scientific and logical technical training. I am afraid, Sir, that however much we may attempt to blink the question, when it is stedfastly and impartially looked at, the unpalatable truth stares us nakedly in the face, that for cleverness, finish, and sound workmanship, we are being fast outstripped by other nations. Some of our most intelligent mechanics have visited the Paris Exhibition; it would be interesting to have their opinions in your columns as to the quality, appropriateness, and amount of excellence possessed by the goods exhibited by other nations at that wonderful show.

Is there a profession in England requiring more technical knowledge than architecture, and is there a profession or business in which less of such knowledge is taught? Is it not possible to establish an architectural college, where the art of architecture may be systematically studied under eminent professors? where we can have separate departments and classes devoted to architectural history; the principles of the designs of ancient and modern buildings, of their various styles, colour, and mural decoration; construction; strengths and qualities of materials, and how they may be judged; geometrical, freehand, perspective, and figure drawing; mathematics, measuring and taking quantities, and surveying. Were such an institution in existence, what noble strides our art might take, and how many old, as well as young, would not avail themselves of its advantages.—I am, &c., A. LE B.

A GEOMETRICAL KEY TO THE PROBLEM OF THE CIRCLE.

SIR,—Within a given circle inscribe the three following geometrical figures, a hexagon, square,



and an equilateral triangle, A A being one side of the hexagon, B B one side of the square, C C one side of the triangle, and D D the diameter of the circle. Supposing the circle to be divided into 360 degrees, the following proportions will be evident:—As the arc A A (60°) is to the arc B B (90°), so is the arc C C (120°) to the arc D D or semi-circumference of the circle (180°). Again, as the length of the chord A A, a side of the hexagon, is to the joint lengths of the chords B B and C C (respectively the sides of square and triangle) so is the length of the diameter D D to the circumference of the circle. By multiplying the joint lengths of the sides of square and triangle B B and C C by the length of side of hexagon A A the superficial area of the circle is obtained. In addition to the foregoing ratios the three circles shown in diagram are also in proportion to each other, the circumscribing circle being four times the superficial area of the circle inscribed within the triangle and twice the area of the circle inscribed within square, the proportions being as figured in diagrams 1, 2, and 4. Believing that the foregoing geometrical proportions will be not only interesting but useful to some of your readers, the insertion in your columns will oblige.—I am, &c.,

GEO. GUILLAUME.

PRIZE DESIGN FOR LABOURERS' COTTAGES.

SIR,—I have seen in last week's BUILDING NEWS the rules issued for the guidance of intending competitors, but as they give no actual information, perhaps you could tell me whether these rules form the whole of the particulars which the Council of the Royal Agricultural Society intend providing. It is easy to imagine that in competitions of this character, where the expenditure is limited to so small an amount, greater care is required in drawing out particulars and giving information than in those of a larger one, and if the scanty rules given in last week's paper are all that architects are to be provided with, I fear this will fare the same fate as the Society of Arts' and other cottage competitions, where the premium has been awarded to designs which could not be executed without an expenditure considerably above the stipulated amount. In some designs provision will be made for water supply, while in others this will be disregarded; in such case, the latter is likely to afford a better house accommodation than the former. It may be thought that water supply must of necessity form part of the estimate, but, unless information is given, architects have no reliable base to work upon, and, if I recollect rightly, in the Central Cottage Improvement Association competition, which took place some eighteen months since, the water supply formed no part of the estimate. We are told that "the estimate is to be based on the average cost of materials and labour in Ireland;" but if, instead of giving such a general base, the Council had named some price of the principal items—for instance, bricking, timber, slating, tiling, plastering, &c.—on which the cal-

culations should be made, every competitor would be working on the same ground, whereas now the prices put down as the average by some may be as much as 15 per cent. below those of others, the consequence of which is their design is likely to be 15 per cent. better, and yet, in both cases, the prices may be the same as those upon which work is done in different parts of Ireland. But we are told to base the estimate on the average price; but how is it to be expected that architects can incur the expense and trouble of ascertaining the average price of materials and labour in a competition where the remuneration—even if successful—ceases at the receipt of the premium. I hope, in common, I think, with many other intending competitors, that the Council will yet provide such detailed particulars as to enable every competitor to work in a fair and open field, and so that a design may be selected which can actually be executed for the stipulated amount.—I am, &c.,
S. S. S.

*** We can give no other information, but will call the attention of the Irish Agricultural Society to the subject.

CHURCH OF ST. BARTHOLOMEW, SMITHFIELD.

SIR,—I learn that the funds for the restoration of the above venerable church have been exhausted, and that the Committee is asking for further aid from the public, in their praiseworthy and desirable work. I am also informed that the restorations are superintended by men of great archæological acquirements, and, therefore, feel very diffident in venturing to question the desirability of anything they intend to do in the matter. I cannot, however, resist the wish I have to state my very strong objection to the proposed groined roof as shown in the view published in 1863, the details of which, of a later date, seem to me out of keeping with the simple grandeur of the existing portions. I should be glad to know if it is still intended to carry out this design for the roof, and, if so, what authority there is for supposing that a vault was originally intended. Many years have passed since I saw the interior, but my impression ever since has been (and the views lately published have strengthened it) that a flat wooden ceiling was intended, as in most of our Norman churches. I therefore take the liberty of suggesting to the Committee that, as there seems to be a prospect of the work standing still from want of money, they should abandon the idea of a vaulted roof, and content themselves with such a ceiling as would have probably satisfied the original builders of the church, and, which, instead of—possibly—endangering the walls by its weight and thrust, would by tying them together add considerably to their stability. The list of subscribers would not, I think, be lessened if it were known that the preservation and strengthening of the existing edifice was the chief object of the restorers, and not the addition of unnecessary and costly features which, however good in themselves, would, I fear, tend rather to destroy the interest and admiration we now feel for the old work.—I am, &c.,
Birmingham. J. A. C.

CONCRETE WALLS.

SIR,—In answer to a letter in your last week's number, from a gentleman signing himself "Enquirer," which refers to a house building at East Sheen, I beg to say that I have no intention of engaging in a useless controversy on the merits or demerits of concrete as a material for walls, either in an æsthetic or a constructive point of view. I suppose every architect would satisfy himself by careful personal examination—without much reference to opinions expressed in the papers—before employing this method of building. I now merely write, as the architect of the house referred to, to say that the facts and figures given by "Enquirer" are altogether incorrect. If he will call on me, which I think he should have done in the first instance, to ask permission before publishing a private contract, I can show him his errors.—I am, &c., ARTHUR W. BLOMFIELD.
8, Adelphi terrace, Strand, December 5.

MURRAY *v.* GILES.

SIR,—Permit me to request your correction of some errors in your report upon the above case.

The directors did not arrange for myself and V. Murray to act jointly. I received my appointment unconditionally from the board, but the friends of Mr. Murray (who was one of the unsuccessful competitors) induced me to make an arrangement with him to act with me, more especially in the construction of the building, as I declined altogether to allow any interference with my plans or the architectural design of the building. I made this arrangement with Mr Murray before I saw any director of the company, and shortly after my appointment.

My real object in defending an action for plans, said to be valueless, was to prove my authorship of the principal plans and internal arrangement of the building, in addition to the architectural design externally and internally. This I did prove, and the verdict of the jury only gave the upper floors and sections to the plaintiff, who certainly had the drawing out, but no part of the designing of the work.—I am, &c., JOHN GILES.

Intercommunication.

QUESTIONS.

[677.]—STRENGTH OF BEAMS.—I shall feel obliged to any of your readers or correspondents who can give me a simple method for obtaining the strength of wrought-iron beams. I have met with one formula, but find it so abstruse and involving such minute and lengthy calculations that I am desirous of obtaining some simpler rule, if there be any.—IGNORAMUS.

[678.]—ST. WILFRED'S ROMAN CATHOLIC CHURCH, YORK.—Will some one oblige by informing me of whom the set of photographs of the doorway, nave, capital, &c., of this church can be obtained? They were published in the BUILDING NEWS for December 22, 1865.—HENRY HEMS, Exmouth-street, Devon.

[679.]—DECAY OF BRICKS.—I should feel much obliged to any one who could inform me if there be any, and, if so, the best means for preventing decay of soft white bricks used for inside lining to walls, the bricks having been exposed to frost?—W. D. J.

[680.]—STONE STAIRCASE.—It is proposed to erect a stone staircase, in which I am practically concerned. Will any of your readers kindly inform me what ought to be the thickness of the wall supporting the stairs, and how far into the wall the steps should be inserted? The stairs will be, when fixed, 4ft. wide, treads 10in., risers 6in.—A YOUNG PRACTITIONER.

[681.]—WOOD BEAMS.—In an article on "Failures in Construction," in the BUILDING NEWS of June 7, a case is given of the breaking of a wood beam of Baltic fir of 13in. × 13in. scantling, and 20ft. clear bearing, with a load of 31,325lb. distributed over it. There is, also, this formula given—

$$\frac{L \times W}{510 \times D^2} = B, \text{ or } \frac{\overset{\text{Feet}}{20} \times \overset{\text{Lbs.}}{31{,}325}}{510 \times 13^2} = 7\tfrac{1}{4}\text{in.}$$

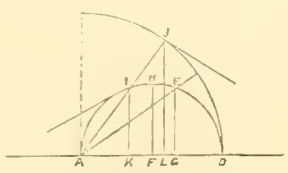
showing that if the beam had been 13in. × 7¼in. it would have been suitable for the load. Will any of your readers kindly answer the following queries:—1. Will not the weight obtained by the above formula be the breaking weight of a beam loaded in the middle? 2. If this be the case, is not half of the breaking weight considered as a suitable load for the above beam to bear?

As I have read that a quarter of the breaking weight is the maximum strain to which beams, &c., may be safely subjected, I should like to know what is the ratio generally used in practice, in buildings where economy, strength, and durability are equally considered.—ALPHA.

[682.]—FOREIGN EMPLOYMENT FOR ARCHITECTS' ASSISTANTS.—Perhaps some of your readers can inform me, through your "Intercommunication," if an English architects' assistant can readily obtain employment in Paris or in any continental town, by advertising in the professional journals, and if the salaries given there are after the same rate as in England?—W. H. G.

REPLIES.

[653.]—PRESSURE ON ROOFS.—Mr. Swansborough has shown very well that a given current of wind (one limited in dimensions as well as in force) will produce most downward pressure when received on a surface inclined 45 deg. Now, repeating as much as is necessary of his fig. 2, p. 808, with the same letters, he has supposed the plane A E hinged at A, and rising as a flap, and finds

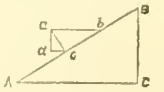


that any current or stratum of wind has its maximum downward effect when E comes to H. Good; now divide the mass of wind into layers, say an inch deep. I must remind him that in raising the flap, he not only increases its opposition to the wind's direction, but at the same time intercepts more and more layers, or a greater depth of wind. This fact, which, he entirely neglects, he will find to alter the angle sought, and alter still more the case of the problem, which, I fear, is not reducible to simple geometry with the case he thinks. He may convince himself that the downward pressure on the whole flap continues to increase in raising it beyond 45 deg, if he will observe that while beyond H the effect of a single wind-layer decreases, as he has shown, in the ratio that H F, I K, &c. (the ordinates of the semicircle) decrease, yet the number of layers intercepted increases as J L, &c. (the ordinates of the quadrant described by the flap), increase. Now the former, after passing H, decrease at first very slowly; while the ordinates of the quadrant, just above its middle, are still increasing pretty fast. He will see then, that for some degrees above the 45 deg., the product of pressure from one layer × number of layers, must still increase, for it can only begin to wane when past that inclination, A I J, at which the descent of I just balances the ascent of J. Now it is found, by the differential calculus, that the inclination to produce this effect must be 54 deg. 44 min.; or it occurs when the base is to the height (A K to K I, or A L to L J) as 1 to √2; or when A K is one-third of A D. Tangents at I and J would then meet A D produced, at equal distances from K and L.

What Mr. Swansborough has proved is simply that if you have a flat-topped roof of an invariable height, the slope of sides that will be most pressed down by wind is 45 deg. But if, instead of the height, the amount of sloping surface be our fixed element, then this maximum occurs at 54¾ deg. (an angle constantly meeting us in questions of all kinds, from the beeswax building to astronomy). Lastly, if only the extent of base be fixed, it is easily seen that no elevation will bring the downward pressure to a maximum, for the higher we go the nearer will it approach, though never equalling, the wind's direct force, on as much vertical surface as the base contains horizontal. This is what Tredgold probably reckoned. I would now suggest to Mr. Swansborough to give us his solution of an easier question than either of these; namely, what is the pitch of roof on which no wind can produce more downward pressure on one wall than on the other?—E. L. G.

[653.]—I am much obliged to Mr. E. Swansborough for his reply to my question as to Pressure on Roofs. I think, however, he has not got a correct result, because he assumes the horizontal force to be always the same, i.e., equal to A D in his diagram, whereas it manifestly increases with the rise of the roof. In examining his solution I found out why I had failed to solve the question myself when I tried it before, and I now forward the investigation, the result of which coincides with the reply given by "E. L. G.," in the BUILDING NEWS of the 9th November—viz., that the vertical pressure per foot super of roof caused by a horizontal wind is a maximum, when the pitch is 54¾ deg.

In the diagram let A B be the rafter.



Let h = horizontal force of the wind per foot super.
s = span of roof.
θ = L BAC.

Then the total horizontal pressure on the roof $= h \times BC = h \times \frac{1}{2}s \times \tan.\theta$.

Let ab be taken to represent $h \times \frac{1}{2}s \times \tan.\theta$, and resolve parallel to and perpendicular to AB. Then ac represents the perpendicular pressure on the rafter, and cb the pressure parallel to the rafter, which produces no effect.

Resolving ac vertically and horizontally ad represents the vertical pressure on the whole rafter AB.

$$\text{Now } ad = ab \sin.\theta \cos.\theta = h \times \tfrac{1}{2}s \times \sin.\theta \cos.\theta \tan.\theta$$
$$= h \times \frac{s}{2} \times \sin.^2\theta$$

and the vertical pressure per foot of A B

$$= \frac{h \times \frac{s}{2} \times \sin.^2\theta}{AB} = \frac{h \times \frac{s}{2} \times \sin.^2\theta}{\frac{s}{2} \sec.\theta} = h \sin.^2\theta \cos.\theta$$

which is to be a maximum.

Differentiating we get

$$\sin.^2\theta\, d \cos.\theta \times \cos.\theta\, d \sin.^2\theta = o.$$
$$\sin.^2\theta \times -\sin.\theta\, d\theta \times \cos.\theta\, 2 \sin.\theta \cos.\theta\, d\theta = o.$$
$$-\sin.^3\theta \times 2 \cos.^2\theta = o$$
$$-\sin.^2\theta \times 2 - 2 \sin.^2\theta = o$$
$$\sin.^2\theta = \cdot 66666$$
$$\sin.\theta = \cdot 81650$$
$$\text{and } \theta = 54 \text{ deg. } 44 \text{ min.}$$

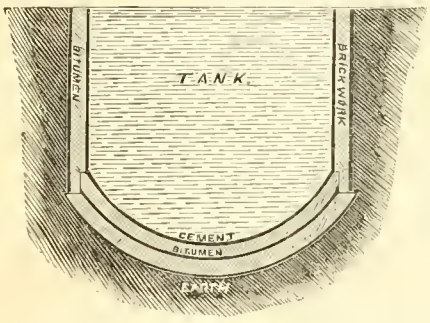
The value of $h \sin.^2\theta \cos.\theta$, when $h = 55$lb.—the greatest recorded force of the wind in England—and $\theta = 54$ deg. 44 min., is 21·17lb.; its value when $\theta = 26$ deg. 34 min., the pitch of ordinary slate roofs, is 9·8lb.; so that in the latter case Tredgold allowed for 30lb. of snow per foot super of rafter, which is equivalent to a depth of 5ft. at least.—H. W.

[656.]—STAINING GLASS.—The answer given to this inquiry in p. 821 could hardly be more misleading. "Inquirer" evidently has a vague notion, naturally derived from our absurd designation of coloured windows as "stained glass," that plain glass can be stained after its manufacture with various tints. Hereon "W. G. P.," apparently rather more ignorant of the matter, copies from some dictionary the names of all the metals used in coloured glass and enamel, with which, it would seem, either of these artists might try what they can make of some plain glass! This comes of the weekly application of the term "stained" to church windows, whereas we might just as well call a building of varied stones and bricks, a "stained building," or a mosaic a "stained pavement."

"Inquirer" should be informed that glass can only be "stained," so far as is yet known, with two tints, yellow and orange. It can be painted upon with enamels, that (after burning in) become translucent (not transparent) of any tint; but this is the art, now deservedly exploded, by which our grandfathers produced their substitutes for coloured windows. All mediæval coloured windows, and all modern ones now tolerated, are composed of glass that has never been white, but was tinged by the mixture of metallic oxides in the melting pot; namely, six oxides of these five metals, copper, manganese, antimony, cobalt, and silver. No others have ever been purposely introduced into window glass. Copper, in its two states of oxidation, gave the mediævals the two exactly opposite colours, ruby and emerald, each in its utmost perfection, but all modern reds from this metal resemble garnet, and are inferior to the gold ruby of drinking vessels, though the mediæval ruby from copper far excelled it. Neither "gold," "uranium," nor "chrome" have ever been used in window glass; nor "tin," nor "zinc," which give no colour, but white opacity; and no "oxides of iron and of chrome" give either "red, brown, and black," or "orange," except to opaque enamel. In transparency they give pale greens only, very inferior to copper. In nature, indeed, chrome tinges both the ruby and emerald, and iron the sapphire, and yellow and pink, topaz; and the ancients got a dull blue from it, but their mode is lost, the sole source of blue for these thousand years having been cobalt. The shadings on coloured windows are an opaque enamel burnt in, which owes its redness, seen from without, to iron.

The "staining" of glass was a late discovery of the middle age, practised ever since, and seemingly without a parallel in chemical physics. The sole two substances known to stain it are pure silver and an alloy of the same with a little antimony. The metal or alloy has to be incorporated with several times its weight of clay or ochre (whose colour has no effect), and a water cream of this metallized clay spread on the plain glass, dried, burned in a furnace, and scraped off again. The stain penetrates about a twentieth of an inch, and without affecting in the least the transparency or polish of surface.—E. L. G.

[668.]—UNDERGROUND TANK.—If the water gets in at the sides, it may be prevented by driving a plank pile 1in. thick and 11in. wide successively along the outside of the tank wall to a level with the bottom of the tank. The pile being extracted would leave a space of 1in. round



the tank. This space should be then filled up with liquid bitumen, which would render the tank waterproof at the sides. The bottom may be made proof by placing two layers of brickwork with a 1in. layer of bitumen between them, covered with cement, as per sketch, which would prevent the water forcing up the bottom.—VERITAS.

[670.]—BICHROMATE OF POTASH.—In reply to "Amateur" I beg to say that bichromate of potash does not answer well for staining soft woods. It is well adapted for oak and other woods of the same nature, but will not suit boxwood. This latter wood requires to be washed quickly over with the strongest aquafortis that can be had, and when it is of a rich colour, rather darker than required, it should be plunged into a basin of cold water to stop the action and operation, which should not take many minutes. The wood, when dry, requires to be brushed over with a stiff brush.—J. M.

[671.]—WOOD CARVING.—The following list of tools which are absolutely necessary in the art of wood carving, I quote for the benefit of your correspondent "B. C.":—1, half-inch flat tool; 2, quarter-inch flat tool; 3, an eight flat tool; 4, half-inch gouge; 5, quarter-inch gouge; 6, backbend; 7, a parting or V-tool; 8, a half-inch former; 9, a corner former; 10, a quarter-inch grounder; 11, a pick; 12, a Maccaroni tool; 13, a carver's screw; 14, a small mallet. Carving tools having about 5in. of handle, and 4 or 4½in. of steel are considered the best and most convenient.—G.

[676.]—CHOICE OF WOODS.—F. Clark will find an answer to his question in another column.—See "Wood-carving—On the Choice of Woods."

STAINED GLASS.

A two-light stained glass window has been erected in Thornthwaite Church, near Harrogate. The subjects are The Good Samaritan and The Alms Deeds of Dorcas. These are represented in panels under canopies of the Early English period. Mr. J. W. Knowles, of York, is the artist.

STATUES, MEMORIALS, ETC.

The monument at Drumclog, N.B., commemorative of the famous battle fought there, having become very dilapidated, the erection of a new one has been determined upon. A design submitted by Messrs. Macdonald, Field, and Co., of Aberdeen, has been selected by the committee, and its execution entrusted to Messrs. Cruikshank and Son, of Glasgow. It will be an obelisk on a pedestal, consisting of base, dado and cornice. The details are treated in the pure Grecian style. The height of the obelisk is 15ft 6in., and that of the monument, from the base to the apex, 23ft.

WAGES MOVEMENT.

Trade is slack at Nottingham, and seems likely to be so all the winter. Very few contracts are out, and those only for small amounts.

The badness of trade has been made worse at Liverpool by the severe frost which set in on Sunday. Great distress is already prevalent among the working population.

The general trade in the neighbourhood of Newcastle-on-Tyne continues flat, and numbers of workmen are out of employment, and the continuance of the frost for any long period would be attended with very great distress to many, although a decided change for the better seems to be anticipated in the spring.

COMPENSATION.

A special jury, under the presidency of Mr. Under-Sheriff Burchell, in the case of "Edwards and others *v.* the Metropolitan Board of Works," assembled at the Sheriff's Court to assess the value of some houses and stables at Goodman's-stile, in Whitechapel, required for the formation of a new street. The proceedings were taken under the Holborn and Whitechapel Improvement Act, under which the removal of Middle-row, Holborn, has just been completed, and which is the best metropolitan improvement effected for a long time. Mr. Hawkins, Q.C., Mr. Keane, Q.C., and Mr. Finlay appeared for the claimants; Mr. Lloyd and Mr. Philbrick were for the Board of Works. The jury went to view the property, and afterwards a verdict by consent was taken for £10,000. The claim was about £15,000.

LEGAL INTELLIGENCE

BREACH OF BYE-LAWS OF THE LOCAL BOARD RELATING TO BUILDINGS.—Mr. John Jones was charged before the magistrates of Winchester with a breach of the 143rd section of the bye-laws of the Local Board, in the erection of a building at the North Walls, of which no defined plans or section had been sent in for approval by the Board. The clerk to the Board said the bye-laws required that for every new building there was required a seven day's notice, and a deposit at the office of plans and sections to a scale of not less than 1in. to 8ft, with specifications of the drainage and water supply. This had been done in the case of some tenements which Mr Jones had erected in the North Walls, but not as to this particular building, which was a carpenter's shop weather boarded and slate roof, the construction of which was objected to by the General Purposes Committee. Mr. Jones contended that though he had deviated in some degree from the plans deposited with the Board, that they had been in effect approved of by the certificate he had received from them that the house and premises (including this workshop) had been properly finished and were fit for occupation.—Mr. Newman said the certificate was given for the house only, of which the plan had been deposited.—Mr. Jones was ordered to pay a sum of £2, and costs, 9s., and to remove the building, or to reconstruct it to the satisfaction of the Board.

WATER SUPPLY AND SANITARY MATTERS.

On Friday the Commissioners appointed to Inquire into the Pollution of Rivers held a preliminary meeting at Warrington. They were met by the deputy mayor of Warrington, the town clerk, and by many members of the town council and other inhabitants. In the course of the conversation which ensued, it was pointed out that, at one time, salmon and other fish abounded in the Mersey, but, that, in consequence of the refuse turned into the river at Manchester and the higher district, no fish could now live in it. At the same time it was admitted that the manufacturers of the town contributed their share to the pollution of the river. The state of the Sankey brook and other tributaries in the neighbourhood was also laid before the Commissioners, who said that Warrington, from its position, ought to afford the strongest case in support of the compulsory cleansing of the river.

The contractors for the new system of drainage at Gravesend are making vigorous efforts to complete the works by next spring. The reservoir for the reception of the sewage is 168ft. long, 60ft. wide, and 7ft. deep, and into it will be conveyed the whole of the sewage of the city. The liquid manure will escape through an outfall drain into the river below Fordwich, and the residue will be utilized.

A meeting of local owners of property and rent-collectors has been held at Leeds, for the purpose of considering the steps at present being taken by the Corporation, with regard to privies and ash-pits under the new Improvement Act. It was stated that the Corporation was beginning to carry out the water-closet system, and resolutions were passed condemning the course that had been taken, and strongly recommending the dry ash system on sanitary grounds, and also as a means of securing a vast amount of valuable manure.

MEETINGS FOR THE WEEK.

MON.—Society of Engineers.—Annual General Meeting for Election of Officers for Ensuing Year, 7.30.
Royal Geographical Society.—Paper to be read: "Journey through Central China, from Canton," by Mr. A. S. Bickmore, 8.30.

TUES.—Institution of Civil Engineers.—Discussion—1. "Description of the Victoria bridge, on the Line of the Victoria Station and Pimlico Railway," by Mr. W. Wilson, M. Inst. C.E. 2. "On New Railways at Battersea, with the Widening of the Victoria bridge, and Approaches to the Victoria Station," by Mr. C. D. Fox, M. Inst. C.E., 8.

WED.—Civil and Mechanical Engineers Society.—"Preservation of Timber," by Mr. R. M Bancrox, 8.

THURS.—British Horological Society.—"On the Practice of Assaying the Precious Metals," by Mr. G. H. Makins, 8.30.

Middle-row, Holboro, has at length entirely disappeared, and on Wednesday carriage traffic passed over the new road which has been laid down where the Row formerly stood.

Our Office Table.

Mr. Tall will deliver a lecture this evening on concrete buildings, before the members of the Architectural Association, 9, Conduit-street. As the subject has attracted a good deal of attention of late, no doubt the meeting will be an interesting one.

A suggestion has been made, in connection with the proposed widening of North College-street, Edinburgh, to convert it into a boulevard, after the Parisian style, by planting suitable trees along each side of the street. Is it too late to ask, as we have asked before, if something of the kind cannot be done in London?

An important resolution was adopted by the Commission of Sewers at their sitting on Tuesday, being a report of the Streets Committee, on the motion of Mr. Pedler, to substitute asphalte or gas pitch as a cement for the usual granite pavement of the roadway, as an experiment, in place of the ordinary grouting. By this plan, which will prevent the soft bed from passing up between the stone, the formation of mud will be rendered impossible. Manchester has been adopting this plan with great success for the last twelve years, and it is hoped that the Manchester town council will lend their aid in giving the citizens a sample of what they are now enjoying in clean and comfortable streets by laying down a specimen in London at the expense of the Commission of Sewers.

The fine wood carving of the choir of Lincoln Cathedral is being restored by Messrs. Rattie and Kett, of Cambridge. The south side is already completed.

Lord Robert Montague the other day informed a deputation from the Associated Chamber of Commerce, which waited on his lordship touching the great question of technical education, that the Government had asked for reports on the subject from their secretaries of legation and that a *precis* of those documents would be given when they were ready to be submitted to the public. Mr. Samuelson, who had volunteered to go abroad and judge for himself, had sent in a very voluminous letter, containing his observations and views; and Professor Leone Levi, whose services had been engaged by the Government in the matter, had furnished a report which was now in type, This report, we presume, will be published almost immediately.

An interesting relic of old Roman Bath has come to light in the course of the excavations at the "White Hart," Bath. The workmen discovered on Saturday what, there seems every reason to believe, is the platform of the great temple dedicated to Minerva. It extends under Stall-street and the east end of the site to be occupied by the new baths belonging to the Corporation.

The annual amount of expenses connected with the National Gallery is £15,894. Of this the Director receives £1,000, and the Secretary and Keeper £750. The cost of the establishment is £1,523. Of this, £327 is paid to Curators, and £786 to police. £621 is spent at South Kensington, £2,000 for travelling expenses, &c., and £10,000 for the purchase of pictures.

The new branch line along the Derwent Valley, from Newcastle to Consett, was opened on Monday. It passes through a closely-populated district, and most of the inhabitants are occupied in the iron trade. The principal bridge on the line is the Hamsterley Viaduct, which crosses the Port Burn at an elevation of 120ft. It has ten arches of 60ft. span each, and is constructed of light-coloured bricks, with freestone parapets. The contractors for the whole of the work were Messrs. Morkill and Prodham.

A terrible cyclone at Calcutta, which lasted eight hours, has destroyed 30,000 native huts, many hundred native boats, and more than a thousand lives. The storm exceeded in severity that of October, 1864, which is remembered as the "Great Cyclone."

A correspondent calls attention to the neglected state of the Chapel Royal of Holyrood, the edifice in which Her Majesty's chaplains for Scotland are supposed to officiate. It is little to the credit of the nobility and gentry of Scotland that the tombs of their illustrious ancestors should so long have been suffered to remain so neglected. He asks what has become of Sir William Molesworth's Report respecting the restoration of the chapel.

Mr. J. S. Crawley has presented to the inhabitants of Luton, 43 acres of moorland on the old Bedford-road for the formation of a people's park.

It is some satisfaction to know that the ornamental water in Regent's-park is now a safe place. A calamity such as occurred here last winter cannot possibly happen again. The immense drain was completed last week, and the water is now gradually being let off. The lakes will be filled up and made one uniform depth with earth and rubbish which will be well puddled over with clay, and then concreted.

A scholarship of £50 a year for three years (being the first yet awarded) in connection with the Royal School of Naval Architecture and Marine Engineering, South Kensington, has been gained upon examination by Mr. J. E. Cearns, of Chatham. The school now numbers 41 students, 24 of whom are sent by the Lords of the Admiralty.

A fine specimen of the Saxon ring worn by the higher classes during the Heptarchy, was discovered the other day on the farm of Mr. T. Hornby, of Cattleholmes, near Driffield. It weighs an ounce and a quarter, and contains gold equal to five sovereigns. It is supposed to be at least 1,200 years old.

A vein of superior gypsum has been discovered near Christiansburg, Virginia.

Three owners of house property in Somers Town and Lisson-grove have this week been fined at the Marylebone Police Court for having their premises in a state "unfit for human habitation."

The Sewers Commission, at their last meeting, agreed to a report from the Improvement Committee recommending the purchase of certain premises in Fenchurch-street and Leadenhall-street with the view of widening those thoroughfares. No part of the City stands in greater need of improvement in this respect than the places mentioned.

Describing a visit which he recently made to the tomb of the celebrated divine George Whitfield in the Presbyterian Church of Newburyport, Massachusetts, U.S., Mr. Henry Vincent says:—We descended into a cellar, through a trap-door behind the pulpit, and removing a padlock from an upright door, we entered the tomb of the great preacher. The coffin of Whitfield is placed across the other two, and the upper part of the lid opens upon hinges. We opened the coffin carefully, and by the light of our lamp saw all that was mortal of the eloquent divine, who had crossed the Atlantic thirteen times to preach the Gospel. The bones are blackened, as though they were charred by fire. The skull is perfect. Whitfield died in 1770.

The constructive powers of the beaver are well known. A curious and most interesting discovery was lately made, which illustrates the ingenuity of this animal in a very remarkable manner. A paper read before the American Association for the Advancement of Science states, that on the southern shore of Lake Superior, in Marquetti County, Wisconsin, have been found remains of long canals and dams constructed by the beavers for the purpose of transporting their cuttings, consisting of trunks of trees two or three feet long, from the places where the trees had fallen to their lodges. Some of these canals were 300, 400, and 500ft. long. They were generally three feet wide, with an average depth of three feet. In order to maintain a continuous depth of water, they made dams at certain distances, and followed the Chinese plan—to whom the lock was unknown—of drawing their cargo from one level to another.

The Court of Common Council has agreed, on the recommendation of the General Purposes Committee to expend the sum of £2,850 in decorating the Egyptian Hall and the saloon at the Mansion House.

The private bills to be applied for in the ensuing session of Parliament will probably not exceed 250 as against 633 in 1866, and 317 last year. Of the papers deposited 54 related to railway and canal bills, 5 to street tramways, and 64 were miscellaneous. The principal schemes relating to London are a viaduct railway from Islington to Finsbury; an underground railway from Bow to the City, under the Mile-end and Whitechapel-roads; a subway under the Thames, at the Tower, to be approached by hydraulic lifts, and worked by omnibuses propelled by men: a boulevard at the West-end, from the Houses of Parliament to Belgravia; and three bills for street tramways, including a revival, for the third time, of what certainly still seems the best or least objectionable of the three, the promoters of which have brought two competitors upon them to contest or share the prize for which they have been fighting.

The fifteenth annual report of the Conservative Land Society, presented at the meeting of the members on Tuesday last, at the Norfolk-street offices, Viscount Ranelagh in the chair, stated that the receipts for the year were £116,983 0s. 11d., and the grand totals £1,100,603 7s. 9d., the total withdrawals on which had been £306,749 0s. 2d., whilst the total sale of land amounted to £537,059 19s. 6d. The £50 shares issued had been 27,783; the reserve fund had been carried up to £15,089 13s. 2d. The share, deposit, land, and building advance departments had been all increased during the year. After payment of the outlay on the new premises the directors declared a dividend of 6 per cent. for the investors. The returns of the land sales showed that large premiums had been paid on the resale of the plots. A large estate, Bolingbroke Park, close to the Clapham Junction and Wandsworth stations, would be soon allotted, as also the final portion of the Brighton estate. Viscount Ranelagh stated that the preliminary arrangements for the formation of a new land company (limited) to work in co-operation with the parent society, had been agreed upon, and that the prospectus would be issued shortly after Christmas.

Trade News.

TENDERS.

DAWLISH (DEVON).—For erecting three houses and shops, a corner shop, refreshment bar, billiard rooms, ball room, &c., for Mr. William Hatcher. Mr. G. Packham, architect:—

Foaden	£3,986
Davey and Son	3,130
Periam (accepted)	2,991

GIBRALTAR.—For drainage of the city of Gibraltar and supply of water for flushing:—

H. J. Saunders, Southampton	£41,100
Waring Brothers, Victoria-chambers	40,080
John Plews, London	37,080
G. E. Peters, London	36,587
Peter Amigo, Gibraltar	34,100
Frederick Furniss, Portsmouth	33,995
Henry D'Almonte, Gibraltar	33,960
Engineer's estimate	33,600
A. Kyan and Co., Battersea (accepted)	28,620

[We have received the following letter with this tender:—SIR,—On the 28th October last tenders were opened in Gibraltar for drainage and water supply for flushing the city of Gibraltar, quantities supplied by Mr. Edward Roberts, engineer for the commissioners of that city. As I have not seen any notice of the same in your publication, and, as in one instance there was a great discrepancy in amount, I think perhaps you would like to have particulars. I went out to Gibraltar for the purpose of tendering, and copy the above from the official list of tenders furnished me by the engineer before returning. I have gone carefully through the quantities since my return, and carrying them out at very low English prices the cost would be at least £30,000. Can you explain how it is to be done in Gibraltar for £28,620, where materials and labour are very much in excess of English prices?—I am, &c., A TENDERER.]

HANLEY.—For timber work for third block of building at Messrs. Meakin's new manufactory. Messrs. W. and C. Palmer, Hanley, architects:—

Barlow	£834
Ogden	650
Blackhurst	625
Matthews (accepted)	581

HORNSEY.—For the construction of a brick gasholder tank for the Hornsey Gas Company. Mr. Jabez Church, engineer:—

Kirk	£4,860
Mansfield	4,570
Ashly and Horner	4,490
Hill and Keddell	4,260

The lowest tender was accepted.

HORNSEY.—For alterations, &c., to house, Goodwin-street, Seven Sisters'-road, N. Mr. J. H. Glenn, architect. Quantities supplied:—

Roy	£479
A. E. Harvey	464
Knight	463
Ennor	445
Eaton and Chapman	440

HULL.—For leather manufactory, engine chimney, and foreman's dwelling-house, for Messrs. Thomas Holmes and Sons, Hull. Mr. W. Botterill, Hull, architect. Quantities not supplied:—

R. Habbershaw	£3,843 10
G. Jackson	3,800 0
C. Hutchinson	3,470 0
J. Jackson	3,470 0
R Sergeant	3,463 0
W. Barritt	3,373 7
W. and J. Hall (accepted)	3,370 0

LONDON.—For pianoforte manufactory, Torrington-mews, Torrington-square, W. C., for Messrs. Brinsmead. Mr. W. F. Potter, architect:—

Hookaway	£284
J. H. Tozer	267
F Honour	259
Manley and Rogers	244
R. Perkins (accepted)	242

LONDON.—For heating new North London Synagogue. Mr. H H. Collins, architect:—

May and Son (accepted)	£146

For gasworks, &c. Mr. H H. Collins, architect:—

Defries and Sons (accepted)	£136

LONDON.—For alterations, &c., to warehouse, Cross-street, Finsbury. Mr. H J. Hammon, architect:—

Turner	£1,374
Brass	1,206
Macey	883
Henshaw	875
D. King and Sons	862
Eaton and Chapman	724

LONDON.—For whiting manufactory, stabling, and cottage, on Surrey Canal Old Kent-road, for Mr. Cann. Mr. J. Thomas, architect:—

Taylor	£3,983
Cowland	3,629
Cannon	3,612
Thompson	3,470
Ring	3,390
Collis and Son	3,200
Wills	2,987

MAIDA-HILL.—For alterations and additions to Gordon-Lodge, Maida-hill, for Mr. A. H. Solomon. Mr. H. H. Collins, architect:

David Sale (accepted)	£1,000

PLYMOUTH.—For the erection of new cement works, including engine-house and stack, 81ft. high, with offices and dwelling-house, at Deadmans Bay, Plymouth, for Messrs J. and T. Harvey. Mr. J. Harvey, architect:—

Architect's estimate for the whole of the work	£1,500

For the carpenters and joiners' work of the factory and engine house only. Quantities supplied by Mr. J. Harvey, architect:—

Mr. W. Harvey (accepted)	£430

PLUMSTEAD (KENT).—For building a pair of villas at Cantwell-road, near Shooter's-hill, Plumstead, Kent, for Mr. George Kitley. Messrs. Wm. Gosling and Son, architects, &c.:—

Upchurch and Hanks	£1,000	15	6
Brett	775	0	0
Wise	740	0	0
Wicks	710	0	0
Lidbetter	700	0	0
Thompson and Richardson	687	0	0

TOOTING.—For building five houses at Tooting, for parish of Christ Church, Newgate-street, E.C. Mr. H. H. Collins, architect. Quantities not supplied:—

Shaw	£2,585
King and Sons	2,460
Scrivener and White	2,326
John Kain	2,300
Pitcher	2,119
Henshaw	2,075
William Ball (accepted)	1,830
David Sale	1,500

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BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

W. H. Palmer, Tysoe-street, Clerkenwell, surveyor—S. Robinson, Richmond-street, City-road, marble mason—R. Atkin, Birkbeck-street, Holloway, builder—J. Dunbar, Lancaster-road, Lower Norwood, engineer—M. J. Hobbs, Kingston-on-Thames, Surrey, plumber—J. Drake, Addington-street, York-road, Lambeth, contractor for buildings—G. O. Lane, Pall Mall, civil engineer—George Green, Greenwich, builder, December 18, at 2—Charles Robert Teague, Old Jewry, surveyor, December 17, at 2.

TO SURRENDER IN THE COUNTRY.

I. Israel, Neath, Glamorganshire, painter and glazier—J. Jackson, Bradford, Lancashire, builder—William Cook, Gateshead, builder, December 14, at 11—John Fletcher, Hurst, near Ashton-under-Lyne, engineer, December 19, at 12.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

December 16, S. J. and J. Dudbridge, Stroud, builders—January 14, W. E. Galliford, Barnstaple, builder—December 18, J. Russell, Birmingham, bricklayer—December 19, A. Napier, Warrington, joiner—January 17, W. Privett, Bishops Waltham, carpenter.

PARTNERSHIPS DISSOLVED.

R. Brandon and H. E. Freshwater, New-street, Spring-gardens, architects—J. S. Fraser and A. Booth, St. Helens, Lancashire, iron merchants—John Ingham and Jonas Ingham, Leytonstone, Essex, builders—J. P. Binns, J. Chatterton, and S. Smith, Leeds, engineers and machine tool makers—G. and J. Sollory, Nottingham, plumbers—Robinson and Woodhouse, Masborough, joiners.

DECLARATIONS OF DIVIDENDS.

J. W. Ward, West Hartlepool, builder, first div. of 5½d.—H. Gray, Leicester, ironmonger, div. 5s.

DIVIDENDS.

January 8, W. Winch, Daniel-street, Bethnal-green-road, timber merchant—December 13, H. Sidders, Teynham, brickmaker.

SCOTCH SEQUESTRATIONS.

W. Moreland, Edinburgh, carter and contractor, December 11, at 2.30—G. Calder and D. Simpson, Arbroath, Forfarshire, ironmongers, December 5, at 12—D. Stewart and Sons, Dundee, contractors, December 9, a 12.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9 0	£10 10	Archangel, yellow .. £11 10 £13 0
Quebec, red pine	3 0	4 10	St. Petersburg, yel... 10 10 11 0
,, yellow pine..	2 15	4 0	Finland 8 0 9 0
St. John N.B. yellow	0 0	0 0	Memel..... 0 0 0 0
Quebec Oak, white..	5 5	5 10	Gothenburg, yellow 8 10 10 10
,, birch.....	3 10	4 10	,, white 8 0 9 0
,, elm	3 10	5 0	Gefle, yellow..... 9 0 11 0
Dantzic oak	3 10	6 0	Soderham 9 0 10 10
,, fir	2 0	3 0	Christiania, per C.,
Memel fir	3 0	3 10	12 ft. by 3 by 9 in.
Riga	3 0	3 5	yellow 16 0 22
Swedish	2 0	2 5	Deck Plank, Dantzic,
Masts, Quebec red pine	6 0	7 0	per 40 ft. 3 in. 0 15 1 4
,, yellow pine..	5 0	6 0	PUMICE STONE pr ton 6 0 8 0
Lathwood, Dantzic, fm	4 10	5 0	OILS, &c.
,, St. Petersburg	6 10	7 10	Seal, pale....per tun 40 0 41 0
Deals, pr C., 12 ft. by 3			Sperm body 112 0 0 0
by 9 in., duty 2s per			Cod 36 0 37 0
load, drawback 2s.			Whale, Sth. Sea, pale 39 10 0 0
Quebec, white spruce	13 0	19 0	Olive, Gallipoli..... 68 0 0 0
St. John, white spruce	13 10	16 10	Cocoanut, Cochin, ton 56 0 57 0
Yellow pine, per reduced C.			Palm, fine 41 0 0 0
			Linseed 34 15 35 0
Canada, 1st quality.	17 0	18 10	Rapeseed, Eng. pale.. 38 0 38 10
2nd do.....	11 10	12 10	Cottonseed..... 34 0 40 0

METALS.

IRON :—				
Welsh Bars in London .. ..per ton	6 7 6	6 10 0	3	
Nail Rod ..... do	7 10 0	7 16 0	2½	
Hoops ..... do	8 10 0	9 0 0		
Sheets, Single ..... do	9 15 0	10 0 0		
Staffordshire Bars ..... do	7 10 0	7 15 0		
Bars, in Wales ..... do	6 15 0	6 0 0	3	
Rails ..... do	5 10 0	6 0 0	net	
Foundry Pigs, at Glasg. No 1 .. do	2 15 0	3 5 6	2½	
Swedish Bars ..... do	10 6 0	10 10 0	net	
STEEL :—				
Swedish Keg, hammered .....per ton	15 0 0	16 10 0	2	
Swedish Faggot ..... do	10 10 0	12 10 0	2	
COPPER :—				
Sheet & Sheathing, & Bolts ....per ton	80 0 0	82 0 0		
Hammered Bottoms ..... do	92 0 0	0 0 0		
Flat Bottoms, not Hammered .. do	85 0 0	0 0 0		
Cake and Tough Ingot ..... do	71 0 0	72 0 0	3	
Best Selected ..... do	79 0 0	80 0 0		
Australian ..... do	83 0 0	84 0 0		
Y 1. Metal Sheathing & Rods ....per lb	0 0 7	0 0 0		
TIN :—				
English Block .....per ton	95 0 0	96 0 0		
do Bar ..... do	96 0 0	97 0 0	2½	
do Refined ..... do	98 0 0	99 0 0		
Banca ..... do	94 0 0	95 0 0	nett	
Straits ..... do	90 0 0	0 0 0		
LEAD :—				
Pig, English .....per ton	21 10 0	0 0 0		
,, Spanish Soft ..... do	19 0 0	0 0 0	2½	
Shot, Patent ..... do	22 10 0	0 0 0		
Sheet ..... do	20 10 0	0 0 0		
White ..... do	27 0 0	30 0 0	5	
SPELTER :—				
On the Spot .....per ton	21 0 0	21 2 6	net	
ZINC :—				
English Sheet .....per ton	26 10 0	27 0 0	2	
Devaux's V. M. Roofing Zinc .... do	26 10 0	0 0		

* And 6 per cent. discount if laid upon the new system.

QUICKSILVER .....per btl	6 17 0	0 0 0
REGULUS OF ANTIMONY		
French .....per ton	23 0 0	0 0 0

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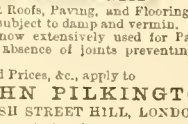
ESTABLISHED  1838.
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THE BUILDING NEWS.

LONDON, FRIDAY, DECEMBER 13, 1867.

THEATRE BURNING AND THEATRE BUILDING.

SINCE Her Majesty's Theatre was burnt on Friday night last, much has been written about its splendour, its size, and the immense loss the public have sustained in its destruction. We might also write in a similar strain, and descant on the beauty and rank which have graced its boxes and stalls, the genius which has enraptured generations of listening spectators, and the unsurpassed acoustic qualification of the theatre now numbered "amid the wreck of things that were." But we prefer to offer a few observations on theatre building and theatre burning. We are surprised that Her Majesty's Theatre was not burnt long ago, for it appears almost to have been built for that purpose; almost every part of its interior consisted of wood, every particle of which was as dry as powder. The means of egress and ingress which the theatre possessed were remarkably defective, and had a fire broken out during an ordinary performance, the consequences, in all probability, would have been appalling. We have scores of times entered the theatre, and almost as many times shuddered at the thought of fire breaking out when the theatre was full. There was only one entrance to the gallery, the amphitheatre stalls, and upper boxes, and that was narrow, crooked, and circuitous; and had a panic rush at any time occurred, it would have been impossible for many to have descended the staircase without crushing, injury, and death. In fact, so thoroughly have we been impressed with the unsafe condition of the theatre that we have always preferred to be as near the door as possible, in order to be prepared for escape if necessary. Whilst, therefore, lamenting over its destruction, we feel there is much cause for congratulation that its fire doom was fixed at a moment when it was empty. The late theatre was erected in 1791, from the designs of Michael Novosielski, and has consequently existed seventy-six years, a very long life for a theatre. Its predecessor, however, on the same site, existed for eighty-four years, but that was before gas was invented, and long before even architects professed to render buildings fireproof. It was opened during the first throes of the French revolution. It was altered and enlarged in 1819 by Nash and Repton, when the Pall Mall and Haymarket fronts were built. Excepting La Scala, at Milan, it is said that the late theatre was the largest in Europe. The Italian opera was introduced in London in 1708. Since that time it has been a growing institution, and young ladies look forward to the opera season as new-fledged members of Parliament look forward to the opening of Parliament. This being the case, we may expect that a new opera house, built more in harmony with modern wants and modes of construction, and subjected to fewer liabilities to destruction by fire, will arise, phœnix-like, from the still smouldering ashes in the Haymarket. An opportunity will, therefore, soon arise to tax the abilities of some scientific architect. The question naturally arises, how shall it be constructed so as to afford the maximum of safety, combined with all the capabilities to make it commercially successful? Just now there are not wanting advisers in the public newspapers who are ready to give no end of suggestions on the best manner to build a theatre. Journalists, in fact, take theatres under their special protection, and it is therefore natural that when an old one is burnt down, or when a new one is to be erected, that they should have something to say on the subject. The State, also, has much to say about the matter; for does not the Lord Chamberlain say when a theatre shall be opened, and when it shall be closed? Has he not also a control on what is presented on the boards? We may, therefore, as a matter of course, expect to hear much from non-professional pens on theatre building.

The first thing that suggests itself on this subject is the manner and the materials of construction, in order to make the building as much as possible fire-proof. To do this absolutely is obviously impossible. Almost everything appertaining to the stage of a theatre is combustible. The platform itself must be of wood, the scenery, the "properties," the dresses, and other appurtenances, must consist principally of very combustible material, which must be brought into close contiguity with gas light. It has been suggested that iron drop curtains should be provided, so that if a fire broke out on the stage it might be shut off from the auditorium. This, it has been said, would give the audience time to disperse, and perhaps be the means of saving one part of the building. The answer to this is that such a curtain would soon get red hot and so become a means of mischief. On this point, Mr. Dion Boucicault recommends a process to extinguish fires which is well worth consideration. He says:—

> Above the stage, and co-extensive with it, there is a gridiron floor from which hangs the pendant scenery. Let the timbers of this floor, which is open work, be laid on their under face, with lines of small iron pipe, forming a gridiron, pricked at every inch with holes; let this system be in communication with the water main constant service. Let one lever which turns on the water be against the wall of the stage on the outside, another corresponding lever contiguous, but on the inside, so that the water may be turned on by a person either outside or inside of the building. The effect of this operation would be to let fall a continuous and even deluge, more effectual in checking a fire than the jet from a hose, because it not only addresses itself to the seat of the fire, but to adjacent material. A similar gridiron process should be introduced underneath the stage, another on the rafters over the auditorium, and a fourth in all available places around the ceiling, so placed that the rain from such would fall or be projected on the woodwork of the boxes and stalls. Each of these systems should have a separate main, so that each could be brought into operation separately; yet the whole might be under the operation of one master main, by turning on which the whole theatre, from the back of the gallery to the rear of the stage, could be deluged in a moment. It is of great importance that such a process should be as readily worked from the outside as from the inside of the building. I believe that the water companies supply what they term sealed mains; that is, the constant service of the street main is conducted into the building and the lever is there sealed up; to break this seal is to confess the use of the supply. Such facilities exist, as I am informed; and if they don't, and the companies offer any impediment to their introduction, an Act of Parliament might be obtained to render such assistance obligatory.

The most painful feature of theatres in London and other large towns is the obvious and lamentable deficiency of egress. Though this point has been enforced again and again, still it has not sufficiently impressed itself on the minds of proprietors and architects, and we are afraid it never will until the legislature interferes, and make it penal to build a theatre that cannot empty itself in three or four minutes. If we saw any hope of touching the consciences, and, through their consciences, the actions of those interested, we would not call for more stringent enactments on this point. But we have almost lost all hope in the matter. So intensely selfish are we all become or becoming, that we will not study the interests of others in promoting what are falsely supposed to be our interests. Perhaps this phase of selfishness has taken a firmer hold of the building fraternity, or a large portion of it, than of any other class of the community. Look, for instance, at the condition of the thousands of dwelling-houses that are starting up in every direction. Almost everyone tries to get what he can, with scarcely a consideration for the convenience or the health of his neighbours. He appears altogether oblivious of the fact that whenever he robs his neighbour he robs himself more. Judging from his acts, this truth, or any portion of it, has never dawned on his mind. Hence we see theatres and other places of public resort built with miserably defective ventilation, and with inadequate means of egress in case of fire. We know that land is valuable, and that architects are compelled to save every inch in order to get the maximum of sitting accommodation, as that is supposed to be the only thing that pays. People not only want sitting accommodation and convenience, but a sense of security, which, if provided, would also pay. The thought or feeling that strikes everyone on going in or coming out of most theatres is, "Oh! if a fire should break out!" which is accompanied by a cold tremour. Now, we maintain there is no necessity for this. Valuable as space is, life and a sense of security are far more valuable; and if theatre-builders will disregard such considerations they ought to be compelled not only to regard them but to provide for them. We alluded just now to the narrow, tortuous staircase which led to the whole of the upper part of Her Majesty's Theatre. Take another fact. Would anyone imagine that the folding doors at the bottom of this entrance opened *inwards*, and not *outwards*. Had a rush taken place, with great pressure, as would have been the case if fire broke out when the theatre was full, the doors could only have been opened with great difficulty, and the stream of people that came or fell downstairs would be dammed up at the bottom. And yet these doors have been in this condtion year after year, and no one considered it his duty to interfere and alter them.

Another suggestion we venture to throw out relates to the undue haste in which theatres are erected. Almost all houses are erected too rapidly, and theatres in particular. Look, for instance, at the last theatre built in London—the Queen's, in Long Acre—illustrations and description of which appeared in our pages a few weeks since. The rapidity with which it was transformed from St. Martin's Hall to a theatre was marvellous. As a rule, things cannot be done with astonishing haste and well at the same time, and this applies particularly to theatre building. No doubt, many of our readers have looked with satisfaction at the decorations of this new theatre; at all events, they have been much praised in the newspapers. Should, however, a fire break out at the Queen's it would burn, young as it is, almost as rapidly as Her Majesty's. The decorations are not put directly on the walls, as the observer may imagine, but on *wood*. It would have been necessary to plaster the walls, and plaster would have taken time to dry; hence the application of wood, and the result is that the Queen's, instead of being incombustible, is about the most combustible theatre in London. If the architect were asked, why board the walls? he, no doubt, would say he was pressed for time; in other words, he was the victim of this insatiable thirst for gain which is such a characteristic quality of our too highly lauded civilization. "Everyone for himself, and the devil take the hindmost," is the practical motto of the age. Let us hope that this undue reckless haste will be conspicuous by its absence during the erection of Her Majesty's Theatre that is to be.

LONG SPAN RAILWAY BRIDGES.

SUBSEQUENT events have incontestably proved that the extreme ideas and anticipations entertained at the first introduction of railways, with all their numerous constructive accessories, have completely failed in realization. After the first successful run over the metals, it was asserted, and the assertion is quite correct, that a speed of a hundred miles per hour might be safely indulged in, upon a good straight level road. It was, therefore, naturally expected that, as we pos-

sess, upon the older lines at least, some excellent portions of road, the speed would increase until it approached nearer to the limited maximum than it has done or ever will do. In strong contrast to these brilliant anticipations and sanguine expectations stand the bare facts. Instead of increasing the speed upon our railroads, the reverse has been the case. When the Darlington Company offered their prize of £500 for the best locomotive, under certain conditions of trial, the "Rocket," which deservedly bore away the palm, was run at a speed of twenty-six miles per hour. How many trains run at the present day at that rate? With the exception of the "limited mails," the boat express, and the Scotch fast train, they are all the most wretched crawlers that could be well imagined. To travel by a parliamentary train is downright misery, and what are termed ordinarily "fast trains" rarely equal thirty miles per hour. It must not be imagined that a much higher speed than what is attained now could not be reached with safety upon some lines, but, in a word, it would not pay to do so. Anyone who travels over a line he has known in his boyhood cannot fail to notice how the stations along its route have multiplied, more especially in the vicinity of the metropolis, and manifestly to run a number of fast trains not stopping at these intermediate halting places, would be virtually to negative the object of erecting them. Unquestionably the construction of the line itself, with respect to its ruling curves and gradients, exercises an important influence upon the rate of travelling, but we shall not now pause to consider this or any other well-established impediment to the acquisition of a high velocity upon railroads.

As with the speed of locomotion, so with the span of bridges. We have already shown that the first locomotive exceeded in speed the majority of its future brethren, and it can be demonstrated with equal facility that the first railway bridge, worthy of the name, exceeds all its cotemporaries. The Britannia Bridge over the Menai Straits still remains unrivalled for length of span or clear opening between piers by any existing railway structure. We exclude from comparison the bridge over the Niagara Falls, as, in the strict sense of the term, it cannot be called a railway bridge. A structure that barely allows the carriages of a train without the engine, to traverse it at the absurdly slow rate of five miles per hour, cannot be regarded in the light of an efficient railway bridge, or placed in the same category with that which permits the Irish mail, the second fastest train in the kingdom, to pass through it at a velocity of nearly forty miles an hour. Moreover, to clinch the matter, no Government inspector would pass a similar bridge for traffic upon an English line, nor would he be justified in so doing. The two principal spans of the Britannia Bridge are each 460 feet in the clear, exceeding by about eleven feet the largest opening of the *chef d'œuvre* of Mr. Brunel, the Royal Albert Bridge over the river Tamar, at Saltash. Both these structures may be justly denominated long span railway bridges, although their design and construction both in principle and detail are widely different. The Britannia erection is upon the tubular system, which characterizes all the bridges emanating from its great designer, Robert Stephenson. He carried out the same principle both in the Victoria Bridge, in Australia, having a span of 200ft., and in that of the same name over the river St. Lawrence, in America. The greatest span of the latter is 330ft. in the clear. Were the Britannia Bridge to be built at the present day, two very important alterations would take place. The principle of its construction would be changed, and the site removed from the Britannia to the Lough Swilly rock. The greatest span required at that locality would be very much less than 460ft., the opening demanded by its present situation. With this advantage in its favour, the most considerable a site could possess, it might be reasonably asked why it was not selected in the first instance? To fully understand the reason of its rejection by Mr. Stephenson, it must be borne in mind, that that engineer was strongly opposed to anything approaching a sharp curve, and never in his wildest enthusiasm about railways, and what belonged to them, imagined that curves similar to what are now of every day occurrence, could ever have been introduced into our railway system. Mr. Stephenson considered that no curve should have a less radius than one mile, except under very peculiarly stringent circumstances. At present, curves of 600ft. radius are frequently laid out for railway purposes. To have adopted the site of the Lough Swilly rock for his great work, would have necessitated the introduction of a sharper curve in the line at that point than the engineer regarded as desirable, and consequently the Menai Straits were bridged *viâ* the Britannia rock. With respect to the tubular system, it has long since exploded; but the fact that cheaper and more scientific principles have been brought to bear upon the subject of bridge building, does not in any manner detract from the boldness, professional skill, and originality of the designer. Even granting that there is a loss of material in its solid sides, massive booms, and cellular flanges, yet, notwithstanding, with its lofty proportions, rock-like piers, and noble span, it utterly dwarfs structures so insignificant as the Charing Cross and Blackfriars railway bridges. With their miserable spans of 150ft. and 170ft., they are not worthy to be classed in the same nomenclature. To draw a poetical comparison, "they are like the gold filagree work of Zamara beside the eternal architecture of Egypt."

Passing on to investigate the Royal Albert Bridge, which is also undoubtedly a long span bridge, it is essentially an unique design, a fit emblem of the great master mind which designed it. Next to the Britannia Bridge in absolute size of span, the true criterion of all similar structures, it has the advantage of being constructed upon an improved principle, and consequently upon a scale of greater economy. In reality it embodies a variety of principles in the design, that of the bow and string predominating, although it is by no means a pure type of that system. The true value of a great depth of truss, both constructively and economically, is particularly apparent in this design, and it is estimated to bear a favourable comparison in cost per foot run with any existing example. It is a national misfortune that Mr. Brunel is not alive to bring his engineering abilities to bear upon the gun and target question. His powerful mind, from its peculiar constitution and bias, was eminently fitted to cope with the present unsolved problem. Size was the distinguishing characteristic of his intellect, and the queston of monster guns and impenetrable targets would have proved an irresistible temptation to it. That we have not the benefit of his services is the more to be regretted as the attempts of some of our leading engineers at target making, have turned out complete—not to term them ridiculous—failures.

Many and various systems of railway bridges have been recently put forward as adapted for long spans, but upon investigation some of them do not by any means bear that interpretation.* Among these the arch has unquestionably the right of priority, but notwithstanding that it is theoretically well suited for spanning large openings, yet of all others it is the least likely to be practically employed. It should not be forgotten that this was the form originally selected for the Menai Bridge; but the power of red tape was too strong for the company and their engineer. The Admiralty imposed restrictions, which rendered the adoption of the arch form a matter of sheer impossibility. We dismiss from our category all girders upon the cantilever principle as hitherto untried in practice, for although however well these particular forms may bear theoretical investigations, especially with reference to a uniformly distributed load, their real practical merit, if they have any, cannot be discovered until they are subjected to the trying ordeal of the passage of an express train. It was not until the suspension principle, which we also exclude from the denomination of a long span bridge, was actually submitted to the passage of a train that its practical inapplicability to the exigencies of railway traffic was rendered apparent. Mr. Stephenson, who was called in to design a new structure in lieu of a suspension bridge, and we believe the only one ever tried upon an English line, mentions that the platform rose up and down in successive waves before the advancing train, and that even after supports had been placed underneath, in the shape of piles, the vibrations and undulations were sufficiently strong to draw them out of the ground. Of all the patents taken out for girders upon the suspension principle, that of Ordish, is the only one likely to possess the requisite degree of rigidity and lateral stiffness for locomotive purposes; but we should be unwilling to vouch even for it, in the absence of a definite practical trial. For bridges of very long span, exceeding five or six hundred feet, it is manifest that the horizontal type of girder, whether the principle of construction be that of the box, plate, tubular, warren, or lattice, must be rejected. Taking the minimum ratio of depth to span, which, at the same time, may be remarked is *primâ facie* contrary to economy, the former dimension would still be so excessive as to involve an enormous loss of material in stiffening the web, and also in imparting lateral rigidity to the entire structure. The mere bracing or stiffening of one girder is of comparatively little use. To ensure perfection, the whole bridge must be so tied together as to act like one mass, and diminish as much as possible all occurrence of local strain. The remaining type to be alluded to is the bow and string, which is well suited for long spans, and may be constructed with greater economy than the straight girder. It loses this merit, however, in bridges of small span, since the advantages it possesses in other respects do not then compensate for the increased cost of workmanship. We are inclined to regard the Rupert type of bridge, and which is not mentioned in the little volume quoted, as a better form for very long spans than any other similarly untried system. There is not the slightest doubt but that some day or other the Dardanelles must be spanned by a bridge, and it is equally certain that none of the ordinary types of bridges would answer the purpose, particularly when it is kept in view that engineers have not now that almost unlimited command of capital which confiding directors once entrusted them with.

* See "Long Span Railway Bridges, comprising Investigations of the Comparative Theoretical and Practical Advantages of the Various Adopted or Proposed Type Systems of Construction, with numerous Formulæ and Tables." By B. BAKER. Reprinted from "Engineering." London: E. and F. N. Spon, 48, Charing-cross. 1867.

ARCHITECTURAL COLOURING IN FRANCE AND ENGLAND.

IN the "Ecclesiologist" for the present month, Mr. Gambier Parry contributes some "Notes and Inferences from Recent Architectural Colouring in French Churches." Now that the subject of art education is engaging so much attention among us, Mr. Parry's remarks have a more than special interest.

The modern revival of mediæval art in France (says Mr. Parry) has been effected very materially under Government auspices. The vast works of cathedral restoration, extending over the whole country at the same time, began less from individual enthusiasm for Gothic art or revived Church feeling, as with us, than from the political necessity of creating great works everywhere in the principal centres of population, to keep the strong and intelligent class of labourers quiet by work. The Government has also aided the movement by assistance in the publication of great literary works on mediæval art—such as the "Monographie de Bourges," &c. There have been noble exceptions to such a course, as, for instance, the restoration of the Abbaye des Hommes at Caen,

which is being effected by the individual care and means of the good curé. In England all has depended on private enthusiasm. Our works have been smaller, but vastly more numerous, and generally of a higher quality of art. In works of original design there can be no comparison. There is a romance about the feeling for Gothic art in England among all classes, which finds but little place in France. The French architects have produced few original works in mediæval styles much above mediocrity: they find but a modified public sympathy. I have just returned from a ramble among the cathedral towns of North France, from Coutances in the west to Rheims in the east. The feeling for colouring the interiors of Gothic buildings began about the same time in France and England. There is no matter of expense in the completion of a Gothic building equal to the cost of its colouring—supposing, at least, that such work be properly done, viz., in the purest design and the best materials. In France they have escaped much of the failure too common in England, from our works having been in many cases the product of individual impulse—without study—presuming on the sufficiency of general education and taste, where indeed nothing but long observation and steady work can at all insure success.

The French work of colour decoration, which surpasses anything we have done, is that of the Sainte Chapelle at Paris. The work of greatest perfection in England is perhaps that at the chapter-house at Salisbury, the work of Mr. O. Hudson, perfect so far as it has been carried. The principal works of colouring in French cathedrals and churches is found in their eastern chapels. At Coutances (to begin from my western point) the lady chapel has been elaborately coloured. There is a feminine delicacy of general effect about it which savours of a reference to its consecration to the honour of the Blessed Virgin. For instance, the roof is painted, with its spandrils picked out with delicate pink patterns of scrollage and crosslets, on a warm cream-coloured ground; and other parts of the building treated more as a decorator would treat a boudoir, than as an artist would paint architecture. The designs of ornament have been made and executed with the utmost care. The feeling throughout is rather for delicacy and prettiness than for genuine mediæval art. There are some interesting remains of late thirteenth century painting in the chapels of the south side. They appear to have been much overpainted with an encaustic material. The subjects are the Annunciation, the Virgin and Child, with adoring saints, &c.

At Amiens Cathedral the chapel of Notre Dame at the east end has been entirely painted under the direction of M. Viollet le Duc. Much of it is very good. The drapery design around the basement is very happily executed, the drawing being delicate and the work bold. Much the same may be said of the groined roof, where richly painted ribs and bosses are relieved on a light-coloured ground powdered with red stars. The one subject of regret in this very complete work is that the two large spaces of wall, on a level with the windows, are covered with a design imitating geometrical grisaille glass, with its leads, and bars, and diapered quarries. It cannot be defended by comparison with the markings of stones universally found in old painted roofs coloured in the simplest way. Those stone markings rather represent the idea of construction than of decoration. They carry the eye along the direction of force, and serve to connect together the groups of the groining spandrils. They are almost universally mere red lines on a white ground, occasionally spotted with a central pattern. There is nothing realistic or imitative about them; whereas the treatment I regret in that chapel at Amiens is in fact the painting of sham windows. I venture to suggest that a quiet diaper of grey blue or sage green, in contrast to the red drapery below, would have been preferable. If there were traces of "sham window painting" of mediæval work, it was all very well to restore them; I only criticize the principle involved. The altar-shrine is almost too crudely painted all over. The charming little figures are treated precisely as they are found on old triptychs, viz., with gold relief and patches of strong colours, with excellent effect.

At Rouen there are some attempts at colouring in some churches, but not worthy of remark. The notable work there is at the church of Notre Dame de Bon Secours. The whole interior is a blaze of gorgeous colour and gold. There is no rest for the eye. The building with which it might be best compared is that of the Sainte Chapelle, at Paris. They are both coloured profusely, but there is great difference in the result. At the latter no side walls exist but in the material of the richest mosaic glass. The shafts between those wall-windows are elaborated on the evident principle of support to the richness of the glass. The coloured designs on those shafts and niches are perfectly architectural, and purport to be merely reproductions. The entire freshness of the gold and colours produces an effect unavoidable in new work—but the unity of the result is perfect; and whether it be in figure drawing in the mural paintings, or in the ornaments of the stonework, windows, or roof, all throughout is good and thoroughly mediæval. The gorgeous colouring of the architecture has a perfect relief in the jewelry and sparkle of the windows. In the church of Bon Secours, on the contrary, we have no such perfect unity nor such relief. It may be hard to say a word in dispraise of a work executed with such infinity of care as that of the Bon Secours, but, in fact, neither in the architecture nor in the painting is there the spirit or the boldness of genuine Gothic work. The figures of angels on the spandrils of the nave arches are modern in every sense, and without the smallest reference to an architectural type of art. The whole church is as a dose of overmuch sack, where one looks in vain for some bread to relieve the taste.

The Sainte Chapelle, at Paris, is a mine of genuine mediæval ornament. Its charm consists of an infinitely varied interest with unbroken unity of general effect. It may stagger a modern whose eyes are unaccustomed to such work. But for consistency in art and for its own durability's sake, it must have been done so, if at all. It will tone down to great beauty in time. Had it been done for the flinching sense of modern eyes, it would only have toned down hereafter into mud. There is much of figure painting and ornamental colour in other churches in Paris. One of the most remarkable is the great modern Palladian church of St. Vincent de Paul, completed under the direction of the late M. Hittorf. No man had more elaborately studied the subject of colour in architecture than he had—but exclusively on the classical side of it.

It would be hard to estimate too highly the late M. Flandrin's services to Christian art. He was one of the few French painters who have attained to the genuine expression of religion. In the church of St. Vincent de Paul, the processional groups of saints and martyrs painted by him on either side of the nave are very dignified and beautiful. The painting is very broad and simple. The composition is thoroughly suited to its architectural position on the frieze. M. Flandrin's predecessor, M. Picot, had in the same church (above and behind the altar), executed much work on the same ideal. It is fine, but it does not attain to an equal refinement of religious sense and expression. The late M. Delaroche had great power of religious sentiment in painting; M. Ary Scheffer also—but their works are not found on church walls. Other important works by M. Flandrin are on the walls of the church of St Germain des Pres. His subjects there are treated with backgrounds, put in with as little relief as possible. There are few things so difficult in art as the treatment of landscape backgrounds in architectural paintings, with just sufficient relief to satisfy the eye as to what they are meant for, and at the same time so conventionally that the sense of mass and solidity of the wall on which they are painted may be still retained. In those over the nave arches of S. Germain des Prés, the painter was evidently feeling his way to this result. They are not quite what they might be. He has given as little atmospheric perspective as he dared—for instance, there is no gradation of the blue of the skies. He has given each subject a framework of red border by way of excusing its semi-pictorial treatment. Those large subjects on the walls at the entrance of the choir are very fine and full of religious feeling. The decorative colouring in the choir is to be regretted as sham mosaic. Most of the capitals are remarkable and well coloured. The piers which carry the nave arches, and on which the whole weight of walls and roofs rests, are painted in such a way as altogether to destroy the idea of their power. It is that which makes their present appearance so unsatisfactory.

At St. Denis the eastern chapels of the abbey choir are painted with a rich diaper of colours, in very strong contrast to the cold effect in the scraped and renovated surface of the rest of the interior. The style of ornament is that of the style contemporaneous with the building. St. Denis was once the centre of a great school of artists collected here, and trained to the service of religion in the days of Abbot Suger, A.D. 1144. The earliest culture of European art was fostered here by him—but now we look around in vain to find a trace of it. Those who know the romance of its vicissitudes will not be surprised. Every stone of the interior is white with newness—and glass and colour, mosaic and metal work, the hoary tints of age, its heraldic pavement, its altars, its sculpture, are gone. We stand, as it were, in a new church, the site and very atmosphere of which are consecrated by the most ancient and sacred memories. Its new era has commenced with a due reverence to its old estate. The glass in the apsidal chapels by Messrs. H. and A. Gerente, and the colouring under the hand of M. Viollet le Duc does all in its honour that the modern state of those arts in France will allow.

The impression left by these and other examples with which I have not thought it necessary to trouble you, is that in this art we have not much to learn from France. An art in which the French have altogether surpassed us in the coloured ornaments of objects used for church purposes is that of enamel. Their ecclesiastical furniture is rarely well designed, but its enamelled ornament is admirable. Their silver *repousse* work for altar fronts is another art not yet adopted in England. Their designs for these are mostly taken from old examples, and are good and effective. The *champleve* enamel on these and on reliquaries, ostensoirs, &c., is in the style of the early Limoges work. The old colours are very well reproduced, except sometimes in the crudeness of the blues, which is the fault of modern chemistry, and easily remedied.

ARBITRATION AND CONCILIATION.

IT will always remain an interesting fact in the history of labour, that the first place in England to establish a "Board of Arbitration and Conciliation, to endeavour to obtain the settlement of trade disputes," was Nottingham. Nottingham formerly was, perhaps, of all towns in the country, the most ungovernable and degraded. Her artizans "inherited a legacy of traditional hatred of employers from their fathers and grandfathers," and their political disaffection, as well as their trade disputes, were of the bitterest kind, and led to the most serious consequences, as everybody knows. The condition of the place advanced with the times, but, like their neighbours, the workmen of Nottingham contrived to indulge in the questionable privilege of strikes, and certain classes of them, as we know, continue to do so still. There is, however, one notable exception, and that is the hosiery trade. The last great strike that took place in this industry in Nottingham was in 1860, and the masters and men both suffered so severely from it that a number of them determined to organize some means that would adjust the differences between them, without having recourse to the "barbarous expedients of strikes and lock-outs." The strike was settled by mutual concession, "upon the express condition that a board of arbitration should be formed to prevent such calamitous disputes in future." An association was accordingly formed, and it has been attended with the most beneficial results both to employers and employed. It is constituted of eighteen members—namely, nine masters and nine workmen, the latter being chosen by the members of the trades' unions, and the former by the masters. With mutual courtesy, the workmen elected a manufacturer as president of the board, and the masters a workman as vice-president. This is the whole machinery of this novel association, the great object of which is the adjustment of all questions relating to wages in a friendly and amicable spirit. And so well has the Nottingham pioneers succeeded in their object that their example has been followed by the hosiery trade throughout the whole county, and in Derbyshire and Leicestershire as well. Mr. Mandella, the well-known Nottingham manufacturer, is the president of the board. That gentleman recently gave an account of the action of his association to the working men of Sheffield, and in inquiring how far that action had benefited employers and workmen, Mr. Mandella said:—Strikes rarely occur in times of depression. It is when trade is good and the manufactured article is in brisk demand that disputes

respecting wages result in strikes, so that the employer loses money at the most favourable time for making it, the workman loses his earnings at the time when he should be gaining a surplus, and the customer is driven elsewhere for his goods, perhaps never to return. All this, you see, is avoided under our system. Another excellent feature of arbitration is the certainty which every manufacturer feels that the rate of wages throughout the trade is uniform for the same description of work; the employer who had the least conscience formerly had his work done at the lowest price, but now, when the workman is unable to protect himself in times of depression, the manufacturers on the board step in to his assistance to prevent the undue depreciation of his wages. I think it desirable that I should call particular attention to another fact consequent upon the introduction of this system. I believe that whilst the trades' unions are stronger than before in numbers and unanimity of purpose, there are no longer any salaried officers connected with them; the chairman and members of committees perform their duties gratis, and the secretaries work at their trade, only being paid for lost time. There is another point to which I would draw attention—its advantageous results to the workman. Formerly, workmen suffered fearful privations during strikes; these are at an end. When at work, they had to contribute largely to their trades' unions to obtain the funds necessary for striking; these large contributions are also at an end. One shilling a-year from each member is now found to be sufficient to defray all the ordinary expenses of the trades' unions. Taking these two advantages together, here, of itself, is a large advance of wages, without one farthing of it coming out of the pocket of the employers. But there is something more. The hatchet of war has been buried, and, if it were dug up again to-morrow, it would be found to be rusted and blunt, and the arms that formerly wielded it would be unaccustomed and unwilling to do so again. We have learnt, by meeting together on common ground, to respect and to understand each other; the workman is better acquainted with the difficulties of the master; the master with the wants and the struggles of the workman, and mutual forbearance and mutual respect have grown from constant and courteous intercourse. I have found, among the representatives of the workmen, leaders of trades' unions, men who once were the dread and horror of the manufacturers, who have displayed as much wisdom, tact, moderation, and self-denial as the best among us of the manufacturers can show. Surely, it is no small result that this organization has, within a period of seven years, done so much to eradicate the accumulated hatred of nearly two centuries; and what, may I ask, have we done in Nottingham that cannot be reproduced in any of our centres of manufacturing industry?"

On Wednesday next, Mr. Mandella will deliver his lecture in St. James's Hall, and he will ask the trade unionists of London the same question that he put at Sheffield. We urge upon all who can to attend. Mr. Mandella and his friends believe that they have succeeded in solving one of the most important questions of the age, on the successful solution of which the social happiness and commercial prosperity of England in the future greatly depend. If that be so, they surely deserve the support and sympathy of all right-thinking men, and the thanks of the whole country.

METROPOLITAN BOARD OF WORKS.

THE annual report of the proceedings of the Metropolitan Board of Works was issued on Saturday last, and records the progress of a large amount of work. About 82 miles of sewers, in addition to the pumping stations, have been constructed, receiving the drainage of an area of 117 square miles having a population of about 3,000,000. The new low-level sewer and its branches are all that remain to be constructed to complete the main intercepting scheme. The high-level sewer from Hampstead to Old Ford, Bow, about seven miles in length, at a cost of £196,804; the middle-level sewer from Kensal-green to Bow, about nine and a-half miles in length, at a cost of £349,869 2s. 11d. The western drainage, comprising Fulham, Chelsea, Brompton, Kensington, Hammersmith, and Acton; these were constructed at a cost of £93,207 11s. 10d.; the outfall sewer at a cost of £649,760; and the outfall reservoir at a cost of about £172,800.

On the south side of the Thames the high-level main sewer, about nine and three-quarter miles in length, at a cost of £234,673. The low-level sewer at a cost of £234,000. The Bermondsey branch of the low-level sewer, about two and three-quarter miles in length, at a cost of £97,515 3s. 2d. The Deptford pumping station at a cost of £137,455 17s. 5d. The outfall sewer, at a cost of £310,648. The Crossness pumping station reservoir has been constructed at a cost of £325,000, and the engines and machinery at a cost of £50,000, and gas-works for the purpose of lighting the station with gas, have been constructed at a cost of £3,000. The Greenwich branch line of sewer has been constructed at a cost of about £23,800.

The experiments upon 210 acres of sand and poor land for utilizing the sewage made by the company to whom the concession was granted, have proved highly satisfactory. The principal crop has been Italian rye grass. The wheat crop was specially benefited by the sewage. Potatoes and other vegetables were tried with promising results.

The first portion of the northern embankment works from Westminster Bridge to Waterloo Bridge, taken by Mr. George Furness, are rapidly progressing, and the value of work done and plant on the ground at the date of the report amounted to £378,634. The second portion, from Waterloo Bridge to the Temple Gardens, was taken by Mr. Ritson, and the work done and plant on the ground amounted to £213,247. The third portion, from the Temple Gardens to Blackfriars Bridge, has not been let, in consequence of impediments thrown in the way by the City Gas-works and the Metropolitan District Railway Company. The claims for property required for the northern embankment amounted to £327,107 11s., whilst the settlements only reached £221,309 10s.

The embankment on the south side of the Thames is proposed to extend from Westminster Bridge to near Vauxhall Bridge, the works consisting principally of a granite-faced river wall about 4,300ft. in length, the formation of landing-stairs near Westminster Bridge, and of a roadway and footways along the embankment, with subway approaches to the various dock and other properties severed by the works, and the construction of a short length of sewer for the drainage of part of the road. The contract for the works is let to Mr. Webster for £309,000. The claims up to March 31 were £323,619 11s. 6d., whilst the settlements amounted to £195,969 7s.

From the termination of the northern embankment at Blackfriars Bridge will run the new street to the Mansion House. It will be 3,450ft. long and about 70ft. wide. There will be a subway for gas and water mains underneath the roadway, similar to that beneath the embankment. The claims dealt with during the past year amounted to £1,773,053 8s., whilst the settlements were £1,456,834 7s.

Middle-row, Holborn, has been removed at an estimated cost of £61,152.

A new street is to be formed leading from Back-church-lane to Leman-street, Whitechapel, at a cost of £115,364.

Park-lane is being widened by setting back the boundary fence, at a cost of between £3,000 and £4,000.

The works at Finsbury-park are progressing rapidly, and it is expected that they will be completed about the end of the present year. The cost of this park has been for 120 acres of land, at £472 per acre, £56,650, in addition to £219 for compensation to tenants.

Sixty-two acres of land were purchased in the parish of Rotherhithe for the formation of South-wark-park, at a cost of £911 per acre. Its cost up to the present time amounts to £55,160.

The fire-brigade stations in the metropolis amount to 41. There are 2 floating engines, 21 land steam engines, 61 hand power engines, and 227 men employed. The amount raised for its maintenance is £53,081 8s. 5d.

The report adverts at some length to the exertions of the Board in Parliament to obtain for the public a cheap and pure supply of gas, but regrets that up to the present time they have proved unsuccessful. It calls attention to the improved condition of the Thames, the formation of new broad thoroughfares, the embankment of the river, and the formation of parks for the people and mentions that means are urgently required for making other improvements which are greatly needed, and suggests that it should be raised by a tax levied on the owners of property.

CREOSOTED TIMBER.

SOME valuable experiments have been lately made in the qualities of creosoted wood by M. Forestier, Chief Engineer of the French Ponts et Chaussées, the particulars of which we extract from his report for the Paris Exposition. M. Forestier states that M. Crepin, Belgian Engineer of Ponts et Chaussées, has proved at Ostend that firewood, after immersion for a certain time, possesses a coherence of fibres, an elasticity and a hardness greatly superior to that which is possessed before immersion. M. Forestier has made a series of experiments upon different specimens of timber immediately upon their being taken out of the creosoting cylinder to ascertain their resistance to bending and breaking compared with that possessed by them in their natural state. The result was that the flexibility and resistance of the wood to crushing weights was greatly increased, and M. Forestier asserts that the wood was also completely proof against the *Teredo navalis*, or marine worm. To ascertain the resistance to bending he loaded, in the middle of their length, pieces of oak, elm, beech, plane, red and white Baltic fir, marine pine, Italian poplar, and white Dutch poplar, to the number of twenty-one, all 2½ metres (say 8ft. 3in.) long, between the points on which they were supported, and being five centimetres square (say 2in. by 2in. square). After increasing the weights to the point of rupture for several specimens of each kind of timber, we verified the flexion of the twenty-one pieces experimented on under the increasing loads after they had been creosoted, and we ascertained that their flexibility had sensibly increased.

The experiments as to breaking were made upon sixty-three blocks of uncreosoted wood and as many of creosoted wood, and the following table shows that creosoting wood augments its resistance to a crushing weight:—

Species of Timber.	Blocks.	Creosote absorbed per cubic foot.	Weight required to crush the uncreosoted blocks.	Ditto for the creosoted.	In favour of the creosoted.	Against.
		lb.	lb.	lb	lb.	
French oak	8	7¼	874	936	62	
Elm.....	12	17 13-16	856	865	9	
Ash	4	16 4-16	867	955	88	
Red Swedish fir ...	8	17	669	693	24	
Ditto Norway	12	20	922	953	31	
Ditto Dantzic	2	23 3-16	618	647	29	
White Norway fir ..	4	12 13-16	865	883	18	
Plane	4	25	786	794	8	
Carolina poplar ...	9	34 2-16	597	570	...	

But out of the five couples of blocks of Carolina poplar tried, the crushing weight was equal in three couples.

HALF-TIME SYSTEM.

THE half-time school system, now in course of extension in the manufacturing districts of England, is beginning to attract attention in France. An association has recently been formed there under the presidency of M. Dumas, of the Institute for the Amelioration of the Condition of Apprentices and Young Children Engaged in Manufactures. Upwards of 2,000 persons have already joined the Association as subscribing members. At the recent solemn *seance*, presided over by the Empress in the Palais d'Industrie, a report was read from the officers of the Association—which her Majesty has taken under her especial patronage—urging for the adoption of the half-time system, the principle of the compulsory attendance of children three hours a-day, as a security against over bodily work, as well as against exclusion from education, and proclaiming the award of a medal to Mr. Edwin Chadwick as the originator and promoter of the system in England.

SEWAGE IN THE THAMES.

A PARLIAMENTARY paper has been published containing some correspondence on the above subject between the conservators of the Thames and the Board of Works. Large shoals of mud are stated to be forming near Barking Creek and Crossness, in the neighbourhood of the main drainage outfall. The character of the mud shows clearly enough whence it comes. Dr. Letheby, who analyzed a sample of it in the summer, found it fœtid, and in a state of active putrefactive decomposition. He describes it as consisting of broken-up sewage matter, with the

remains of myriads of animalcules, and a large quantity of carbonate of lime in a partly crystalline state, together with the usual ferruginous clay of the lower water of the Thames. He found the very large proportion of 14·49 to 15·5 per cent. of organic matter in the well-dried mud; and he states that "by undergoing putrefactive decomposition this mud, which is accumulating in such large quantities at the sewer outfalls, may be a cause for serious alarm, especially as it there meets with sea water, the sulphates of which may, by their chemical decomposition by the putrefying mud, occasion the escape of much sulphuretted hydrogen, and set up that remarkably offensive change which is characteristic of the action of sewage upon sea water." The greatest accumulation is near the northern outfall, about 2,000ft. above the point of delivery, showing that the discharge is not managed so as to carry all the sewage down the stream. The survey made in June showed near the northern outfall a space of more than 40 acres, and near the southern outfall about 120 acres of the bed of the river, covered by a deposit varying in depth down to 7ft.; the deposit has been traced for above a mile, and might be followed further down the river, though in decreasing amount. The conservators have been in correspondence with the Metropolitan Board of Works, whose surveyor does not admit that the accumulations are due to their works. But the Board did not much urge this point, being able to give, in their letter of November 11, a reply which in substance amounts to this—that Acts of Parliament require them to cast all this solid sewage into the lower part of the river, and other Acts of Parliament make it the duty of the conservators to take it out again if it is too much for Father Thames.

CEMENT AND GRAVEL.

MR. W. MAY, jun., Northfleet, draws our attention to a house, which, he informs us, he has erected for a gentleman in that neighbourhood, and which has been built of cement and gravel, or, in other words, of concrete. Our correspondent's concrete, and his method of construction, however, differ somewhat from the ordinary system of concrete construction. We have not seen the building ourselves, but as Mr. May wishes to describe his method, we allow him to do so in his own words. He says:—

I made my blocks 1ft. square 3½in. thick, making the walls hollow. I have one block for inside wall and one block for outside wall, with a 5in. air chase between the two walls, making the walls as 1ft. thick. I laid the blocks as header and stretcher, well bonded across from wall to wall in cement and sand; thus 3½in. for outside wall and 3½in. for inside wall, and the 5in. air chase between the two, made it 1ft. thick. I had to use a few bricks for the fireplaces, jambs, &c., because cement and gravel won't agree with heat; and I have at the ground line of house two large air gratings at front of house, and two gratings at back of house, one at each corner, to admit air into chase between the walls, and this chase is all round the house. The rafter and ceiling joist plates lie on the outside 3½in. block or wall at top, and the air between the walls plays from the bottom of the house up through into the roof. The windows and door frames are built in between the walls, and the air in the chase can play all round the frames. For arches over windows and doors I cast a piece on purpose to fit the opening in one piece, being similar to a stone arch, 1ft. deep, 3½in. thick, fitting them into the shoracks. I simply laid down pieces of quartering on the ground to cast the whole. I had two labourers to make the blocks, and they made nearly 400 in one day. They had to draw water from a well 50ft. deep, shift their quartering, and make their stuff; and they told me they could make the blocks for 2s. 6d. per hundred. Instead of plastering over the blocks, as I have done, they might be made similar to a lump or any size by facing them with the hand float, then build them, showing correct bond as stone or brickwork, and it would then show what it really was, instead of plastering over to hide it. The cost for the whole of the labour, including materials, could be done for between £5 and £6 per rod for ordinary work.

PALAIS DE JUSTICE, BRUGES.

THE history of a country is nowhere more plainly written in its architecture than it is in the buildings of Belgium. Bruges, the city of bridges, is full of such memorials. The hand of the Spaniard was at one time heavy upon these "low countries," and he has left many works to remind us of his presence, as, for instance, in this Palais de Justice, with its grotesque minaret pinnacles; the still more singular turret of the neighbouring chapel of the Holy Blood; and in the grand "Halle" tower, which dominates over every other feature of the view for miles and miles of this rich flat country—this "kitchen-garden of Europe." Bruges has not been quite improved off the face of the earth; but the people are rich and enterprizing, and it behoves all who have a love for the picturesque and beautiful to study and sketch its old buildings without ceasing while the examples still remain. Every one interested in art and archæology ought to visit this quaint old town.

The lithograph, although a fair copy of my sketch, has missed something of the elegance of the pinnacles. The copying, too, ought to be thinner, and not drawn with a straight line, as it gives the building too new an effect.

FREDK. ROGERS.

BITUMEN AS PAVING.

BITUMEN was much in use for building purposes among the Assyrians and Egyptians, as the ruins of Babylon and Memphis show. It was not adopted by the Romans, and has only now returned into fashion after a lapse of 5,000 years. In Paris more especially, the system of replacing stone paving, as well as road metal, by compressed bitumen is becoming the favourite one. It was first tried, as we learn from "Galignani," in 1854, in the Rue Bagere, in order to deaden the noise of carriages in the immediate neighbourhood of the Conservatoire de Musique. Since then, it has come into frequent use, and is now being laid down in the Avenue Victoria and around the square of the Place du Chatelet. It was feared that the smoothness of this bitumen coating would cause horses to slip down more easily than on paved or metalled carriage-roads; but it has at length been proved by direct observation that accidents of the kind are not more frequent on the former than on the latter. The bitumen or asphaltum at present in use for flagging and for compression is a pure carbonate of lime, naturally impregnated with from 7 to 10 per cent., and even more, of liquid bitumen. This rock is regularly quarried at Val de Travers, Neufchâtel, at Seyssel in the Ain, and at various other places of the Jura region. At a temperature of 100 deg. centigr. this rock has the property of crumbling to dust; and, if in that state it be spread over a surface, and well rammed down on it, the particles on cooling will coalesce again, and return to the state in which they were in their native quarry. This method is found to be superior to the old one of flagging by spreading out the matter in a semi-liquid state. We hear that the Commissioners of Sewers in the metropolis are about to try the system of cementing the paving stones with asphalte in place of the ordinary mortar, a system which is in use in Manchester, where it is said to answer well. The asphalte prevents the mud rising up from the lower bed between the flags, and thus keeps the pavement in a cleaner condition than is possible by the ordinary method.

COMPETITIONS AND THEIR RESULTS.

IN his "Memoir of the late Mr. Charles Fowler," read before the Institute of Architects, and alluded to by us last week, Professor Donaldson made the following pertinent remarks, generally, on the subject of competitions and their results. The recent decision in connection with the New Law Courts, as well as similar decisions, give rise, in Professor Donaldson's opinion, to very grave considerations on the subject. He trusts that these recent results will "induce the profession as a body to take up the matter dispassionately and judicially, and to decide authoritatively the following leading principles, among others:—

"1. Whether, be it in an open or limited competition, when a *bona fide* honest decision has been arrived at by the body appointed to make the selection, it is competent for one or more of the competitors or others to endeavour to overthrow the decision, or assist those who seek to do so.

"2. Whether any member or members of the profession are justified in attempting to disparage the design or professional character of the successful candidate, in order to deprive him of the fruits of his fair success.

"3. Whether the general principles of a competition be not rather to test whose design appears best, and to designate the man most capable of carrying out the intention of the promoters of the competition, rather than to turn upon servile adhesion to the regulations prescribed, or absolute perfection in the successful design.

"4. The merit may be relative rather than positive, but, should the author of the best project be employed as the architect of the work, with liberty to modify, alter, and render his conception such as to meet the original or modified views of the committee or body delegated to carry out the building?"

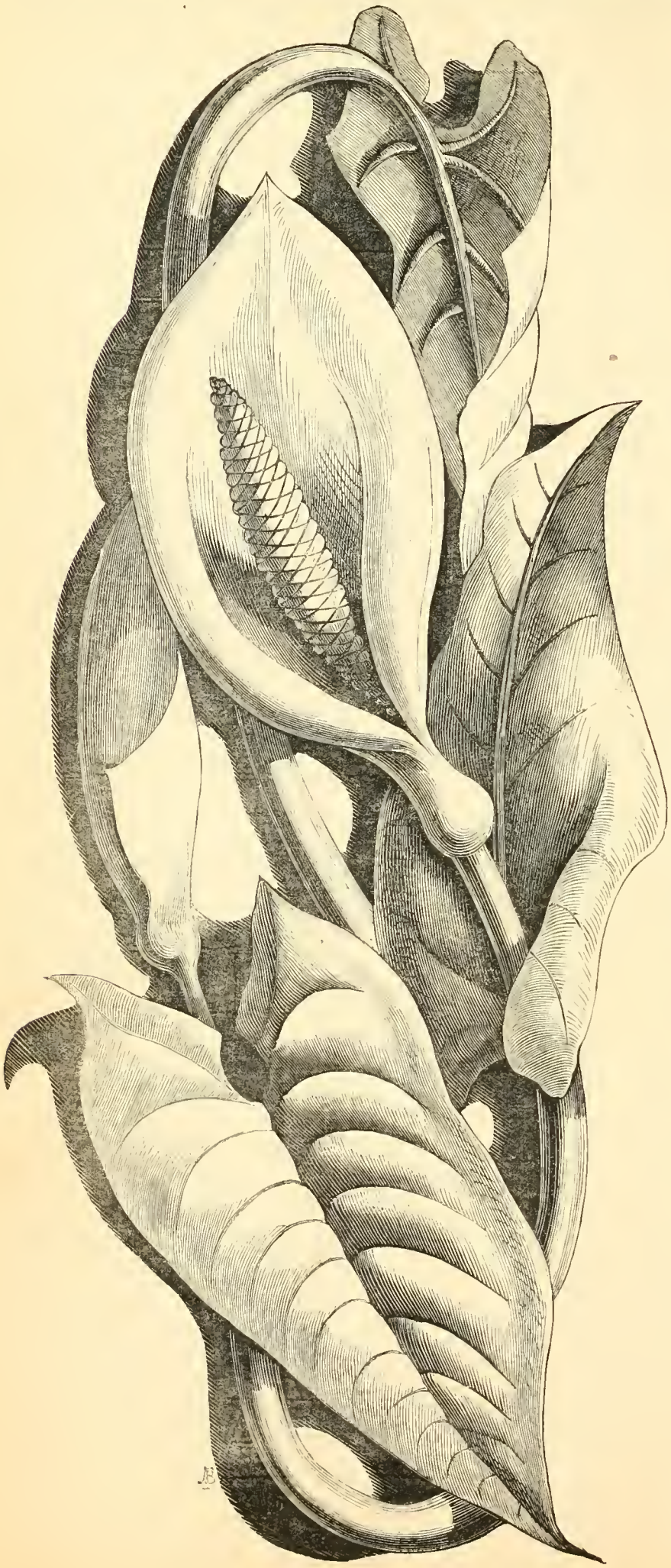
"It will be perceived," adds Professor Donaldson, "that in these propositions thus broadly enunciated, I do not enter upon the advisability of instructions more or less minute, precise and absolute, nor the extent to which they should go. My experience leads me to suspect that, ample and copious as they may be, it should be left to the discretion, and its consequences, of the designer to adhere more or less thereto. I feel convinced that such instructions are frequently ill-conceived in some particulars, and absolutely pernicious to the proposed object, and harassing to the judgment of the architect, who, if left to his own more experienced or gifted judgment, might suggest possibly happier and more useful combinations and arrangements. Thus thoughts of rare value and many fertile ideas are lost, from the reasonable fear of want of success, if departing from the strict letter of instruction. And perhaps I may carry your concurrence with me in the opinion, that a dual decision, as on a late occasion, is unjust to the competitors. It overthrows the essence of all competitions, which should be an absolute selection, and may leave the subject open to a fresh contest, when others may have the advantage of benefiting by the conceptions of the designs already submitted."

TURKISH BATH, BRIGHTON.

THESE baths are about to be erected on a plot of ground in West-street, having a frontage of 50ft. and a depth of 121ft. The designs have been prepared by Messrs. Goulty and Gibbins, architects, who have, by the desire of the promoters, followed the general arrangements and plan of the bath in Jermyn-street, London, with which establishment the Brighton bath will be connected (although financially distinct). In other respects the design is altogether different to that in Jermyn-street, although the Turkish or Moorish style of architecture is adhered to. In one particular the arrangements differ from the one in Jermyn-street. It is proposed to have a double tier of alcoves, with a balcony running round the cool room, instead of confining the whole to the ground floor. This gives a greater height to the room, and adds to its beauty. There are separate entrances for ladies and gentlemen, with waiting rooms, cloak rooms, &c. There are also private baths for those who desire them, and separate baths for special medical cases. The cool room is 45ft. by 43ft. The hot room, covered with a brick dome, contains 28,000 cubic feet, and will be heated to 130 deg. The hot chamber, leading from this room, contains 4,000 cubic feet, and will be heated to 180 deg. The hotter chamber, also communicating with the hot room, contains 4,000 cubic feet, and will be heated to 200 deg. The elevation in West-street is in the Moorish style, and will be built with white, red, and black bricks.

A GREAT DEFECT OF MODERN DWELLINGS.

THE "Popular Science Review" contains some seasonable remarks on the subject of ventilation of rooms, from the pen of Dr. Lawson. Let us consider, says the writer, the condition of one of our sitting rooms in winter. The fire burns brightly, and as a consequence several thousand cubic feet of air are hourly drawn up the chimney. Whence comes the air to supply this loss, asks Dr. Lawson. The clinks in the door and windows are constantly admitting a stream of cold air, and this ventilation is effected at the expense of draughts, which produce chilled feet, catarrhs, and so forth. This is the condition of the room when the gas is not lit. But the moment the chandelier comes into operation (supposing it to contain five ordinary fish-tail burners) the state of things is changed, and in the course of half an hour or so this change becomes distressingly perceptible. Why? Because twenty-five additional pairs of lungs have begun to use up the air, each burner in use being equivalent to about five persons. Dr. Lawson is right in considering this the great defect of our modern dwellings. He supplies the remedy by converting the gas into a fire, providing it with a chimney to convey out the products of combustion, and compelling it thus to ventilate the room as thoroughly as the fire does. Dr. Lawson recommends for this purpose the use of "the Ventilating Globe Light," which he says is the most satisfactory of the methods suggested.



ARUM. FROM "WOOD CARVING," BY A. F. B.

WOOD CARVING.*

IN commencing the study of any new art or accomplishment, it is often of advantage to have before us the experience of more than one master, and although we noticed some weeks since a work published with a similar intention as the above by a professional carver, we nevertheless welcome this volume, which is evidently from the pen and pencil of a clever amateur. The designs given are somewhat unequal in excellence, and from amongst much good advice, which is given in the instructive letterpress, we feel it our duty to point out where we believe the author is in error. We do not, for instance, agree with the use of glass paper for the groundwork of carving before all the carving is entirely finished, as the edge of the tools would be injured when they came in contact with the fine glass which always remains. Nor do we like the recommendation to use gloves; there is a sensitiveness in the fingers which is always needed in all delicate work, whatever its nature, which would be lost by their use. An evident typographical error occurs on page 10, which may mislead the inexperienced. "Pretty little screws" should read "pretty little saws."

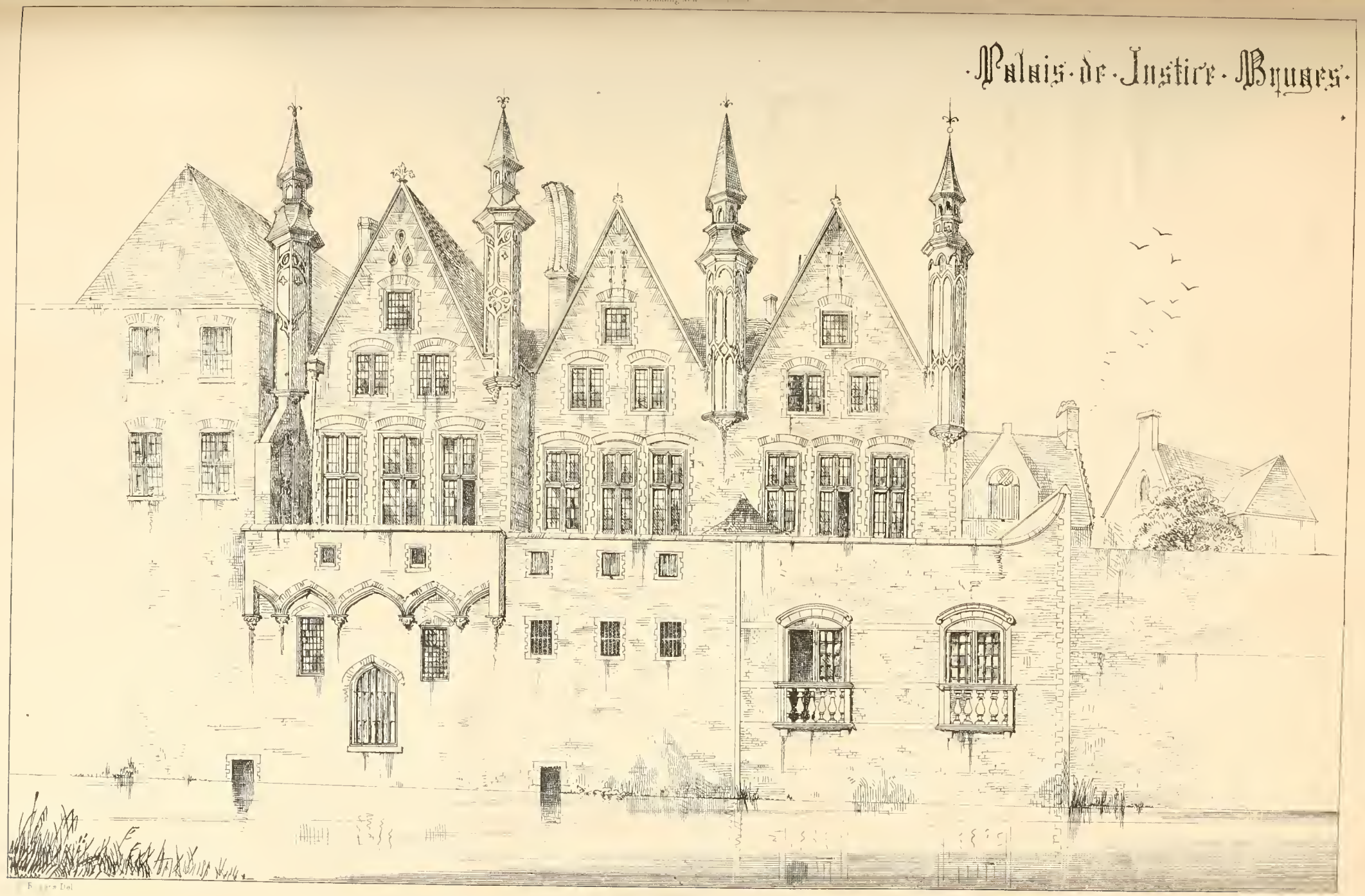
More explanation is, we think, here and there required to make the work of that utility which the author certainly wished. For instance, no mention is made as to carving the mouldings under the fern and the wheat in the miniature frames on Plate IV. (which we do not fancy the easiest part of the work), or of the thickness of wood required for the elaborate bracket on Plate VIII., or the shape of its shelf which its shading does not indicate.

Many of the plates are very commendable, more especially those of Plate I., which capitally illustrate the general process of all carving. Plate VI. is a very pretty geometrical design, and one, we should think, will prove of great use to amateurs. The blackberry branch on Plate XIX. is also very good, and would be a nice (though rather difficult) study. That on Plate XII., elegant as it is, seems to us more fitted for painting than for carving. There are many other examples of merit, but we cannot reconcile that portion of the preface which states that all the drawings were carefully studied from nature, with the grapes on Plate X., many of which are growing upwards, and less with the strawberry leaves on Plate XVIII., which are utterly unlike what they are supposed to represent. After we have condemned the ugly conventional patterns on Plates VII. and XVII., the disagreeable part of our duty is over, and we may recommend the work to our readers (with the exceptions we have given) as one which will prove of some service to those who do carve, and is calculated to induce those who have not yet commenced to try their hand at an art which the author well describes "as always increasing in interest and intellectual capability, as it learns to express individual ideas; still more, that it may provide to some fresh material for admiration and love of Nature, our great Model, and Art, so far as it conscientiously fulfils its work of bringing Nature nearer to us in our every day life."

The plant Arum, as here illustrated, forms the frontispiece to the book, and has been lent to us by the publishers.

Another new metropolitan street is spoken of from the New Kent-road, across the Dover-road, Kent-street, through St. George's New-town into Tooley-street. This, says a local journal, will break up a colony of the most desperate thieves and other birds of prey at a cost of nearly £20,000, to be borne by the parishes of St. George-the-Martyr, St. Mary Bermondsey, and St. Mary, Newington.

* "Wood Carving," original designs, by A. F. B. Longmans, Green, and Co.


Palais de Justice Bruges

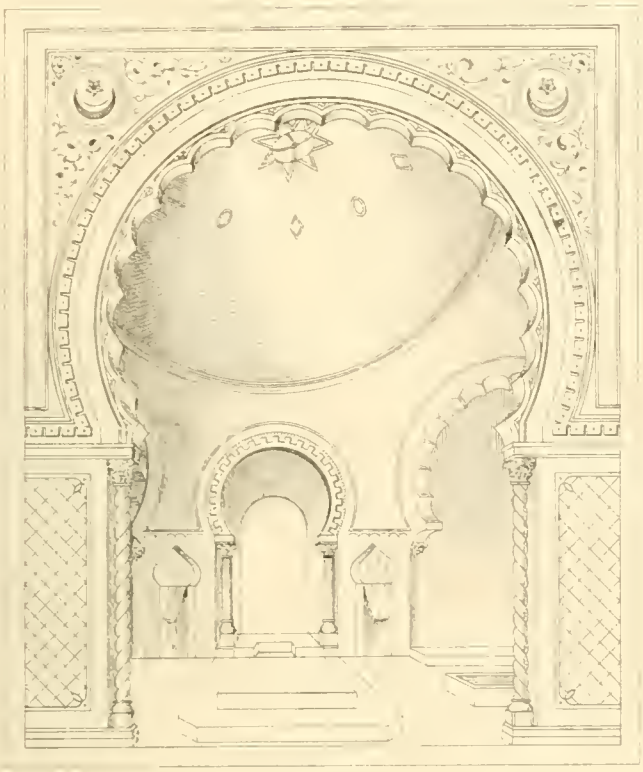
PROPOSED TURKISH BATH, BRIGHTON.

FOR THE

BRIGHTON TURKISH BATH COMPANY,

LIMITED.

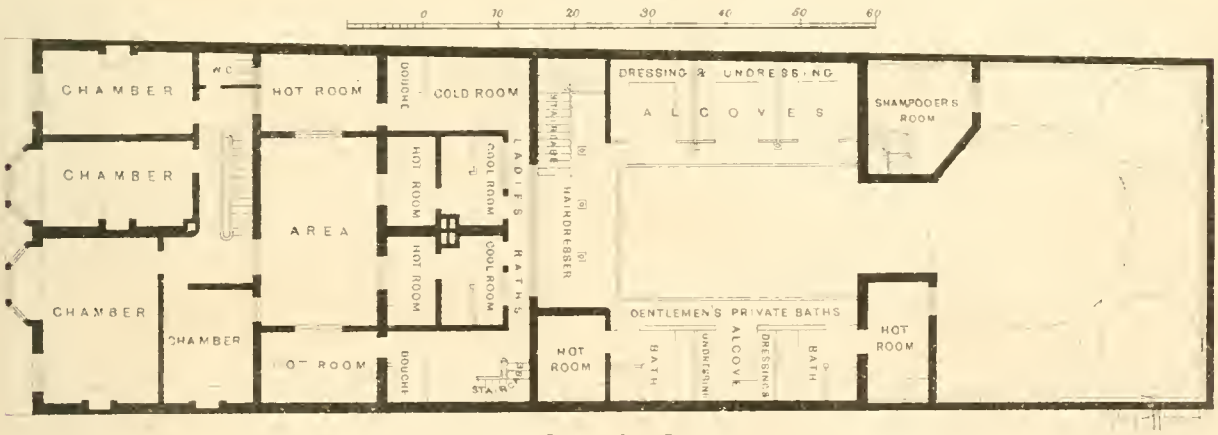
HORATIO N. COULTY, ARCHT. BRIGHTON



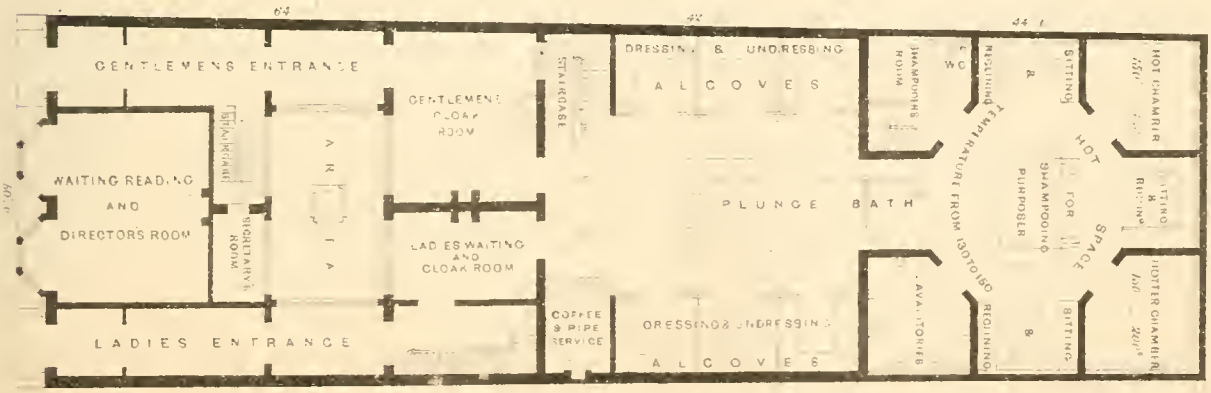
NTERIOR OF CENTRAL HOT ROOM.

INTERIOR OF COOL ROOM.

Scale of Feet.



ONE PAIR PLAN



GROUND PLAN.

The Art Student.

ART EDUCATION.

SINCE the close of the Paris Exhibition the press has absolutely teemed with laments of our inferiority in the arts of design and the remedies to be applied. The burden of the complaint appears to be, that whereas in 1862 we had made immense progress, and were becoming formidable rivals to the French; in 1867 we find ourselves very much behindhand. The question then arises, how does this happen? The answer is a very easy one—viz., the want of proper art education in all classes. Of course, allowances must be made for Englishmen between an exhibition in London and an exhibition at Paris. In the former case, we were naturally in the majority. In the latter, the difficulties of transit, and the expense of space, naturally prevented some of our best men from exhibiting at all; for large spaces in the British department were occupied by newspapers, advertisements, and South Kensington work, which could have been far more worthily employed. As is well known, the British sculptors refused to send anything at all, and it would perhaps have been as well had the architects taken the same wise resolution, considering the scandalous incapacity shown in the arrangement of the drawings and photographs, some being actually placed on the floor, others omitted from the catalogue, and the whole mixed up with brass and iron work. It is evident, therefore, in comparing the two exhibitions—viz., of 1862 and 1867, that great allowances must be made. In the one case, we were in full force, and with every advantage, whereas in the other we were a small detachment and very badly commanded.

But the real evil is much deeper. In all classes and conditions we want more art education, and until we get it we shall remain inferior to those of our neighbours who have directed their attention that way. Of all countries, the United Kingdom is the one where art education is most necessary, and where, to a certain degree, it is most difficult to attain. In other lands, with more favoured climates, works of art are to be found at every turning of the streets. In ours, on the contrary, our weather almost forbids their existence out of doors. Even our architecture suffers from this cause, for we have absolutely no material, except granite and majolica, which can stand against the smoke and acid-charged atmosphere of our great cities, so that we are condemned either to brick, which, at the end of fifty years is perfectly hideous; or to stone, which is very little better as regards preservation of colour, while it is far more liable to decay; or to cement, which requires continual repainting, and therefore in the end very nearly as expensive as stone.

As to the polished granite, its cost must evidently prohibit its general employment, and the sheen of the majolica would probably be found very unpleasant to the eye where large quantities of it were used. But this is a matter of experiment. It is just possible that some glaze may be found which may not be so dazzling as that in common use, and until the experiment of a series of houses faced with majolica has been tried, and has failed, that material must be considered as the most hopeful for us in our present situation.

We are not much better off in-doors. Here our only decorations are engravings, and what our ancestors called table pictures. As to decoration proper, the quantity of it is so small as hardly to deserve notice, and we may go into one another's rooms without finding a single object that we care to examine. Nor are our public buildings much superior; for questionable stained glass, with bad drawing and loud colours, is almost the sole decoration of our ecclesiastical edifices; and in the secular ones, for the most part, decoration is conspicuous by its absence.

This want of art education, as before observed, tells upon every trade and every profession. Thus, in architecture, for the want of it, the client is apt to demand quantity instead of quality, and the architect (who ought to have art education if anyone has it) seldom has the courage to tell his client the truth. He is afraid of getting the name of being an expensive man, and therefore trusts to the chapter of accidents to lead his client on to do what he thinks is right. Of course we all know that a building whose decoration is an afterthought can never be the same success as one where the ornament has been designed at the beginning. But sometimes it happens that the architect is nearly as deficient in art education as his client. This state of things is most apparent when he does get money at his disposal, or then he makes the most amusing use of it, as sundry of the new City buildings can testify. In fact, no conjunction can possibly be worse than a bad architect with too much money to spend.

If art education were more spread people would be less ambitious and less desirous of getting everything finished at once. Thus it is better to have one good litany desk, or one good altar with temporary stalls, to doing the whole furniture indifferently. Our modern wooden ecclesiastical furniture is continually spoilt for this cause. How often do we see thin standards and stuck-on tracery, and how seldom do we meet with any figures! In fact, the difficulty of getting figures carved in wood would hardly be believed. Up to the present day we have produced no set of stalls to in any way come up to those of Ulm or Amiens, far less to rival them, and yet we have spent immense sums on church work.

There are a great many painters who find that the exhibition system is a very uncertain means of selling their pictures and getting a living. These men have had an academy education, and can draw the figure. We make a great deal of stained glass, with very indifferent drawing. The above-mentioned artists would often be only too glad to draw for stained glass, but it is very difficult to get clients to go beyond the regulation price of £2 per square foot, whereas at least £2 10s. per foot is required if the services of a competent artist are to be obtained.

Again, look at the decoration of our theatres. How little real art is ever found! An artist, perhaps, paints the proscenium, if there is one, and all the rest of the work falls upon the decorator, whose great care is to employ as few figures as possible. Consequently, when the spectator has seen the proscenium he has generally seen all worth looking at.

This is hardly the place to descant upon the absurdities of the costumes of the theatre. Books of costume and archæology are within everybody's reach, and yet at the present moment there is a most successful piece acting at one of our largest theatres where there are not above two or three costumes of the period in which the events took place. The armour of the soldiers is about one century later and the buildings about two centuries, while the costume of the ladies belongs to no period at all. One would think that these faults would have been pointed out by the audience, say, on the first night, but, unfortunately, theatrical audiences have given up the inconvenient practice of hissing. Probably the greater portion knew no better, and thought it was all right; but surely, it will be said, the critics of the daily press were loud in condemning the faults. On the contrary, one paper talks about the "magnificence of the scenery, the splendour and rich variety of the costumes, and the dazzling character of the *mise en scène*;" and another says "nothing that the actors, painters, and musicians' arts could, in combination, effect to delight the intellect and senses of the audience was left unaccomplished." Now, here is a distinct case of want of art knowledge on the part of the manager, the costumiers (their names are on the bill), the public, and, above all, of the critics of the daily press. It was reserved for a weekly paper to make the very evident observation that when a man is executed by means of a sword a block is rather in the way.

Nor is the want of art knowledge upon the part of the press confined to theatrical matters. If we except exhibition reviews palpably done by artists, or by literary men, such as Messrs. Sala and Thornbury—who began their career in a studio—how much ignorance do we find whenever the writer has to speak of any subject relating to art, and yet it is hardly fair to blame him, for his opportunities for acquiring such knowledge have been very few.

It would be quite possible to go through nearly all the other arts, professions, and trades, and to show how grievously we suffer through the want of art education. One great object should be to consider the means by which it may be more diffused, and reach all classes of society. For our purpose society may be divided into two divisions, the upper and lower, each of which would require different means of learning. For the upper classes there might be an art college attached to each of our universities, with a proper staff of professors and lecturers; it might remain a question with the heads of the university as to whether a man should be allowed to take his degree in art equally with other branches of learning. The instruction thus afforded would often bring forth most valuable fruit, considering the position that such students might be expected to fill after leaving the university. Should any of them wish to follow up any of the various branches, good teachers are always at the command of those who have the money to pay for them.

With regard to the other division of society, in which I would include those who do not have an university education, it is evident that the South Kensington machinery will be found the best to administer to their wants, but then the system must undergo very great modifications. Each provincial school should have its museum of works of art, its casts, and its life class. Dyce's outlines should be suppressed, and all the copies might, perhaps, be burnt, and the pupil, after a few preparatory lessons, put on to the figure (not the life); this will teach him the value of lines in a much more subtle manner than any drawing of ornament will do. If a knowledge of ornament be required, as it often will be, this branch might be studied, say, two nights out of six. Again, as your correspondent Mr. Puckett very truly suggests, a great deal more time should be given to modelling. If the study of the figure were made the great means of conveying instruction, doubtless schools of art would become much more numerous and much more popular than they are at present, and South Kensington no longer be under the accusation that after all these years of trial she has produced only a few masters for her provincial schools—one artist, Mr. Godfrey Sykes, and one art archæologist, Mr. Robinson.

W. BURGES.

ARCHITECTURAL MODELLING.*

THE next thing is the fastening of these different thicknesses together, for which a strong and quick-setting cement must be used; perhaps the best is gum arabic melted in a gallipot or small open-mouthed bottle, and allowed to dry quite hard in one mass. Before using, pour a little hot water over it, allow it to stand a moment or two, then throw the water away; this leaves the surface damp, and covered with a little very thick gum just suited for the purpose; but sometimes, when spread over a large surface, it is better to use it thinner. In this way No. 2 must be fastened behind No. 1, and No. 3 behind No. 2, taking care to keep the window

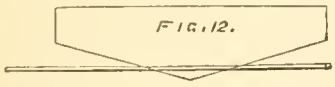
* Continued from page 852.

openings nicely one behind the other, so that each shows a little. When two thicknesses are gummed together, they should be immediately placed in a press, or under a weight, for five or ten minutes. Repeat this process till all the thicknesses are fastened together, taking great care to keep the work perfectly clean by covering it with tissue paper when in the press, and not to let any gum show, which will look shiny and disagreeable; each piece should be kept in a little paper bag till the whole is finally fastened together.

When the first three pieces are fastened, the top should be splayed off, as shown in fig. 6 *b*; and 4 and 5 must be splayed from the back, and a long strip fastened along the top will form the coping of the balustrade. The sill of the window may be splayed in the same manner before the first part of the tracery is added, and if the window should be chamfered all round, two or three pieces may be fastened together, and splayed at one cut.

Sometimes when a window or door is very deeply recessed a great many thicknesses of cardboard will be required—amounting, perhaps, to twenty or thirty. In this case it is not always worth while to use up so many pieces the full size of the wall; a small scrap piece rather larger than the opening, as shown in fig. 4, will suffice. The plumbers and glaziers' work has now to be done to the windows, and the sides, with the exception of buttresses, will be complete. Some fine black netting fastened behind each window will form the lead quarries; short pieces of black thread the saddle bars; and a piece of thin glass gummed behind the whole, the glazing: the glass must also be secured by a strip of linen at the top and bottom, gummed on to the cardboard. Where the windows are of stained glass, the netting should be omitted, and the pattern of the glass drawn on tracing paper, and oiled and gummed behind the glass. Sometimes small pillars are to be met with which will introduce the student into a fresh set of difficulties, namely, columns, capitals, and bases. In Gothic architecture large columns are very seldom met with in the exterior; and all our instructions are being given on the supposition that the student will not be rash enough to attempt to model an interior till he has had considerable experience. Still, the method pursued in large and small columns is the same. For the caps, bases, and bands be very careful to save all the small round pieces of card which are stamped out by the punches, keeping them in separate boxes and labelled No. 1, 2, 3, &c.; by these, caps and bases will easily be made by gumming these little rounds together, taking them up on the point of a fine needle, like a Chinese would use his chop sticks. Thus in fig. 11 the cap would be formed by Nos. 6, 5, and 4, a small piece of column, and No. 4 again. The band by Nos. 4, 5, 4, and the base by Nos. 4, 5, and a small square underneath.

Take a piece of tissue paper about the size and shape of that shown in fig. 12 gummed

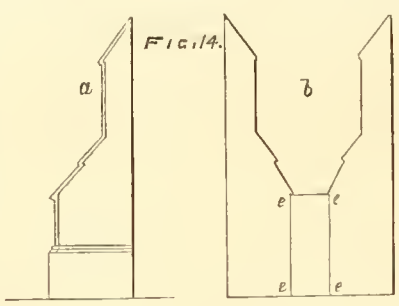


along the shaded edge, then place a netting needle, the size being settled by the required diameter of the column at the point shown, turn the point of the paper over it and roll it quickly along with the fingers, then draw out the needle; the gum adheres immediately, and forms a little white pipe; dozens of these may be made in a minute; when perfectly dry, cut them into the required lengths, join the capitals, bands, and bases, and the pillars are made.

A new difficulty presents itself when coupled or triplets of pillars are met with; the three columns are easily placed side by side, but not so the three caps, which must evidently be made in one piece in stamping, which the circular punch would do too much. To obviate this difficulty, another set of punches must be ground down so as to cut out a semicircle only; with this instrument a quatrefoil or trefoil figure can be cut as easily as a quatrefoil or trefoil with the round punch, and these quatrefoil or trefoil figures halved will form the different members of coupled caps and bases.

And now we may suppose that the main walls are done, but the model is by no means finished; more patience and ingenuity will be required in the buttresses, pinnacles, spires, and finishing than in all the rest taken together. We, however, will lose no time, but proceed at once to describe these several parts in detail, only observing that, whatever model the student may undertake, he is almost sure to find some parts in which his ingenuity must teach him his own method, and these parts will be the most useful to him.

In the buttresses, wood must be called to the assistance of the cardboard. Let *a*, fig. 14,



be the projection of a buttress to be modelled. Cut a piece of wood the exact shape of the buttress, but a little smaller, to allow for the thickness of the cardboard. Cut a piece of cardboard the shape of *b*, draw the knife sharply down the lines *e e*, *e e*—without cutting through the card—to make it bend easily, fasten the card round the wood with gum, as shown at *c*; an oblong piece neatly joined will form the upper face, some smaller pieces will make the weatherings, and the buttress will be complete, all but the plinth, which should be left till the last thing, when the model is set up, and is nearly complete.

Before fastening the buttresses on, it is certainly an improvement if the joints of the stones, and the quoins, &c., are neatly drawn on in Indian ink; the buttresses may then be added, and everything will be ready for "setting up." Up to this time the student may have been chaffed by his friends on the small progress he has made, except an assemblage of little paper bags, the contents of which are pulled out one by one. The next week, however, will make all the difference. The whole building will spring up as from the touch of Aladdin's lamp.

Get now a strong board the size you wish your model to stand on. It should be mahogany, and at least an inch thick, for if it warps the model is ruined. Procure, also, plenty of smooth flat pieces of wood and little cubes for blocking, and take plenty of glue. Mark out on the board the exact plan, with all the buttresses, &c. On the back of each side fix a piece of flat wood reaching from the level of the gutter to the ground, which, of course, is represented by the board; in the clerestory these pieces must still be long enough to reach the board. Then fix each side in its place with plenty of glue blocks on the inside, and carefully set; plumb with the square; where the angles meet they should be carefully fitted together and blocked behind by a piece of wood. The student will now be able to see the effect of his work, but don't let him flatter himself that it is yet finished; still there are the roofs and the pinnacles. Let him be very careful, too, that this part of the work—"the setting-up"—is properly and securely done, for on it depends the permanent beauty of his model as much as the permanent beauty of a building depends upon good materials and sound construction.

The construction of the roofs is very simple: solid triangular bars of wood should be made of the right shape, allowing, as before, for the thickness of the cardboard. In a lead roof strips should be fastened to the sides to imitate the lead rolls in a slated or tiled roof—horizontal bars lapping over one another, with the flashings made in a proper manner, will give the effect; or the slates are sometimes simply drawn on, but this last method is decidedly "scamping." There will be no difficulty in fastening the roofs, as they will rest on the wood backings to the sides mentioned above, to which they should be well glued.

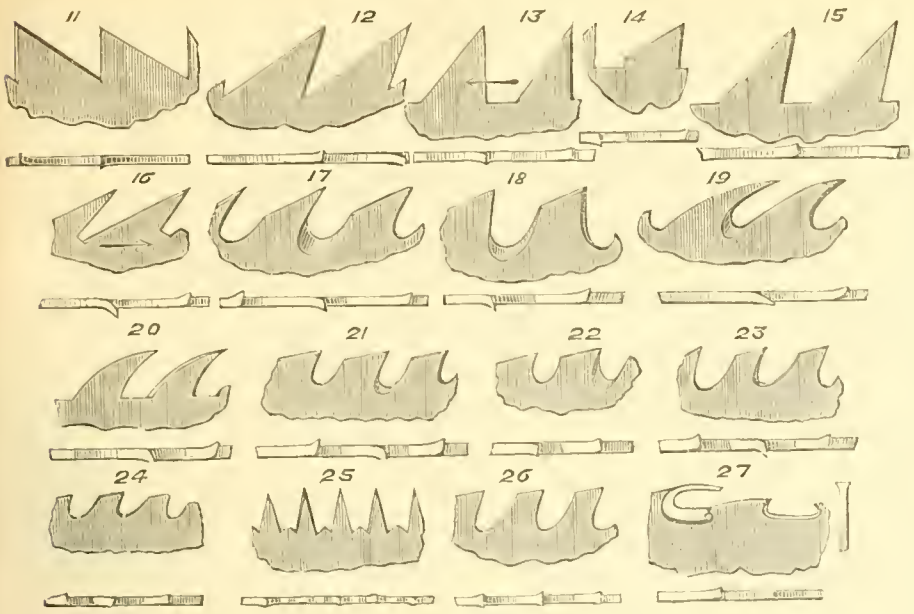
It is almost impossible to suggest a general way of finishing any turrets, pinnacles, or spires that may be required, as they differ so much in individual examples; and when the student has progressed thus far he will no doubt find a way to overcome any difficulties he may meet with. Only let him keep his patience to the last. We would advise, however, that in every case these adjuncts should be of solid wood inside; a tower and spire should in its interiors be solid from top to bottom; everything that partakes of a gingerbready character in modelling, as in real building, is sure to lead to all sorts of difficulties, and very often to total failure.

Sometimes it is considered desirable to show the "night effect," and for this purpose holes are bored in the board below the model and a light placed in a box concealed underneath, which streams up and through the windows. I once knew an ingenious modellist who enhanced this effect by a peal of chimes in the box, but all these devices lower the model from a work of art to a child's plaything; there is nothing instructive to the artist in the chimes or the candle, but there is in the carving of the model if it is really well done. Any one who wishes for the so-called "night effect" can buy a plaster cast of a church for sixpence from an "image man," with a tallow candle inside, which will answer his purpose equally as well as the costliest model. At first sight, modelling may seem a great waste of time, but when it is considered that almost every requisite mental quality which an architect requires is called out and exercised by it, it is not perhaps too much to say that a more improving study could not be recommended to a young architect.

OBITUARY.

WE regret to have to record the death of Dr. Thomas Clark, late Professor of Chemistry in the University of Aberdeen. Perhaps Dr. Clark was best known by his chemical discoveries in connection with water, a melancholy chapter in his history. About the year 1840, says the "Scotsman," he had thought of a method of softening the hard waters of chalk districts by the application of a fact already known—namely, that lime water, poured into a water containing lime in solution as chalk, threw down the old hardening matter with the new, and softened the water on the whole. He investigated the action minutely, and with a view to render precise what was known only in a vague manner, he set to work to discover means of accurately and easily testing the hardness of water. The previous modes of analyzing water were operose and clumsy, and had no very direct bearing on the merits or demerits of the water for common uses. He devised a most ingenious test, known as the soap test, for ascertaining the amount of hardening matter by an easy process, and with extraordinary precision. This method is now in universal use for testing waters, and has played a great part in the choice of waters for towns for more than twenty years. By its help he reduced to an exact measure his proposal for softening chalk waters by lime. His water tests were employed everywhere and made his reputation, but did him no pecuniary service. Dr. Clark was born in Ayr in 1801.

MECHANICAL SAWS.



MECHANICAL SAWS.

A SHORT time since we gave an extract from Mr. S. W. Worssam's paper on saws, as read before the Society of Engineers. The saws as then illustrated are employed for cross-cutting. Some of those above illustrated are used for ripping, or cutting with the grain; these have very little in common with those of cross cutting saws, as the action of the former may be assimilated to a succession of chisels working in a line, whereas the latter approach more to scraping tools; consequently, the facial angles of the teeth have to be made to follow out these varying conditions, those for ripping being generally more acute and set forward than those for cross-cutting. Fig. 11 is known as the ordinary or hand saw tooth. The face is almost perpendicular, and the back inclines at an angle of 30 deg. from the edge of the saw or line of work. Most of the saws used by cabinet makers and joiners are thus toothed, as are also those for veneers. Fig. 12 exhibits the peg-tooth. It possesses more hook than the preceding, the point having an acuteness of 42 deg. instead of 60 deg. It is occasionally used for circular saws and pit-saws, and is serviceable for working soft stone, &c. Figs. 13 to 16.—Sometimes the acute angular notch is not continued to an internal angle, as in figs. 13 to 16. Such teeth are designated as mill-saw teeth, by virtue of their adaptation to that description of saw. Their angles are exceedingly variable, having perpendicular, slight, or considerable inclination, as necessity dictates. Figs. 17 and 18.—These figures comprise what are termed gullet-teeth. The expression appears to have originated from the fact of the face of one tooth being continued to the back of the following, forming a large hollow or gullet. These teeth also frequently pass under the appellation of briar teeth, though, wherefore, is not easy to decide. In gullet-teeth, the angles of the faces depend, in a measure, upon the nature of the work they are called upon to perform; for instance, fig. 17, being of slight pitch, is peculiarly applicable to sawing medium woods, such as chestnut, bay-wood, cherry, &c., whilst fig. 18, by reason of its approach to perpendicularity, is more suitable to hard woods, such as hickory, amboyna, and ebony. The teeth for hard wood should not be very deep, or have excessive pitch or hook, as it is called, as they will tend to hang or draw themselves into the wood and stick fast; but the angles of teeth for soft wood may be more or less acute, in proportion to its degree of hardness or softness. Figs. 19 and 20 exemplify a modification of the gullet-tooth, called parrot-bill, but which is not so perfect as the former, producing work of an inferior description.

MISCELLANEOUS.—Fig. 21.—It is desirable always to have different blades for hard and soft wood; but in cases where this is not possible, the teeth are made of moderate depth and pitch, as seen in the diagram; the results for soft woods are not quite so favourable as with teeth of larger dimensions, but the work is of equal quality. Fig. 22.—Certain woods of plain figure, such as lancewood and ash, are troublesome to saw, because of their disposition to rend in advance of the teeth; to avoid this as much as possible, hog-mane teeth are employed, the tops of which, being filed of triangular shape, appear to have the desired effect by preventing their deviation from the correct course. Figs. 23 and 24 are specimens of gullet-teeth for mill-saws, sharpened by means of a machine. Fig. 25 depicts a species of tooth much favoured in France and Germany, for rectilinear veneer saws. Segmental saws are scarcely to be found in these countries. Fig. 26 is the type of tooth habitually used by the Americans. On account of the great thickness of the blade, the teeth, instead of being set alternately, as in England, are upset respectively with an instrument called a crotch punch. In America, the author has seen saws with false teeth inserted into the blades: it is claimed as an advantage that superior steel can be used for the teeth, and, when worn out, they are easily renewed. Fig. 27 shows one mode of affixing and securing these teeth. It will be seen that the backs are concave, so as to be capable of adjustment to the convex seat prepared for them; this preserves them in place, where they are firmly retained by a small rivet, half and half in the tooth and blade.

WATER SUPPLY AND SANITARY MATTERS.

Great complaints continue to be made that notwithstanding the exertions of the Manchester and Salford Sanitary Association to improve the health of that town its hygienic condition is still unsatisfactory. The dwellings, the water supply, and the drainage all appear to demand effectual measures of reform.

Sub-sulphate of alumina has been recommended by M. Bellamy as a test, both quantitative and qualitative, for organic matter in solution. A precipitate of the alumina, combined with earthy bicarbonates, and organic matters, is thrown down after a few hours, and may be roughly estimated by the height at which it stands in a graduated tube.

On Tuesday, a meeting was held at Newcastle, for the purpose of considering the report on the public health for 1866, and to decide what action should be taken thereon. The unhealthy condition of the city, its numerous unpaved streets, its cellars and underground kitchens standing seven or eight inches under water and liquid filth, the want of proper drainage, and the nuisance arising from the gasworks, were strongly commented upon. A resolution was passed requesting that a special meeting of the council be called to further consider the report and determine what steps shall be taken.

The Council of the Social Science Association, at a meeting held last week, decided to accept the invitation of the Mayor and Town Council of Birmingham to hold the next annual congress in that town.

Building Intelligence.

CHURCHES AND CHAPELS.

The parish church of Husband's Bosworth, Northamptonshire, was reopened lately, after restoration, at a cost of £2,500, by Messrs. E. F. Law and Sons, architects, of Northampton. Messrs. Law and Sons, of Lutterworth, were the builders.

The church of the Blessed Virgin, at Dilwyn, Hereford, was reopened last week after restoration. The style of the building is late thirteenth century Gothic. The roofs and the walls have been stripped of their successive coats of plaster, and the building repaired and repewed. The cost has been about £1,800. Mr. G. Cowley Haddon, of Hereford, was the architect.

St. Peter's Church, Little Oakley, Northampton, was reopened on Advent Sunday, after restoration. The style of the chancel is Early English, that of the nave and aisles fourteenth century Decorated. The east wall of the chancel has been rebuilt, the tower arch unblocked, and the church repewed. Messrs. Slater and Carpenter were the architects.

Mr. Street, we hear, has in hand a large domestic chapel at the seat of Lord Lindsay, at Dunecht, near Aberdeen.

The foundation stone of a new Methodist chapel was laid at Middlesbro' last week. It is built of white brick, in the Early Gothic style. It will hold 330 persons, and will cost about £800. Mr. John Hunter is the architect.

St. Hilda's Roman Catholic Church, Whitby, has been opened. The style is Early Pointed. It consists of nave and aisles, but has no chancel, on account of the limited space at the disposal of the architects. The length is 101ft., width 54ft., height to ceiling 54ft. The architects were Messrs. Hadfield and Son, of Sheffield. The font and altar were executed by Mr. Earp, of London, from the designs of the architects. The contractors were:—Masonry, J. Scales; carpentry, J. White; and plastering, Blakely, all of Whitby.

A new Roman Catholic church was opened at Castle Douglas, N.B., last week. It is built of the local Trap stone, with dressings of Dumfriesshire red sandstone. Mr. George Goldie, of London, is the architect, and Mr. M'Cartney, of Castle Douglas, is the contractor. The encaustic tiles with which the church is paved were supplied by Messrs. Maw and Co., and the metal work by Messrs. Hardman and Peard and Jackson.

On Wednesday, the church of St. James, at Selby, was consecrated by the Archbishop of York. The style is Early Geometric Gothic. The length is 122ft., the width 50ft., and the height of tower 165ft. Messrs. Newstead and Low, of York and London, were the architects. The church is paved with encaustic tiles, supplied by Messrs. Maw and Co. The ornamental ironwork is by Messrs. Johnston Brothers.

The parish church of Cirencester (one of the most interesting in the county of Gloucester), having been restored at great cost (upwards of £10,000), was reopened on the 27th ult. by the Bishop of Gloucester and Bristol.

The Memorial Church at Constantinople, intended as a memorial to our countrymen who fell during the Crimean war, is rapidly approaching completion. It will be remembered that the Sultan granted the site, and the Queen and the Prince Consort were among the contributors. Some difficulties arose at first, which delayed the progress of the work, and it was found almost impossible to get a contractor, but ultimately Messrs. Rogers and Booth, of Gosport, took the work in hand, and have carried out the designs of Mr. G. E. Street. It is noticeable that no carved or painted figures will be admitted into the church.

WARTNABY, LEICESTERSHIRE.—The church here, which did look a very poor structure, has had the greater part of its chancel rebuilt; and the remainder of the edifice, it is expected, will be restored after the winter. The exterior of the new part is simple, but the crosses, which are very nice, with other parts, promise something good to be seen within. The chief feature is an Early English triplet of lancet windows at the east, the shafts, mouldings, rear arch, and general arrangement of which are extremely good, and show a highly cultivated taste. There is a new chancel arch of Early Decorated style, the period for which seems to have been suggested by a small original inserted side window still remaining. The work of the arch is suitably masculine and harmonizes

with the bold character of the nave. The date of the church appears to be about 1200. It has a nave with one aisle on the south side, which is little more than 6ft. in width; the original doorway here is remaining, and one in the north wall opposite to it, also a window of Norman design and very rude, at the west end of the aisle. There is a tower of the same date as the nave; it has an open belfry with two bells, and is covered with a double gabled roof which formerly had crosses. The font is cylindrical and equally old. The antiquary would be especially interested in visiting this modest and retired sanctuary by the decorations on the arches, which has been discovered by removing the plaster, and which seems coeval with the building. The arcade between nave and aisle is of three bays; the arches are semicircular, supported by circular piers, with massive moulded bases and octagonal capitals with semi-Norman carving. The stencilling on the arches has the Norman zig-zag and saw patterns conspicuous; also quatrefoils, &c., and a device of stalks with leaves, &c., something like the water lily. Ultimately we expect to see this church not only unique and interesting, but also beautiful in its rural situation. The manor came to the Knights Templars not very long after the erection of the church, and afterwards to the Hospitallers. With the exception of a late and very poor clerestory, scarcely any change (besides the present) has occurred in the church from the first. It has now, however, a benefactor, who, with the architect employed, will restore it in a manner worthy of the interest it possesses.

BUILDINGS.

The enlargement of the hall of the Royal College of Physicians of Edinburgh, commenced about two years back, is now completed. The size has been more than doubled by its extension backwards, and the height increased. The panels are adorned with medallions of the great ancient and modern physicians, and female emblematic figures. Mr. David Bryce, R.S.A., was the architect, and Messrs. Beattie the contractors. The figures and medallions were sculptured by Mr. George Maccallum.

On Monday evening the new public hall recently erected in Runcorn was formally opened. It is of red brick, in the Gothic style. Mr. Culshaw, of Liverpool, was the architect; and Mr. Thomas White, of Runcorn, the contractor. The large hall will seat 800 persons.

Messrs. Casebourne and Lucas, cement manufacturers, West Hartlepool, are constructing an experimental sea wall near the lighthouse at Seaton. The wall is composed of cement concrete made of the shingle from the beach and Portland cement, mixed in proper proportion, and cast in a mould formed by planks fixed to upright posts set to the desired width. The experiment, as far as it goes, seems likely to prove highly successful, as the portion already built was put to a severe test during some recent gales and high tides, when the whole of the planks, &c., forming the mouldings, were carried away, and the concrete wall, left exposed to the full force of the sea, withstood the storm, although the cement concrete had only been set about forty-eight hours.

The Sassoon Hospital at Poona (India) has been opened by Sir Seymour Fitzgerald. It is in the Gothic style, and cost 3,10,000 rupees. The design is by Colonel Wilkins, R.E, and it was erected under the superintendence of Major Mellis, Lieutenant Cruickshank, and the architect. It affords accommodation for 144 patients, allowing to each 1,100 cubic feet of space. On any emergency 60 more patients can be accommodated in the verandah.

Twelve large barracks have been erected at Deololee, near Nassick (India), at a cost of eleven lacs of rupees, and a hospital is now building to cost about three lacs more. Mr. J. W. Reeve was the contractor.

A new Free Church school has been erected at Chowpatty (India) at a cost of 67,000 rupees. The style is Gothic adapted to local circumstances. The materials employed are Bassein rubble, pointed with black mortar, with Porebunder stone dressings. Messrs Scott, M'Clelland and Co. were the architects, and Nursoo Dhurmajee the contractor.

The foundation stone of the new national schools at Newbiggen, near Newcastle, was laid the other day. The style is a mixture of Gothic and Elizabethan. Mr. H. Robson, of Durham, is the architect; Mr Brand, of Shields, is the contractor; and Mr. Robert Craig the builder.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty four Words.

RECEIVED.—W. S.—T. and C.—E. W. G.—D. S.—A. J. M.—A. G. H., with photographs of Hayling drawings.—T. S.—J. E. R.—R. L. B.—M. C.—J. R.—W. W.—J. B. T.—G. H. G.—C. L.—J. S. C.—A. P.—W. R. B.—W. A. M., with plans for labourers' cottages, Liverpool.—W. S.—E. W. G.—G. and G.—W. A. L.—H. S.—S. F.—E. D.—J. L.—W. B.—C. and F.—J. H.—A. S. H.—W. J. P.—H. and C.—W. H. T.—J. B. W. J.—J. T. S.—T. C., with "Water Supply of Towns."—T. F. M.

W. WILCOX (Stamnore).—The office of the Central Cottage Improvement Society is the Whittington Club, Arundel-street, Strand, London.

Correspondence.

HOW HOUSES ARE BURNT.

To the Editor of the BUILDING NEWS.

SIR,—The number of private residences destroyed by fire is something wonderful; also the last sentence in the reports—"cause unknown." It is not a little singular, however, that these fires should take place in many "speculative buildings." The Metropolitan Building Act, by its stringent clause respecting the non-placing of wood near flues, would render, one would think, fires from this cause, in newly-erected dwellings, almost impossible. And, indeed, if buildings were erected in accordance with the provisions of this Act, it would be so. The question then arises—are houses built contrary to the Act? The answer must be clearly, yes. Do the district surveyors discharge their duty, then, if this be the case? Have they no power to inspect carcases as they are run up, and object if they see no regard paid to this important clause? Clearly they have the power, but they cannot in all cases exercise it. Two cases which have occurred within the last fortnight have led me to think that proper supervision could not have been made. In one, the greater part of a large house was destroyed, together with valuable furniture; in another, the discovery was made before the smouldering timbers had burst into flame. On inspecting the larger house, I found that a piece of timber was built into the wall at the back of a fireplace, running clean through the wall, communicating with the fireplace on one side, and with a range of bookcases on the other. It was here that the fire broke out. All was right, apparently, when the house was closed at night, but by two o'clock in the morning the contents of the library had been consumed, and the adjoining rooms wrapped in flames. Great surprise was manifested, inasmuch as there had been no fire in the library for some days, nor in the rooms above, beneath, or adjoining, save a small one in the lobby, at the back of the inner wall of the library. When examining the partially gutted library, however, it was seen that a joist, &c., had communicated directly with the adjoining fireplace, and that in process of time it had been gradually consumed; the heat of the last fire kindling the "tinder wood" which remained, and spreading to the timber scantlings of the floor with which it was in contact, set the library in a blaze.

In the other case, the house had not been occupied for six months, when the mistress, who had occasion to go to an upper bedroom before she left the premises, found it filled with smoke. On examination, she perceived smoke coming up through the carpet, and by the skirting next the fireplace. Pulling up the carpet, the flooring was found to be discoloured, and the boards hot. An alarm was raised, and some men at work on the new building opposite were soon on the spot. To tear up a few boards was the work of a moment, when a large extent of joisting was found to be smouldering, and upon contact with the air burst into flame. It was speedily extinguished, and on examination it was found that the joists ran into the flues, that in the kitchen flue soon availing itself of the opportunity to transmit its heat to more distant neighbours. Further examinations proved that other floors were the same, and this inspection extending itself to other houses adjoining, which were in course of completion, the same defect was discovered. It need not be said that the offending timbers were removed, the floors retrimmed, and the requirements of the Act satisfied. The houses were purchased in carcase, so that the owner, who was finishing them, was not responsible for this.

The fully carrying out the Building Act, defective as it may be in other respects, would materially lessen the number of fires in the metropolis, and render the buildings more substantial. It is clearly the duty of the district surveyor to exercise this wise supervision. Then comes the question as to his ability. Is he able to so inspect every house as to guard against danger? No. In some districts, give the surveyor twenty heads, forty feet, and forty hands, he could not do it. With miles of streets constantly making, with thousands of houses springing up like mushrooms—and like mushrooms some of them must some day "come to grief"—a house to house inspection is impossible. Of what service, then, is the Act, without provision being made for an efficient staff of assistants under the surveyor? It remains for the framers of the amended Bill so to contrive that, having the right to certain interference, they should secure fresh power for exercising that right. That the power does not now exist is manifest, and the Act is, in consequence, almost inoperative.—I am, &c., W. W.

BELL RINGERS' ACCESS.

SIR,—Lest your correspondent should mislead where he intends to inform, allow me to state that the little doorway referred to in the exterior of All Saints' Church, Kensington Park, Notting-hill, freely to admit ringers, was in reality intended for a very different purpose. It was in order to give free access to the church from the clergyman's house, which was intended to extend along the western side of a quadrangle north of the tower, and at the same time to keep control over the ringers' entrance.

Moreover, my own feelings being so very strong that church bell ringing is intended for an expression of religious joy, rather than of secular rejoicing, and that it is an unbecoming use of church bells to apply them to the purpose of prize ringing, or other secular ends, I should be sorry to see the regulation of the ringing taken out of the hands of the minister in whom it is most properly invested.

I can suggest a remedy for this, which, I believe, has been in use in other ages—viz., the erection of a bell tower by the inhabitants of a town, for secular purposes, wherein they may ring to their hearts' content.—I am, &c.,

WILLIAM WHITE.

30A, Wimpole-street, London, W., Dec. 9.

PUBLIC MEETINGS.

SIR,—Can you kindly inform me as to the usual practice at public meetings with regard to amendments on motions? I have sometimes observed that chairmen of meetings are almost as much in the dark as I am on this subject. For instance, a motion of considerable importance was before the Architectural Association on Friday evening last, and there were three amendments to it. The questions which arose in my mind during the debate were:—

1. May a second or third amendment be proposed until the first has been disposed of?
2. Supposing that they may, which of the three should be put to the vote first?
3. Supposing, as was the case on Friday, that the second and third were disposed of first, can the debate on amendment No. 1 be resumed?
4. Supposing an amendment to be carried, should the original motion be put?—I am, &c.,

December 7. IGNORAMUS.

CONCRETE BUILDINGS IN PARIS.

SIR,—In your journal of the 6th inst. is an article referring to the report of an operative bricklayer on the Paris Exhibition, lately published in the "Times;" the writer of the report refers to the houses I am building in concrete for the Emperor Napoleon, and as there are one or two inaccuracies in the report, perhaps you will allow me to correct them. In the first place, the writer says "the houses will cost £400 each, which is considerably more than was expected." Now, I beg to say that I agreed with the Emperor to build the houses for 6,000f., or £240 each, and I have no intention of overstepping that figure. I believe, however, that His Majesty paid a very large sum for the land, and as there were several tons of earth to be removed before we could com-

menee building operations, this occasioned a considerable expense. We also constructed a capacious sewer 6ft. 6in. high, and of ample breadth; and, moreover, formed the roads and side walks. If the costs of all these items be added together, I dare say we shall find that the total charges incidental to the whole affair will amount to nearly £400 per house. It is not correct, however, to say that the houses themselves cost more than £240. The writer, in describing the process of building, says that "the carpenters fix two rows of board 5ft. or 6ft. high, or more," &c.; this is not correct, inasmuch as the boards, as he calls them (but which are, in fact, a strong wooden framing faced with sheet zinc), are only 1ft. 9in. high, and not 5ft. or 6ft. These frames are bolted together so as to form a kind of mould, and are raised every day, so that the building rises at the rate of 1ft. 6in. per diem. The arrangement of the rooms certainly is not convenient. This has been pointed out to His Majesty, and I believe he is now satisfied that it might be improved. I am not, however, responsible for the arrangements or dimensions of the rooms.—I am, &c., W. E. NEWTON.

66, Chancery-lane, December 10.

Intercommunication.

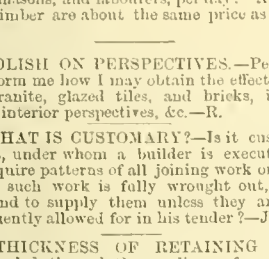
QUESTIONS.

[683.]—LABOUR IN IRELAND.—Could anyone inform me what is the price of labour in Ireland, viz., bricklayers, carpenters, masons, and labourers, per day? Also whether bricks and timber are about the same price as in London.—A. F. G.

[684.]—POLISH ON PERSPECTIVES.—Perhaps some one will inform me how I may obtain the effect of polished marbles, granite, glazed tiles, and bricks, in coloured drawings of interior perspectives, &c.—R.

[685.]—WHAT IS CUSTOMARY?—Is it customary for an Architect, under whom a builder is executing a contract, to require patterns of all joining work on approval, before any such work is fully wrought out, and is the builder bound to supply them unless they are specified, and consequently allowed for in his tender?—JUSTITIA.

[686.]—THICKNESS OF RETAINING WALLS.—I should be glad, through the medium of your valuable column, to learn a good and practical rule for calculating the thickness of a retaining wall—of this shape—for a



reservoir or railway embankment, supposing the height to be 12ft., and the soil of an ordinary earthy nature.—FOREMAN.

[687.]—PRICES OF TIMBER.—I wish to know in your next "Intercommunication," if your list of prices for building materials are the London or Hull list, or if any difference, and if the 1s. duty per load is to add to the list, and what you mean by the drawback 1s.; also how is it that St. John's white spruce is quoted at £13 10s. to £15 10s. and St. Petersburgh only at £10 10s. to £11.—IGNORAMUS.

[The price of timber in Hull is considerably cheaper than in London, and the list we give is London prices. The duty is usually paid by the importer, unless a builder purchases a cargo out and out. With regard to the difference in prices of St. John's white spruce and St. Petersburgh, you will notice that the St. Petersburgh deals are sold in hundreds of the standard measurement, while the dimensions of the St. John's spruce are much larger.]

REPLIES.

[634.]—FIREPROOF MORTAR.—Your correspondent should set his firebricks with fireclay, either Newcastle or Stourbridge. The latter is stronger, but for merely setting the bricks in grates and stoves, the former will answer perfectly well. In setting gas retorts, the clay is used by itself; but where brickwork is concerned, it may be mixed with an equal proportion of very fine sand. I have employed it in this manner for setting the brick wall of Siemen's gas furnaces, which will fuse nearly any material.—CLERK OF WORKS.

[635.]—PIRACY OF DESIGNS.—Having had a good deal to do with builders lately, will you allow me to inform "Othello" that no one can claim any particular design of a building, and so make a "copyright" of it. Anyone is perfectly at liberty to build a house as he pleases, and may copy his neighbour's, if he thinks fit. So soon as the house is built, it is public property, inasmuch as the design or architecture is concerned, and very justly too.—H. C

[637.]—MARINE GLUE.—"C. E." will find the following recipe answer his purpose:—Mix together, with a slow and not too high a heat, 15 parts of shellac powdered fine, 9 parts of coal tar, and about three quarters of a part of caoutchouc, or india-rubber. In a short time this mixture will cool down, and can be easily obtained in thin cakes like glue. It must, of course, be heated before use.—CARPENTER.

[640.]—A GOOD FOUNDATION.—I have had some experience in getting in foundations, and the following is the course I would advise "Foreman" to pursue:—Let him first sink three feet deeper, and then fill in the hole with concrete, well punned and rammed. He has met with what is termed "a soft spot," and the plan I have suggested is the only really safe one under the circumstances. The concrete must be carried well up to the level of the footings, and ought to be continued underneath them all, or otherwise there will be a chance of a "crack" occurring in the walls over the bad spot, owing to the fact that one portion of the house will be founded upon harder ground than the other.—ENGINEER.

[641.]—TURNPIKE ROADS.—A case precisely similar to that stated by "Surveyor" is under my notice at present, and will probably only be settled by an appeal to law. To determine what is the real "building line" or line of frontage in country places is one of the bugbears of a local surveyor. A good deal depends upon the bye laws of the local board and the manner in which they enforce them. The argument of "Surveyor" appears to me to be weak in two points. The first is, that notwithstanding the encroachment, the width of the road would still be 32ft. 8in. The half of this is 16ft. 4in., and the minimum distance insisted upon by law is only 15ft., measured from the centre of the road. The second is, that it is not possible to ensure an uniformity in the line of house frontage, for although a man may be restrained from putting his house forward beyond a certain distance, he may set it back from the road as much as he likes, provided he obtains the usual 500 square feet of area at the back and sides.—SURVEYOR TO A LOCAL BOARD.

[644.]—FOUNDATIONS FOR A TOWER.—Allow me, through your columns, to inform "Inquirer" that although it is better for the bottom course of footings to be a double one, there is no advantage gained in making the others more than a single course in height. The chief point in brick footings is to keep the back joists, as far as they

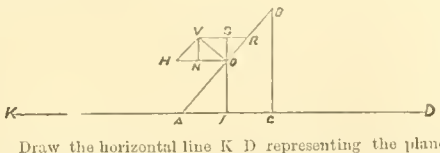
can be kept, from the face of the work. The accompanying cut will show the arrangement recommended.—S. S.

[646.]—DILAPIDATIONS.—If there is no agreement either way respecting repairs the tenant is bound in law to do them, and keep the premises in a proper state of repair. "S. T." should consult an excellent work by a barrister of eminence, "Every Man his own Lawyer," in which all these cases are especially entered into, propounded, and explained.—A LAWYER'S CLERK.

[651.]—WATER-TIGHT VAULT.—In answer to "F.N.," I would beg to say that ½in. is not the least too small for a close joint of Portland cement. I have seen 3-16in. made in good mortar with careful work. He can, however, easily render the vault watertight by paying it over with a coating of tar and sand, or of mineral asphalte.—L. P. D.

[652.]—DEAFENING PARTITIONS.—Both cork and felt have been used for the purpose alluded to, but with very indifferent success. The best safeguard against noise from adjoining rooms is thick walls and partitions, but in their absence it is impossible to find a substitute.—T. C.

[653.]—PRESSURE ON ROOFS.—The following investigation will show that the downward pressure, by a horizontal wind, reaches a maximum when the pitch of roof is 54¾ deg. (nearly). H. Swansborough, in arriving at his conclusion that the downward pressure is greatest when the pitch is 45 deg., has fallen into the error of supposing that the horizontal force of the wind is a fixed instead of a variable quantity. It will be apparent to everyone that the force of wind will vary according to the angle at which the roof slants; when the roof is vertical the pressure is at its maximum, and when horizontal it is nothing.



Draw the horizontal line K D representing the plane the roof springs from. As the length of roof is a fixed quantity, draw A B, representing it any angle from point A; from B draw B C at right angles to K D, meeting K D in C. Now the force of wind is as B C, and acts at centre of line A B in point O; from O draw O I perpendicular to K O, meeting K D in I; then O I is half B C; O I is therefore as the force of wind; from O draw the line O H parallel to K D, making O H equal to O I. Now O H represents the force of wind acting on point O, from H draw H V parallel to A B till it meets a line drawn from O at right angles to A B in V; from V draw V R parallel to K D meeting A B in R, then O V represents the vertical pressure on roof; the force represented by O R acts in the plane of the roof, and, therefore, does not effect the downward pressure. Again, to resolve O V into a vertical and horizontal force, from V draw V N perpendicular to K D, meeting H O in N; also from O draw O S perpendicular to K D, meeting V R in S. Now the force O V is resolved into O N horizontal and O S vertical, O S being as the downward pressure, therefore the downward force is a maximum when O S is a maximum. Now to find the angle B A D at which this occurs is our next question; we know that the triangles A O I, R V O, and O V S are similar, and that V R is equal to O I. From this we have the following proportions:—A O : O I : : V R : O V and A O : A I : : O V : O S. Taking r = A O and x = O I we have A I = $\sqrt{(r^2 - x^2)}$, by substituting the values in the proportions we shall have $r : x :: x : OV = \frac{x^2}{r}$, and $r : \sqrt{(r^2 - x^2)} :: \frac{x^2}{r} : OS = \frac{\sqrt{(r^2 - x^2)}\ x^2}{r^2}$. Now the next point for us to prove is what the value of x is when $\frac{\sqrt{(r^2 - x^2)}\ x^2}{r^2}$ is a maximum. As r is a fixed quantity we take it equal to 1, then we have $\sqrt{(1 - x^2)}\ x^2$ for a maximum, it follows that its square $(1 - x^2)\ x^4 = x^4 - x^6$ is also a maximum. Now the fluxion of a quantity that is variable when it is at its maximum, is equal to O ∴ we have $4x^3 \dot{x} - 6x^5 \dot{x} = 0$ for an equation, dividing all along by $x^3 \dot{x}$ we have $4 - 6x^2 = 0$, and $6x^2 = 4$ $x = \sqrt{\frac{4}{6}} = OI$ ∴ $AI = \sqrt{\frac{2}{3}}$ A O being 1, or we can have $AO = \sqrt{3}$, $OI = \sqrt{2}$ and A I = 1, by multiplying these quantities by $\sqrt{3}$. So we have proved that the angle at which O S is greatest, and consequently the downward force is greatest when tangent O I is = 2, radius being 1, which corresponds to 54¾ (nearly) deg.

For logarithm of 2 = 2)3010300

..... $\sqrt{2}$ = ·1505150

..... radius = 10

Log tangent 10·1505150 corresponds to 54¾.

JOHN FROST, Hazelwood-cottage, Coventry.

[653.] There is a rather unfortunate omission in the article "Pressure on Roofs," at p. 838. After "wind," in the third line, the limiting words, "when the height of the roof remains constant," should have been inserted. The idea of this simple demonstration for the particular case occurred to me whilst trying to find a more evident solution of the problem wherein the length of the rafter is the fixed element than is afforded to the majority of readers by the formidable looking notation of the differential calculus, but being obliged for the time to abandon the investigation, I thought the partial demonstration of sufficient interest to forward to you. The omission of the words above alluded to, fairly enough laid the article open to the strictures of "E. L. G." and Mr. Hope, the former of whom had already correctly stated the angle, giving a maximum vertical pressure in the more general problem, though without giving the demonstration. The result of the investigation of this latter case by the differential calculus is, I apprehend, too well known to leave the matter open to question to anyone whose knowledge of mathematics enables him to test the solution.—E. SWANSBOROUGH.

[673.]—THE "LIMNER" is a simple contrivance, base on one of the oldest inventions connected with art. It is useful for making correct copies of engravings, drawings, and paintings (small or large). It is also of great utility in sketching from nature, as no previous knowledge of the ordinary rules of perspective is required.—SCHR: FACIAS.

[681.]—STRENGTH OF BEAMS.—Tredgold gives 1-5th of the breaking weight as the maximum fixed distributed load on a beam fixed at both ends. No doubt a beam will safely bear a considerably greater load, but in the case of a bresummer it is required that the beam shall be strong enough without deflecting sufficiently to cause fractures in the brickwork supported.—W. L. J.

STAINED GLASS.

A two-light memorial window has been erected in St. Hilda's Roman Catholic Church, Whitby. It is by Wailes, of Newcastle, and represents the Resurrection, and Our Lord Blessing Little Children.

HEREFORD CATHEDRAL.—Eight stained glass windows have just been placed in the Ladye Chapel of this cathedral, in memory of various members of the family of the late Canon Morgan. The windows have been designed in accordance with the best existing examples of the 13th century—the date of this chapel. The subjects illustrate events in the Life of Christ, and the windows are of the Mosaic class, each window consisting of three medallions, divided by a rich pattern or boss, the whole being surrounded by a border, and an inscription in Old English forms the base of each light. Mr. Gibbs is the artist of the new windows.

STATUES, MEMORIALS, ETC.

Busts of eight of the great musical masters have been placed over the four doorways in the interior of New Colston's Hall, Bristol. They represent Beethoven, Handel, Haydn, Mozart, Weber, Spohr, and Mendelssohn. Mr. R. L. Boulton, of Cheltenham, is the sculptor.

LEGAL INTELLIGENCE.

CONSPIRACY IN THE BUILDING TRADE.—J. M'Master, Adam Hanning, and Thomas Slater, joiners, were indicted on Monday, at the South Lancashire assizes, for obtaining by false pretences £100 from Messrs. Pennington and Bridgen, architects, of Manchester. The particulars of this case were fully reported in our issue of November 1. The prisoners were found guilty, and sentenced to nine months' imprisonment.

ENCROACHING UPON THE HIGHWAY.—Charles Stewart appeared in answer to an information issued at the instance of the Woolton Local Board, charging him with having erected a certain building in Woolton (near Liverpool), which encroached in one place an inch, and in another four inches on the highway, thereby rendering himself liable to a penalty not exceeding 40s., and an order to pull down the houses, or a portion of them. Two houses were built by the defendant a short

time ago in Quarry-lane, one being at the corner of Cobden-street, in Woolton. It was stated that during the erection of these buildings the surveyor for the Woolton Local Board directed Mr. Stewart's attention to the frontage of the houses, which, he said, encroached upon the high way. He, however, went on with the building, and the work was completed. In defence, Mr. Layton contended that the houses were built within a wall which separated a field from the high road, and which had been pulled down. Mr. Neilson said the evidence in regard to the position of the houses was very conflicting. Supposing there was an encroachment, it was undoubtedly a very slight one indeed, and they therefore dismissed the case.

A JOINER'S CLAIM FOR WAGES.—MATTHEW HINDMAN *v.* HENRY DUCKWORTH.—The action was instituted, in the County Court at Bolton, to recover the sum of 13s. for wages, stated to be due on account of work done.—Plaintiff said he had been engaged by the defendant to work as journeyman for the sum of 28s. per week. He had been working at some windows, and when he finished them on Thursday morning, defendant began to question him about the time it had taken him to do the job, saying he had been a great deal too long, and that he (defendant) should not pay him any wages that week. He (plaintiff) said he should try to recover the amount, upon which defendant replied that he would not pay until he was made. Defendant said he engaged plaintiff as a competent journeyman, and he was understood to be able to do certain work in a certain time. He had not fulfilled that; he had not turned sufficient work off, and he (defendent) could find men who could do the work in a great deal less time.—As a witness for the defendant Thomas Jackson was called, and deposed to seeing a portion of the work done. He (witness) could have made the windows in less time, but admitted that the work of the plaintiff was well done.—James Bradley, joiner, stated that the windows in question could be made in nine hours each. Cross-examined by plaintiff: The engine was stopped three days, and part of the work which should have been done with the aid of steam power had to be done by hand. Plaintiff was at first supplied with wrong material, and part of the work had been done twice on that account.—His Honour, in giving a verdict for the amount claimed, said plaintiff had given two substantial reasons why he had been longer than usual at the job.—Mr. Duckworth said it was piece of laziness, and added: "I do not intend to pay; you will have to distrain on me for it."—Plaintiff applied for costs, which were allowed, he having come from Heywood—twenty miles distant—where he was then employed.

Our Office Table.

That the Japanese are a wonderful people we have had many interesting proofs. We were, however, hardly prepared for the statement which occurs in a report just published from Mr. S. Locock, Secretary of Embassy in Japan, to the effect that in the city of Osaka there are no fewer than forty native photographers obtaining their lenses, plates, and chemicals from abroad, and all finding full occupation. An album of Japanese photographs would be interesting to Europeans.

A meeting of the Leicestershire Architectural and Archæological Society was held in the Town Library, Guildhall, Leicester, on the 25th ult., the Rev. J. H. Hill, in the chair. After the transaction of business in committee, Captain Whitby exhibited two drawings of the porch of Thurlaston Church, South Devon. The peculiarity shown by the drawings is that the porch carries a buttress. Neither tradition nor history give any clue either to the founder of this curious little church or the name of its dedicatory saint. Along the south wall externally is a stone seat commanding a grand view of the chancel. At the same meeting Mr. Weatherhead exhibited several specimens of mediæval pottery, found in excavating the north-east corner of St. Nicholas-street, and a portion of a flat dish of Samian ware, showing a small handle on the rim, lately found in Sycamore-lane, Leicester.

The second meeting of the session of the Manchester Architectural Association was held on Tuesday evening, December 3, when the Vice-president read an interesting paper, entitled "Notes on Our Old Houses."

The opening meeting of the Manchester Architectural Association was held last week at the Cathedral Hotel, Manchester, Mr. L. Booth, the President, occupying the chair. The seventh annual report, which was read, showed continued improvement in the state of the society. The introduction of the student and archæological elements had especially tended to increase its usefulness. The report referred to the memorial presented to the Corporation respecting the site for the New Town Hall, and stated that, notwithstanding the coarse and irrelevant remarks which were made by the Mayor and other members of the Council, it was hoped it would be productive of some effect. The chairman, in his address, expressed himself satisfied with the competition, and the way in which it had been conducted, but he condemned the manner in which the memorial had been received, and as the best contradiction to the Mayor's assertion that the members of the Association were not the architects who did the business of Manchester, he reminded the meeting that the last town hall built in or near Manchester was from the designs of Mr. Darbyshire, the secretary to the Association.

The following interesting details of the precise expense of the Exhibition building have been given to the Imperial Commission by M. Krantz, head engineer of the Champs de Mars Palace:—The total expense of construction amounted to 11,783,087f. (£466,525) for a superficie of 153,138 square metres, which puts the cost at 76f. 76c. per metre—that is, £3 per square yard. From this outlay must be deducted 1,200,000f. (£48,000), the produce of the sale of the materials, which has taken place since the closing of the Exhibition.

We have received the following in answer to Mr. Giles's letter in our last:—In Mr. Giles's letter to you last week, he states "the verdict of the jury only gave the upper floors and sections to the plaintiff." This is not the fact. The jury gave a verdict for the plaintiff, with costs, and the judge directed the defendant to give up all the drawings he admitted were in his possession. Amongst them are the whole of the plans, excepting the basement mezzanine, lost.—I am, &c., JAMES MURRAY, 25, Portman-street, W.

By the direction of the Duke of Cambridge, a class has been formed at the Royal Engineer establishment, Chatham, for the instruction of the non-commissioned officers in architecture and architectural drawing, to qualify them for filling the appointments of foremen of works at the various Government offices.

Workmen are now employed in the Long Gallery at the House of Commons, where the committee-rooms are situate, in placing, in two convenient recesses, two marble drinking fountains. This, doubtless, will be a great boon to witnesses and others, especially during the summer months. The water supply will be from the artesian well situate at the rear of the National Gallery.

The parish church of Betwell, in North Nottinghamshire—one of the smallest and prettiest Norman churches in the country—has been destroyed by fire. The church was in existence before the year 1573, and was restored in 1864.

A new Act to amend the Metropolitan Streets Act was issued on Monday. The cab question is disposed of by a clause stating that no regulation is to be made in respect of the carriage of lamps by hackney carriages except with the approval of the Secretary of State.

It is proposed to found a Professorship of Engineering and the Mechanical Sciences at the University of Edinburgh on condition of Government providing an annual sum of £200 a year to the Professor, who would receive a similar sum from endowment, making the salary £400, besides the class fees. A third donation of £5,000 having been made to the University by Sir David Baxter, of Dundee, has enabled the senators to propose the establishment of this long desired addition to the University.

In reference to labourers' cottages, referred to by "S. S. S" in our last number, a correspondent says:—I think that all that is required in the design for a labourer's cottage is set forth in the "conditions," and the Cotters' Tenant Act (Ireland). The question of water supply is not to be considered. The prices of masonry, brick, labour, &c., vary in the different localities. The gentlemen appointed to adjudicate on the plans and prices will, I should say, be in a position to come to a proper conclusion on that subject.

The discovery of a substitute for rags in the manufacture of paper is reported from the United States. It is stated that the okra plant, which grows luxuriantly in the States, possesses all the requisites for making every description of paper, from the commonest to the finest bank-note, without the addition of any other material. If this turns out true it will certainly affect the price of paper, as the okra can be grown cheaply and abundantly. We hear that arrangements have been made for commencing the manufacture of okra paper this season.

The National Gallery has acquired the celebrated picture of the "Raising of Lazarus," by Hayden, which was for many years to be seen at the Pantheon, in Oxford-street. This picture has always been deemed one of Hayden's most successful efforts.

If the world is not to be ultimately destroyed, it will not be for want of suggestions by means of which such a result may be obtained. A French philosopher not long ago assured us we were in imminent danger of splitting up into moons. Since that a wise Yankee discovered that all earthly substances were rapidly turning into petroleum, and that one of these days we should burst into a blaze that would illumine the universe. The latest idea from the same side of the Atlantic is that "if" a volcanic eruption were to happen near the sea, and "if" the water were once to get into the earth's central fires, an amount of steam would be generated which would by its explosion send us all to "eternal smash."

The anniversary meeting of the Royal Society was held on Saturday week at Burlington House. The president delivered his annual address, on the progress made in science during the year, and the society afterwards proceeded to elect a president and officers, when the following were chosen for the year ensuing:—President, Lieut.-General Edward Sabine, R.A., D.C.L., LL.D., re-elected; treasurer, William Allen Miller, M.D., LL.D.; secretaries, William Sharpey, M.D., LL.D., and George Gabriel Stokes, M.A., D.C.L.; foreign secretary, Professor William Hallows Miller, M.A., LL.D. The two oldest fellows of the Royal Society are Lord Brougham and Sir Henry Ellis, late principal librarian to the British Museum. The former was elected in 1808, and the latter in 1810.

The great demand for bricks has, as in all other trades, called into existence machinery which supersedes hand labour and does the work better. The Nottingham Patent Brick Company (limited), have lately commenced on a large scale the manufacture of machine bricks. One machine prepares sufficient clay for 20,000 bricks per day, and another turns out over 18,000 perfect bricks in the same time. One important fact in connection with these bricks is that they are made without mixing with water, thus giving a hard, compact body, capable of bearing great weight, and less absorbent than ordinary bricks.

On Wednesday evening last the prizes were awarded for drawings executed during the year 1866 by the students of St. Martin's School of Art. The Rev. R. C. Maul, the honorary secretary, said the school was in a prosperous condition. He said at present there were but ten gold medals for the United Kingdom, and Mr. Herbert Johnson, one of their pupils, had gained one of them.

On January 23 and 24 next a conference will be held, under the auspices of the Society of Arts, "to consider and suggest what measures may be taken to promote the industrial and scientific education of the various classes of the community." Earl Granville and Earl Russell have accepted invitations to be present.

At the usual meeting of the Liverpool Architectural Society, Mr. Kilpin, president, in the chair, a paper upon "Paris: its Public Buildings and Works in Progress," was read by Mr. L. Horneblower, who illustrated his description by photographs.

Mr. J. T. Smith, of 8, Windsor-terrace, the Grove, Ealing, has written in reference to our article in last week's number on "Cottage Improvement." He says the first prize was unanimously awarded to him, and that Mr. Habershon's design was chosen for the second premium. Why, then, does the Central Cottage Improvement Society refuse to pay Mr. Smith the premium, and wish to refer the matter to arbitration, which Mr. Smith declines? The truth is, we believe, that Mr. Smith's design cannot be carried out for the sum specified. At all events, we consider that he prejudices his case by refusing arbitration.

Baron Haussmann, who is generally supposed to exercise more power in Paris than even his imperial master the Emperor himself, is now popularly known, it appears, as Comte du Macadam. Would not Comte du Asphaltum be the more appropriate title?

Mr. Thomas Groom, tin-plate worker, Union-court, Holborn, took out a summons against the Corporation of London to assess the damages he had sustained by being compelled to remove his premises from Union-court to Liquorpond-street, in order to make way for the Holborn Valley Improvement. The claim had been reduced from £7,000 to £1,800. Alderman Hale fixed the award at £822, 10s., with £70 costs.

In the excavations at the West Dock Works, Hull, the navvies have come upon a stratum of dark soil, in which a number of trees in horizontal positions were met with. They are oak, and in excellent condition, and remarkably hard. Besides those interesting remains, a large number of acorns and hazel nuts were found, and some oyster and mussel shells. The discovery is the more interesting to geologists, seeing that the trees were found at a depth of about 19ft. below the water-line of the river.

MEETINGS FOR THE WEEK.

MON.—Society of Engineers.—"On the Most Recent Improvements on the Injector," by Mr. J. Gresham, 7.30.

TUES.—Institution of Civil Engineers.—The Annual General Meeting, 8.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

1018. H. BUSS. IMPROVEMENTS IN THE CONSTRUCTION OF SEA-WALLS, QUAYS, JETTYS, PIERS, AND ROADWAYS, &c. Dated April 5, 1867.

This invention consists in fixing firmly to the floor of a river or sea shore, or elsewhere, of two parallel rows of iron foot rails. The precise mode of fixing must depend upon the nature of the shore. The space enclosed between such foot rails is to be of the full width of the required sea wall. Each foot rail is grooved on its upper edge. Into this groove is run the tongue of an upright iron stile, which is also grooved at both its edges. Into the groove of the foot rails is run the edge of an iron plate panel, which is likewise slid into the groove of upright stile. These stiles and panels are kept together by top longitudinal rails, which are also grooved to receive the tops of the aforesaid panels and stiles. The stiles are secured both to foot and top rails by bolts or otherwise. Transverse and oblique rods connect together and secure the panel walls in position. These panel walls may be either vertical to the floor and parallel to each other, or inclined at any desired angle to each other. Panel and stile may thus be quickly added in succession after the foot rails are fixed, and the whole secured by internal appropriate framing for any desired length down to a low water mark. Finally, the space included between the two panel walls will be filled up with concrete. The filling up with concrete will keep pace with the advance of the iron panel walls, provision to be made if necessary for temporarily excluding the water at flood tide from flowing in at the open end, so that it may not interfere with the solidification of the concrete. *Patent completed.*

990. J. PICKERING. IMPROVEMENTS IN AN APPARATUS FOR RAISING WEIGHTS AND OTHER APPLIANCES. Dated April 3, 1867.

This invention embraces, among other features, arranging and constructing an improved apparatus for reducing the speed of motion less than the speed by which it is actuated, such apparatus being applicable to all machines where power is required. The patentee makes it in the following manner:—He uses a common chain pulley with sunken chamber in the periphery to receive the links of an endless chain; on one side of this chain pulley he fixes a crank pin or eccentric, and upon this crank pin or eccentric he fits a toothed wheel which is made to revolve loosely upon the said crank pin or eccentric, and is made to revolve with the chain pulley also, thus describing the sun and planet motion. This planet toothed wheel is surrounded with two other internal toothed wheels, which are each half the breadth of the former wheel. These two orbit wheels he makes with one or more teeth, different in number, but each fitted so as to allow the inner planet wheel to work therein. He secures one of these orbit wheels to the framework of the apparatus; the other runs loose upon the axle, and this axle is made to pass through the frame. When he uses this improved purchase to a pulley block he also attaches a second chain pulley on the axle, and fixes it to the loose orbit wheel. A chain is placed over this second chain pulley, which will be used to raise weights. The power is obtained by the motion communicated to the first-named chain pulley running on the axle, carrying round with it the toothed planet wheel, which gears into the aforesaid orbit wheels; the difference in the number of teeth in the orbit wheels gives a corresponding reduced speed to the second chain pulley. For a hoist he uses a drum of any required length in lieu of the second chain pulley. This drum will wind on the chain or rope in hoisting, and thus he makes a combination of hoisting block and winch. *Patent completed.*

983. J. MAHLER. IMPROVEMENTS IN COVERINGS FOR INTERNAL WALLS AND SURFACES. Dated April 2, 1867.

The patentee claims the manufacture of wooden hangings or coverings for walls and other surfaces in the form of long lengths, "pieces," or rolls, ready for application in the manner adopted for paper hangings, by joining together two or more lengths of thin wood veneer along a broken or irregular line, and strengthening such hangings by a backing of paper or woven fabric, as described. *Patent completed.*

1062. F. WALLER. AN IMPROVED SPRING FOR DOORS AND OTHER PURPOSES. Dated April 9, 1867.

This improved spring is constructed as follows, and for doors forms what is ordinarily termed a spring centre:—Round the stud or pin upon which the ordinary shoe of the door turns, and which is carried down into the spring box, the patentee fixes a block, the upper face of which is cam-shaped. A roller on one end of a lever bears upon the cam, and the other end of this lever is pivoted, while a link carried from about its middle connects it below to a spring preferably composed of a number of superposed plates. *Patent completed.*

1158. R. H. FRITH. IMPROVEMENTS IN DISTRIBUTING AND MEASURING GAS, STEAM, WATER, AND OTHER FLUIDS. Dated April 20, 1867.

This invention consists in combining the supply and distributing pipes in one, the same pipe which admits water from the street main into the house cistern serving also to distribute the water from the cistern to the house, or to outbuildings, as required. We cannot here give space to the details of the invention. *Patent completed.*

1147. W. KIRRAGE. AN IMPROVEMENT IN THE MANUFACTURE OF BRICKS AND OTHER MATERIALS WITHOUT THE AID OF ARTIFICIAL HEAT. Dated April 20, 1867.

The patentee claims the manufacture of a hard indestructible brick or other material by the use of sulphates of iron, or other metallic sulphates, together with the admixture of a compound of silica, as described, and in the manner stated; also the use of aluminas or clays as set forth in first part of the specification. *Patent completed.*

Trade News.

TENDERS.

BEDALE (YORKSHIRE).—For the erection of new brewery, offices, &c., for Messrs. Hy. Plews and Co., Bedale, Yorkshire. Messrs. Davison and Scamell, of London, engineers and architects. Quantities for buildings by Messrs. Curtis and Son, of London:—

A. Neill, Bradford	£5,025	0	0
J. Bullmer, Darlington	5,021	10	0
G. Simpson, York	5,014	0	0
D Hurworth, Darlington	4,881	4	0
T. Tasker, Leyburn	4,757	2	9
J. Drake and Sons, Normanton	4,540	0	0
Robinson and Marshall, Darlington	4,497	18	5
J. Kettlewell, Darlington	4,433	3	2
J. Jones, Leyburn	3,995	0	0
For brewing copper:—			
John Abbott and Co., Gateshead	£273		
Bennett and Son, London	252		
Henry Pontifex and Son, London	252		
Dickson and Welsh, Edinburgh	230		

DALSTON.—For building a colour factory for Messrs. Reeves and Sons, at Dalston. Mr. E. H. Horne, architect:—

High	£2,797
Turner	2,767
Browne and Robinson	2,480
Axford	2,735
Scrivener and White	2,361
Sewell and Son (accepted)	2,343

LONDON.—For alterations and additions to Gordon Lodge, Maida-hill, for Mr. A. H. Solomon. Mr. H. H. Collins, architect:—

Sale (accepted)	£1,000

LUTON.—For new Plait Hall, Luton. Messrs. Ordish and Co., architects and engineers. Quantities by Mr. Backshell, 17, Great George-street, Westminster:—

St. Pancras Ironwork Company	£6,987	6	4
Manley and Rogers	5,800	0	0
Lacey and Flaxman	5,618	0	0
J. R. Brown	5,240	0	0
W. Henshaw	5,188	0	0
W. Boucher and Son	5,128	0	0
J. Haywood	5,098	0	0
Smart Brothers (accepted)	4,840	0	0

MUCH WOOLTON (LANCASHIRE).—For the main sewerage works. Mr. Geo. Wm. Goodison, C.E., engineer to the Board. Quantities supplied by Messrs. Reade and Goodison:—

Byrnes	£16,970	0	0
Elliott	16,937	7	1
McGuire	15,970	5	9
Lee	15,250	0	0
Fegg and Co.	14,168	6	0
Dixon and Sleight	13,575	1	0
Hunking	12,917	2	10
Fawkes and Maude	12,489	14	9
Anderson and Sons	12,110	0	0
Standing and Little	11,918	6	4
Dowell	10,836	0	0
Thomas	10,241	8	2
Makinson (accepted)	9,625	18	0

PECKHAM RYE.—For the erection of a pair of villa residences for Mr. H. Lankford. Messrs. Berriman and Son, Wilson-road, Camberwell, architects:—

Shapley and Webster	£3,028
Wills	2,697
Fish	2,695
Perkins	2,694
Tarrant	2,658
Sharpington and Cole	2,555
Henshaw	2,540
Thompson	2,537
Janett	2,468
Marsland and Son	2,380
Westrope	2,357
Cook and Son	2,347
W. Dennis (accepted)	2,300

RICHMOND (SURREY).—For laying new channel, curb, and repairing the footpaths of, and approaches to Richmond Bridge, Surrey, for the Commissioners. Mr. J. Blore, surveyor:—

Munro	£1,050
Burt	1,035
Sims (accepted)	995
J. Long	869

SOUTHWARK.—For house and offices, Elephant-buildings, Newington, for Mr. E. H. Rabbits. Mr. W. Young, architect. Quantities by Mr. Nichols:—

Colls and Son	£2,370
J. H. Tarrant	2,276
W. Higgs	2,273
Rider and Son	2,260
W. Thompson	2,260
S. G. Bird	2,248

WANTAGE (BERKS).—For eight new almshouses in Mill-street, for the governors of the town charities, part of the old materials being re-used. Mr. J. P. Spencer, Wantage, architect:—

G. and J. Kent	£800
G. Haines	889
Wheeler and Gregory (accepted)	824
Partridge and Aldworth	804
Architect's estimate	850

WREXHAM.—For building a pair of villas in Grosvenor-road, Wrexham, Denbighshire, North Wales, for Mr. Evan Powell, ironmonger. Messrs. Hugh Davies and Son, architects:—

Parker	£2,450
Owen	£2,250
Rogers	1,848
Townsend	1,816
Bunn	1,735
Samuel	1,698
Roberts (accepted)	1,600

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots also Cost for Transit to any part of the United Kingdom furnished on application to Bath Stone Office, Corsham Wilts.—[ADVT.]

PROPERTY SALES.

DEC. 4.

AT THE MART.—By Mr. A. Booth.—The equity of redemption of five houses and business premises, Nos. 1 to 5, Amelia terrace, Seven Sisters-road, Holloway, annual value £245, term 99 years from Christmas, 1864, at £24 per annum—sold for £3,110.

Freehold plot of building land in Albert-road, Woodford—£140.

By Messrs. Fuller and Horsey—Freehold residence, No. 35, Surrey-street, Strand—£1,620.

By Messrs. Winstanley and Horwood.—Leasehold factory premises, Nos. 3 and 4, Bleeding Hart-yard, Charles-street, Hatton-garden, term 14 years unexpired, at £85 per annum—£180.

Leasehold residence, known as Rose Cottage, Sudbury, Middlesex, annual valve £50, term 12½ years unexpired, at £26 per annum—£80.

DEC. 5.

AT THE GUILDHALL COFFEE-HOUSE.—By Mr. H. E Marsh.—Freehold estate at Camberwell producing £599 2s. per annum, comprising 17 houses and shops in Southampton-street, four houses one with shop, beer-house, two plots of land, one with cottage thereon in Wells-street, and four houses in Cottage-green—sold in 28 lots, at prices ranging from £140 to £680.

Leasehold improved ground rent of £50 per annum (for 20 years) secured on houses in Southampton and Wells-streets, Camberwell—£460.

Leasehold two houses and shops, Nos. 121 and 123, Southampton-street, producing £44 per annum, term 20 years unexpired, at £10 per annum—£290.

Leasehold ground rents amounting to £27 12s. 6d. (for 19 years) secured on houses in Douglas street and Southampton-street—£180.

Leasehold house, being No. 135, Wells-street, Camberwell, let at £18 per annum, a leasehold ground rent of £4 per annum, secured on a piece of ground in Douglas-street, and yard and shed adjoining the above, let at £6 per annum, term 20 years from 1866, at £10 per annum—£145.

Leasehold three houses, Nos. 121, 123, and 125, Wells-street, Camberwell, producing £53 per annum, term 20 years unexpired at £10 per annum—£300.

Leasehold ground rents amounting to £46 1s. per annum, secured on houses in Douglas-street, Camberwell, term 20 years unexpired at £10 per annum—£300.

Leasehold eight houses, Nos. 1 to 8, George place, and the Comical Fellow, ale and porter store, No. 9, George-place, Camberwell, producing £155 4s. per annum, term 16 years unexpired at £30 per annum—£740.

Leasehold ground rent of £10 per annum, secured on a house in Park-street, leasehold house known as Wells Cottage, let at £32 per annum, and two freehold houses in Wells street, Camberwell, producing £44 per annum, term seven years unexpired, at £25 per annum—£530.

Freehold five houses, with leasehold gardens, situate in Wells-street, producing £116 per annum, term 7 years unexpired, at £30 per annum—£850.

Freehold ground rents amounting to £12 per annum, secured on houses in Wells street, and three freehold houses, with leasehold gardens, Nos. 128, 134, and 136, Wells-street, term 7 years unexpired, at £21 per annum—£700.

Leasehold improved rental of £60 per annum (for 15 years), arising from No. 65, Newington-causeway—£380.

Absolute reversion to 2-6th parts of £500 invested in a bond of the Mersey Docks and Harbour Board, expectant on the death of a gentleman, aged 73 years; also a policy for £1,000, effected with the London Assurance Company on the life of a gentleman aged 29 years—£115.

AT THE MART.—By Messrs. Rushworth, Jarvis, and Abbott.—Freehold property, known as the Windsor Theatre, Thames-street, Clewer, Berks—£1,030.

Freehold business premises, situate in New Park-street, Southwark, let on lease at £100 per annum—£3,300.

Freehold public-house, known as the White Bear, situate adjoining the above; let on lease at £60 per annum—£1,550.

Freehold house with cooperage, adjoining No. 18, New Park-street, let at £30 per annum—£850.

Leasehold factory warehouse, with stabling and residence, known as the Atlas Works, situate in Emerson-street, Southwark, producing £130 per annum; term, 61 years from 1842, if three gentlemen, aged 73, 74, and 64 years, shall so long live, at £30 per annum; also two policies of assurance for £500 each—£800.

Leasehold premises, comprising the offices of the Southwark and Vauxhall Waterworks Company, situate in Sumner-street, Southwark; let on lease at £50 per annum; term similar to above, at £30 per annum—£300.

Leasehold seven houses, Nos. 1 to 7, New Park-street, Southwark, producing £209 per annum; term 71 years from 1827, at £35 per annum—£1,350.

Leasehold six houses, Nos. 8 to 13, New Park-street producing £151 per annum, term 71 years from 1828, at £18 per annum—£1,130.

Leasehold business premises, No. 16 and 17, New Park-street, let at £115 per annum, term similar to above, at £12 per annum—£1,160.

Leasehold residence, No. 73, Penton-place, Walworth, let at £50 per annum, term 86½ years from 1799, at £6 per annum—£310.

By Mr. R. Reid.—Freehold premises, No. 19, Lincoln's-inn-fields, annual value £600—£4,230.

By Mr. A. Savill.—Freehold four tenements, with cart-house and stable, situate in High-street, Barking, producing £66 6s. per annum—£740.

Freehold three cottages, situate at Sam's-green, Ilford, producing £22 2s. per annum—£240.

Freehold residence, situate at Golding's-hill, Loughton, let at £12 per annum—£230.

Freehold two tenements and 6a. 2r. 25p. of land, situate at Lambourne, Essex, annual value £42—£900.

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

Joshua Kidd, Paul's wharf, Lower Thames-street, gas engineer—Henry H. Strick, Stafford-street, Lisson-grove, carpenter—William Driffill, jun., Lewisham, Kent, plumber—Richard Chatfield, Croydon, bricklayer, December 24, at 11.

TO SURRENDER IN THE COUNTRY.

William Orrin, Colchester, builder—Edward Simpson and Thomas Beck, Leicester, joiners—Luke Vincent, Thornford, Dorsetshire, carpenter—Joseph Martin, Liverpool, contractor—Henry Hickson, Sheffield, painter—Henry Evans, St. Mary-at-Pembroke Dock, mason—Goliath Hitchcock, Ilkeston, Derbyshire, stonemason—Richard J. Barnes, Denby, Derbyshire, mining engineer—John Barrett, jun., Luton, carpenter, December 24, at 10—James Farrar, St. Helen's, builder, December 23, at 11—Thomas Suddaby, Hull, bricklayer, January 8, at 12.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

January 23, G. Eames, Rickmansworth, builder—January 22, G. J Rollason, Birmingham, gasfitter—January 6, H Evans, Llantrissant, Glamorganshire, builder—December 12, H. Clay, Wednesfield, joiner—January 22, J. H. Naylor, Colchester, builder.

PARTNERSHIPS DISSOLVED.

S. Milnes, W. Radcliffe, and A. Kershaw Halifax, stonemasons—S. Deacon and T. Wood, Reading, engineers—Pinker and Stephens, engineers—R. and T. Barton, Edith-road, Peckham, builders—Higgings and Clark, contractors—Halket and Bates, Gateshead, nail manufacturers.

DIVIDENDS.

January 15, J. F. Matthews, Reigate, surveyor—December 23, J. Burton, Burton-on-Trent, plumber—December 23, F. Brown, Barton-under-Needwood, plumber.

SCOTCH SEQUESTRATION.

Peter Sinclair, Greenock, painter, December 17, at 12.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9 0	£10 10	Archangel, yellow ..	£11 10	£13 0		
Quebec, red pine	3 0	4 10	St. Petersburg, yel...	10 10	11 0		
,, yellow pine..	2 15	4 0	Finland	8 0	9 0		
St. John N.B. yellow	0 0	0 0	Memel.....	0 0	0 0		
Quebec Oak, white ..	5 5	5 10	Gothenburg, yellow	8 10	10 10		
,, birch.....	3 10	4 10	,, white	8 0	9 0		
,, elm	3 10	5 0	Gefle, yellow.....	9 0	11 0		
Dantzic oak	3 10	6 0	Soderham	9 0	10 10		
,, fir	2 0	3 0	Christiania, per C.,				
Memel fir	3 0	3 10	12 ft. by 3 by 9 in.				
Riga	3 0	3 5	yellow	16 0	22		
Swedish	2 0	2 5	Deck Plank, Dantzic,				
Masts, Quebec red pine	6 0	7 0	per 40 ft. 3 in.	0 16	1 4		
,, yellow pine..	5 0	6 0	PUMICE STONE pr ton	6 0	8 0		
Lathwood, Dantzic, fm	4 10	5 0	OILS, &c.				
,, St. Petersburg	6 10	7 10	Seal, pale....per tun	41 0	0 0		
Deals, pr C., 12 ft. by 2			Sperm body	110 0	112 0		
by 9 in., duty 2s per			Cod	36 0	37 0		
load, drawback 2s.			Whale, Sth. Sea, pale	39 10	0 0		
Quebec, white spruce	13 0	19 0	Olive, Gallipoli.....	67 10	68 0		
St. John, white spruce	13 10	16 10	Cocoanut, Cochin, ton	56 0	57 0		
Yellow pine, per reduced C.			Palm, fine	41 0	0 0		
Canada, 1st quality.	17 0	18 10	Linseed	34 15	35 0		
2nd do.....	11 10	12 10	Rapeseed, Eng. pale..	38 0	38 10		
			Cottonseed.....	34 0	40 0		

METALS.

IRON:—						
Welsh Bars in London .. ..per ton	6 7 6	6 10 0	3			
Nail Rod ..... do	7 10 0	7 15 0				
Hoops .. .. do	8 10 0	9 0 0	2½			
Sheets, Single ..... do	9 15 0	10 0 0				
Staffordshire Bars ..... do	7 10 0	7 15 0				
Bars, in Wales ..... do	5 15 0	6 0 0	3			
Rails ..... do	5 10 0	6 0 0	net			
Foundry Pigs, at Glasg. No 1 .. do	2 15 0	3 5 6	2½			
Swedish Bars ..... do	10 5 0	10 10 0	net			
STEEL:—						
Swedish Keg, hammered .....per ton	15 0 0	15 10 0	2			
Swedish Faggot ..... do	10 10 0	12 10 0	2			
COPPER:—						
Sheet & Sheathing, & Bolts ....per ton	80 0 0	82 0 0				
Hammered Bottoms ..... do	92 0 0	0 0 0				
Flat Bottoms, not Hammered .. do	85 0 0	0 0 0				
Cake and Tough Ingot ..... do	71 0 0	72 0 0				
Best Selected ..... do	79 0 0	80 0 0				
Australian ..... do	83 0 0	38 0 0				
Y. I. Metal Sheathing & Rods ....per lb	0 0 7	0 0 0				
ZINC:—						
English Sheet .....per ton	26 10 0	27 0 0	2			
Devaux's V. M. Roofing Zinc .... do	26 10 0	0 0 0				

* And 6 per cent. discount if laid upon the new system

TIN:—						
English Block .....per ton	95 0 0	96 0 0				
do Bar ..... do	93 0 0	97 0 0	2½			
do Refined ..... do	99 0 0	99 0 0				
Banca ..... do	94 0 0	95 0 0	nett			
Straits ..... do	90 0 0	0 0 0				
LEAD:—						
Pig, English .....per ton	21 10 0	0 0 0				
,, Spanish Soft ..... do	19 0 0	0 0 0				
Sheet, Patent ..... do	22 10 0	0 0 0	2½			
Sheet ..... do	20 10 0	0 0 0				
White ..... do	27 0 0	30 0 0	5			
SPELTER:—						
On the Spot .....per ton	21 0 0	21 2 6	net			
QUICKSILVER .....per btl	6 17 0	0 0 0				
REGULUS OF ANTIMONY						
French .....per ton	28 0 0	0 0 0				

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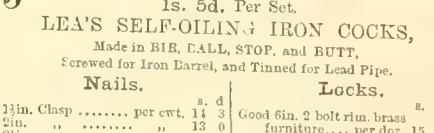
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THE BUILDING NEWS.

LONDON, FRIDAY, DECEMBER 20, 1867.

LEICESTER AND ITS CLOCK TOWER COMPETITION.

THE historical associations of Leicester, the treasures of mediæval architecture which the town still possesses—in spite of those three merciless thieves, civil war, "improvement," and "restoration"—and the still picturesque character of many of its streets, furnish us with reasons more than usually cogent why we should watch with anxiety the progress of modern art within this ancient borough. That a vast mass of highly interesting and instructive work has been "improved" away within the last few years no one who knows Leicester can doubt. Bow Bridge, over which Richard rode to the fatal field where the doom of the splendid line of the Plantagenets was irrevocably sealed, has been swept away, and its place is usurped by a paltry cast-iron structure of imitation Gothic, with trumpery shields emblazoned with bad heraldry. The bridge leading to the abbey is, while we write, suffering a similar transformation, and the cast-iron parapet, so mean and yet so pretentious, with its traceried panels of the proportions of stonework, is too contemptible to describe. Here and there, throughout the old parts of the town, charmingly picturesque houses—sometimes of half-timbered construction, sometimes of bricks—are passing into the catalogue of things that were, and ill-proportioned, ill-decorated buildings, savouring of nothing but that worst of all pretensions—a pretension to Early French Gothic—are rapidly assisting to improve out of existence the homely national English character of the place, not for the sake of importing a foreign style—which some may think from its scale more adapted to the wants and circumstances of the nineteenth century—but merely for the sake of committing, in fabric of bricks and mortar, that which, if executed in textile fabric, would be condemned by everyone as a "loud" vulgarity. The best of the old churches, too, are being restored. Mr. Raphael Brandon and Mr. G. G. Scott have severally left their marks—no small ones, by the way—on the churches of St. Martin and St. Mary, two buildings of the extremest interest to the architect as well as to the antiquary. Still the Leicester men and English folk generally have much left to be thankful for. The Jewry wall is carefully propped up, and appears to be thoughtfully looked after; the smaller churches have, for the most part, escaped, and we sincerely hope they may be lucky enough to continue to escape, the modern mania for restoration. Of the old brick boundary wall of the abbey, erected by Abbot Penny at the end of the fifteenth century, a great portion yet stands, admirably built, with large mortar joints and chequered work of black brick, a mass of glorious colours. The long low building used as a town hall, with its open timber roof, and the mayor's parlour adjacent, with its stained glass, amongst which can still be traced fragments of circular medallions illustrating the labours of the months (September, February, and June), in yellow stain upon white, are still, happily, unrestored and unimproved. A sixteenth century clock, of wood, with a canopy for its quarter bells, and two armed figures to strike them, yet remains over the west door of All Saints Church. Wigston's Hospital (*c.* 1512) has suffered but little from anything but time. The outline of the Norman hall of the castle and one gable, with the grand old windows well-preserved, remain; as do also the gateways of the inner and outer baileys, and not a few other fragments of mediæval architecture in other parts of the town.

In such a place as this we have thus hastily sketched the erection of any building must be fraught with some anxiety to the archæological world, and with scarcely less anxiety to the architectural student. When, however, the building is a public work to be erected from a design obtained through a public competition, the case calls for the most earnest attention. Although we do not propose to question the policy of municipal government, or quote the long list of thoughtless or obstinately ignorant deeds for which our old corporations are notorious, yet we cannot refrain from reminding the corporation of Leicester, and through them all other corporations, that they hold their office in trust to do the best for the town, and that they would do wisely to act sometimes with a trifle less confidence in their own judgment. It is too much to expect that every candidate for municipal honours should be an antiquary, much less that he should be able to appreciate the unambitious and simple character of English mediæval architecture, when so many architects in this day are urging him in a different direction; but we might expect him to listen to the protests repeatedly issued by learned societies anent the destruction of ancient buildings, to the memorials and opinions of such bodies as the Royal Institute of British Architects, the Royal Society of Antiquaries, the Archæological Institute, &c. It cannot be that he thinks the common object of such societies to be a mere fancy—a sort of pastime for gentlemen who have got no work to do? The names of some of the very hardest worked of our working men are prominent members of these societies, and are sufficient to stifle the thought. It cannot proceed from what old-fashioned people would call "the pride of the cobbler's dog?" It surely cannot be that the town councillor feels inwardly ruffled at being told by an outsider something about the value of his town and its contents that he did not know before, and there being no way to preserve the dignity of his ignorance, laughs down the very idea of an old building having any value beyond its rent value, and repels alike all prayers, all advice, and all warning, as insults to the dignity of what he delights to call his "ancient and honourable body." What, then, can it be? We cannot tell. Perhaps some of our readers may be able to explain how it is that art, and especially English art, ancient and modern, meets with little—we may add with no—reverence, or even sympathy, at the hands of the great bulk of Englishmen. That the most palpable counterfeits and the basest imitations of art should have currency is remarkable. And although we cannot but deplore the frightful results which obtain thereby, we gather a sort of hope that the tradition of art is still somehow with us, though cherished after a clumsy fashion, and put away in some bottom drawer for the use of another generation. Were it otherwise, such a melancholy spectacle as the exhibition of the designs for the clock tower at Leicester would have been impossible. It appears that about 100 designs were sent in for this work—a work which at the most could only bring its architect some £50. Out of this number three have been selected by a committee appointed for the purpose, and these now await the final judgment of the town council. They are—

No. 14. Messrs. Giles and Biven, London.

No. 6. Messrs. Millican and Smith, Leicester.

— Messrs. Goddard and Son, Leicester.

To these we add, after examining the residue, six others:—

No. 45. Messrs. Shenton and Baker.

No. 28. W. F. G. Jackson, M.A.

No. 9.

and "Well Considered."

Of the rest, *i.e.*, of 90 per cent., we scarcely know how to write. To use the ordinary phrase, and say they are beneath notice, is saying very little. The difficulty is to decide whether these ninety designs are all *bonâ fide* works, or whether some of our practising architects, who are fond of jokes and are adverse to gratuitous competitions, have contributed their opinion in the form of satirical drawings. For instance, in many designs it is not a question of bad proportion, or bad detail, or bad colouring. These things we expect from young architects more or less, but from no architect's pupil, not even his youngest; from no mechanic, not even the hardest handed blacksmith or roughest of quarrymen, could we have expected such a combination of wrongs. There are perspectives which could not be rivalled in badness if one tried for a week. Not only is every possible error committed, but things are done which we should have thought beyond the reach of human obliquity. If they are intended as jokes or satire, we feel they can serve but little use except to expose the profession to the ridicule of the Leicester people, who fail to perceive the joke or the satire. If they are not intended for this, and are to be taken seriously as the labours of serious men or boys, we can only say, most seriously too, God help them. Of the nine designs we have above noted, there is not one worth erecting anywhere, least of all in a town of such importance and of such grand associations as Leicester. The favourite design has a marked advantage over all others. Not only is it coloured better than its rivals, but it is a really good water-colour sketch, and we should like to know the artist who did it. Apart from this drawing, we have nothing to say in praise of Messrs. Millican and Smith. They have produced a design for a tower about 46ft. high, very like a stout chimney shaft, having an extended ground floor like all large chimneys, and a top which certainly looks as if it had a funnel within it. The detail consists of overloaded and badly-selected trimmings of cusps and panels, and pinched-up work. Four statues occupy the four angles at the base below, which are very weak, toy-like angle buttresses. The walls above the base are weak looking, because of their extreme thinness, and the geometrical drawings do not show in any part the work of a master. Style, Counterfeit Perpendicular. Messrs. Goddard and Son, who have no view, show a tower 60ft. high, with statues placed as last, only smaller, a sprawling church door, bad detail, and bad drawing. Style, Counterfeit Decorated. Messrs. Giles and Biven give us an octagonal shaft, just roomy enough for the clock-keeper to squeeze up statues as before, some very vulgar iron work to suspend lamps at the angles, a prettily coloured drawing, and some dumpy red granite columns. For a clock shaft, 62ft. high, this is a very fair design, barring the iron work and the dumpiness of columns, but it is not a clock tower. And now of the other six. If Messrs. Shenton and Baker had paid more attention to detail and sculpture, and how to design it to suit high positions, they would have produced a very good design, as well as a good drawing. As it is, we prefer their work to any of the three selected, and cannot think by what strange fatality they were rejected by the committee, seeing, too, that they are Leicester men.

Early French—very simple, honest work; a little faulty in the philosophy of its construction, and unsuited to Leicester. But it is a clock *tower*, and not a chimney-shaft nor a pedestal.

and Mr. Jackson send very fair designs, though not quite what a Leicester clock tower ought to be. In No. 9 we have a Classic design, as is also an alternative design by "Well Considered." Both of these Classic designs exhibit better architecture, and

greater knowledge and more feeling than any of the Gothic designs. If "Well Considered" would not mind being advised we would warn him to eschew the violent yellow colour which afflicts his otherwise admirable drawings.

Finally, we would warn the town council against the flattery of the water-colour artists. We would ask them not to be too confident in their own judgment or their local judges of art; and we would suggest that when next they wish to erect a public building it would serve their purpose better (presuming that purpose is to do the best they can) to give a fee of £20 to each competitor, and select half-a-dozen architects who might be willing to compete from amongst those whose works show not merely that they possess the knowledge necessary for an architect, but that they also have a reverence for the past that would be sure to prevent them from acting out of harmony with those ancient works which form, *per se* and by association, the chief value and the main glory of such a town as Leicester. Of course, in making this selection, the local architects should not be forgotten on any account. *Pari passu*, the local architect is the fittest man. It may be doubted whether he keeps equal step with his London brethren, or, indeed, whether it would be possible for him. For, in these days of railways and telegraphs, the good local architect, who can in any way cope with the London architect, soon changes the country for the town. Until municipal affairs take a similar direction it would be better for the authorities in country towns to remember this.

LIVERPOOL LABOURERS' DWELLINGS COMPETITION.

THE offer by the Liverpool Corporation of a premium of £200 for the best plans for laying out a site for dwellings for the working classes, has elicited a large response as to quantity, if not as to quality, of designs, more than eighty being exhibited, of various degrees of merit and demerit, and a large number of them possessing so strong a family likeness as to plan and arrangement that discrimination would be difficult but for the mottoes and the various styles of "getting up." The mere problem of laying out the site with suitable and convenient buildings would present no insuperable difficulty were it not complicated by the financial question of outlay and return, the satisfactory solution of which was, we apprehend, one of the main objects in offering the premium. A large proportion of the competitors, however, have, like Peter Pindar's celebrated penitent, "boiled the peas"; they have discovered that figures are things easily cooked (on paper), and the diversity of creeds in this matter is really amusing, from that of the modest gentleman who, under the signature "Multum in Parvo," offers us a site crowded with buildings for the sum of £8,343, with a rental of £631, up to the golden promises of Mr. G. Grayson, who sends in a very symmetrical plan with a very large interior court and lofty elevations, at a cost of £28,000, for which we are promised a clear return of 10 per cent., which the author thinks is "by no means a bad speculation"—an opinion in which the Corporation would, no doubt, heartily coincide, but, unfortunately, the alchemist has not given the details of this wondrous transmutation of bricks and mortar into "gold of Ophir." The methods of laying out the site, which is an oblong parallelogram of about 2 to 1, may be broadly grouped under four heads—the longitudinal court, with a block of buildings down each of the longer sides; the cross-court plan, with parallel blocks running across the site, and divided by courts; the quadrangle plan; and the pavilion plan. Of these, the second is decidedly the best for attaining through ventilation, as there is a wide street adjacent to each of the longer sides of the site, while the ends are comparatively blocked up by contiguous buildings, so that a longitudinal court, unless so broad as to involve great waste of land, must be very much shut in. Many of the competitors, however, have been carried away by the desire after a long street elevation, for it is possible, by the aid of strong shadows and a fierce sky, to make even model cottages look sublime in a perspective view. In No. 3, "Verité sans Peur," the absurdity has been committed of throwing back the two longitudinal blocks 15ft. or 20ft. from the main streets on each side, thus reducing the central court to a mere alley, which, by way of further preventing ventilation, is covered by a glass roof, the space between the building and the street on each side being absolutely thrown away. No. 4 (Mr. C. H. Howell) is a carefully prepared and well-considered plan—a long quadrangle, the cross block at each end being devoted to laundries, washhouses, and baths; the external walls to be of 14in. brick up to first floor, and above that of cement in two thicknesses, with a 2in. space between; the partition walls of rooms to be of 4½in. brick (contrary to the Local Building Act), with iron door frames for greater stability. There is a staircase to every two sets of dwellings, the author thinking, with Mr. G. E. Grayson, that external communication galleries are to be eschewed, as shutting out light from the windows. Ventilation of each room is carefully provided for, and staircases and passages are fireproof. There seems rather a deficiency of water-closets, the arrangement of which forms one of the chief difficulties in this class of buildings, and most of them are only attainable through the sculleries, a defect which meets us in several of what are otherwise the best-arranged plans. The external aspect shows nothing special beyond a laudable endeavour after a skyline; the building would never have the effect which the well-coloured perspective gives it. The figures show an expenditure of £20,750, with a return of 7½ per cent., which seems nearer the mark than some other calculations.

"Economist" (No. 16) has not economized paper and stretchers, and makes a great show with two designs, differing chiefly in elevation, and arranged in *three* longitudinal blocks, which reduces the intermediate courts to a minimum, the light being further obstructed by galleries of communication on each storey. The centre block is appropriated to lodgers, male and female, a large day room being provided for each class, and laundries and washhouses under. The living rooms of the outer blocks are towards the narrow courts, and bedrooms towards the street; the elevations pretentious, without being effective; and the whole thing will certainly cost half as much again as the author's estimate. Mr. Rollett (No. 20) proposes a new and cheap method of construction, consisting of brick on edge, liberally grouted with cement, to be applied both to walls and floors; but he gives no section of the construction of the latter, and even the financial success of his scheme would not atone for the direful ugliness of the elevation. As a contrast, let us mention the drawings by Messrs. Habershon and Pite, most effectively got up, though not laboured, and showing an elevation really pleasant to look at, though produced by the most simple means; for, as the authors remark, "the materials are local brick and stone, the effect being acquired by proportion, not by ornamentation"—words which it is refreshing to read, showing, as they do, a perception of the true method of bringing buildings of this kind under the denomination of *architecture*. The plan, though very symmetrical and well considered, covers too much ground; the quadrangles are too small, the entries narrow, and we do not think the sculleries common to two or three dwellings, as here arranged in blocks between the courts, would work well in practice. Messrs. Lucy and Littler send a very original and clever plan, arranged entirely on the pavilion system, which, however, we beg to say, is *not* "equally applicable to a larger or smaller plot of land," inasmuch as, in their own plan, the various blocks approach so near each other at the angles as to mar the effectiveness of the system; while the assertion that an arrangement entailing so much external walling is "economical" is still bolder. The various blocks, however, are very compactly and carefully planned, and a small area or yard, upon which the scullery opens, divides each water-closet from the house, and gives it an external ventilation; while the open squares between the blocks (to quote from the very well written report) "would prove of far greater value to the inhabitants of the dwellings than if the same area were appropriated as walled-in back yards," a process carried to excess in one or two of the plans submitted, which are a complete congeries of back walls. The authors' estimate of rental (£696) is, as they say, under the mark; but their estimate of the cost, eleven thousand odd, is surely much more so.

Mr. G. E. Grayson, who states that he "has strictly conformed to the requirements of the Building Act, but that this has been done in several particulars to the disadvantage of his plan, both in a sanitary and constructive sense," shows three alternative plans, A, B, and C, with very plain but sensible elevations of brick, relieved by black stringcourses; all the drawings very neatly got up. A is a longitudinal court plan; C a cross-court plan; B is partly on the cross-court and partly on the pavilion system. B is, on the whole, the best plan, and, according to the author's figures, yields the best percentage (7, as against 6½ and 6¾ from the other two plans). There is a separate staircase to each two sets of dwellings. In design C the end courts are laid with gravel to form a drying and playground; but there is no laundry accommodation, and apparently no special provision for ventilating; and the water-closets are not sufficiently isolated, and open through the sculleries. In plan A a children's playroom and washing and drying rooms are provided in the top storey; but we have found from experience in a similar case that there is a reluctance on the part of the tenants to take the trouble of transporting the clothes up to the attic, and that a washhouse so situated generally results in the washing being done in the kitchen or living room. Mr. G. Williams (No. 46) has done better in placing a series of washing and drying rooms in the two end courts on ground floor (this being also a cross-court plan). Mr. Reeve's plan (No. 47) ought, we suppose, to be spoken of respectfully, since it is the one recommended by the Committee for the approval of the town council: for what reason we know not, unless that there is no novelty in it, and it may, therefore, be considered "safe." There is a centre quadrangle with court, divided on each side by a cross street from the two end blocks, the houses in which latter have each a separate staircase taken out of the living room in the old-fashioned manner. There is no special provision for washing, drying, dust-shafts, or ventilation; and the elevation shows the most commonplace treatment, the window-heads being all formed by that abominable constructive—or, rather, *non*-constructive—expedient, the flat arch, which crops up in many of the inferior designs, but which ought to be as an accursed thing to any man calling himself an architect. The calculations show a return of a little over 7 per cent., but about one-fourth should be added to the estimated cost. Certainly the decision puzzles us; but in the multitude of counsellors there is safety—for the counsellors.

Messrs. Reade and Goodison (No. 49) have evidently gone in to win, but their drawings are chiefly remarkable for their large size and careful finish. The buildings are in two main longitudinal blocks, with a return at each end devoted to ash shafts and water-closets, which, in a sanitary point of view, is commendable, though on other grounds we doubt the advisability of this arrangement of water-closets in buildings intended for what must be called a low neighbourhood. There is a communi-

cation gallery carried right round the quadrangle, but a great deficiency of staircases, and the ground floor water-closets project as a lean-to from each dwelling, with the door close to the window of the living-room. The elevation is entirely without character; in this, how different from the design No. 48, (oddly distinguished by a postage stamp in the corner), charming in its simple and picturesque treatment, and beautifully drawn, but unfortunately, only offering a return of from 6 to 6½ per cent., so that we must set it down as a failure. The position of the washhouses in the centre of the quadrangle does not seem desirable. No. 53 shows a very effective external design, but far too elaborate and expensive for the purpose, and it is odd that Mr. Crofts, who is a Liverpool man, should not have known the neighbourhood better than to suppose that a rent of seven shillings a week could be regularly obtained from that class of property. Even with his high rental, however, he can only promise *nearly* 6 per cent., which will scarcely tempt anyone. Messrs. Longson and Adams (No. 60) place their houses in a collection of small blocks with yards and out-buildings, leaving no open space anywhere; the drawings are well got up, and there is a clever contrivance for utilizing the iron supports of the external galleries, which are made hollow and used as ash shafts and soil pipes, an iron double water-closet being placed along the edge of the gallery at intervals; but we do not like this prominent position (opposite the front of the dwelling) for a water-closet, and these sort of patent contrivances are expensive and apt to get out of order. Mr. J. Birch, who gained the Society of Arts' prize for a design of this class, sends two alternative plans A and B, the first in longitudinal blocks with washhouses and baths in centre court, decidedly too expensive, and not very well arranged; there are no sculleries anywhere, but in the best class of rooms a sink in a dark corner removed from the window. B consists of detached blocks arranged in the form of a quadrangle, and is somewhat cheaper than the other, but the estimated rental of £2,406 (more than 11 per cent.) is too good to be true. The elevation is pleasing and well drawn, but not so architectural as Messsrs. Habershon and Pite's. We may notice, in closing, the plan by Mr. Newlands, the borough engineer (not submitted in competition), which shows three sides of a quadrangle, the fourth side open towards Sylvester-street, with galleries of communication round, and staircases well and effectively placed in the re-entrant angles. The plan, for convenience and economy of space, is equal to most in the room, and the large quadrangle, entirely open at one side, and with an ornamental lamp in the centre, is a capital feature, both as to appearance and healthfulness. Special provision is also made for due ventilation of the water-closets.

We have noticed what appeared to us the best of the plans exhibited: some of the others were good, but presenting no novel or noticeable feature; and not a few, we are bound to say, were simply rubbish. One point we would press upon those who undertake to design model cottages—viz., that while every effort should be made to render them, as far as possible, pleasing objects, and not mere lumps of brickwork, this is to be done by the treatment and disposition of the solid materials, of which the building is, or ought to be, composed, not by sticking on vulgar and tawdry bargeboards and pinnacles; that nothing is so repulsive as a building of this humble class aping its more expensive neighbours, or hiding its plainness under a garniture of sham pilaster and cornice; and that the simplest building may take rank as architecture if it display character and breadth of treatment. No. 40, "Labour," in addition to one or two others we have named, gives an instance of this truthful style, and furnishes a remarkable contrast to such pieces of gimcrack as that by Messrs. William and Wallis (26), or Messrs. Green and Parslow (62), and others we could name.

THE PHOTOGRAPHS OF THE ARCHITECTURAL PHOTOGRAPHIC ASSOCIATION.

THE photographs of the Architectural Photographic Association are issued early enough this year for the collection in its neat portfolio to be regarded as one of those things "suitable for a Christmas present." Again, we have to congratulate the Association on their labours, and particularly Messrs. Cundall and Fleming, on the success which has attended their part of the work, beset as it was with so many difficulties. In some respects the present collection is better than the last. We have not now to complain of too many views of the same subject; there is nothing quite so bad as last year's view of St. George de Bocherville, and we are not compelled to feast entirely upon churches. At the same time, it would be as absurd to say that this year's photographs were as good and as interesting as last year's collection, as it would be to assert that the churches at Boppard, Munster-maifeld, or Treves, were as good and as interesting as those at Chartres, Poitiers, or Civray. To the architect who is hard up for ideas, the less important examples of the architecture of the Rhine provinces will, however, be more useful than the rich portals of Chartres which he cannot afford to repeat, or the storeyed front of Civray, which he cannot understand. In some remarks which I offered on the last issue,* I took it for granted that the work of this Association was primarily for the help of the art student, not for the gratification of the art critic, nor the archæologist, nor the amateur, and that until cathedral building became the order of the day, it would be better to select subjects somewhat akin to present needs instead of the grand portals of huge cathedrals. If, then, any disappointment be felt owing to the simplicity and limited scale of the subjects in this year's issue, and blame be forthcoming, it should fall in the right direction, and not altogether upon the committee. That there will be disappointment I have no doubt, for if you *begin* to feed upon the rich confectious which are usually rightly placed at the end of the feast, you will not take kindly to the simple and easily digestible food which you so much more require. Had the Association kept its mince-pies and its almond covered cakes of 1863 and 1866, the cutlets and bread which they now offer us would have been received with larger thanks, and without any sense of disappointment. Let us now see what these cutlets and bread are like. There are altogether twenty-two photographs; of these, eight are general views of churches, eight illustrate parts and details of churches, four are views of domestic buildings, one is a view of a ruin, and one a fountain, &c. The churches illustrated are those at Limburg, Treves, Munster-maifeld, Boppard, Andernach, and Laach Abbey. The domestic buildings are Schloss Elz, the Porta Nigra, at Treves, a half-timbered house at Rhense, and one at Boppard; the interior of the apse of the ruined abbey church of Heisterbach, and the fountain of Sayn, &c. Do you ask what "&c." means? It means a background to the fountain composed of the west front of the ugliest of churches, redeemed by a full-length portrait of Mr. J. P. Seddon artistically posed upon some stone steps, and apparently in the act of sketching. I propose reviewing these photographs in the order above given:—

Limburg—On the Lahn. This cathedral is illustrated by two photographs—an exterior view of the west end, No. 5, taken just one point to the north, and an interior looking east (No. 6), taken at a level about half way between floor and roof. These are quite enough to show that the Cathedral of Limburg, as a piece of architectural composition, is far beyond any other building in the collection, and yet it is only illustrated by two views. As I asked last year respecting Lisieux, so I ask this year respecting Limburg,—why could not the photographers have been content to remain at Limburg instead of spending their time on such dreary work as the subjects from Boppard, or such vapidities as those from Treves, shown in Nos. 11, 14, and 15. Here at Limburg we have a cathedral which in size and scheme is in every way suited to the wants of the present day. It measures only about 180ft. by 75ft., and yet it possesses all the dignity of the most complete minster. The arrangement of the transepts, with their large angle turrets growing out of a solid basement, is full of breadth and vigour. The plan is compact, and grandly simple, and the style of architecture (first half of the thirteenth century) is not less praiseworthy. In fact, this is just one of those examples which ought to have been photographed from every available stand-point—east, west, north or south. Nor is it merely in proportion and composition that the cathedral of Limburg excels. The interior views show us most admirable though simple detail, both in carved and moulded work, and the idea not merely of gradation, but of growth which its architect cherished, and which unquestionably every architect must cherish if he would have his work instinct with vitality.

Treves.—The Cathedral and the Church of Notre Dame attached to it form, with the cloisters and buildings adjacent thereto, one of the most interesting archæological studies in Europe. To attempt any description would take up far too much space. Anyone can see from the plans and the short notice in Mr. Fergusson's "Handbook of Architecture," that to describe such a group of buildings would involve a retrospect of no less—and probably more—than fifteen centuries. To the architect, as distinct from the archæologist, we doubt the wisdom of publishing three general views and four other subjects from a group of buildings which, however attractive to the antiquary, can scarcely be said to be fit models for that critical study which sooner or later must supersede mere antiquarianism. I have no wish to disparage the value of associations, whether they belong to the time of Constantine or later, but no amount of association can excuse the publication in these days, by an architectural society, of subjects the like of which—only incomparably finer—we have already had published almost *ad nauseam*. Take, for instance, No. 9, the west doorway of the Church of Notre Dame. Can anything be worse than the composition of the figures in the tympanum, or the want of scale and proper gradation in the five rows of small figures which jag the curves of the arch? The east doorway, No. 11; the arches, Nos. 14 and 15; and the cloisters, shown in No. 13, are as bad as any modern work with which I am acquainted. We must, however, be thankful for the glimpse we get of the late Romanesque apse in No. 13 c 1190, and the view of the apse of Notre Dame in No. 12 (c 1230). The interior of the Cathedral, No. 10, and Nos. 11, 14, and 15, may be of value to subscribers, but I confess I am unable to appreciate them.

Munster-maifeld.—This church is shown to a large scale, and the view is taken from the south-east. The west end is Romanesque, the choir Transitional, and the body of the church atrocious Geometrical Gothic. The east end of the choir, which is polygonal, is the chief feature of the photograph. Each side of the polygon is gabled, and the roof is treated upon the ridge and furrow principle, like the turret roofs of the Romanesque churches at Cologne. On a small scale, and at a great distance, the furrow or sunk portion of the roof, if properly managed, has not a bad effect, but on a

*BUILDING NEWS, February 22, 1867.

large scale, as in the example before us, it looks both tricky and awkward. The church may be curious, but there is nothing to learn from it.

Boppard.—This photograph shows the east end with its polygonal apse and flanking towers, the tops of which latter are, unfortunately, out of the plate. Had this not been the case, we might have had a picture which is always wanted when there is no architecture worth looking at.

Andernach.—No. 22 shows the upper part of the apse, and Nos. 3 and 4 the carved capitals of the south doorway. These are eminently useful illustrations, although it may be questioned whether our carvers would be any the better for possessing the details. To an architect they are suggestive, but their crudenesses might do harm to the carver, and their suggestiveness might have been obtained with a less expenditure of collodion. The apse is not only one of the best of the Rhenish apses, but is illustrated by one of the best photographs of the series, the detail of everything being wonderfully clear.

Laach.—A north-west view of the abbey church, seen over the roofs of the atrium parvis or western cloister, is given in No. 7, and in No. 16 we have the entrance to the cloister. This building was erected in the first half of the twelfth century, is of one Romanesque style throughout, and is one of the most complete churches in Christendom. It has a western as well as eastern apse, a square tower at the west end, western transepts joining it to two flanking circular towers, a nave of five bays, then the great transept, and over the crossing an octagonal lantern, and two small square towers in the angles formed by the choir and transepts. If the detail of the architecture were only as good as the completeness of the arrangement, and the upper part of the structure as thoroughly thought out as the ground plan and some of the carved work, this abbey church would be an extraordinary gem.

Schloss Elz.—The photograph of this baronial residence is marked No. 1. As a picture it stands alone, and as a photograph I know no better in the publications of the Association. I presume that the lovely position and the piled-up picturesqueness of Schloss Elz are to be accepted as its chief attractions, although it is not without its architectural lessons. Thus the way one of the turrets changes in plan and overhangs in three machicolated courses, is worth studying; as is also the management of the chimney near it with its abutting roof and buttresses.

Porta Nigra, Treves.—No. 8. Interesting, no doubt, to the antiquary, and useful to architects practising on Dartmoor or at the Land's End.

Rhense.—The old half-timbered house shown in the photograph No. 19 is not more interesting than hundreds in Cheshire and Herefordshire. A circular staircase, just visible over the doorway, and an angle turret, are the only facts worth any record.

Boppard.—Another specimen of the same kind of construction is shown in No. 21. But in this case the long horizontal lines of the moulded beams and the simplicity of the framework give to the building a certain amount of breadth, if not dignity, which may prove suggestive to the lovers of square-headed openings and sash windows.

The Interior of the Apse of the Ruined Abbey Church of Heisterbach, shown in No. 2, is a good plain example of the use of pointed and semicircular arches in the same composition, and of what may be done by good proportion, unaided by clustered shaft or moulded architrave. In saying this, however, I am not prepared to defend all the proportions, for some of the minor divisions are unquestionably too lanky.

The Fountain at Sayn, No. 17, is certainly interesting: it is just the sort of effective inexpensive article anyone might erect in his courtyard or garden. The full-length portrait in the background is even more interesting, but the other half of the photograph is rubbish—not merely rubbish, not merely bad by itself, but so utterly bad that it covers fountain and "full-length" with its ghastly gloom, and induces one to pass the photograph by before one has caught sight of its two great attractions.

Lastly, if any of my readers wish to make a selection, and are unable to see the entire set, I would advise them to make their selection in the following order, so that, if they only wish to select four, the numbers would be 5, 6, 22, and 1:—

No. 5. Limburg Cathedral, west front.
" 6. Limburg Cathedral, interior.
" 22. Andernach Church, apse gallery.
" 1. Schloss Elz.
" 21. Boppard, old timber house.
" 2. Heisterbach Abbey.
" 17. Sayn, Fountain.
" 13. Treves Cathedral, east apse and cloisters.
" 12. Treves, Church of Notre Dame, east apse.
" 9. Treves, Church of Notre Dame, west doorway.
" 10. Treves Cathedral, interior.
" 18. Munster-maifeld Church.
" 7. Laach Abbey.
" 16. Laach Abbey, west entrance.
" 20. Boppard, Church.
" 8. Treves, Porta Nigra.
" 19. Rhense, old house.
" 15. Treves Cathedral, detail.
" 11. Treves, Church of Notre Dame, east doorway.
" 14. Treves Cathedral, detail.

EDWARD W. GODWIN.

ELEMENTS OF ENGINEERING.

I.—CONTINUOUS BEAMS.

WHENEVER the breadth of the intervening space to be crossed by a bridge is so large as not to be capable of being accomplished in one span, it becomes necessary to erect a certain number of intermediate supports or piers, so as to subdivide the total distance between the abutments into several smaller spans. We are not at present concerned with the substructure. It is the superstructure which claims the attention of our readers. Manifestly there are two principal methods of effecting the superimposition of the beams or girders which serve to carry the load, and for the moment let us confine our attention to the simplest case of continuity that can arise, in which the bridge consists of two spans only, being composed of two abutments, and one intermediate pier. In fig. 1 this arrangement is represented, and

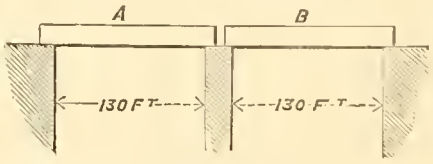


FIG.

the girders are shown placed upon the supports independently of one another, that is, having no connection or junction over the intermediate pier, which is supposed to divide the total distance from one abutment to the other into two equal parts. The two spans being thus equal, the beams are perfectly similar in every respect, and are each of them designed and constructed in precisely the same manner as if only one were employed for a bridge of half the total span. A glance at the cut will point out that the action of any load, whether rolling or fixed, static or dynamical, upon the beam A will not produce the slightest effect upon the beam B. Its action will be altogether confined to the girder, it is bearing upon for the time, and when it leaves it, the beam will return to its normal condition. Consequently, if the dimension of each span in fig. 1 be 130ft., the girders will be designed upon the assumption that individually they cross that span, and that span alone. Dismissing this preliminary alternative, we find in fig. 2 our first and simplest

FIG. 2.

example of the continuous principle as applied to beams. Instead of the whole distance being crossed by two independent girders separated from one another over the central pier, the two spans are virtually made one, so far as any break in the superstructure is concerned, by uniting the two beams together at their junction at the intermediate support. That such an arrangement gives greater strength and security every carpenter is well aware of. He knows perfectly well that if he can put a central support under a long joist he may diminish the depth that would otherwise be required, were it necessary to make the joist stretch the entire length without any such support. In other words, it takes less material to compose a beam or girder, for the rule holds good for large bridges as well as for small timber joists, when placed as in fig. 2., than as in fig. 1. This is one of the advantages of the continuous principle which is particularly manifest, when the load is uniformly distributed and fixed: less so when it is movable and irregular, and least of all when the latter description of load bears a large proportion to the insistent weight of the superstructure. As will be seen hereafter, the manner in which the load acts is sometimes so unfavourable as almost to nullify the compensating benefit obtained by the adoption of the continuous principle. Where, however, the rolling load is small compared to the dead weight of the bridge itself, the continuous system loses little or nothing of its practical and economical value.

Considering, therefore, the continuous beam in fig. 2 to be supported at three points—namely, the two abutments and the intermediate pier, we will investigate the particulars in which it differs from a single independent girder, similar to one of those represented in fig. 1. First, with respect to the nature and position of the greatest strain, resulting from the action of a load uniformly distributed over the whole length of the beam. Fig. 3 shows a single span girder,

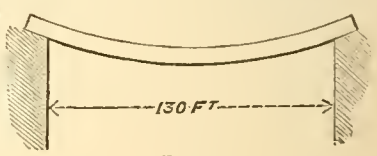


FIG. 3.

deflecting under the weight of a load as above described, and the position of greatest deflection, and also of greatest strain, will be at the centre of the span. Putting S for the value of this strain, calling the load per foot run W, and making L = the span of the girder, we have from the well-known laws of mechanics, $S = \frac{W \times L^2}{8}$. Comparing this with the position of the greatest strain in a continuous girder of two spans, a very wide difference will be at once apparent. Let fig. 4 represent a continuous beam under the influence of a uniformly distributed load, and under similar conditions to those attending upon an independent single girder. In the first place, the deflection will assume a different appearance to that occurring in fig. 2. It will no longer be uniform either in amount or direction, but will descend down to a certain point, and then rise again. The points A B, where the curve ceases to be convex and becomes con-

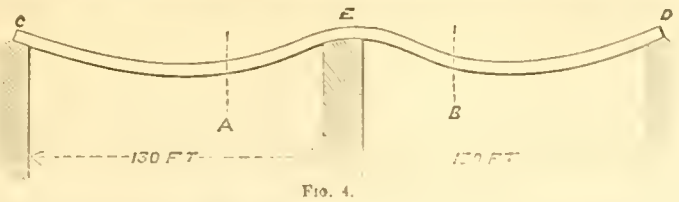


FIG. 4.

cave, are usually termed the points of contrary flexure, and are one of the distinguishing characteristics of the principle of continuity. To determine the greatest strain, we may commence at C, taking into consideration only one opening at a time, for the other will undergo similar changes. At C the strain is equal to zero, or rather it commences there, and gradually increases towards the middle of the beam. On reaching within a short distance of the centre of the span, it commences to decrease until it arrives at the point of contrary flexure, where it again equals zero. After passing this minimum it undergoes a fresh augmentation, and reaches another maximum over the intermediate support at E. The greatest strain takes place, not in the centre, as we have shown to be the case with a single girder of one span, but at a short distance from it, which will be determined hereafter. Employing the same notation as before, we have the expression for the maximum strain $= \frac{W \times L^2}{14{\cdot}16}$, instead of the above $\frac{W \times L^2}{8}$. So far as the maximum strain in the spans, therefore, is regarded, there is economy in the employment of the continuous principle, since it is reduced in the proportion of $\frac{1}{1{\cdot}77}$. At the same time a strain is evidently produced over the pier E by the reaction of the two openings upon one another, and in the case of two spans, as shown in fig. 4, it is equal to that produced at the centre of an independent girder, or equal to $\frac{W \times L^2}{8}$. In all instances of comparison, the values given to the letters in the equations must be identical for both descriptions of beams, or the results will not be a fair criterion of their respective merits. It has been found that the position of the maximum strain in the beam in fig. 4 occurs not at the centre, but at a distance from C equal to $\frac{L \times 3}{8}$. This distance, it must be kept prominently in view, only holds for a load uniformly distributed, and varies within certain limits with the position of the load upon the bridge. It is, therefore, easy to understand how a large rolling load may affect the economy of this principle of construction by shifting the points of maximum strain, and also those of contrary flexure nearer the centre support.

In a uniformly distributed load the points A B of contrary flexure are constant, and the distance A E or E B equal $\frac{L}{4}$, and their advantage consists in virtually reducing the span of the bridge, which is no longer equal to L but to $\frac{3 \times L}{4}$. Instead, therefore, of designing the beam C E in fig. 4 as a beam of a span of 130ft., it is treated as one of 97·5ft., and the remaining portion of the span 32·5ft. in length is considered in the light of a cantilever. Our last articles upon "Elements of Engineering," contained full information upon the subject of cantilevers, so we shall not recapitulate their particular features. The continuous bridge represented in fig. 4 may be regarded as virtually consisting of two independent girders and a couple of cantilevers, which are not to be considered as having any connection with one another, but are to be proportioned and designed as if they were altogether independent of one another. There is another point to be noticed with respect to the comparison between fig. 3 and fig. 4, and that is the difference in the amount of their respective reaction over the abutment. The reaction at the abutment of a single beam is equal to $\frac{W \times L}{2}$, but that of the example in fig. 4 is only equal to $\frac{3 \times W \times L}{8}$, or an eighth less than that in fig. 3. Over the intermediate support of the continuous beam the reaction is equal to $\frac{5 \times W \times L}{4}$, or this last may be easily found as follows. Let the reaction at each abutment equal R; put R' for that over the pier; then, bearing in mind that the whole load upon the bridge equals $2 \times W \times L$, we have $R' = 2 \times W \times L - 2\,R$. Substituting for R its value $\frac{3\,W\,L}{8}$, we obtain $R' = 2\,W\,L - \frac{3\,W\,L}{4} = \frac{5\,W\,L}{4}$, the result given above. It is at the points A and B of contrary flexure that the girder and cantilever portions of the bridge are supposed to unite, and when the bridge is designed for a large rolling load, care must be taken to place these points so that they are adapted to meet the maximum variation which is likely to occur. A very nice adjustment is sometimes necessary, more especially when the example becomes more complicated, and the spans are unequal in length, in order to effect this desirable arrangement. We have hitherto considered the simplest case of the continuous system that could be selected, but in our next, now that we have elucidated the principles governing their application, we shall proceed to the more difficult and intricate examples of this method of construction.

RAMBLES IN THE RHINE PROVINCES.*

"NO attempt has been made to render the present work deep or scientific." We should have thought that this announcement, which occurs in the preface, was quite unnecessary. We opened the book at random at three places, and these are the sentences which saluted us:—

Page 3.—"It was certainly fortunate for the reputation of the patriarch Job that he never had to try his hand at photography in the streets of a city, or I fear even his patience would have been exhausted."

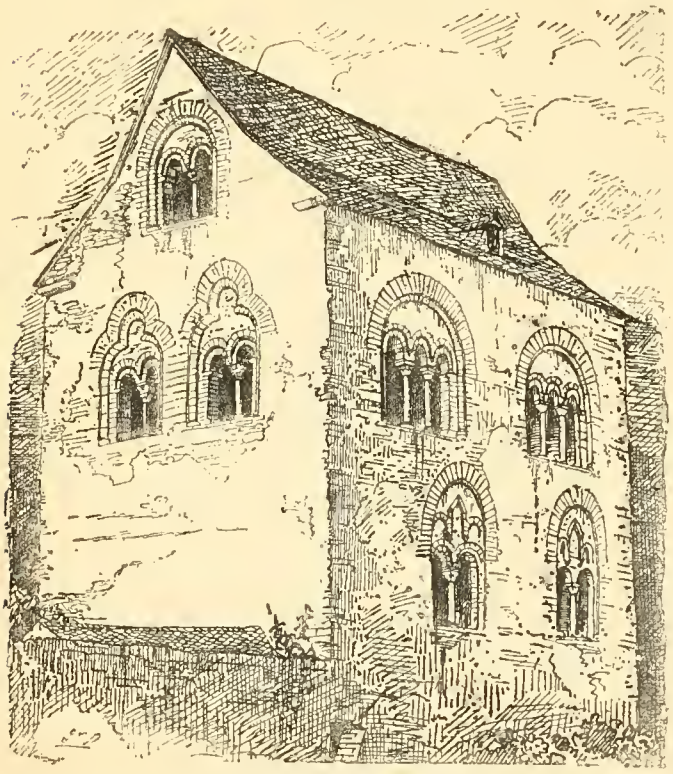
Page 77.—"Having disposed of no few convivial cups, the rival dignitaries began to ply the bottles in other fashion, and broke a few of them upon each others' heads."

Page 119.—"Returning from this survey, I peeped over the churchyard wall and looked down, over a precipice of some 50ft., into the courtyard of the old town house, which, resonant with garrulous children, pigs, and cocks and hens, &c., was a relief to the solitude above."

The author's impatience is recorded in more than one place, and the prophet Elisha, with the forty naughty children, are dragged in like the patriarch above-mentioned. Indeed, Mr. Seddon's book is distinguished by the same great fault which is found in Mr. Street's works. Of what possible interest can it be to us to know that Mr. Street arrived at a certain place at night, or that Mr. Seddon looked over a wall and saw cocks and hens. Nor are our author's poetical flights of such a quality as to require publication. Here is a specimen:—"Not many scenes have impressed themselves upon my memory more strongly than that of the broad and straight reach of the river, which, after passing through the gorge by the Lurlei, breaks upon the sight at Oberwesel. I have seen it in the mellowed light of sunset, with the Pfalz Castle on the island in the distance, blazing like a gem set in molten gold, and have been fain, at such a moment, to shout, 'The Rhine! the Rhine!' as did the army of Blücher when they first caught sight of this spot, from the bank immediately opposite, on their triumphal march homeward." Then we have nearly three-fourths of the description of Schloss Elz, or four pages devoted to nothing but gossip, interesting enough, perhaps, to the "party of five," but not worth the paper it is printed on as far as the public is concerned. There can be no excuse for all this padding when the author escapes from noticing many very interesting things under the shelter of "limits imposed" upon his work, and shortness of "time allowed." Of course, if Mr. Seddon's object was to write for a certain class of school girls, or the readers of M. F. Tupper, Esq., he has well fulfilled it, only we would advise him to be a little more cautious with his patriarchs and prophets next time. No doubt there are some people whose chief pleasure in reading is to form a sort of imaginary intimacy with the author. To know how many eggs he had with his breakfast, how many bottles of Moselle he drank with his dinner, how he drank it, and such like, is not what we care for; but then it brings one into such close communion with the author! It is so pleasant and so very agreeable of him to tell us of the pretty sunsets, the funny beggars, the nice things he had to eat and drink—in fine, to let us into the secrets of *his* everyday life, to say nothing of the retired lives of others who he may have met, and who he so funnily exposes to our view. This may have been Mr. Seddon's ambition, and if it was we have no cause to grumble, nor is there any reason why he should have refrained from making his book a picture-book at all hazards. If, however, his ambition were somewhat more than this, if he cared for an audience of thinking men, if he cared to help the architectural *student*, he would have done well to have kept back the gossip and much of the history in his book for the pages of "Once a Week," where also not a few of the illustrations might have appeared with better grace. That he did not choose to do this we regret, because there is so much to be put down on the opposite side of our balance-sheet. Hitherto we have grumbled, and we might, if so inclined, go on grumbling, especially when we look at such a drawing as that at p. 94, or think of the number of illustrations confessedly borrowed from a second-hand source, or of those which, though not acknowledged, might have been borrowed for all the credit they are to the author. But it is time to look on the bright side of the book. We give three extracts, which show that however much inclined our author may be to gossip, his eyes are, after all, looking in the right direction. At p. 36, Mr. Seddon, referring to a small cemetery chapel near Bonn, says:—"It is difficult to see at first wherein lies the difference between the old and the modern. The simplest doorway, decorated with billet mouldings, has a stamp of originality about it which, if it fall into the hands of the restorer, seems to evaporate without apparent reason. A reason, however, exists, for it will be found upon examination that the ancient builder had an idea on the subject of billets, and hewed them out with a will to express it, and could not wait to see whether they all corresponded in their dimensions. The copyist had no idea, but thought to correct all irregularities, set out their lengths by rule, and after cutting them as a task, sand-papered them up to per-

* "Rambles in the Rhine Provinces." By J. P. SEDDON. London: Murray.

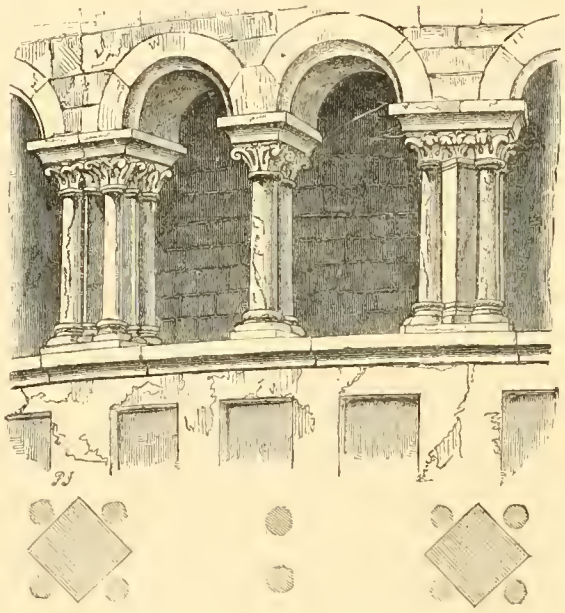
ILLUSTRATIONS OF "RAMBLES IN THE RHINE PROVINCES."



PART OF TEMPELHOF, BOPPARD.

CARVED CAPITAL FROM LAACH ABBEY.

fection, and the consequence is that the whole thing is worthless." At p. 54, writing of the Church at Sinsig, Mr. Seddon says:—"The interior is being profusely decorated in colour in a harmonious but sombre scale. The effect of this will, no doubt, be good, and the ornament quite in character; but, in my opinion, the original treatment must have been much brighter, and have reflected more light. It is comparatively easy to produce harmony by the use of deep and subdued colour, but such a method is by no means necessary. Church decorations should be bright and pure as well, like the paintings of Giotto and Fra Angelico." At p. 112, we read of Limburg Cathedral:—"The internal proportions are charming, and considering the very moderate dimensions, it would seem to be a model, not beyond the means of the present day to follow. Externally its pretensions are greater, and its grouping almost unequalled, for though such a cathedral as that of Laon was designed to have many and far grander towers, they could not have had the same due subordination. Here are two stately western towers, like those at Andernach, without the objectional eastern pair to mimic them; but instead, there is a grand quintuple group at the other end, near enough to unite well with the former, the octagon tower and spire in the centre of which brings the whole into one fine pyramidal composition."



PORTION FROM APSE AT ANDERNACH.

These are thoroughly sound criticisms, and the reader of "Rambles in the Rhine Province" will meet with many such; his only regret concerning them will be, that they were not always illustrated by drawings from "J. P. S.," the very few bits of detail which reveal these initials being as superior to the rest as the billet moulding of the 12th century is to that of the present day. Of the fourteen photographs which the book contains, Sinsig Church, Limburg Cathedral, Schloss Elz, the doorway from Treves, S. Werners Chapel, and an old house at Bacharach, may be specially noted. That of the west doorway of the Church of Our Lady, at Treves, exhibits some most admirable sculpture, but we would venture to suggest to Mr. Seddon that the statue in the jamb, which he describes as the "Virgin holding her book," is the conventional personification of the synagogue holding the tables of the law reversed, or upside down.

As samples of the engravings which illustrate the book, we give a carved capital from Laach Abbey, a portion from apse at Andernach, and part of Tempelhof, the residence of the Knights Templars at Boppard.

At the Guildhall, Westminster, this week, a jury awarded the sum of £1,800 as compensation in the case of Milns and Co. *v.* the Metropolitan District Railway. The claimants had assessed the damages for a loss of business from removal in consequence of improvements at £6,000; on the other side £900 had been offered.

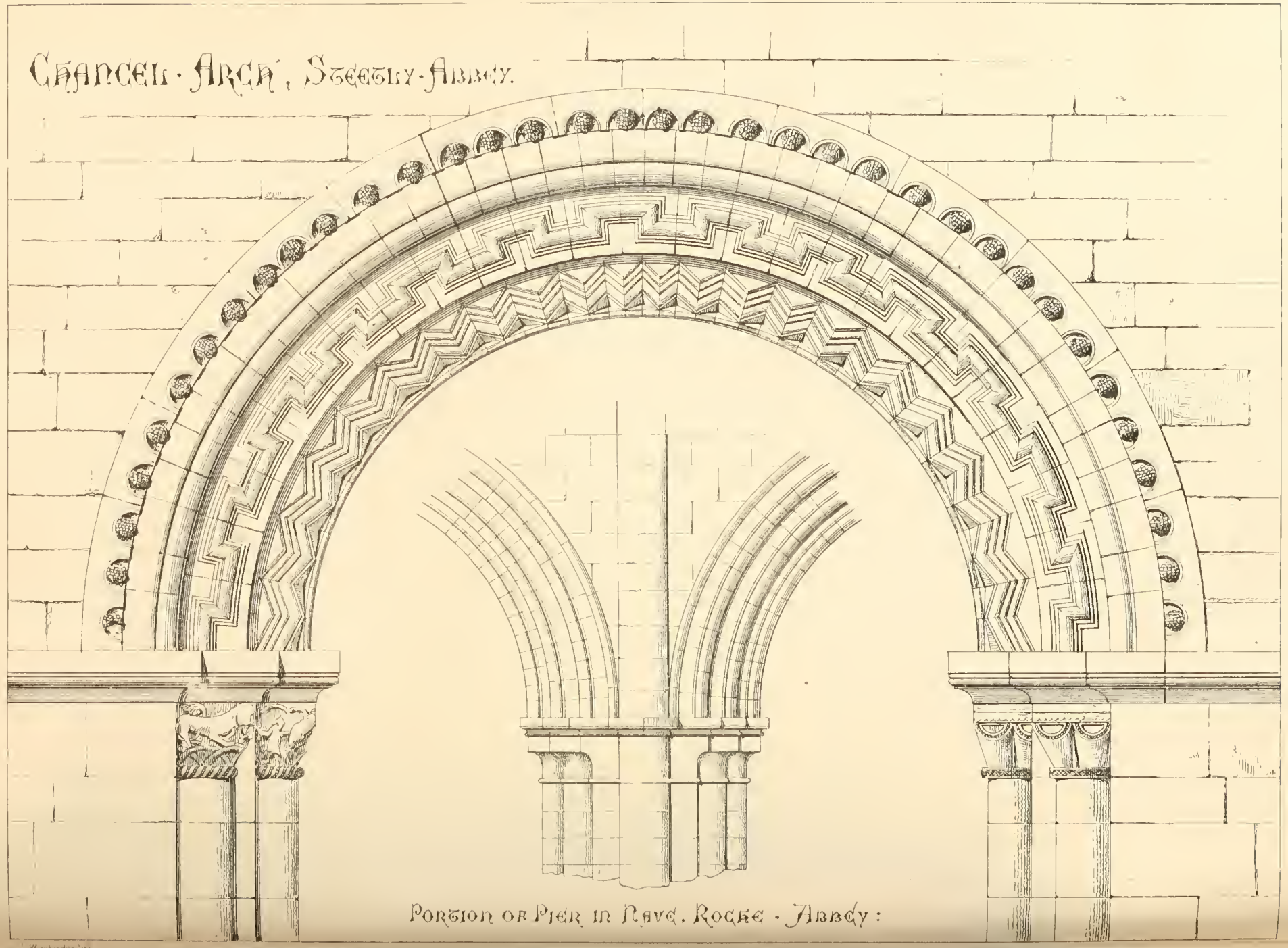
PUBLIC OFFICES AND VESTRY HALL, STRATFORD.

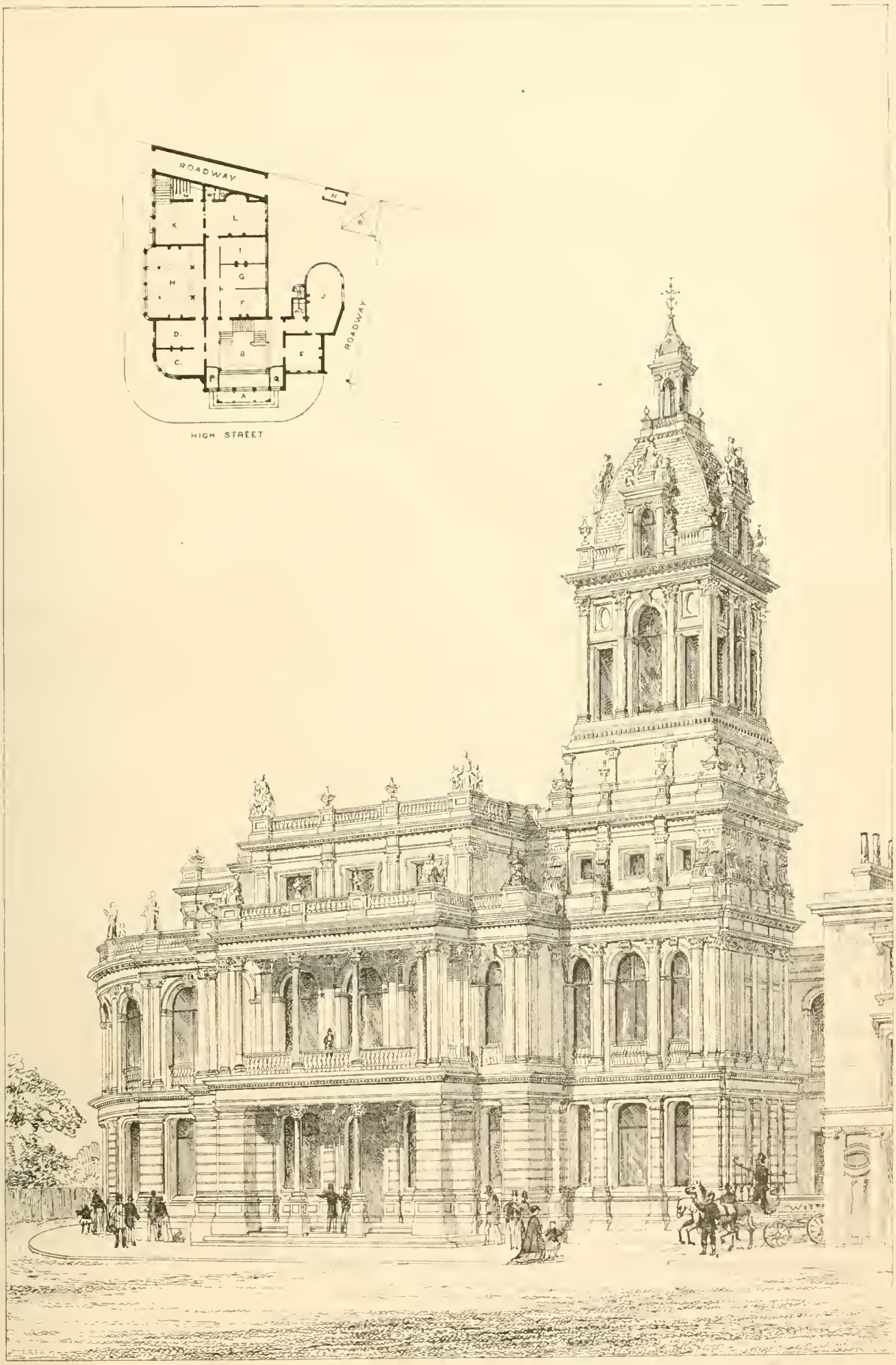
THE subject of one of our illustrations this week is the successful design in the recent competition for the Public Offices and Vestry Hall at Stratford, E., for the West Ham Local Board of Health. The building will be erected on a plot of ground at the corner of the Broadway and West Ham-lane. It will be seen, on reference to the plan, that the principal front and main entrance faces the Broadway, and includes a grand entrance hall and stairs to the assembly room; a corridor connects the grand entrance with the various local board and parochial offices, and the board rooms, all of which are upon the ground floor. A public entrance and waiting hall, with stairs to the assembly room, is also provided at the south end of the corridor in West Ham-lane. The assembly room, retiring rooms, &c., are situated on the first floor. The basement contains strong rooms, stores, and accommodation for hall-keeper; the sleeping rooms are in an upper storey. The tower, which rises to a height of 100ft., is placed at the north-west angle of the building, and contains the surveyor's private office, muniment rooms, and other accommodation. The principal front will be faced with Portland stone, the elevation facing West Ham-lane will be in white brick with stone dressings. Over thirty designs were submitted by various architects, that selected being the joint design of Mr. Lewis Angell, of Stratford, and Mr. John Giles (Giles and Biven), of 28, Craven-street, Charing Cross, who are appointed joint architects to carry out the work, which will be commenced forthwith. We are requested to state that the prize designs were coloured by Mr. Betholme, of Great Coram-street.

REFERENCE TO PLAN OF OFFICES.

A—Portico.
B—Principal stairs and hall.
C—Local board clerk.
D— ,, ,, office.
E—Surveyor.
F—Collector.
G—Vestry clerk.
H—Local board room.
I—Vestry clerk's office.
J—Surveyor's drawing office.
K—Public waiting hall.
L—Vestry board room.
M—Lavatories.
N—Engine house.
O—Inspector's office.
P—Hall keeper.

11,655 patents and registered designs were issued in America during the year ending September 30 last.


Chancel · Arch, Steetly · Abbey.
Portion of Pier in Nave, Roche · Abbey:



PUBLIC OFFICES & VESTRY HALL . STRATFORD.

JOHN GILES & LEWIS ANCELL, JOINT ARCHITECTS.

The Art Student.

INDUSTRIAL ARTS—PARIS EXHIBITION.

THE following is a condensed report on the industrial arts of the Paris Universal Exhibition, by W. J. Muckley, Head Master of the Manchester School of Art. It is addressed to the Secretary of the Science and Art Department, South Kensington:—

SIR,—In accordance with a communication received from the Science and Art Department, in April last, I have now the satisfaction to lay before you my report on that part of the Paris Universal Exhibition which relates chiefly to those manifold forms of industry to which fine art has been applied. No doubt much disappointment will be felt by many who visit the French Exhibition as regards the effect of the building itself, after the interior magnificence of those in our own country of 1851 and 1862, but persons whose interest and pleasure it is to see the masses of matter brought together under this vast shed, with a desire to grasp at once, so to speak, the products of each country in the readiest form of classification, should forget this architectural deficiency, to a certain extent, in realizing the facility which the present arrangement offers for such examination. The primary object of this, as of all other exhibitions of the kind, has been to afford an opportunity of testing the progress of nations in their application of art to industry, and although craftsmen whose product may be widely different to those connected with art, have found it to their advantage to be represented on such occasions, still the former causes have stimulated these matters of such world-wide importance into life, the effects of which hereafter must certainly have a tangible and perpetual existence.

Art under the most favourable culture is of slow growth, and as it advances it is less and less marked in its progress; this fact alone will explain in a certain degree the apparent stationary condition of some of the departments of English art manufacture, as evinced in the present Exhibition, when compared with the English Exhibition of 1862; and if various French Exhibitions make a more favourable display in this instance (which they certainly do) than other countries, both as to quality and quantity, and although we must admit that art is generally better felt and understood in France than in England, still it must not be supposed that the present occasion is a fair representation of the case. The circumstances of this universal gathering being at the very doors of the French Exhibition is sufficient to warrant a large preponderance in their favour; and although this fact must be evident to all, and which should be kept constantly in view when balancing one nation's productions against another, I am persuaded it is too frequently lost sight of altogether. In the examination of the various phases of art manufacture of French production, one finds that the highest knowledge has been obtained in many instances, and that sometimes the best painters of France have been called upon to assist in the work of furnishing design to be afterwards carried out by the able artizan, in various applications to industry, which, of course, tends very much to raise the standard of the work, and I am of opinion that one prevailing feature above all others evinces itself in their best productions, which is the manifestation of a knowledge and power in reserve; being, in fact, far beyond the immediate requirements of the work on which they may be engaged, indicating that the whole matter has been thoroughly grasped with ease in all its bearings. As to the fittest and best manner of dealing with the object in hand, all this being the result of good education, together with the influence of their artistic surroundings in every direction, and a communicated aptitude, inbred from many generations. This condition of things contrasts greatly to the disadvantage of many of the English ornamentists, as it frequently happens that their entire resources are quickly exhausted in the early part of their undertakings. The best materials they have at command discover a want of cultivation and research, and as they proceed still greater difficulties present themselves, the fruits of their labour ending in shallow and insipid performances, only to be endured by those who are as unlearned in art as themselves. This, in contradistinction to the influences on the French designer, arises from the want of a better education and better surroundings, and a lack of that inbred aptitude which, I am inclined to believe, is often the result of inheritance from a long period of time.

As I have already intimated, in England we do not generally understand art, and we are too much in the habit of looking for that fruitage which is only to be derived from the growth of centuries. Elaborate machinery has been set in motion for supplying art education to the million; foreign countries have been ransacked, and many of their choicest art treasures have been transferred to England for our assistance, and art, in consequence, has taken a firm and rapid root in many a pleasant form amongst us; still, it is quite impossible for a satisfactory and permanent result to show itself at present, as that knowledge which we seek ever was accumulative, and, I apprehend, ever will be.

The interesting departments of the history of labour—which, by the way, does not appear to be a term significant of what it intends—are not yet completed, but they promise to be of a very instructive character, and in many respects clearly indicate to us the course to be taken in the future.

It is not only to our benefit to examine their historical relations in the order of time and country, but they afford a rare opportunity for us to estimate their several culminating points of artistic excellence, which are often so fittingly at the present day the subject of our emulation. Here France has had the opportunity of unfolding her treasures, and to speak eloquently on the subject of her ancient lore in the form of a very rich display of her art wealth, and the tale is told in many a pleasant form how art and manufacture may be fittingly united, dictating at the same time the only laws by which such unions may be unerringly consummated.

Beginning with the rudest efforts in the form of stone weapons, with a few specimens of very early pottery, through the metal period down to the tenth, eleventh, and twelfth centuries, when we have some curious examples of illuminated manuscripts, and the general works of the cloister abundantly unfold themselves.

Still further down, a greater variety of materials are made subservient to use and decoration when wood carving and woven fabric are brought more fully into use, while tapestries and stained glass were intimately connected with the interior luxuries of the period, with some very choice church ornaments, rich in enamelling and precious stones.

Then come the works of the fifteenth century, with the exquisite enamels of Limoges and various phases of pottery, amongst which we see a large quantity of the beautiful blue and white earthenware of Rouen; works in wood, carved and inlaid, are abundant, together with many examples of *repousse* work in different metals, with other objects quite worthy of study by the ornamentist or art workman, whatever may be their speciality.

After this satisfactory array of excellencies, the climax of much that is unexceptionable, comes another era, and the landmarks here displayed enable us to measure unmistakably how gradually and surely, yet swiftly, the French decadence set in, and which one discovers as veritably stamped on the whole range of the decorative arts, as though a blight had descended, withering the best spirit and energy of the past, and in the course of its decaying power sowing in the place thereof every form of corruption in the various fields of ornamental art.

The revival in the present day of the decorative arts of France ought not to be found a difficult undertaking, having as it has such ready materials, vestiges of earlier times of its own country, to fall back upon, to which we, in comparison, can lay but little claim; and I have no doubt that it would be found easier to regulate the growth and culture of a plant whose seeds have been long sown, and become next to indigenous to the country, and whose roots and influences have found their way into countless and incalculable existences, than to plant to a great extent anew, and foster seeds in a land comparatively foreign to it. If my views are correct, it would appear that nothing more was needed to call back to life the amplitude of remains around the French people, and to stir up to new growth those latent germs interwoven with their being, but the special demands of the manufacturer, and a jealous desire to keep in advance of other nations.

Next in importance is the collection shown by England; and, although not so complete in many respects as that of France, it is of much interest. At the same time, it should not be understood that this is a fair display of our possessions, illustrative of the retrospective industrial arts of this country, but which mistake, it is to be feared, has been made by some of our French neighbours.

The difficulty of obtaining objects to be transferred to this exhibition ought at once to have been realized, and notwithstanding the willingness of individuals to lend, so long at the contributions were kept in the country, the risk, however slight, attending their transit to France, must have been an obstacle in the way of procuring objects to give to our department of the retrospective arts that consequence which perhaps otherwise it might have had; and this excuse which we may plead for ourselves, will, no doubt, be claimed by other countries.

A few words on the pictures exhibited may be sufficient in the present report, and in referring either to the peculiar merits or defect of any school of painting, I am persuaded that it ought to be done with more caution and hesitation than is customary the case, and it is only by allowing the sympathies to have free action, and intimately throwing the motive power which originates their works, together with a longer residence in the country to which they belong than is often convenient, that we are able in a correct degree to estimate the true standard of the arts of that country, and the opposite of this in many instances explains the small appreciation we have of each other's productions.

As regards the painters of France, they may learn much as to the imitation of nature from the pictures of the English school if they will, and the English painters may do themselves a service by the study of the work of the French painters in those deeper and more subtle resources of art knowledge which they feel and understand generally so much better than we do.

Many of the subjects selected by the leading painters of France for their pictures are of an extremely simple character, and with the knowledge they possess they are able to turn very doubtful materials to the best account, as may be seen by the works of Mellet, Bretton, Frere, Madame Browne, and others, which are frequently imbued with the deepest sentiment and pathos. But one of the distinguishing features of the French school in the conduct of its works, as indicated by those in the present Exhibition, in my opinion, consists in the knowledge displayed in the sacrifice of parts to the whole, with the habit of keeping nearly the entire picture in deep and subdued tones, and although often carried to an unwarrantable extent, resulting in excessive dinginess, still it is much more to be desired than that commonplace rendering of materials, that unschooled and tawdry choice of colours and want of subordination of parts, which are so much the defects of our own school of painting.

The characteristics of the other schools of painting which have found a place in this exhibition, may not be considered of that marked importance as distinguished from those to which I have referred to require a notice here.

Etching on copper may be said to constitute a school in Paris at the present moment, so great is the enthusiasm with which it has of late years been taken up, both by the Society of Etchers and painters generally, and the success that has attended their labours in a mercantile, as well as an artistic direction, has probably tended to the encouragement of the pursuit.

The Exhibition affords a good opportunity for the French photographers to test the beauty of their productions with those of other countries, in which examination they certainly come off victorious; and apart from the favourable conditions of sunlight, they possess, when compared with the photographers of this country, they most assuredly are better in manipulation than we are. With a more entire command of the chemicals employed, the value of which, I am afraid, we do not yet appreciate in England so fully as we might. The rich and deeply-toned examples by Solomons, of Paris, are triumphs of the art, as they have not only great strength and cleanness in the shadows, but the details are developed with wonderful truth to nature. In this respect the specimens entitled "Etude au Soleil," by Berne Bellicour, of Paris, stand quite distinct in the whole Exhibition.

The application of photography in enamel colours to metal plaques has been ably undertaken by Lefou di Camarsae, and it is almost impossible to eulogize too greatly his fortunate attempts to transfer to so imperishable a material such truthful and elegant pictures of the leading men of the age. Mention should not be overlooked of the recent discovery to reproduce drawings by the combined aid of photography and lithography,

copies of which are displayed in the French department; and the collection of decorative works by Holbein, from Basle, has been so well accomplished by this process that it is felt that the main art schools of England would benefit by the acquisition of the series.

In any remarks that I may have to make on the Industrial Department of the Exhibition, it may be considered best that I should confine them, for the most part, to those leading features of art manufacture which require a special form of ornamental application, at the same time making such suggestions as may be of use in the course of our own practice, either in schools of art, or for those who may be engaged as ornamental designers or decorators.

It has always been my conviction that the chief element in the designs of most ornamental arrangements for various manufactures has not yet had in England that consideration which it ought of necessity to have received, namely, the drawing of flowers and foliage from nature; and although other branches of study are of the utmost importance, and quite essential to ornamentists, the circumstance of the natural element forming, as it does, so large a portion of the materials employed in the composition of decorative design generally, would seem to need nothing more than a knowledge of that fact to cause them at once to make themselves at home with this particular kingdom of nature, in order that they might produce at will, from their repository of materials, fitting devices for the work required.

An intimacy with the various styles of ornamentation, together with the power to call up when necessary any distinct phase of them, is only one part of the work of the decorative artist, as with a use of this knowledge alone his production must ever be, to a certain extent, a rearrangement of old materials, dead and cold compared with this additional reservoir of knowledge of nature, the very life, as it were, of the subject, the want of which explains so much of the tame reproductions of the styles of ornament of the 15th and 16th century, and the meagre use of worn-out materials. And I feel sure that in whatever branch of manufacture the artizan may be engaged, the course of study to which I have referred is the most important of them all; and we should constantly bear in mind that the intelligent and satisfactory conventional treatment of natural forms is only to be arrived at by a close acquaintance with the growth of the plant or flower itself, and it would not be found difficult to commit to memory the form and structure of most of the plants of this country best fitted for ornamental design, if the student were to understand from the commencement of his career that his thorough success as a designer depended on it.

The artizans of this country are, as a rule, unfavourably situated as to the time they have at command for acquiring that extra qualification which their particular pursuit may demand, and at most it will be found that they are not in a position to give more than an average of six hours a week for that purpose, and, as their progress in consequence must be very slow, and to many sufficiently disheartening to cause them to discontinue the study altogether, I am of opinion that after students of this class can draw ornament tolerably well they might be taken sooner than is the custom to draw and paint foliage and flowers from nature, as bearing in the most direct manner on their occupations as ornamentists, and this method of study, being stimulated by the masters, would not only result in making the most of the little time pupils may have, but they would receive that encouragement from work of this description that I do not think they would obtain in any other way. Of course, where there is time to grapple with the other departments of study necessary to their complete success, it should always be done, as it is quite certain that an accomplished ornamentist must be conversant with the whole range of art, but I am persuaded that those persons who have but little time to give to study ought to be dealt with in a very special manner, and that they would turn to the most profitable account that information which they would acquire by the course of study to which I have alluded.

The best French decorators have always been fully alive to the value of this special department of knowledge, and have truly estimated it, so much so that for centuries they have not only been able to turn it to direct account in their pursuit, but, as a means of relaxation, they have often painted beautiful pictures of flowers and still life; and, at the present time, the most able decorators of Paris and Lyons produce the best drawings with which I am acquainted, as also, with one exception, the most perfect flower pictures in the world.

In support of my views in this respect I will begin my remarks on art manufacture by reference to the excellent display of printed fabrics sent from Mulhouse, where nearly the whole resources constituting the ornamentation are taken from national flowers and foliage, and although the treatment may be in many instances in too direct an imitation of nature, still the distribution and balance of parts is truly ornamental, and there is that refinement in the arrangement of the designs that nothing but the closest study of natural forms could give. The printed goods of Dollfus, Meig and Co. are excellent, as showing the achievements made in this direction, the able chemist and the skilled designer having united their efforts to produce at once a result so entirely satisfactory with regard to scientific and artistic research. Gros, Roman and Co. have a fine display of printed fabrics, muslins, cottons, chintzes, shawls, &c., all showing the value they place on fitting designs and good colours. The bareges by Grolleau and Deville, of Paris, and those by Hooper, Carroll and Company, are very elegant, as are also those by Bulteon Frere; and the tinted grounds, with a distribution of flowers from nature on them of their natural colours, show much artistic discrimination.

As a whole, the exhibits from Mulhouse are entirely satisfactory, particularly when we take into account that the peculiar demands of the market had to be considered, and not only is the purpose of the exhibitors abundantly served in the advertisement of their goods and placing their claims before so many nations at once, but they cannot fail to effect a salutary influence on the public taste generally.

It is much to be regretted that England does not send anything of consequence in the branch of industry, and it may be questionable as to how far it could afford to keep out of the field of competition on this occasion. Possibly manufacturers may not be affected by such a course for the time being, but certain it is that this policy will not serve them in the future, which fact appears to have been recognized by nearly all other classes of producers; they will be compelled to look after their interests in times like the present, and choose (if possible), some other mode of showing their products to the world, and in the opportunity of a display such as this one in Paris now affords, it would be difficult to find another method where they could lay their claims for patronage before the consumers of the universe.

In short, exhibitions of this kind are tribunals by which the arts and manufactures of the four quarters of the globe are to be judged, and if some parts of them are not present to state their case, from some unexplained cause, if they are not found in court at the time of the eloquent pleadings of some of those which are, the verdict very justly will be given against them as defaulters.

The brocaded satins intended for furniture covers, curtains, &c., from Tours, are all that can be desired as to colour and material; but the application of design, in almost every instance, is very defective, the pattern being too large and commonplace as to distribution and otherwise. A few examples are to be found, good in all respects, and they indicate what is the most fitting manner to deal with this elegant material. The display of silks for ladies' dresses by Schuls and Berand, and Coquet and Co., of Lyons, are very tasteful, and amongst the best are those ornamented with a small pattern on a black ground; also, a pleasing application of the butterfly, some printed, and some brocaded, and others, beautifully executed, combining the two processes. The shawl and lace department of Lyons is fairly represented; nevertheless, I do not think any novelty presents itself. Frank Alexander, of Paris, has a good selection of satin dresses and other articles of apparel, edged with different kinds of fur, which are most skilfully chosen as to colour, the effect of the whole being very rich and satisfactory. The ribbons from St. Etienne are very pretty, and the printed as well as the embroidered flowers, with which they are ornamented, are applied with the utmost delicacy and sense of beauty. The selection of brocaded silks and satins sent by Austria is of considerable merit; and those exhibited by F. H. Haas and Son are excellent both as to design and colour. The exquisite and varied tints of velvets sent by Lyons are a wonderful evidence of the skill of the chemist, combined with an artistic appreciation of the delicacy of colour. The moire antiques exhibited also show that feeling for colour to which none but the French can lay claim.

Manchester is chiefly represented by plain goods, and what ornament is applied, either by printing or otherwise, is very inferior, notwithstanding the help of the French designer. The white damask for bed furniture, of which there is a large quantity, seems to have had no consideration as to improvement in design; and, while the world has been busy in this respect, the producers of this material do not appear to have recognized the importance of making one step in advance. The great prosperity of the Manchester trade generally has made those, in whose hands it is, most careless with reference to that improvement in design which has taken place in other kinds of manufacture; but the evil hour must come unless they are careful to arrest it; the men who were early in the field have well-nigh reaped their harvest, and it will be for their successors to look to those sources of profit which they will not acquire to much advantage unless the decorative arts, as applied to their speciality, are better cared for than they are at present.

In the French lace department there is a great advance, and the designs, when applied to borders and horizontal arrangements, show that the best assistance has been obtained, and the conventional treatment of natural forms well understood.

The designs for mantles, in black and white lace, by Dognin and Co., are of a very exquisite character.

Two curtains of Point de Venise, shown by Lefebure and Son, of Paris, are excellent, both as to design and execution; and the repose given to the charming border by the plainness of the adjacent parts ought to point out clearly to the lace-makers the value of this quality, the absence of which, constituting, as it does, one of the leading defects of their work. The embroidered curtains exhibited by Sarare do not show the least improvement in design, as they appear to be produced altogether on the old models, and the application of such large figures and arabesques are only suited for the decoration of panels.

The objects in lace exhibited from England are not, as a whole, satisfactory; and the large display of curtains made by Nottingham does not enhance the reputation of that town in this respect, the designs being meagre in the extreme, compared with what might be done by well-directed artistic knowledge. James Hartshorne sends some good examples of edgings and trimmings, and those sent by Barnett and Maltby are also in good taste. A very good selection of Honiton lace is exhibited by Hayward, of Oxford-street, London; but the designs are not very well chosen. The speciality of French Cashmere shawls is well represented, but no new feature in any respect appears sufficiently conspicuous to be worthy of record.

The decorative furniture and cabinetwork of France still takes the precedence of all other nations, and the artists employed are assuredly most consummate masters of those styles of ornament used in the best period of the Renaissance, and here again we may benefit by the course pursued by the French designer, as evinced in their best works, and it has not only been their desire to produce objects of great cost merely within the reach of the wealthy, but we find a plenitude of articles of elegant form intended for the homely use of the less luxurious classes. In the training of ornamentists in our own schools, I think we do not attach sufficient importance to the study of the materials used in the early style of the Renaissance, as in my opinion it is not sufficient to draw occasionally objects that would furnish this information, but students ought to be encouraged to sketch them constantly in the most intelligent and readiest manner, and thus storing the memory with the works of the past, understanding them completely even to the most minute details, which is only to be achieved to practical advantage by holding converse with these remains in the manner to which I refer.*

A valuable series of drawings of Greek and Roman mosaics, to be found in Spain, France, Pompeii, Prussia, Switzerland, Rome and Italy generally, Constantine, Carthage, and also in various counties of England, has just been presented to the art library of the South Kensington Museum by the widow of Dr. Woollaston.

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* To be concluded in our next number.

GLASGOW.

(FROM OUR CORRESPONDENT.)

IT has been long a fashion with some Scottish as well as English writers to speak generally of the Scottish people as dirty, drunken, and niggardly; and Glasgow, as their chief swarmery, has of course received a large proportion of the abuse. For the drunkenness, Scotland has imposed upon itself a law that closes public-houses at eleven o'clock on "week nights," and wholly upon Sunday; the charge of niggardliness can in various ways be triumphantly refuted; and, if dirt be still assumed as a characteristic of Glasgow, "the authorities" assuredly will have washed their hands of it. Scarcely had they brought an inexhaustible supply of water from Loch Ketturin than they passed a bill through Parliament to root out the rookeries, and expose to the light of day—a light much more *seeing* than is the bull's-eye of Messrs. Dogberry and Verges—the perennial habitations of disease, vice, and every uncleanness. And this Bill, as an Act, has progressed little farther than assessing the citizens sixpence on every £1 of rental last year, minus twopence this. Then down came Mr. Bateman, from Manchester, and Mr. Bazalgette, from London, to look into our sewage. Glasgow, until this year of grace, was wont to "flourish by the preaching of the word," and, fortunately for its prosperity, "cleanliness is next to godliness."

Another thing against Glasgow is, that being so utterly engrossed with iron pigs and Turkey reds, it has neither care for the fine arts, nor leisure for their study. Glasgow is said to be the aristocracy of wealth, and Edinburgh of intellect. Be this as it may, Glasgow has—and with no assistance from Government—done perhaps as much for the furtherance of art as the more favoured metropolis. On the death of Bailie MacLellan, the corporation purchased his gallery of pictures and the building he erected for (*inter alia*) their keeping and exhibition, at a cost, I believe, of somewhere about £40,000. Within these few years, nearly a hundred windows of the cathedral have been filled with stained glass, some of them costing close upon £2,000; and twelve or fifteen years ago fewer than a dozen of architects, and one or two builders, bought a building and filled it with treasures of art, and, after giving it their time, talents, and labour, lost so much money by the adventure that they had to be assisted out of their difficulties by some art-loving friends. The latest form that our interest in art has assumed is a proposal that was sanctioned the other day by the town council to have an exhibition of portraits of distinguished men, natives of, or associated with, Glasgow. As I mentioned in a former communication, a new home for the MacLellan pictures has been fitting up above the Corporation Galleries, from designs by Messrs. Wilson and Thomson; and it is purposed that when this is opened in February there will be simultaneously opened with it the portrait exhibition and the annual exhibition of the West of Scotland Academy. Shortly since, a portrait of Thomas Campbell, the author of "The Pleasures of Hope," was presented to the Corporation, and possibly this is the parent hint of the portrait exhibition. In any such exhibition the line must be drawn somewhere, and it must be conscientiously remembered that "the rank is but the guinea stamp, the man's the gowd for a' that." Instead of the uninteresting portrait of the mere "man made of money," I expect to look upon the counterfeit presentment of Hamilton, the architect; Hugh MacDonald, the essayist; Macintosh, the chemist; Stow, the founder of our normal schools; Alston, the educator of the blind; Graham Gilbert, the painter; Neilson, the inventor of the hot blast, and such men whose works live after them. The idea of this exhibition is an excellent one, and it is to be hoped that it will be fairly carried out.

The Glasgow Architectural Society seems, this session, to be at a loss for subjects for its syllabus. At its first ordinary meeting it could find nothing better to do than criticize the occasional address by the president at the opening of the session; and it must have been very grateful to Mr. Honeyman to preside over a meeting at which his own prelection was the subject on the dissecting table. Mr. Honeyman's address was in two divisions; the first dealt with the present position of architecture, and the second with the Glasgow Improvement Act. It is only the first division that has as yet been criticized; the second is to be disposed of at the next meeting of the Society. Mr. Honeyman is one of our leading Gothic architects, but his faith in his favourite style appears to be wavering. He says, "I had hoped for better things from the revival of Gothic architecture than we have yet seen. But if this revival is to lead to nothing better, I fear there may be too much truth in what a distinguished predecessor in this chair affirmed, that Gothic was but a fashion, the rage of the day, doomed soon to pass on to oblivion or contempt, like the patches and peri wigs of the past, or the crinolines and chignons of the present." The criticism on the second head of the president's discourse will have considerable local interest, and it will be worth while for the newspapers to give *in extenso* the opinion of the representative architectural skill and experience.

Justice is proverbially blind: in Glasgow she cannot be heard. At the last-held meeting of the justices it was complained, *imprimis*, that the court was too small; and, secondly, that it was badly ventilated. In consequence of the first, several justices left; and, in consequence of the second, the windows were opened, when, from the noise from the street, not a single syllable could be heard. About the same time, complaints were made elsewhere of the inadequacy of the law courts. As Jaques says in "As You Like It," "The why is plain as way to parish church." The growth of Glasgow has been so great and rapid that the housings of many of its institutions—standing still—have become too small for it. A house doesn't grow as streets do. The pteroceras can gradually add to his shell; the lobster can increase his only by casting it.

CHANCEL ARCH, STEETLY ABBEY.

WE give as one of our illustrations this week an elevation of the chancel arch at Steetly Abbey, Derbyshire, from a photograph. This is a particularly fine piece of Norman work, and very well preserved. It will be noticed that the ornamentation on the outer moulding is very peculiar, the semicircle with berries occurring twice or thrice in each stone according to its size, quite regardless of their unequal spacing as a whole. The other engraving on the same sheet represents a portion of pier in nave, from Roche Abbey, and is a very good example of transition work, and though now very much exposed to the action of the weather, is in a remarkably fine state of preservation.

NITRO-GLYCERINE EXPLOSIONS.

WE are getting fearfully familiar with an explosive agent even more terribly dangerous and deadly than gunpowder itself. It is exactly twenty years since M. Sobrero, a pupil of M. Pelouze, the distinguished chemist, discovered that glycerine when treated with nitric acid—the proportions being one part of the former and three parts of the latter—became converted into a highly explosive substance. This new liquid, designated by the discoverer nitro-glycerine, attracted very little attention among chemists until M. Nobel, a Swedish engineer, began very recently to apply it with great success to blasting. He found by experiment that the new substance possessed a very marked advantage over gunpowder—it required a much smaller hole or chamber than the latter, which is scarcely one-tenth the strength of the former. In fact, it reduced the cost of blasting something like 50 per cent. The mode of using nitro-glycerine in mining is extremely simple. If the chamber of the mine presents fissures, it is first lined with clay to make it water-tight; the nitro-glycerine is then poured in, and after it water, which being the lighter liquid, remains on the top. A slow match, with a well-charged percussion cap at one end, is then introduced into the nitro-glycerine. The mine is sprung by lighting the match, there being no need of tamping. About two years ago, M. Nobel made a series of experiments with this fluid in some of the mines and granite quarries of Cornwall, when its explosive qualities were proved to be enormous. The great danger of nitro-glycerine lies in its tendency to spontaneous combustion, from which several very disastrous accidents have arisen. This has prevented its becoming of general use. Nothing could prove so emphatically the terribly dangerous nature of this substance, and the extreme care which is necessary in its management, than the sad calamity which occurred at Newcastle on Tuesday last, when five men were literally blown to atoms through an explosion of nitro-glycerine. Curiously enough, in the same day's papers we read of an equally shocking disaster which recently happened from the same cause, though under different circumstances, in the United States. At a place called Claremont, on the Newark and New York Railway, now in course of construction, were a number of shanties constructed for the workmen, as well as a blacksmith's shop. The work in this locality consisted chiefly in blasting rocks, for which purpose nitro-glycerine was used as a substitute for gunpowder. One evening, a workman named Thomas Burns carried a bucket of this explosive material into the blacksmith's shop for the purpose of heating it. Being of a resinous, gummy quality, it is necessary to reduce it by heat to a liquid state before it is fit for use. Burns, it is stated, grasped a red-hot iron, and with a view of expediting the process, plunged it into the bucket, when in an instant the unfortunate man, with all the inmates of the building, were blown away, and of the house not a fragment remained. Some of the men around the shop shared the same fate, while at the same instant a shock like an earthquake shook every building within at least a mile and a-half from the scene. Every house adjacent to the fatal spot was more or less damaged, three of them being perfectly shattered. So completely did the deadly agent do its work that two of the unfortunate men who are among the dead were on the roof of a house at some distance putting on a patent tin roof, when they were carried away with the upper portion of the building. That the explosion in this case should have taken place does not surprise us, but when we find that nitro-glycerine is capable of working such havoc, notwithstanding the most careful handling by practical men, it is our duty to distrust to the utmost a substance so subtle and destructive in its nature.

THE FUTURE OF DESIGN.

AT a recent meeting of the Birmingham Architectural Society, a paper was read by Mr. Yeoville Thomason, on the "Future of Design." The writer set out by saying that it was well known that buildings erected since the Reformation were in a style that was not of natural growth, but the reproduction of a bygone age, and, as such, had been designed upon principles totally different to that of a living style. Until recently, the style in vogue was based upon the various schools of what was generally termed the Renaissance, the chief feature of which was the employment of one or more of the five orders. The introduction of Grecian architecture, by the publications of Stewart and Revett, rendered copying a perfect mania, every desire being to produce designs "purely classical." This desire to be classical descended to the commonest shop fronts; terraces of houses were afflicted with it to an enormous extent, the orders were fairly caricatured until absurdity could no further go. All this was, unfortunately, aided by the introduction of cement, which, at the time, was supposed to last for ever, but a generation has been sufficient to dispel the illusion. The works of the elder Pugin, Britton, Rickman, and others, however, soon led to an examination of the English styles, and a change was gradually made from copying Grecian to copying Gothic; from Pagan temples to Gothic churches was a step rendered all the easier by the ancient examples being close at hand. As in the so-called "classical," the slightest deviation in the contour of a moulding or a departure from that rule-of-thumb method of proportioning a column called modules and minutes; so it became in the Gothic system, any deviation from the acknowledged proportion of a buttress, the outline of a capital, or the contour of a moulding was at once condemned; the only redeeming quality in this later period of copyism was the fact of a sounder principle of construction being urged—a quality that was unfortunate as regarded very many works, as tending to preserve them, mainly, on the score of the expense of their removal. The result of this pernicious system was such, that there was scarcely a town in the United Kingdom without one or more of those literal forgeries. The profession of the present day appeared to be divided between two styles—the Gothic, with its many shades and varieties, and what was usually termed the Italian; and the conclusion to be drawn was that architectural design, considered as a whole, was in a state of transition, being at the termination, and wearied of a long period of copyism of styles which suited only other ages and climes, and yet undecided how to proceed, by reason of the absence of any data on which to form a starting

point. In the many works recently erected in either of the styles now practised, an observer could not fail to perceive a desire for progress; and it was both hopeful and encouraging for the future prospects of architecture to see the continued perseverance in a course of free thought and action, avoiding eccentricity on the one hand, and sensationalism on the other. If the work be Gothic, as in a church, a greater freedom of thought would be perceived, the mind of the designer being disposed to be clear of the influence of archæology, and other trammels that usually confined and cramped ideas; if the work was in stone, it was designed upon those principles that were applicable to stone; if of brick, it was honestly and fairly worked out upon principles applicable to brick, and no longer a stone building worked in brick. And so on with iron and other materials required. The decorative portions were designed and suited to the requirements of the work, and not a mere reproduction of the past. Again, if the work were one devoted to commercial purposes (and also Gothic), an endeavour was made to blend and harmonize with it qualities unknown in the old structures, from which the style was derived. On the other hand, works in the Italian style had been executed without reference to the teachings of Palladio, Chambers, and other previously-considered standard authorities. In this style of the future (supposing their best anticipations to be realized), it would no doubt be easy to trace the influence of the architecture of other times and other lands. Though many features should be recognized as derived from preceding styles, they would be so adapted and incorporated with what was new, as not to appear in any degree discordant, and would themselves receive a character which should show that they belonged to the present time; a style also that would progress through ages, and elevate the position of the architect to a higher scale than he had hitherto attained; and if future archæologists were to contemplate the ruins of palace, church, or town hall, from a few fragments, they might be enabled to fix the date of and reproduce the structure, as was done by a fragment of an old abbey in our own time.

THE LONDON FIREMEN.

THERE are few institutions, we venture to say, to which the metropolitan public owe so much as to the Fire Brigade. The services they render to society in the protection of life and property, private as well as public, are of the most precious kind. Their duty is not only arduous and difficult in the extreme, but almost in every instance they risk their lives in the performance of it. No one will say that on the whole they do not perform that duty well. The very calamitous events that have taken place during the last two weeks abundantly show the absolute necessity there is for having a well appointed fire brigade in a place such as London. Until lately it must be confessed the brigade was neither so complete nor so well equipped as the exigencies of the case demanded. The Act of last year, however, brought about a great improvement, and has been the means of rendering life and property vastly more safe than they were formerly. By this Act—which took effect on January 1, 1866—the London Fire Engine Establishment was transferred to the Metropolitan Board of Works, which immediately set itself to introduce a thoroughly organized system of protection from fire. The progress made by the Board in their arrangements—which are not yet completed, however—may be gathered from the annual report just published, and which contains some facts not uninteresting at the present time. The number of stations transferred to the Board at the date we have mentioned was seventeen, exclusive of two stations on the Thames. There are now forty-one land stations in the metropolitan area, and others are in course of erection. The power at the disposal of the brigade for extinguishing fires has been largely increased as regards engines. They have two floating and twenty-one land steam engines, with sixty-one hand-power engines, as compared with twenty-three steam engines (two of these being floating engines), and twenty-seven hand engines. The Board is at present constructing a third floating steam fire engine at a cost of over £6,000. This engine, it is stated, will be superior to anything of its kind hitherto constructed, and must add considerably to the security of the warehouses and other valuable property on the river side. During the same period the force of the brigade has been raised from 130 men to 227 men. These are ranked as follows:—Four foremen of districts, 29 engineers, 15 sub-engineers, 50 firemen of the first class, 50 of the second class, and 79 of the third class. This, it will be seen, is an increase of nearly 100 men in eighteen months, but we understand that the force has recently been still further augmented by the addition of a large number—upwards of sixty—of the fire escape conductors, employed by the Royal Society for the Protection of Life and Fire, who, it appears, will shortly enter the service of the Board, in consequence of the latter having undertaken the duty hitherto discharged by the Society. Between July 1, 1866, and June 30, of the present year, the brigade have attended with their engines 1,394 fires, or upwards of 100 a month. This is exclusive of chimney fires, of which there were during the same period 1,673. In as many as 1,219 of these cases penalties amounting to £608 12s. 6d. were imposed. Efficient as these facts and figures prove the brigade to be, they complain of the hindrance to their operations, and the consequent loss of property occasioned by the delay which frequently occurs in obtaining a proper supply of water at fires.

TRADE SCHOOLS IN FRANCE AND AUSTRIA.

THE following description of one of the trade schools in Paris occurs in one of a series of able papers on the subject of technical education in the "Birmingham Daily Post," from the pen of Mr. J. C. Woodward, the science master in the Midland Institute—an institution which is doing good and useful work in scientific teaching. In Paris, writes Mr. Woodword, the Establishment de St. Nicholas is a school in which is combined instruction in a branch of trade in conjunction with the ordinary branches of education. After receiving a commercial education, the boys can, at the request of their parents, be placed in the workshops of the school. The workshops are under the direction of master manufacturers, where boys can learn one of the following trades—metal chasing, musical instrument manufacture, bronze ornament making, optical instrument making, shawl designing, picture frame making, jewelry, bookbinding, wood carving, portmanteau and leather box making, and saddlery. The masters are selected by the council of the school, who take care that the person appointed is not only a good manufacturer, but that his character is good, and that his business is sufficient to ensure constant work to the boys. Nine hours a-day are spent in the workshop, and two hours a-day during the apprenticeship are devoted to drawing and music. The apprenticeship lasts four years. During the first three the parents or guardians pay thirty francs a month, which includes board and lodging; while for the last year the master pays in consideration of the benefit he receives from the apprentice's labour. The number of apprentices in the school is about 100. They receive no pay whatever during the apprenticeship but are able at its completion to obtain wages varying from three to five francs a day. The apprenticeship is completed at the age of sixteen or eighteen.

According to the "Chronicle," we may well derive a large amount of instruction on the subject of technical education from the industrial schools at Vienna. They are intended to provide apprentices with instruction suited to their special calling. In all of them there are classes for drawing, geometry, physics, &c.; but some have workshops attached to them, in which the pupils practise their profession, working under the eyes of a master. In the Gewerbschule, in the Wieden quarter, the pupils are instructed in the work of locksmiths, furniture makers, and turners. At Gumpendorf they learn weaving. In the school of St. John they are taught masonry and building; and so on according to the quarter of the town in which they are situated; for it must be remembered that these schools are founded by associations or districts with a special local object. It may perhaps be asked how pupils can be taught masonry and building at night in a workshop. The method is this:—The pupils begin by making small bricks in plaster, and with these miniature bricks they raise buildings which, liliputian as they are, are yet large enough for the teacher to show the principles of the work, and for the pupil to learn to apply them. With these bricks the pupils learn to construct arches, chimneys, and other important parts of a building not generally entrusted to apprentices. In this school the locksmith's business is also taught, and carpenter's work is practised on models. The industrial schools in which weaving is taught have jacquard looms, while other schools have workshops in which the pupils work with plane, file, and hammer on a large scale, though the work is more often confined to models in wax, plaster and clay.

INCOMBUSTIBLE WOOD.

ACCORDING to M. Schattenmann's experiments, there is an easy and cheap way of rendering wood incombustible; it consists of coating it with chloride of lime. It is true this will only protect the surface, but it will prevent the flames from spreading. Chloride of lime, or more properly chloride of calcium, is obtained on a large scale by decomposing bones with hydrochloric acid which dissolves the calcareous part without attacking the gelatine they contain. This neutral and liquid chloride marks 14 deg. by Baume's aerometer and contains 15 per cent. of anhydrous chloride. To this liquid an equal weight of slaked lime should be added, and it may then be applied to the woodwork to be preserved. The operation should be repeated twice with a common whitewashing brush. The cost is at the rate of about five francs per one hundred square metres, the liquid costing one franc and the rest being the men's wages. The Bouxwiller Mining Company, which extracts gelatine from bones, can afford to sell liquid chloride of lime at two francs per hundred kilogrammes, not including the price of the cask. Where chloride of lime cannot be had, it may be made by treating chalk with hydrochloric acid. To test the incombustibility of wood prepared in this way, take a few bricks and enclose a square with them; fill up the space with a kilogramme of straw; place three wooden laths across, coated as above, then put another row of bricks upon the first, and place the three uncoated laths across. Having well secured them, set fire to the straw, when the upper or uncoated laths will catch fire and be immediately consumed in five or six minutes, while the lower ones, protected by their coating, will only glimmer and be carbonized where the flames touch them, but will everywhere else be safe from combustion. Fir should be selected for the experiment.

ARCHÆOLOGY.

THE ISLE OF MAY.—The Scottish papers publish an interesting letter from Mr. John Stuart, secretary of the Society of Scottish Antiquaries, having reference to a deeply curious old ecclesiastical building on this island. St. Adrian's Chapel, says Mr. Stuart, is hastening to ruin. It is now only a fragment of the original edifice which remains, but it serves to keep alive the memory of some interesting points of our early ecclesiastical history; and it seems to me that it would be a reproach to us to abandon it to decay at a time when so much is doing to preserve the scattered materials of our early history. The Isle of May was at first the retreat of St. Adrian, about the middle of the ninth century, when he, with St. Monan and other followers, settled on the east coast of Fife; and here the saint was soon after martyred by the Norsemen. Nearly two centuries after this time, David I., King of the Scots, founded a monastery on the island, which he gifted to the Abbey of Reading. It continued in possession of the English monastery for upwards of a century, but in the time of Alexander III. it was purchased from the monks of Reading by the Bishop of St. Andrews, and annexed to the Priory of that name. The Isle of May, from its early associations, was regarded as holy, and was much resorted to as a place of pilgrimage in the middle ages. In the time of James IV., Andrew Wood, of Largo, got a charter of certain lands, on condition that he should be ready to pilot and convey the King and Queen in visiting St. Adrian's Chapel; and from the breviary of Aberdeen it appears that the island was much resorted to by ladies wishful to have a family, and that they were not disappointed in their hopes on paying it a visit. The same authority informs us that while in the beginning of the sixteenth century the monastery had become ruinous, there remained a church, which was often resorted to by the faithful, on account of the frequent miracles there wrought. It is added that where the bodies of the saints and martyrs repose a fragment of

this church is still standing; but, from long exposure to the weather the walls are in a state of great dilapidation.

PRE-HISTORIC REMAINS IN GRAVEL BEDS.—Some months ago a stone hatchet was discovered some 8ft. or 9ft. deep in the undisturbed oolitic gravel beds at Malton. The hatchet was smooth, and quite unlike the gravel implements of other parts of England, and by some the discovery has been regarded as doubtful, the idea being that the hatchet had fallen in from the top. The hatchet, however, is incrusted with lime, which would not have resulted from the surface soil. On Friday last another discovery was made in the same beds, but about half a mile from the place where the hatchet was found. This was part of the leg bone of an ox (quite fossilized), split lengthwise to extract the marrow, precisely as in the cases of the animal bones found in tumuli. This was 4ft. 6in. from the surface, and 2ft. below the clean gravel, which showed several unbroken layers. The hatchet and bone are in possession of Captain Copperthwaite, of Malton.

NOTICES OF PUBLICATIONS.

"The Waterworks of India." By ZERAH COLBURN and WM. H. MAW. London: E. and F. N. Spon. 1867.

WE have here a series of articles descriptive of the different waterworks of the metropolis, with an account of some of the proposed schemes for a better supply of water—Mr. Bateman's, Messrs. Hemans and Hassard's, Mr. Remmington's, and others, which have already been criticized in the BUILDING NEWS. Another series of papers gives an account of the water supply of Aberdeen, Dublin, Paris, Bombay, Philadelphia, and other great cities. The whole is reprinted from "Engineering." Twenty-one plates elucidate the text. The descriptive accounts of the waterworks in the United States, and elsewhere, are interesting enough, but we find nothing really new in the volume on the great question of water supply, of which it pretends to treat.

"The British Almanac for 1868." Knight and Co., 90, Fleet-street. We welcome with pleasure Mr. Knight's volume as one of the most useful of the many publications that make their appearance at this season. The more important portion of the work is the companion to the almanac, which contains, among other matter, thoughtful and well written papers on the Royal Commission on Railways; the Economical Results of Trades' Unions; the Present Position and Prospects of the British Iron Trade; Native Textile Industry in India; and the Exhibition of National Portraits, 1867. An excellent feature of this almanack is its annual *resume* of the architectural and engineering improvements of the year, which will have a special interest to members of these professions. "Gutch's Literary and Scientific Register and Almanack for 1868" (W. Stevens, 421, Strand), has reached its twenty-seventh year of publication. We know of no other work of its class which contains the like quantity and variety of handy information in the same neat and compact form, and at the same price. It is a perfect Thesaurus of every-day facts and figures for everybody. The present edition has undergone several improvements. We have also to acknowledge "Dietrichsen and Hannay's Royal Almanack," Edward Cleaver, 63, Oxford-street; "The City Diary and Almanack," 117, Aldersgate-street. Messrs. Letts, Son, and Co., have sent us their usual annual packet of diaries—a class of publications for which they have acquired a well-deserved reputation. Of the six diaries before us—each having special features of its own—we would particularly recommend those marked No. 12 and No. 18, as being admirable in arrangement and get up. The "Office Calendar" (No. 3) is an exceedingly cheap and simple convenience. The "London Bradshaw" (W. J. Adams, 59, Fleet-street). The new Bradshaw confines itself to the London through route, and does not embrace branch lines. The work differs in arrangement from the famous guide of the same name, inasmuch as it is both alphabetical and tabular, which is certainly an advantage. In addition to its railway information, this guide gives the arrivals and departures of steamers from London and Southampton, cab fares, omnibus routes, &c. A map of the environs of the metropolis is also given. The new Bradshaw will be published monthly at fourpence.

Building Intelligence.

CHURCHES AND CHAPELS.

A new Evangelical Union Church has been opened at Leith. The cost of the building is £2,100, and it seats 800 persons. The original design was by Mr. Herbertson, of Galashiels, but was considerably altered, and the building erected by Mr. Gaolen, of Leith.

A new Methodist chapel was opened at Burslem on Sunday week. It is in the Italian style, and will seat 350 persons, at a cost of £900. Messrs. R. Scrivener and Son, of Hanley, were the architects, and Mr. J. Bowden, of Burslem, was the contractor.

Mr. G. Somers Clarke is not the architect of St. Andrew's, West Bromwich, as mentioned by us a fortnight since.

The fine church of St. Paul, Clifton, near Bristol, was totally destroyed by fire on Sunday night last. The fire is supposed to have been caused by the overheating of the flues connected with the warming apparatus.

A new Methodist chapel was opened on Sunday at Newcastle. The dimensions are 60ft. by 30ft.; height 24ft. It accommodates 260 persons, at a cost of £700. Mr. S. Oswald, of Newcastle, was the architect.

The church of St. Luke, which has been lately erected in the new district of St. Luke, Lyncombe, near Bath, from the designs of Messrs. Hickes and Isaac, was consecrated on Tuesday last by Bishop Anderson. The church will seat 384 persons, 128 of the sittings being free. The amount hitherto subscribed has been £1,500, besides £1,000 for the endowment, and £250 is still required to complete the spire, which it is intended to carry up 100ft.

The parish church of Whissendine, Rutland, a structure of noble proportions, is in course of restoration, the architects being Messrs. Goddard and Sons, of Leicester. This church, which is dedicated to St. Andrew, is undoubtedly the finest in the county. Considerable funds have been collected, and it is earnestly hoped the present energetic vicar will receive such further assistance as will enable him to complete the work now fully commenced. The works are being carried out by Mr. John J. Fast, of Melton Mowbray, by whom the chancel was restored some years since.

St. Mary's Roman Catholic Church, Barnard Castle, has been undergoing extensive repairs and alterations, and an apse has been added to the altar end. The designs were prepared by Mr. Joseph Hanson, of London, and carried out under the direction of Mr. B. Hepworth, of Barnard Castle.

BUILDINGS.

Last week the Bishop of London consecrated a new permanent stone church at Fulham. The total cost is £7,000. Some additional work remains to be done, such as tower and spire, carving, &c. Mr. Darbishire is the architect, and Messrs. Cubitt were the contractors.

The Alexandra Working Men's Institute building was opened on Monday. It consists of a lecture hall capable of holding 600 persons, and a number of small rooms, and was erected at a cost of £800. Mr. Pratt furnished the designs gratuitously, and Mr. John Hodgson was the contractor. The building is of brick with ornamental facings.

The foundation stone of the schools in connection with St. Mary's Church, Aston, near Birmingham, was laid on Monday. The building will be a neat Gothic structure with bell tower and spire, and will cost £1,500. Mr. Chatham, of Birmingham, is the architect, and Mr. W. Partridge the builder.

A new wing has been added, at a cost of about £7,000, to the Wesleyan Training College, Horseferry-road, Lambeth. It comprises a lecture hall, a day room, classrooms, and about 30 bedrooms. The building is of picked stocks with plain Gothic Bath stone windows. Messrs. Wilson and Wilcox were the architects, and Mr. Hobson, of the Adelphi, was the builder.

The winter garden and ball-room just completed at Werneth Park, Oldham, for John Platt, Esq., M.P., from the designs of Mr. Peter B. Alley, architect, Manchester, were thrown open on Tuesday evening last to a large gathering of Mr. Platt's friends, including the Right Hon. W. E. Gladstone, M.P., W. H. Gladstone, M.P., the mayor of Manchester, Sir Elkanah Armitage, &c.

Buildings on the suburbs of Bristol have been extending very rapidly of late. In fact, quite an impetus has been given to business, the more favourable when contrasted with the slackness prevalent in many large towns. Among others, a number of pretty Gothic cottages, erected by Mr. White, of Hanham Court, deserve mention. They are of Pennant stone, with Bath dressings, and have been built by Mr. Charles King, of Bitton.

WATER SUPPLY AND SANITARY MATTERS.

The new main drainage works have been commenced at Ventnor, Isle of Wight. Mr. Frane is the contractor.

Mr. W. Russ, in conjunction with Messrs. Lucas and Wilkinson, has submitted a plan to the local board of West Ham, Essex, for disposing of the sewage now pumped into the River Lea, by taking it to a height of 100ft., at Hainault Forest, the main sewage costing £4,500 per mile. An agriculturist offers to give £2 per acre on 600 for a supply of 6,000 tons per acre per annum, and to take all the surplus which cannot be sold on the way to market gardeners, &c., who are expected to take the sewage to the value of £5,000 per annum. These returns will give a profit of about 9 per cent.

The Commissioners for the Prevention of Pollution in Rivers paid a visit last week to Blackburn, and inspected plans of the district showing the courses of the Rivers Blakewater and Darwen. They visited the sewage works at Wensley Fold, the junction of the Blakewater with the Derwent, and the weir above Feniscowles Hall, and intimated that their next visit to take evidence would probably be in February or March.

For a length of time past the water supplied to the town of Halifax has been of an impure character, but for the last six or seven days past it has been much worse. The complaints against it are consequently numerous and severe. It is said that the fouling of the water arises from the new waterworks going on.

The Rivers Pollution Commissioners have held a preliminary meeting, to consider the state of the Ribble, at the Town Hall, Preston. They viewed the river both at Preston and at the outfall of the sewers at the Marsh End. They also visited the new Cattle Market, and the Town Hall, with which they expressed themselves much pleased.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 31, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—L. and Son.—A. B.—W. B. A.—J. C.—T. J. S.—G. B. J.—A. P.—J. O.—P. and S.—T. H.—W. J. M.—W. and T. F.—H. H. S.—J. W.—J P. P.—A. M. M.—J. P.—T. C.—E. B—J. T. S.

H. H.—Declined. We cannot make the BUILDING NEWS a vehicle for personal squabbles.

J. H. T.—We cannot read your writing.

A. G. W., with drawing of font.

G. B.—Engravers have had copyrights in their works from 1734, sculptors in theirs since 1798, and painters in theirs only since 1862. At present the proprietors of British copyrights are admirably protected by the laws of several foreign states against the infringements of their rights there; but the proprietors of foreign copyrights are most inefficiently protected by our laws

Correspondence.

COTTAGE IMPROVEMENT.

To the Editor of the BUILDING NEWS.

SIR,—I observed an article under the above heading in your issue of the 6th inst. As the report of the Central Cottage Improvement Society is incorrect, I beg to state that I have erected one cottage at Wanstead, after Mr. Smith's design, for £105, and am willing to build one or any number of them within two miles of Snaresbrook Station for the sum above stated, provided the ground does not require more brickwork in foundation than shown on section. The cottage already built took in foundation nearly a rod of

brickwork more than shown on section, for which I could get no extra. Where the cottage now stands was a large pond not two years since.—I am, &c., THOMAS HILLS, Builder.

George-lane, Wanstead, December 16.

ARCHITECTURAL COLOURING IN FRANCE AND ENGLAND.

SIR,—With reference to the paper on the above subject, in the last issue of your journal, will you permit an "outsider," who has recently rambled over the same ground as the writer of the article, to supplement it by one or two observations of his own. The Cathedral of Rheims is in itself, in my opinion, a most notable example of the failure of chromatic decoration. What would not have been the effect produced by the play of colour from the glorious (though sombre) clerestory windows, and the kaleidoscopic upper rosace at the western end, if the white stonework of the roof had not been hidden by the dark blue wash so liberally bestowed upon it; and why is the scant depth of the triforium lessened by a background of the ever obtrusive blue? Who would imagine the roof to be but 30ft. lower than that of Beauvais? Again, the profusely gilded capitals of the nave arcade quite destroy that verticality which is so essential to all true Gothic architecture.

Take a glance at the metropolitan church of our neighbours. Will the gorgeousness of the choir aisle sculpture compensate for the lack of that quiet antiquity, that "petrified religion," so all-pervading the uncoloured sculpture of Chartres? Even the latter grand old pile, in its present dirty and dilapidated condition, seems to be afflicted with a plethora of dark tints, but what the result may be when the walls are scraped, according to French fashion, and the windows cleaned and releaded, it is perhaps difficult to say, keeping in view the brightness imparted to the old glass in the northern transeptal rose window at Lincoln by the cleaning process. Is there not an infinity more of "frozen music" in the old uncoloured cathedral of Laon than in all the chromatic splendour of the Sainte Chapelle, excellent though it is.

To my mind, whenever architecture is above mediocrity, there colour should be entirely subsidiary; where otherwise, there the decorator should be allowed greater latitude. According to my idea, an illustration of the latter proposition will be found in the chancel of the large church, near the barracks at Abbeville. I pass by the chapter houses of York and Salisbury as brilliant exceptions to this rule. My impression is, that not only "in this art have we not much to learn from France," but that we have positively many examples and warnings of what to avoid.

The "sham window-painting" at Amiens cannot, surely, be defended on any ground whatever, even if there were traces of mediæval work. By all means *preserve* every touch of antiquity, even at the risk of incongruity, but to *imitate* the barbarisms of the middle ages is a very different thing. Might we not, on the same principle, retain tallow candles in our churches and refuse the aid of gas? Should we not still build organs upon which only "muscular Christians," with good fists, could operate? To take only one instance in point—look at the quaint figures on the chancel roof of St. Mary's, Beverley; can anything more be said in their favour than that they are curious? And should this be a sufficient recommendation in an age like the present? Again, I say, jealously preserve even the curiosities consecrated by time; but the creation of spurious antiquities should be a thing of the past.

I merely take the case of St. Mary's as one instance out of many, but it is peculiarly apposite, for while care is taken that the very builders of the edifice should recognize the roof, were they to revisit their work, it is to be feared they would be scared away by the big stoves and gigantic chimney-piping introduced into the building, which have not even the merit of necessity, seeing that beneath the Ladye Chapel a most exceptional site is offered for a hot water apparatus. Surely the spirit of conservatism (if reproduction be entitled to that term) should also prevent the introduction of unnecessary and unsightly modern appliances.

To return to our first subject, I think that chromatic architectural decoration forms no exception to the rule that *excess* is dangerous in all things. It would be interesting to know how far these views are shared in by the great numbers of lay readers of the BUILDING NEWS, because it seems to me that the profession cannot be wholly uninfluenced by outside opinion.—I am, &c., VIA MEDIA.

PRIZE DESIGN FOR LABOURERS' COTTAGES.

SIR,—Permit me to say, with reference to the remarks in your current number, on the award of prizes by Cottage Improvement Society, that the reason I was unable to report favourably on Mr. Smith's design was twofold—1. Where the position of bed was indicated in third bedroom I found a large bulkhead, and on referring to the plan it appeared sufficient headway could not be obtained to stairs without such projection. This prevented the use of the room for the purpose intended, without alteration of material kind. 2. We having failed to procure estimates within nearly 25 per cent. of the sum stated, were bound to be particular for the sake of our subscribers. I asked the builder to call on me and questioned him on the subject. He distinctly declined building any single cottage from these plans for less than £120, and that in his own locality Of course, I was bound to accept this as final, so far.

With reference to my nephew. I did not know he was a competitor, and when the envelope was opened I at once put aside his design, which had been selected as best, as without the pale of the competition. To preserve it to the Society I myself volunteered a third or extra prize of three guineas.

When the council met Mr. Smith, I stated these points, and, as he expressed himself aggrieved, I offered on their behalf to refer the matter to the arbitrament of any well-known architect, or one of six, to be chosen by himself.—I am, Sir, &c., WM. G. HABERSHON.

National Club, Whitehall-gardens.

LANGHAM HOTEL.

SIR,—Permit me for the last time to refer to the above subject in answer to Mr. Murray's letters in the BUILDING NEWS and "Builder." The statements contained in them are untrue in every particular. The judge himself struck out of the list the plans I proved I had made. Mr. Murray (as my clerk can prove) never saw them until they were sent from my office to his—complete, with the exception of inking in and colouring. From his office they were sent to the works, and this, I presume, is what he means by "furnishing" them. As regards the other part of his letter I can only quote the report of the directors to the shareholders, as follows:—"The directors, having taken the best professional advice, selected the design of Mr. Giles." Mr. Murray evidently forgets the names of the directors when he says he was unknown to them. I will charitably abstain from taxing his memory.—I am, Sir, &c., J. L. GILES.

28, Craven-street, Charing-cross.

[This correspondence, if continued, must be transferred to our advertisement columns.]

CONCRETE HOUSES.

SIR,—In your last issue, Mr. W. May, jun., of Northfleet, in describing his method of building concrete houses, makes statements which are inaccurate and calculated to mislead the public. My proofs of Mr. May's statements being incorrect, are, first, I was informed by the manager of Messrs. Heywood and Hatcher (the gentlemen for whom the house was built) that it had cost more than it would have done in brickwork, and we all know that brickwork cannot be done for £5 or £6 per rod, but costs even more than double that amount. Second, I analysed and compared his method with other methods, the cost of which I am perfectly well acquainted with. Mr. May casts his blocks one day and uses them the next. Now, to be able to do this the proportion of cement cannot be less than one in two. He also states that he casts 400 blocks per day. To do this he must have 400 moulds, for nothing but worthless cement would set fast enough to allow of casting two blocks in the same mould in one day. But having cast them he is compelled to lay them by skilled labour. Moreover, he acknowledges to using bricks for fireplaces, jambs, &c. Now, sir, please to compare this system with the one carried out with my patent apparatus, in which no skilled labour whatever is required. The proportion of cement is only one in eight, and I require to use no bricks for fireplaces; I merely use burnt ballast instead of gravel, and this will stand the heat of any ordinary fireplace. Yet with all these advantages the wall built on my system costs about £5 or £6 per rod. Therefore, I feel justified in asserting that Mr. May's statements are inaccurate. Also hollow walls may be built with my system much easier than described by Mr. May. I have only to insert cores or prints to form the hollow part, and draw them upward as the work proceeds. I can make even 9in. and 6in. walls hollow, which, I think, will puzzle anyone to do on Mr. May's system I will only say, in conclusion, that if Mr. May will undertake to build walls at the price he states, I will guarantee him constant employment, for I am daily declining offers of building.—I am, Sir, &c., J. TALL.

Falstaff-yard, Kent-street, Southwark, London, Dec. 18.

Intercommunication.

QUESTIONS.

[688.]—WATER-FLOW PIPES.—Will any correspondent inform me what quantity in cubic feet per minute is an 18in. pipe capable of throwing at a fall or gradient of 9¾ft. per mile, and if the same formulæ will do in less and more gradients for bigger and smaller pipes?—INQUIRER.

[689.]—PROFESSIONAL CHARGES.—In the report of the committee of the Royal Institute of British Architects on Professional Practice, presented to the Council and published in July last, it is stated that the scale of charges of the Institute "has been universally adopted by the public and the profession, and quoted as an authority in the courts of law." I shall feel greatly obliged if any member of the profession can give me one or more instances of the recognition of this document by the courts as stated.

I should also wish to be informed if the charge of one-half per cent. for obtaining tenders, althorized in special cases by clause 13 of the Institute scale, was ever made previous to its publication by the Institute in 1862. I should suppose it must have been usual long previous, but have heard it questioned on the ground that it is a new thing recently imposed by the profession on the public.—F. W.

[690.]—GAUGING WATER.—Will any reader kindly inform me, through the medium of the "Intercommunication," the rule for calculating the discharge of water in gallons per hour through a rectangular orifice 1ft. 6in. in width, the water measuring 8¾in from the bottom of the orifice to the surface of the water? The discharge is through an orifice in a dam erected at the outfall of a 4ft. × 2ft. 8in. sewer, and the velocity of the water being 77ft. in 6 minutes. I have endeavoured to calculate this from the "Engineers' Pocket Book," but have not succeeded.—H. G. S.

[691.]—CENTRAL COTTAGE IMPROVEMENT SOCIETY.—Having seen several references to this Society recently in the BUILDING NEWS, I should be glad to know the objects and the address of the Society.—W. W.

[We copy the following from a report of the Society:—

The principal desire and aim of the Society is to promote the improvement of the dwellings of the working classes, whether agricultural labourers or artizans, either by improving those already in existence, or by inducing proprietors to erect new ones, constructed with greater attention to the health, convenience, and comfort of the inmates than formerly. The latter being the most promising and permanently useful part of the design, the Society has directed its chief efforts to the construction of cottages. To this end it has devised and published plans, which being erected in all parts of England, have proved the practicability of producing greatly improved dwellings at a cost upon which the rent will return a fair rate of interest. In these plans special attention has been paid to the importance of providing separate sleeping rooms for the parents and the different sexes of children; and to surround their homes with accommodations which allow of the observances of the decencies and proprieties of life.

As a material auxiliary in carrying out these important objects, the Society is forming a museum, in which may be found at one view, by means of models, plans, books, or papers, a collection of all the best designs not only for the dwellings themselves, but of all improvements in heating, lighting, and ventilating which may be applicable to them; and a vast amount of information on cogent subjects.

The chief objects of the Society are the improvement of suburban dwellings for artizans; the erection of cottages for labourers—in the agricultural districts—on such plans and specifications as will give a fair return on the outlay; the construction of village lodging houses and the best means of providing accommodation for single labourers; the general improvement of existing dwellings and cottages, gardens, &c.

The Society have published five designs for cottages:—No. 1 has a kitchen and second room, to be used either as a sitting or extra bedroom, with two good bedrooms on second floor. No. 2 is similar to No. 1, but slightly larger, and one bedroom upstairs has a movable partition, for the better separation of children, if desired. No. 3 is similar to No. 1, with the addition of a convenient scullery or washhouse. No. 4, or model cottages, as erected near the International Exhibition, 1862, contain superior accommodation to meet the requirements of the artizan class, while, at the same time, a very moderate rent will give a fair return on the outlay to the landlord. No. 5, triple plan, the centre cottage has one bedroom, the left-hand cottage two bedrooms, right-hand cottage three bedrooms.

No. 1 has been built for £162, No. 2 £168, No. 3 £175, No. 4 £220 per pair, and No. 5 at £225 the block.

Further information may be obtained from the secretary, Mr. H. Martin, 37, Arundel-street, Strand, W.C.]

[692.]—CEMENT FOR STOPPING CAEN STONE.—Could any one of your numerous readers inform me the best cement used for stopping defects in Caen stone.—CARVEWORK

[693.]—NITRO-GLYCERINE.—Will any of your readers kindly inform me what are the component parts of this highly-explosive substance?—D. S.

[Our correspondent is referred to another page for a short account of nitro glycerine.]

[694.]—ETCHING VARNISH.—I should be obliged for a few words of direction as to how I should prepare etching varnish I have searched in vain for a work on the subject.—A LONDONER.

[695.]—DEAD DIPPING.—I am aware that the agreeable pale yellow dead surface on ornamental brasswork is the result of a process called dead dipping. If any of your readers will describe the process it will be a favour conferred upon—W. E. C.

REPLIES.

[641.]—TURNPIKE ROADS.—From the reply of "Surveyor to a Local Board" to my question in your journal, November 1, it is very clear he is not acquainted with the duties of a turnpike surveyor, and apparently not that of the requirements of a highway surveyor, or he would not put forth such a foolish argument as he has done upon the non-uniformity of the line of building on a freeholder's land; the letter referred to the uniformity of line on the side of the road and not in fields and gardens over which he has no control. What can be more objectionable, when travelling along a road, than a building projecting beyond the general line of hedge or wall line, added to which the closer buildings are brought up to the boundary line of a road, less sun and wind acts upon the metalled part of the road to dry it up, and as a consequence extra expense is incurred by those who have to maintain roads. The surveyor should endeavour to have all buildings set back a distance from the hedge or wall line.

As to the width of a turnpike road, "Highway Surveyor" seems equally ignorant upon the General Turnpike Road Acts. 3 Geo. 4, cap. 126, s. 118, enacts the road to be 60ft. wide within three miles of a market town, and 50ft. if beyond that distance. The extra width not metalled is required for obtaining as much as possible sun and wind to dry up the road. I will admit many roads are not of that width; therefore, it becomes the duty of a turnpike surveyor to be vigilant in retaining all the width he can. In some cases the "uniformity" of line on the road side may be improved with advantage. The Highway Act wisely provides a less width of road because there is less travelling upon such roads, and to have the same width as provided for turnpike roads would have caused a waste of land to the country. I think "Surveyor of Highways" will see that he has been weak on "all points," and not your humble servant—SURVEYOR.

WAGES MOVEMENT.

Notice has been received by the Birmingham master masons, from their operatives, of a required increase of wages of one farthing per hour. The present condition of trade is such that there is little probability of the advance being conceded.

Differences have arisen between the quarrymasters of Leeds and their workmen. The former have reduced the wages 4d. per day, or about 7½ per cent. This the men determined to oppose, and strikes have been more or less general. A meeting of the masters was held last week, when it was resolved to maintain the reduction. Many of the men have since resumed work.

STATUES, MEMORIALS, ETC.

Mr. Thomas Woolner is the sculptor selected by the committee of subscribers to execute the statue of Lord Palmerston, to be erected near the Houses of Parliament. The work, we believe, will consist of a single colossal figure, 8ft. in height. The site fixed upon is at the corner of the new enclosure in Palace-yard, immediately opposite the Peel monument.

A monument intended to be placed in Dunfermline Abbey, to the memory of the late General Bruce, has been finished by Mr. Foley. It is an altar tomb. Bas-reliefs on the panels commemorate the principal incidents of his journey to the Holy Land with the Prince of Wales, and his effigy is defined on the lid.

The monument to be erected by the tenantry of the Herbert estate is to be in the form of a Celtic cross, 28ft. in height, and to be placed on the summit of the highest mountain on the estate. Besides the usual ornamentations, there will be inserted two panels, one containing a medallion of deceased, and the other symbolical figures. The design is by Mr. William Atkins, South Mall, Cork, and the execution of the work has been entrusted to Mr. P. J. Scannell, of same city.

LEGAL INTELLIGENCE.

DANGEROUS STRUCTURES.—Mr. Baylis, solicitor to the Metropolitan Board of Works, appeared on Monday, at the Guildhall, in support of two summonses taken out against the owners and occupiers of dangerous structures, situated No. 18, Fetter-lane, and 4½, Widegate-street, which were in such a condition that they required to be either shored up or taken down to the first-floor. Evidence was given as to the condition of the premises. After which the parties respectively promised to do all that Mr. Woodthorpe, the district survey, required, and Mr. Alderman Cotton made a formal order in each case for the necessary precautions to be taken for the public safety.

CURIOUS CLAIM UPON A CLERGYMAN.—A case of some importance to the clergy, owners of property, and parochial authorities in London, has just been heard before Mr. Barker, at the Clerkenwell Police-court. The plaintiffs, the vestry of St. Pancras, summoned a clergyman for improvements made about his church, under the various metropolitan improvement acts, for a sum of nearly £700, and the claim was resisted, although it is said that several of the St. Pancras clergy who have been applied to have paid the sums at which they have been assessed without resistance. Mr. M. Garvey, who appeared for the plaintiffs, said:—The defendant is the Rev. A. R. G. Thomas, incumbent of St. Paul's Church, Camden-square, and the claim made upon him was for £690 11s. 10d., for paths and footways made round his church. He contended that as the incumbent of the church he was the owner of the freehold, because induction to the church made him *ipso facto* the freeholder of the church. That had been provided by direct legislation. Mr. Thomas was, therefore, sued as a corporation sole, representing the whole interests of the church for the time being. Mr. Sleigh, for the defence, contended that, for the purposes of the Act, Mr. Thomas was not the "owner" of the property. The owner must be the person who receives the rack rent. Mr. Thomas was a salaried officer, paid £400 a year by the trustees, to whom the pew rents were assigned. The magistrate said he should reserve his opinion. In any case, the matter will, it is believed, be taken to the Court of Queen's Bench.

PARTY WALLS.—At the Marylebone Police-court, on Friday, Mr. Henry Baker, district surveyor for St. Pancras, preferred a complaint against Mr. George Ashley, builder, 38, Elgin-terrace, Maida-vale, for not complying with the Metropolitan Building Act, through neglecting to erect a certain party wall to the Lichfield Ale Stores, Frederick street, Hampstead-road, for Mr. Benjamin Taylor. Mr. W. F. Potter stated in answer to the summons that he was architect to Mr. Taylor, and that a party wall already existed, against which it was proposed to construct a lean-to roof, but inasmuch as there were certain windows in the said party wall, an application had been made to the Metropolitan Board of Works to allow the erection of an iron roof, so as not to obstruct the existing windows, which could not be done away with, and which application had been granted. Mr. Baker demurred to this arrangement, as that did not get over the difficulty of the party wall. Mr. Benjamin Taylor was prepared to state on oath that the application to the Metropolitan Board of Works was made at the suggestion of Mr. Baker himself, and who said this would get over the difficulty, if granted. Mr. D'Eyncourt, the magistrate, said the question was whether the Metropolitan Board of Works had the power to grant the application. Mr. Potter contended, under the 56th section of the Building Act, the Board had the power to grant applications of this nature in exceptional cases, and this was an exceptional case. Mr. D'Eyncourt ultimately, after a lengthened controversy, dismissed the summons. Mr. Baker then took out another summons against the same defendant, for erecting the same building contrary to the rules of the Warehouse Class, Mr. Ashley having served him with a notice that the building was to be of a warehouse class. Mr. W. F. Potter said the builder had certainly served Mr. Baker with a wrong notice; he had inadvertently signed a printed form in Mr. Baker's office, which he did not know the nature of, and when he had been informed of it, he had served Mr. Baker with a proper notice, describing the building as of a dwelling house class. The building had ale vaults in the cellars beneath, and the ground-floor and upper storeys were to be used as offices. If it were ruled that these ale stores were a warehouse, then every alehouse, tavern, or beershop in London would come under that category. Mr. D'Eyncourt dismissed the case.

Our Office Table.

Mr. R. Campbell Puckett, of the Bath School of Art, who matriculated at Bonn University, has just taken the degree of Doctor of Philosophy.

The well-known empty houses at the corner of Stamford-street are at last "To Let." Twenty years have elapsed since they were last occupied.

Mr. J. B. Hebbert, who mainly assisted in organizing the courts of arbitration, presided over by Mr. Thomas Lloyd, which have for some time settled most of the disputes in the building trade at Birmingham, was presented, on Thursday week, with a handsome cabinet desk and silver inkstand, subscribed for by masters and operatives, in acknowledgment of his valuable services.

Immense beds of pure white alabaster have lately been discovered in the vicinity of the great rock salt deposit on the island of San Domingo. Specimens have been seen by some New York builders, and pronounced of superior quality.

It is understood that in consequence of the recent disclosures relative to the management of workhouses, a Royal Commission will shortly be issued to enquire generally into the management of workhouses throughout the country.

A commencement has been made with the new Sefton Park, Liverpool, and as many as a thousand labourers will shortly be engaged on the works.

An Act is to be applied for in the ensuing session of Parliament for powers to construct a canal from the river Thames, at Wandsworth, along the valley of the river Wandle to Wimbledon. The probable cost of the proposed undertaking, as estimated by the engineer, Mr. Hamilton Henry Fulton, amounts to the sum of £120,000. The consumption of building materials, coals, and other articles in the neighbourhood of Wandsworth, Wimbledon, Tooting, Merton, Mitcham, Croydon, Streatham, &c., owing to the erection of so many new houses, is very extensive; and, in addition to the traffic to the Wandle manufactories, it is said would afford a very large traffic. The proposed undertaking comprises also a roadway, tramway, and sewer.

The premiums awarded at the last meeting of the Institution of Civil Engineers for some of the communications brought forward last session (and which were presented after the reading of the Report), included Telford medals and Telford premiums of books to Messrs. J. T. Chance, M.A., and E. Byrne; a Telford medal to the Astronomer Royal, F.R.S.; a Watt medal to Colonel Sir W. Denison, K.C.B., R.E.; a Watt medal and a Telford premium of books to Mr. John Bourne; Telford premiums of books to Captain W. H. Tyler and Messrs. W. H. Preece and W. A. Brooks; and the Manby premium of books to Mr. C. D. Fox.

The annual meeting of the Stourbridge School of Art was held on Monday last. The Hon. C. L. Lyttleton presided. The report stated that there was again a satisfactory increase in the number of scholars, and that this had been the case for the last ten years. In the study of colour there was a marked improvement, and as the effect of colour was being more considered in works in glass, it was hoped that to the superiority of manufacture, for which English glass-makers had always been famous, would be added a reputation for successful colouring, in which, hitherto, continental glassmakers had excelled. The proceedings terminated with a distribution of Government and other prizes to the successful students.

The members of the Amalgamated Carpenters and Joiners' Society, at a meeting in Manchester on Tuesday evening last, almost unanimously passed a resolution in favour of the adoption of arbitration in the settlement of trade disputes, and of appointing delegates to the proposed court of arbitration. A most important meeting on this subject was held in St. James's Hall, on Wednesday, when Mr. Mendella, from Nottingham, gave a splendid address to an enthusiastic audience. This, in all probability, will become one of the most important movements of modern times.

At the annual general meeting of the Institution of Civil Engineers, held on the 17th inst., the following gentlemen were elected to fill the several offices on the council for the ensuing year:—Charles Hutton Gregory, President; Joseph Cubitt, Thomas Elliot Harrison, Thomas Hawksley, and Charles Vignoles, Vice-Presidents; James Abernethy, William Henry Barlow, John Frederic Bateman, Joseph William Bazalgette, Nathaniel Beardmore, Frederick Joseph Bramwell, James Brunlees, George Willoughby Hemans, John Murray, and George Robert Stephenson, Members; and John Horatio Lloyd, and Captain Henry Whatley Tyler, Associates.

At a recent meeting of the Builders' Benevolent Institution, the following resolutions were passed:—1. That no person should be admitted as a candidate for the benefits of the institution under sixty years of age (instead of, as before, sixty-five), total incapacity only being excepted; and that they must have lived within the metropolitan postal district for five years, and received no parochial aid within two years previous to the period of application; widows to produce proof of eligibility under the rule. 2. The expunging of two sections of a rule which called upon candidates to provide a certain number of subscribers, and, in the event of the subscriptions being discontinued, the pension to be suspended. 3. That on the death of a male pensioner, leaving a widow "eligible" to be elected, the pension allowed to widows may be continued at the discretion of the directors to such widows until the third subsequent election of pensioners, instead of at the next election as heretofore.

The municipal reform association in Newcastle-on-Tyne brings heavy charges against the corporate authorities in that town. We all know, says the association in a manifesto just issued, how miserably the town hall was managed. Originally estimated to cost £18,000, that building was only erected in the end for nearly treble the original estimate. The new lunatic asylum was to have been built, in the first instance, for the sum of £26,928, but the Council has since unfortunately discovered that it cannot be finished without an additional outlay of £30,000, owing to the mismanagement of the justices. The document also contains a list of the officers of the new association, which is under the presidency of Mr. John Bradburn.

The distribution of prizes in connection with the Reading School of Art took place last week at the town hall, Reading. The president, Higford Burr, Esq., took the chair, and the prizes were distributed by G. J. Shaw Lefevre, Esq., M.P. A number of oil paintings, colour drawings, and architectural designs were exhibited in the council chamber. The proficiency of the pupils is very satisfactory, but it is stated that the Government minute of 1865, which transfers the management from the art masters to the managers of schools, has had the disastrous effect of reducing the number of pupils from 838 to about 150.

Herr Von Dreyse, the inventor of the Prussian needle-gun, died at Sommerda, on the 9th inst., at the age of 71.

At the general meeting of the Royal Scottish Academy, held on the 13th inst., Mr. John M'Whirter and Mr. G. P. Chalmers, two rising young artists, were elected associates.

An alarming accident occurred in Kelso on Saturday night last. An iron tank or reservoir, capable of holding 60,000 gallons, and from which the town is supplied, is raised on massive stone walls to a height of nearly 70ft. From some unknown cause the side of the tank burst, and the water escaping, carried all before it. A dwelling-house close by was completely shattered. The damage done is very considerable, besides the inconvenience that will result from the temporary want of water.

Madame Rude, *nee* Sophie Fréinyet, has just died in Paris, at the age of 70. She was the widow of the celebrated sculptor, and was herself a distinguished artist. She was a pupil of Devosges of Dijon, and afterwards of David.

The needle-gun now definitely adopted by the Russian War Office is of the Prussian pattern, but the needle being somewhat shorter and thicker the rapidity of the firing is said to be slightly increased. If Russian accounts are trustworthy, an ordinary soldier will easily accomplish eight discharges a minute, while a skilled hand is stated to have no difficulty in reaching up to fourteen. There are not many new rifles being made, the old ones admitting of adaptation.

The formation of another new street is being discussed. It is to strike through from the New Kent-road across the Dover-road into Tooley-street. The estimated cost is £20,000. It will, if carried out, break up one of the worst nests of crime and disease in the metropolis.

Dr. Medlock, of Tavistock-square, thinks it will interest the public to know that the inflammable compound known as Greek fire is not so dangerous as it is represented. It consists of phosphorus dissolved in a very volatile liquid known to chemists as bisulphide of carbon. When thrown upon any combustible material, the liquid rapidly evaporates, and the phosphorus, being left in a comminuted condition, bursts into flame, evolving suffocating vapours of phosphoric acid. Water will only temporarily extinguish the flame, which bursts out again when the water dries up, but it is important that the fire brigade and the public generally should know that the so-called Greek fire may be immediately and permanently extinguished by a solution of common washing soda—one pound to a gallon of water.

Mr. Joseph Newton has written us another letter on the bad state of the paving and lighting of Trinity-square, Tower-hill. He communicated with the Metropolitan Board of Works on the subject, who referred him to the Whitechapel District Board of Works. It now turns out that the City of London has jurisdiction over the matter. Certainly it is time that definite responsibility should be fixed on somebody, and the bad condition of the roads rectified.

At a meeting of the Society of Engineers, held on Monday last, a paper was read by Mr. James Gresham "On the most Recent Improvements in the Injector," after which a discussion on the paper took place. The president announced the following names of the president, vice-president, and members of council for the ensuing year:—Council, 1868.—President—Baldwin Latham, Esq. Vice-president—Fred. Wm. Bryant, Esq. Members of Council—John H. Adams, William Adams, D. K. Clark, James Hendry, Charles Julian Light, William Macgeorge, William Naylor, Vaughan Pendred, Frederic C. Reynolds, William Wilson. As honorary secretary and treasurer—A. Williams. As auditor—P. F. Nursey.

Trade News.

TENDERS.

BATLEY (YORKSHIRE.)—For erection of four warehouses for Messrs. Brearley, Hall, and Co., woollen manufacturers. Mr. Michael Sheard, of Batley, architect. Quantities supplied:—

Masons, &c.			
William Kitson, Boothill	£1,336	14	0
Preston and Webster, Batley	1,320	0	0
Smithson and Baines, Batley	1,265	0	0
Hepworth and Sons, Batley	1,250	0	0
Robinson and Hirst, Batley	1,230	0	0
James Booth, Batley	1,225	0	0
Copley and Co., Batley	1,220	0	0
John Robinson, Batley (accepted)	1,205	0	0
Carpenters and joiners.			
Robert Ibberson, Batley	£899	10	0
Petty and North, Batley	899	0	0
Sykes and Rodwell, Cleckheaton	880	0	0
John Willans, Birstal	860	0	0
John Shaw, Batley	800	0	0
Thomas Fozard, Batley	790	0	0
Joseph Fozard, Batley	777	0	0
John Child, Batley (accepted)	568	0	0
Plumbers, &c.			
James Brummitt, Batley	£150	0	0
Thomas Armitage, Birstal	142	19	0
John H. Senior, Batley	124	0	0
Matthew Tohley, Batley	115	7	4
Plasterers.			
J. W. Hey, Batley	£114	10	0
John Broadhead, Batley	110	0	0
R. Howroyd, Dewsbury (accepted)	104	0	0
Slaters.			
J. T. Raustborn, Dewsbury	£45	0	0
R. Denton, Mirfield	40	10	0
J. & J. Hills, Wakefield (accepted)	38	16	0

CARDIFF.—For warehouse, top of West Bute Dock, Cardiff, for Mr. John Driscell, merchant. Mr. J. Hartland, architect. Quantities supplied:—

Webb, Brothers	£1,290
Cooper	1,141
Jones, Brothers	1,100
Seager (accepted)	1,071

LEWISHAM.—For public-house for Messrs. Courage and Co. Mr. Loe, architect:—

Wright	£2,506
Bates and Lucas	2,500
Gammon	2,483
Winder	2,439
Walker	2,437
Kent	2,337
Sawyer	2,353
Charlton	2,345
Shurmour	2,295
Stoner	2,289
Nightingale	2,279
Perry	2,240
Willis	2,239
Knight	2,187
Hendson	2,130
Bland	2,120
Eustace	2,093
Steddy	2,070
Crabb and Vaughan (accepted)	2,060
Harris	1,999

LONDON.—For house and offices, Elephant-buildings, Newington, for Mr. E. H. Rabbits. Mr. W. Young, architect. Quantities by Mr. Nichols:—

Colls and Son	£2,370
J. H. Tarrant	2,276
W. Higgs	2,273
Rider and Son	2,260
W. Thompson	2,260
S. G. Bird	2,243

LONDON.—For building a colour factory, for Messrs. Reeves and Sons, Dalston. Mr. E. H. Horne, architect:—

High	£2,797
Turner	2,767
Browne and Robinson	2,480
Axford	2,735
Scrivener and White	2,361
Sewell and Son (accepted)	2,343

WEST HAM (ESSEX).—For rebuilding the Unicorn Inn. Quantities by Mr. F. G. Widdow:—

Norris	£1,453
Potten	1,368
Perry and Co.	1,347
Ennor	1,193
Rivett (accepted)	1,183

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots; also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

William Blatch, Loughton, carpenter, January 15, at 2—John Smith, Great George-street, Westminster, contractor, January 1, at 1—George Veale Colliver, Sutherland-street, Pimlico, builder, January 20, at 12—Edward Hunt Carter, Norwich, January 20, at 12—John Crabb, Gravel-lane, Southwark, stonemason, January 20, at 12.

TO SURRENDER IN THE COUNTRY.

Charles Gilbert Allen, New Romney, plumber, December 20, at 12—Abraham Callard, Honiton, builder, December 30, at 11—Robert Coppen, Grimstone, carpenter, December 24, at 11—William Dalby, Atwick-in-Holderness, joiner, December 28, at 11—James Hart, Exmouth, contractor, December 23, at 1—James Jennings, Ventnor, painter, December 28, at 12—Isaac Jones, near Pisgah Chapel, Talywain, mason, December 30, at 11—Henry Jones, Carmarthen, cabinet maker, December 18, at 12—Charles Trail, Shrewsbury, civil engineer, December 30, at 11—Robert Burgess, Rottingdean, bricklayer, January 2, at 11—William Bulcock, Evertoo, mason, December 30, at 11—Lawrence Robinson, Darlington, joiner, December 30, at 10—John Walker, York, joiner, January 3, at 12—Joseph William Wood, Wednesbury, ironmonger, December 30, at 12.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

January 28, E. Branscombe, Cirencester-street, Harrow road, decorator—January 31, A. F. Nind, Bedford-street, Holloway, painter—January 9, G. Crone, Chester, builder—January 15, J. Jackson, Bradford, Lancashire, builder—January 15, E. V. Williams, Ware, builder—January 31, T. Bailey, Heigham, carpenter—January 13, J. Collins, High-street, Southwark, builder—January 27, I. Israel, Neath, painter.

DIVIDENDS.

January 9, J. J. Bishop, Portsea, timber merchant—December 30, W. Lane, Vauxhall Bridge-road and Surbiton, stonemason—December 24, J. B. Higman, East Looe, plumber—December 23, W. Duckett, Liverpool, glazier.

PARTNERSHIPS DISSOLVED.

Gwynne and Co., Essex-street, Strand, engineers—Tress and Co., Queen-street, Cheapside, architects.

DECLARATIONS OF DIVIDEND.

J. F. Gilbert, Manchester, contractor, div. 2s. 11d.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

TIMBER, duty 1s per load, drawback, 1s.

Teak .....load	£9	0	£10	10	Archangel, yellow ..	£11	10	£13	0
Quebec, red pine	3	0	4	10	St. Petersburg, yel...	10	10	11	0
,, yellow pine..	2	15	4	0	Finland	8	0	9	0
St. John N.B. yellow	0	0	0	0	Memel	0	0	0	0
Quebec Oak, white ..	5	5	5	10	Gothenburg, yellow	8	10	10	10
,, birch.....	3	10	4	10	,, white	8	0	9	0
,, elm	3	10	6	0	Gefle, yellow.....	9	0	11	0
Dantzic oak	3	10	6	0	Soderham	9	0	10	10
,, fir	2	0	3	0	Christiania, per C., 12 ft. by 3 by 9 in.				
Memel fir	2	0	2	10	yellow	16	0	22	0
Riga	3	0	3	5	Deck Plank, Dantzic, per 40 ft. 3 in.	0	15	1	4
Swedish	2	0	2	5	PUMICE STONE pr ton	8	0	8	0
Masts, Quebec red pine	6	0	7	0	OILS, &c.				
,, St. Petersburg	6	10	7	10	Seal, pale ...per tun	40	10	41	0
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.					Sperm body	110	0	112	0
					Cod	36	0	36	10
					Whale, Sth. Sea, pale	39	10	0	0
Quebec, white spruce	13	0	19	0	Olive, Gallipoli.....	67	10	68	0
St. John, white spruce	13	10	15	10	Cocoanut, Cochin, ton	56	0	57	0
Yellow pine, per reduced C.					Palm, fine	40	10	41	0
					Linseed	34	15	35	0
Canada, 1st quality.	17	0	18	10	Rapeseed, Eng. pale..	38	0	38	10
2nd do.....	11	10	12	10	Cottonseed.....	33	0	39	10

METALS.

IRON:—						
Welsh Bars in London .. ..per ton	6 7 6	6 10 0	3			
Nail Rod ..... do	7 10 0	7 15 0	2½			
Hoops ..... do	8 10 0	9 0 0				
Sheets, Single ..... do	9 15 0	10 0 0				
Staffordshire Bars ..... do	7 10 0	7 15 0				
Bars, in Wales ..... do	5 15 0	6 0 0	3			
Rails ..... do	5 10 0	6 0 0	net			
Foundry Pigs, at Glasg. No 1 .. do	2 15 0	3 5 6	2½			
Swedish Bars ..... do	10 5 0	10 10 0	net			
STEEL:—						
Swedish Keg, hammered .....per ton	15 0 0	15 10 0	2			
Swedish Faggot ..... do	10 10 0	12 10 0	2			
COPPER:—						
Sheet & Sheathing, & Bolts ....per ton	80 0 0	82 0 0				
Hammered Bottoms ..... do	92 0 0	0 0 0				
Flat Bottoms, not Hammered .. do	85 0 0	0 0 0				
Cake and Tough Ingot ..... do	71 0 0	72 0 0				
Best Selected ..... do	79 0 0	80 0 0				
Australian ..... do	83 0 0	84 0 0				
Y 1. Metal Sheathing & Rods ....per lb	0 0 7	0 0 0				
ZINC:—						
English Sheet .....per ton	26 10 0	27 0 0	2			
Devaux's V. M. Roofing Zinc .... do	26 10 0	0 0				

* And 5 per cent. discount if laid upon the new system

TIN:—			
English Block .....per ton	95 0 0	96 0 0	2½
do Bar ..... do	93 0 0	97 0 0	
do Refined ..... do	99 0 0	99 0 0	
Banca ..... do	94 0 0	95 0 0	nett
Straits ..... do	90 0 0	0 0 0	
LEAD:—			
Pig, English .....per ton	21 10 0	0 0 0	2½
,, Spanish Soft ..... do	19 0 0	0 0 0	
Shot, Patent ..... do	22 10 0	0 0 0	
Sheet ..... do	20 10 0	0 0 0	
White ..... do	27 0 0	30 0 0	6
SPELTER:—			
On the Spot .....per ton	21 0 0	21 2 6	net
QUICKSILVER .....per btl	6 17 0	0 0 0	
REGULUS OF ANTIMONY			
French .....per ton	28 0 0	0 0 0	

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THE BUILDING NEWS.

LONDON, FRIDAY, DECEMBER 27, 1867.

OBITUARY FOR THE YEAR.

IN looking over the grand record of the departed for the year that is now so near a close, we have been impressed with the fact that the losses which science and art have sustained have been unusually heavy. The losses have not only been large numerically, but individually they have been great. As there are few families where death has not left a vacant chair during the past twelve months, so there are few nations that have not been deprived of one or more of their representative men. In our own country the list is a long and mournful one, and includes a number of great names. France, also, has lost not a few of her leading ornaments in science and art.

The principal English architects who have passed away during the year were Sir Robert Smirke, R.A., and Mr. Charles Fowler—the one dying on April 26, the other on September 29. Both ranked high in the profession; their personal careers, and numerous works, were recently recorded in these pages, and are familiar to our readers. Among the architects of lesser note were Mr. Thomas Cundy, who designed Hewell Park, Tottenham Park, Grosvenor House, and other well-known mansions. He had long acted as architect and surveyor to the extensive estates of the Marquis of Westminster. Mr. Cundy was born in London in 1790, and died about the middle of August. Mr. John Bull Gardener, F.R.I.B.A., died on January 7, at the age of 81; Mr. W. F. Cross, of Exeter, in February; and Mr. H. M. Wood, of Nottingham, in the beginning of October, at the age of 82. Mr. Cross, who was an architect of great promise, had only reached his thirtieth year. He designed the extensive asylum at Wonford. M. Hittorff, the distinguished architect of Paris, whose death took place on the 25th of March, contributed much to the embellishment of the French capital. He was the architect of the Cirques de l'Empereur and de l'Imperatrice, of the great church of St. Vincent de Paul, and the decorator of the Place de la Concorde, the Champs Elysées, and other public places. M. Hittorff was royal gold medallist of the R.I.B.A. He was a native of Cologne. In June, at the patriarchal age of 85, died M. Le Bas, member of the French Institute, senior member of the Section of Architecture; and, in August, M. Paccard, the architect of the palaces of Fontainebleu and Rambieuillet. M. Paccard was 54. Many noteworthy deaths have occurred among the members of the Institution of Civil Engineers. In the decease of Michael Faraday the world of science sustained an irreparable loss. The great chemist died on August 25 at the age of 73—his name will never die. Lord Rosse, another honorary member of the institution, and universally known as the inventor of the great telescope which bears his name, departed in October. In the list of members and associates we find the names of a number of very worthy men—Nichol Baird, John Cass Birkinshaw, William Carpmael, James Combe, Alexander Gibbs, W. G. Ginty, J. Cramond Gunn, Robert Hawthorn, Alfred King, George May, Auguste Perdonnet, J. C. Street, Christopher Cato, Edward Magdalen, Joseph Delany, F. S. Homfray, Captain Mark Huish, E. Loysel, W. Jopling Nesham, Thomas Richardson, Ph.D., and Lieut.-Colonel Short, R.E.; also, Edward Humphreys—who began life as a shoemaker, and became one of the most successful engineers of the day. He died on the 24th of May, and John Bethell, who in 1838, introduced the process of preserving timber with oil of tar, commonly called creosote oil. On the 22nd of January, Sir William Snow Harris died at 74, the inventor of the only safe method of lightning conductors; in March, William Baddley, C.E., for twenty years the Inspector of the Royal Society for the Protection of Life from Fire, at the age of 61; and on the 9th of the present month, Herr Von Dreyse, the inventor of the Prussian needle-gun, at the age of 71.

The death of John Philip, R.A., the finest colourist of his time, was one of the greatest losses of the year. This eminent artist was suddenly struck down by paralysis on the 27th of February. He was born in Aberdeen in 1817, and few men have risen to the same distinction from so humble an origin. Octavius Oakley, member of the Old Water Colour Society, the admirable delineator of gypsies and organ boys, died from the same cause two days afterwards, aged 67. About this date also occurred the decease of the great French painter Ingres; Peter Von Cornelius, the restorer of German painting, died at Berlin on the 6th of March, aged 80; Dr. E. Ruggles, the American artist, whose cabinet pictures, the "Ruggles' gems," are extensively sought after in his own country, on the 10th; and G. F. Phillips, the English landscape painter, on the 30th of the same month, aged 87. Charles H. Bennett, the most humorous and original of the comic or eccentric school of English wood draughtsmen, was cut off on the 2nd of April, in his 38th year; and on the 14th, at the still earlier age of 35, died Adelaide Ironside, an American artist of considerable repute. Another young English draughtsman of acknowledged power, William McConnell, departed on the 14th of May, at the premature age of 36. The Scottish School of Water Colourists lost their leading member in the demise of G. M. Greig, on the 3rd of May; and England her greatest landscape and marine painter since Turner, in that of Clarkson Stanfield, R.A., on the 18th of May. Stanfield died at the age of 74, and some interesting particulars, not generally known, of his remarkable career, will be found in the BUILDING NEWS of June 7, 1867. He was closely followed by Horatio McCulloch, the head of the Scottish School of landscape painters, "the faithful and loving interpreter of those scenes and aspects of nature more peculiarly characteristic of the North, and to the illustration of which it was his pride exclusively to devote the vigorous and busy pencil that only dropped from his hand in the hour of death." He was born in Glasgow in 1805, and died on the 24th of June. On the 14th of the following month Mollinger, the Dutch landscape painter, died aged 34. In the International Exhibition of 1862 his works were among the best and most characteristic of those exhibited by the modern Dutch school. This gifted young artist was the pupil of Roelofs, one of the most distinguished landscape painters in Belgium. This present month, on the 18th, died at Paris, Madame Rude, *née* Sophie Frémyet, aged 70. She was the widow of the celebrated sculptor, and was herself a distinguished artist—a pupil of Devosges, and of Dijon, and of David. Madame Rude was a constant exhibitor at the modern artists' *salon* of Paris for forty years. In 1833 she was awarded a medal of the first class for the "Adieux de Charles I. et ses Enfants"—a picture now in the Ministry of the Interior. John Hardman, and Michael O'Connor, painters on glass, died, the former on the 29th of May, the latter on the 25th of June. In sculpture, we note M. Jules Klagman, of France, in January; on the 22nd of May, E. H. Baily, R.A., the English sculptor, at a venerable age. This distinguished pupil of Flaxman was born in Bristol, the son of a ship carver, and very early gave indications of ability in the profession in which he afterwards won so high a reputation. He was especially renowned for his beautiful and graceful delineation of the female figure. His best works, perhaps, are "Eve Listening to the Voice," a companion to his "Eve at the Fountain," "The Graces," and "The Sleeping Nymph." He executed a large number of statues of public men, including the statue of Nelson which surmounts the column in Trafalgar-square. Mr. Baily was elected an A.R.A. in 1817, and an R.A. in 1821. The sudden death, under very melancholy circumstances, of Alexander Brodie took place at his native town of Aberdeen on the 30th of May, in his 37th year. He was younger brother of William Brodie, R.S.A. of Edinburgh, and a man of undoubted genius. His statue of Her Majesty at Aberdeen, of the late Duke of Richmond at Huntley, "The Mitherless Bairn," and "Highland Mary," have called forth more than local notice. John Macdonald, another Scottish sculptor, was carried off by the cholera epidemic at Rome in August. Though less known than his brother Lawrence, he possessed no mean ability, and

A warmer heart death ne'er made cold.

Seurre, the French sculptor, died in October. He executed the statue of Molière on the fountain in Rue Richelieu, and that of Napoleon which surmounts the famous Colonne Vendome, one of the most characteristic monuments of Paris. John Henry Wyatt, the engraver, died on the 1st of June, aged 68; H. T. Ryall, on the 14th of September, aged 57; and the same month, William Walker, celebrated for his rendering in stipple of the portraits of Raeburn. His last work, which he thought his greatest, occupied him for six years—"The Distinguished Men of Science of Great Britain living in the year 1807-8." Walker was a Scotchman, born in 1792.

The geological and botanical sciences were deprived of an energetic observer in the untimely death of Fred. James Foot, of the Geological Survey of Ireland, who was accidentally drowned on the 17th of January, at the age of 37. This month also, John D. Alton, the learned Irish antiquary and historian, breathed his last. In May—within a week of each other—died Edward Hawkins, for many years Keeper of the Department of Antiquaries in the British Museum, aged 88; Sir Thomas Phillips, Chairman of the Society of Arts, aged 65; and John Parker, the well-known antiquary, aged 87. Dr. Gerhard, the celebrated Prussian archæologist, and M. Champollion-Figeac, the Nestor of French archæologists, likewise in May. In July we note Mr. James, F.S.A., of Nether Edge, a notable Yorkshire antiquary, author of a history of Bradford, and the article "Yorkshire" in the "Encyclopædia Britannica," besides other useful works. In August, James Rennie, author of the well-known work "Insect Architecture," closed a busy life of fourscore years in Australia; and on the 15th instant died the Duc de Luynes, the eminent French archæologist.

VISIT TO THE TWICKENHAM ECONOMIC MUSEUM.

THIS rather unique exhibition bears upon its programme the title of "The Economic Museum; or Museum of Domestic and Sanitary Economy, Twickenham, S.W." It stands in the private grounds, and is the private property of, Mr. Thomas Twining, a Vice President of the Society of Arts, who has devoted the leisure of many years, and much thought and expenditure of money, to its formation. It is, however, freely opened for public inspection and study, without any special request for admission, on Wednesday and Saturday afternoons, and at all other times by appointment, and it has a well defined public object in view. We therefore take train at the Waterloo Station to go down and see for ourselves. Seated therein, we indulge in a few thoughts about museums in general. The present is an age of museums. The British Museum, though considerably enlarged, has become so overstocked that a large portion of its treasures can never be seen, and it must soon be split into two or more museums. The South Kensington, a growth of the present day, promises very speedily to rival the older establishment.

We have museums for special departments, all more or less freely opened to the public within the present generation. No provincial town of any pretentious considers that it can pass through life comfortably without a museum of some kind or other; the working men are beginning to clamour for extended hours of opening, and the bringing of museums to their very doors by the establishment of branch or local museums. All this betokens progress. A properly arranged museum teaches through the eye most agreeably and effectually. The amount of instruction that may be gathered in such a place is to be measured only by the receptive faculties of the student. But most of the existing institutions are intended to illustrate those departments of art, science, or antiquities which, though highly useful, bear but remotely upon the every-day familiar wants and necessities of the mass of the people. The museum we are about to describe is intended to occupy ground thus left vacant, and to impart, in a scientific and agreeable manner, that knowledge of common things of which many are destitute to an extent they are scarcely aware of.

Here we are at Twickenham. Crossing the railway bridge, a walk of two or three minutes brings us to the door of the museum, one of the most unpretentious buildings, for such a purpose, we ever saw. Had we expected any striking *coup d'œil* we should find ourselves disappointed. But we are informed that as one main object of Mr. Twining in forming this museum has been to show how similar collections might be made in other localities where space and pecuniary means are both limited, it was felt that an attempt to make a striking show would have frustrated any such design. Accordingly, we have a building of the plainest material, measuring about 80ft. by 30ft., the whole of which space is economized to the greatest extent possible, being divided into four longitudinal passage ways, each having on both sides table space and screens, or wall space running to a height of about 10ft., these being covered by glass cases, drawings, diagrams, &c. Certain articles are also suspended from the roof by pulleys, which admit of their being lowered for minute examination. Looking down this first vista of 80ft., we have before us Classes 1, 2, and 3, and we proceed to their inspection. The curator kindly attends us, as he does every visitor, ready to point out anything remarkable which might otherwise escape us, or to afford explanations respecting the arrangement and objects of the various classes.

The first class is that of Economic Architecture, which contains a series of designs for improving the dwellings of the poor both in town and country. The collection of drawings and cardboard models is more complete than we have anywhere seen. The models are very unpretending in appearance, but highly useful for unprofessional students of this all-important subject. Side by side, for purposes of comparison, we see the plans of Lord Shaftesbury's Labourers' Friend Society, of the Metropolitan Association of Alderman Waterlow, of the buildings erected by Miss Burdett Coutts, by the trustees of the noble gift of Mr. Peabody, and many others, some of them with full details for study of architects and builders. We also observe designs which have gained prizes from various sources; and looking on the walls at the woodcuts of the horrible dens wherein both the moral and physical life of our poor brethren is made wretched, we wonder how long the time will be in coming when all the thought and care which this spot witnesses to have been bestowed upon the subject shall bear practical fruit, when the dens shall disappear, and every poor family in our towns and villages be able to live in places worthy to be called home. There is a second section in this Class 1, in which are shown models of building details, small wooden bricks teaching the meaning of various technical terms relating to the bricklayer's art. Who that knows not what is meant by brick-nogging or brick on edge, and who knows not the cunning ways in which bricks are laid so as to form various kinds of bond, let him come to the Twickenham Economium, and he can learn in five minutes. This knowledge few people outside the trade possess; it would be none the worse for them if they did, and would prove of great use when they might have to decide on purchasing, building, or renting a brick-built house. We glide by an insensible transition from these things to Class 2—Building Materials. Here is an instructive case containing carefully classified specimens of the principal kinds of rocks selected for illustrating what may be called the natural history of the department, forming a fit introduction to the commercial series of stones in common use contained in the drawers beneath, accompanied by an explanatory list, giving information as to the varying qualities and degrees of usefulness of the different specimens. That there are "sermons in stones" is an old saying, and its truth will be re-affirmed by every one who takes the trouble to avail himself of the information upon such common objects, laid freely before him in this place. In these drawers, silently but forcibly witnessing to the danger of a bad choice of building stone, are preserved the identical specimens which were prepared to assist the committee who selected the stones for building our Houses of Parliament. They managed to make a bad selection, and the result has been that almost before it was entirely finished, several portions of that costly building were going to premature decay.

Passing by an orderly arrangement of all that appertains to a thorough knowledge of mortars and cements, a matter of the greatest importance as regards solidity of construction, we come to a series of shelves, with examples of brick earth and of bricks. "Nothing commoner than a brick," some thoughtless visitor might exclaim; "I have seen enough of them in that great Babylon of bricks I left at Waterloo Station." True, they form a very essential part of your home; you cannot live in comfort without them; a wall built of bad bricks will not only crumble away (that may be the landlord's affair), but it may permit the damp to infest your house, and affect your health most grievously; and, common as they are, you, who are not of a trade which uses them, what do you know of them?

Should you have thought, now, for example, that there was such an astonishing variety as you see here. Burr bricks, shuff, place, stock, malm, Stourbridge, paving bricks, and many other names, are full of meaning and importance, as indicating the adaptability of a particular kind for a particular purpose. Here you have them all before you, and many more of all materials, shapes, and sizes, and of many countries, and you can examine and study them at your leisure, either just enough to gain a general knowledge of the subject, or more profoundly, if you desire. And is the study profitless? We fancy not. We rather think that if a general knowledge of such common things as the materials of our houses and the method of construction existed amongst us, and were very widely diffused, we should hear the last of such ramshackle erections such as we see all round London, built to delude the members of building societies and small capitalists with the promise of a home, rent free, for the rest of their days, but which begin to crumble away before they are well occupied. There may, indeed, be no rent to pay, but the cost of repairs, added to the interest of the purchase money, make the house as dear or dearer than if the occupant had hired rather than bought it. Tiles, slates, zinc for roofing, corrugated iron, felt, and miscellaneous building materials come next. Among them is a specimen of the fibrous slab for making which a company was formed some years ago, and which was to effect an entire revolution in domestic architecture. It being a matter of some importance to test the reliability of these pretensions, Mr. Twining gave the material a thorough trial in the construction of the present building. For the walls and flooring he considers it to have answered tolerably well, but as regards the roof, the public have the advantage of learning, at his expense, that it was an utter failure, long ago having been replaced by slate.

We next see the various kinds of wood used in building and for furniture. On the walls are drawings illustrating the botany and information as to the comparative strength and durability of various kinds. We see practical examples of the various kinds of joiners' work, and, if they will only be at the trouble of visiting here, the general public may soon become too wise to be at the mercy of scamping workmen who tack and glue the work together, instead of making good and sufficient joints. Next are shown the various kinds of window glass, crown, sheet, and plate, with illustrations of the processes of glass-blowing and casting, followed by a variety of pigments used in house-painting, with examples, in the shape of small surfaces, prepared to illustrate the processes of knotting, preparing, flatting, distempering, and the like. To complete the building illustrations, we have next some paper-hangings in the various stages of preparation, with a wooden block, and showing how it is printed with variegated patterns.

The house being thus planned, built, and decorated, the other side of the long aisle is dedicated to Class 3—Furniture. We are first shown, by means of specimens, drawings, and various illustrations, the method of getting metals in the crude state of ore, and the processes through which they pass, until we get them in the shape of the manufactured articles, samples of which in various kinds of household hardware are shown, most of them, not to lose sight of the utilitarian object of the exhibition, being ticketed with prices. We notice, as one peculiarity here, a few articles of curiosity, such as a pump from Japan, a wooden lock with a wooden key used by the Arabs, &c., exhibiting much ingenuity of contrivance, but, withal, showing by contrast the superiority of the metals in use amongst ourselves. Next, we view specimens of different kinds of filters, articles which, though they only remove the mechanical impurities of water and leave the more deadly chemical corruptions untouched, are yet less used than they should be. The larger articles of hardware, such as stoves, ranges, and the like, being exhibited separately, we come next to some very interesting illustrations of the manufacture of pottery and glass, showing the processes through which they pass, from the rude mass of clay to the polished and figured article glittering upon our tables; and, as a practical summary of the whole department, we have examples of several complete sets of various kinds, with prices annexed, to suit the means of every working man, from the poor labourer to the clerk. Our house is now not only built but furnished. By the way, we are inclined to ask, where are the tables and chairs, and such like, but we refrain, as it is evident that they would want a museum all to themselves. Not so the materials for stuffing them, which, on account of the importance of learning how to reject whatever may be likely to breed corruption or unwholesomeness, are duly exhibited. We will reserve what we have to say about food, household stores, sanitary matters, home education, books, &c., as exhibited at the Museum, for our next number.

VENTILATION OF DWELLINGS.*

IT was a saying of old Doctor Stephen Hales that could he but see the immoderate use of spirituous liquors less general,

* "On the Ventilation of Dwelling Houses, and the Utilization of Waste Heat." By FREDERICK EDWARDS, JUN. Hardwicke, Piccadilly. 1867.

and the benefits of ventilation more generally known and experienced, he might then hope to see mankind better and happier. And "the perpetual curate of Teddington, and rector of Faringdon" was not far wrong. The worthy doctor gave his conviction a practical turn by not only writing a treatise on ventilation, but by contriving a ventilating bellows, which, though a very humble and somewhat inconvenient machine, nevertheless did good service in our hospitals and prisons a hundred years ago. Though the great importance of good ventilation is better appreciated, and its true principle more clearly understood now than they were in Dr. Hales's day, the practical application of the principle, even at the present day, is neither so complete nor so successful by any means as could be desired, or as the public health demands. There are still many practical difficulties to be overcome in the satisfactory solution of this great social problem. Among recent writers on this subject, no one has done more to give us clear views in regard to it than Mr. Frederick Edwards, jun., the author of an excellent practical work on our "Domestic Fireplaces," reviewed in the BUILDING NEWS. His work on ventilation is even a more important treatise, and one that ought to command great attention. Mr. Edwards goes into the whole question of ventilation thoroughly, reviewing the numerous contrivances and systems that have hitherto been adopted for ventilating public buildings, and gives the result of his own experience and observation in a series of valuable suggestions. Dividing his book into chapters, the author devotes his introductory chapter to "A short account of those who have introduced arrangements for ventilating public buildings, and of the systems adopted." This is an extremely interesting essay on the history of ventilation. We learn all about the air channels introduced by Sir Christopher Wren, Dr. Desagulier's blowing wheel, Dr. Hales's ventilating bellows, Mr. Samuel Sutton's pipes, and the Marquis de Chabannes's "Calorifere Stove," which was so largely in use half a century ago, and was certainly a great improvement on all the previous contrivances. Indeed, the Marquis, as Mr. Edwards observes, anticipated much regarding ventilation with which the public became familiar at a later date. The labours of Count Rumford, Sir Humphrey Davy, Mr. Tredgold, Dr. Neil Arnott, and the still more important services rendered by Dr. Boswell Reid, are also described, and the merits and defects of their systems pointed out. Public attention had long been directed to the ventilation of public buildings before the ventilation of our dwelling houses was thought of. It is only of comparatively recent years that the necessity for improvement here has been felt. As our author remarks, "The cholera visitations of 1832, 1848, and 1854 in particular, acted in a terrifying, and therefore useful, part in exciting the attention of thousands, and many began, happily, to be careful about breathing pure air with the instinct of self-preservation." To enumerate the multitude of appliances in use for the purposes of ventilation, and more particularly for admitting fresh air by the window, would occupy too much space. Scores of these have been patented, in the shape of air-bricks, perforated glass and zinc, wire gauze, &c. The more applicable and useful of this kind of ventilator are illustrated and described in this work. "Irrespective of these various contrivances, however," says Mr. Edwards, "it is easy for any one, with a little ingenuity, to contrive, with the aid of perforated zinc or glass, wire gauze, air gratings, and sliding valves, any arrangement that may suit his own fancy, and if he can be trusted not to rush off to a patent agent to get him a patent, he will have gratified himself without losing his money." Again, he remarks, "For the escape of air from the room the chimney is nearly always available, and it would be more frequently so than it is if the supply of fresh air from the doors, walls, or windows, were in all cases sufficient. The upward current in a chimney is, of course, greatly interfered with if a rarefied atmosphere is allowed to exist below. When a fire is actually burning, the chimney answers the purpose of ventilation most powerfully, and occasionally excessively, so that a contraction of the fireplace becomes indispensable for the purpose of warmth. It is exactly this contraction of the fireplace which makes it possible to utilize the chimney draught above. It is only necessary to break a hole into the chimney anywhere below the ceiling for an additional amount of air to pass away, and that without occasioning personal inconvenience from any current." To the objection often urged by architects and others to the liability of sooty particles being blown into the room, and to the flapping noise made by the door of the ventilator in gusty weather, it is replied that if soot is liable to be blown down through the ventilator, it appears probable that it may also be blown down into the fireplace. In this case, it is the construction of the chimney, and not the ventilator, that is at fault. With a sufficient pressure of air below, and a simple protection above, down-draught, whether from wind or otherwise, could hardly be known. And the same precaution, says the author, will suffice to prevent the flapping noise of the door. As a substitute for a window ventilator in cold weather, Mr. Edwards recommends a small ventilator with a face of perforated zinc, and a sliding valve at back, to be fixed below the cornice over a doorway. Another important provision relating to the warming of an apartment, considered in connection with ventilation, is to furnish a channel for giving a special supply of air near to the fire. If a tube, we are told, containing a sectional area of twenty to thirty square inches for a small or moderate-sized room, were fixed between the joists, with one end communicating with an external wall, and the other end placed in communication with the apartment at the hearthstone, or at the bottom of the grate, a supply of air would enter as long as there was not ample convenience for air at other points. The effect of this arrangement would be to check the sensible movement of air over the floor to the fireplace, and, consequently, to add to the comfort of the room. It is well known that much of the fresh air which enters near the fire becomes instantly warmed, and circulates in the room. In summer this warm air channel is unnecessary. The atmosphere of a water-closet may be greatly purified by a ventilator fixed near to the floor in the external wall with perforated zinc, or an open grating on one side, and a sliding valve on the other, that can be readily opened and closed, together with another ventilator of perforated glass or zinc, fixed near to the ceiling. In like manner, cupboards may be kept well ventilated by a slit being taken off the bottom of the door of a quarter of an inch, and a few holes perforated near the top. On the subject of smoke in private dwellings, what appears to be most practicable, in the opinion of Mr. Edwards, is the introduction of improved systems of cooking, by which smokeless fuel can be used, and the use of those grates for warming which furnish the least smoke. If it be the fact, as we believe it is, that two-thirds of the smoke produced by our present grates could be avoided, a smoky chimney ought to be a rare thing. We have given, we believe, the leading suggestions contained in Mr. Edwards' book. They will not perhaps meet every case, and yet they contain nearly the whole principle of ventilation. If, as the author concisely puts it, "arrangements be adopted for admitting air imperceptibly at our windows, and warm in winter, at positions near the floor, and if air be removed by ventilating channels, and the open fire place, we shall have done much that is readily within our power to maintain both a comfortable and wholesome atmosphere in dwelling houses." We may again refer to the author's remarks on the utilization of waste heat. For the present, we content ourselves with giving his volume our hearty commendation.

ARTESIAN WELLS.

THE subject of well-boring having lately attracted some attention, we have received repeated applications to devote a portion of our space to an article on the subject. This we now purpose doing, giving first an elementary description of the formation and construction of artesian wells, and then examining some improvements that have of late years taken place in the machinery for boring. Although the general application of the principle of artesian wells is only common to modern times, their uses were known to the ancients. They have undoubtedly existed in China for more than 1,500 years. They have, too, been sunk in Italy, and in the district of Artois, in France, from whence their name, from time immemorial. They are perpendicular borings into the ground, generally of a few inches in diameter. The disposition of water to seek its own level regulates their action, and a large amount of caution is necessary in the selection of situations favourable to their success, a geological knowledge of the surrounding district being necessary to the avoidance of useless operations.

The following is a description of the geological formation of a district favourable for boring. Upon the surface, or immediately under the surface of a country, see illustration, A (*a*), occurs a bed of hard earth or rock impervious to water, or through which water will hardly pass. Under this and above another stratum similar to it (*c*) is a bed of sandy or other soft rock (*b*) through which water easily percolates. Rain water falling upon elevations of the adjacent districts (*h*) is absorbed by portions of the sandy rock which crop out of or are exposed to the surface, and from the action of gravity passes downwards until it reaches the lower stratum of hard rock. Unable to rise to its own level through the upper hard stratum it remains there, free from evaporation. Upon a boring being made (*w*) down to the stratum by which it is absorbed, the water immediately rises to the surface, the various hindrances to its passage through the rock, notwithstanding as the boring is comparatively small, and the force of the water beneath of course very considerable. The stratum of sandy rock may, in fact, be considered as an immense bent horizontal pipe, into the two raised ends of which water is poured, upon which, a hole being bored in the centre, the water springs up endeavouring to reach the level of the two ends.

Large areas of stratified rocks seldom occur unbroken, but are generally fractured by the past action of different disturbing forces. Successful borings have, however, been made under these circumstances by piercing the hole between the fracture and that part of the surface where the soft rock absorbs the water (see illustration B).

During its passage through various strata of rocks, water often becomes impregnated with deleterious substances—some so much so as to render it useless for employment in many manufactures. When in sinking an artesian well it is found that a supply of bad water only is to be obtained at the first water line reached, it is usual to bore deeper with the view of obtaining purer water. This being accomplished, the boring to the depth of the first find is widened sufficiently to admit of the insertion of a cylinder through which the pure water rises unmixed with the impure. Sometimes, too, although only an insufficient amount of water is found at the higher stratum, a more abundant supply may be obtained by boring deeper.

The extraordinary depth of some borings has rendered it necessary to invent special machinery to facilitate the working of the excavations, and while the principles which regulate the supply of water remain unaltered, the modifications of the machinery thus introduced have effected such considerable changes in the manner of well-boring, as the art is now practised, that it behoves engineers to enquire carefully into the merits of the different systems from time to time pursued.

A valuable paper was read by Mr. G. R Burnell before the Institution of Civil Engineers about three years ago, from which much reliable information is obtained on the subject. The first well executed of great depth, and which directed public attention to the art, was one for the city of Paris, by M. Mulot, at the Abbattoir of Grenelle. Commenced in 1832, after more than eight years

of incessant labour, the water rose on the 26th of February, 1842, from the depth of 1,797ft. 6in.

The German engineers, in their endeavours to meet with the brine springs found in the Rhine provinces, introduced important modifications of the tools employed, and amongst other inventions M. Euyenhausen imparted a sliding movement to the striking part of the tool used for piercing the rock, and thus he avoided the jarring of the tools while he produced a uniform action on the bottom of the rock.

In 1856, M. Kind contracted with the municipal council of Paris to complete a well at Passy, in the Paris basin, within twelve months, and to deliver from 1,786,240 gallons to 2,232,800 gallons of water per day for 300,000f. (£12,000.) On the 31st of May, 1857, after the works had been in operation nearly the time stipulated for their completion, and the depth of the boring had attained 1,732ft. from the surface, the excavation collapsed in the upper strata at a depth of about 100ft., and filled up the boring. Time and indulgence were granted to M. Kind, and a new arrangement was entered into. The upper part was finally lined with masonry to a depth of 150ft., and beyond that a tubing of wood and iron was continued to a depth of 1,804ft., and at the bottom a length of copper pipe pierced with holes, to allow of the entrance of the water, was added. Success at length rewarded the enterprise in September, 1861, at a depth of 1,913ft. 10in. from the ground, the ultimate uniform yield of water being 3,795,000 gallons per diem, and the total cost of the well £40,000.

There are three systems of boring generally practised, viz., the Chinese or M. Fauvelle's system, M. Kind's system, and the French system, which is the most known.

Fauvelle's system, although at first extensively patronized by M. Arago and Dr. Buckland, is now seldom practised on the Continent, and not at all in Great Britain. Its principles were, first, that the motion given to the tool in rotation was simply derived from the resistance that a rope would oppose to an effort of torsion; and, therefore, that the limits of application were only such as would provide that the tool should be safely acted upon; and, secondly, the injection of a current of water descending through a central tube to wash out the detritus at the bottom. The difficulties attending this were enormous, and mainly caused the abandonment of the system in all operations on a large scale.

In the ordinary system, the motion of the tools is effected by the use of solid iron rods, the weight of which, of course, increases in proportion to the depth attained; and it follows from this that where the boring is very deep, either the vibration produced in the long rod, or the torsion, causes an unequal delivery of the blows at the bottom. To obviate this, hollow rods have been used presenting a larger sectional area than was necessary in the particular case, to increase their lateral resistance to the blows producing vibration. The height of the fall of the trepan is 2ft., but the disengagement of the machinery is effected by the reaction of the column of water that the trepan works in. Many well-borers have used hollow rods filled with cork, and some have tried the Euyenhausen joint, augers and chisels being frequently used to remove the detritus.

M. Kind's system may be best described by noting the differences between it and the ordinary system, and by carefully tracing the results of its employal at Passy, to which we have already alluded. The essential difference consists in the use of a trepan of considerable diameter falling through a certain height, and in the use of oak rods, for the suspension of the trepan working in water, and thus easily counterbalanced.

At Passy, the weight of the trepan was 1,800 kilogrammes (about 1 ton 16 cwt.), the height through which it fell was 2ft., and its diameter was 3ft. 3 7-16th in. The oak rods were about 8in. on the side, and the dimensions of the cutting tool were 3ft. 3 7-16in. Great strength was given to the head of the striking tool, and to the part of the machinery employed to turn the trepan, there being a danger of the latter breaking off under the influence of the shock. The details of the trepan are shown in figs. 1, 8, and 4. It is composed of two principal pieces, the frame and the arms, all of wrought iron, except the cutting teeth, which are of steel. Fig. 3 represents at the bottom of the frame a series of slightly conical holes into which the teeth are inserted and wedged tightly up. These teeth are placed with their cutting edges on the longitudinal axis of the frame that receives them, and at the extremity of the latter there are formed two heads, also carrying two teeth double the width of the others, to give more power to the part. Above the lower part of the frame of the trepan is a second piece composed of two parts bolted together, to support the lower portion of the frame; this part also carries two teeth at its extremities, to guide the tool in its descent, and to work off any asperities left by the lower portion of the trepan. Above this are two pieces of wrought iron, independent of the blades of the trepan, arranged in the form of a cross with the ends turned up, to preserve the machinery vertical in its movements by pressing against the sides of the boring already executed. Lastly, the stem and arms are terminated by a single piece of wrought iron joined to the frame with a sort of saddle joint, and secured by means of keys and wedges. The whole is jointed to the great rods that communicate the motion from the surface by a screw coupling formed below the part of the tool which bears the joint (fig. 2).

M. Kind adopts Euyenhausen's sliding joint, availing himself for large borings of sliding guides made in two pieces, and connected with pins with a sliding joint, which at Passy was thrown out of gear by the reaction of a column of water above the tool unloosing the click that upheld the lower part of the trepan (figs. 13, 14, 15). These, however, were matters of detail, and it is probable that there was some hitch or deficiency in his system of causing the column of water to act on the disc by which the click was set in motion.

The rods used for the suspension of the rod were of oak, and the advantages, as stated by M. Kind, derived from their use are greater rigidity and strength, and exact counterbalance when working in water, and, on account of its elasticity, great power of resistance to any sudden jar. Straight grown trees of the required diameter should be used rather than cut timber, to avoid warping. The lengths used by M. Kind were about 50ft., and connected by wrought-iron joints (see fig. 18.) In the works at Passy there was a kind of frame erected over the centre of the boring of sufficient height to allow of the rods being withdrawn in two lengths at a time, thus producing a considerable economy of time and labour.

The apparatus employed for the removal of the detritus was, like all others in use, very defective. It consisted of a spoon (figs. 8 and 9), with a cylinder of wrought iron suspended from the rods by a frame, and fastened to it a little below the centre of gravity, so that it could be easily upset when loaded. This cylinder was lowered to the level of the last working of the trepan, and the materials detached were forced into the tool by its gradual movement in a vertical direction. Mr. Burnell thinks that M. Kind deprived himself of a valuable appliance in not using the ball clack ("la soupape à boulet") employed by other borers (fig. 10.) Tools used by MM. Mulot, Dru, Laurent, and others are adapted for the extraction of the materials in wells of small diameter, but would have been of no use at Passy.

The head of the "assemblage" was connected with the balance beam of the steam engine made of two pieces of wood, the upper of fir and the lower of beech, by a Vancanson chain, with a screw coupling (figs. 16 and 17). The whole of the machinery was worked by steam admitted to the upper part of the cylinder, which pressed it down, and thus raised the tool at the other end of the beam to that part in connection with the cylinder. The counterpoise to the weight of the tool was also placed upon the cylinder end of the beam, which prevented the piston from striking the cylinder cover too forcibly when it was brought back to its original position. The balance beam is continued beyond its point of connection with the piston, and goes to meet the blocks placed to check the force of the blow given by the tool.

The beating of the rock was usually effected at Passy at the rate of about fifteen to twenty strokes per minute. The average number of men employed was fourteen, and the trepan was usually worked for about eight hours, and the spoon was then let down to remove the detritus.

The total time employed in sinking shafts on this system in the north of France, where it has been applied without meeting with the accidents encountered at Passy, has been estimated thus:—From 25 to 56 per cent. in manœuvring the trepan, from 11 to 14½ per cent. in raising and lowering the tools, from 19 to 21 per cent. in removing the detritus, and from 8 to 10½ per cent. was lost owing to stoppages, &c.

M. Dru has introduced a contrivance for the application of the tool "à chute libre," or free-falling tool, to wells of large diameters, with a view to prevent the trepan from being thrown out of gear in the manner we have before mentioned. He made his trepan in the manner shown in fig. 13; the tool was gradually raised until it came into contact with the fixed part of the upper machines, when it was thrown out of gear. The bearings of the clutch were found to be more evenly worn, so that this instrument could be worked from eight to fourteen days without intermission. It could also be applied where water is scarce, as there is no necessity for a column of water with the trepan.

After all, these improvements are little more than matters of detail, and the merit of the discovery of the principles of the construction of the tools is still due to Euyenhausen and M. Kind.

While engaged with the subject of well boring, a word or two on the new American tube well, which is attracting considerable attention from scientific men, may not be deemed inappropriate. It consists of an iron tube, the lower end perforated with holes, and shod with a steel point. This is driven into the ground by means of repeated blows given by a hollow monkey. The process of driving is continued until it is found that a water-bearing stratum is reached. A pump is then attached, and the water obtained. This invention was extensively used by the Federal army. The English Government have sent a number of the tubes to Abyssinia, and the Emperor of the French has sunk several with decided success.

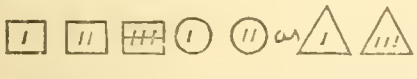
Of course, no very great depth can be reached; it is, however, stated that the inventor has sunk one at Ithaca, New York, 120ft. in depth. Its great advantages are cheapness, purity of the water obtained (it being entirely free from surface drainage), and the rapidity with which the operations may be conducted.

MARKS UPON DEALS, AND QUALITIES OF TIMBER.

MERCHANT or trade marks are of very ancient origin. They serve to denote by symbol, initial, or device the particular class of goods manufactured by certain persons. In unlettered times they were acknowledged necessities in every branch of trade and in every circle of society. We have proof of this from the royal arms of the sovereign to the humble vendor of refreshments at the village inn. Each in their turn fixed upon some device or pictorial representation as their badge of rank or their device in trade by which to denote their particular goods. We may trace the custom from the makers of porcelain down to the moulders of rude earthenware, from the goldsmith to the worker in baser metals, from the rude ages of semi-barbarism to the present days of ease and polished refinement. To those not immediately connected with these particular devices they appear a perplexing mystery. There is an inherent pride in the trade marks possessed by certain houses, as by established custom they represent a species of capital. On the one hand, they are a warranty for the quality of the article; and, on the other, we are reminded of their value to the owner by the familiar notice—"To imitate which is forgery." That the custom of branding timber with trade marks and devices is borrowed from other trades there is little doubt, but that one particular colour of brand or one superior device should be used over the whole area of a country, and almost a continent, is not so easily explained. With the northern nations from which we draw our supplies of timber a crown has been used from time immemorial to denote a superior quality of goods. We are familiar with this device in the timber trade. Crown logs, crown beals, crown timber, and staves, are every-day terms, and are even used where particular makers mark their goods otherwise than with a crown. In the Riga wainscot oak different qualities of crowns are used. We find the term English crown ranking as the best quality, and the Dutch crown as the seconds; in this case it is not essential that the log should be branded with a crown. With a certain shipper we should have a brand C denoting the English crown—H the Dutch crown, and W for the common or "brack" quality. In like manner, we have Riga deals; the first quality is termed "crown," and the second quality "half crown," when crowns, or even brands of any kinds are absent. In some cases where crowns are used we find a plurality of

them denoting the best quality from one part and the common from another. From Russian Finland we have a make of best Uleaburg goods branded with three crowns and the letters A and R in a circle. This is an exceptional device; the general rule is that letters and figures or devices, if repeated three times, imply the goods to be of common quality; in the above case we have the addition of the letters and the arrangement of the crowns in a circle to guide us from confounding them with the ordinary three crowns or common goods shipped from Gefle. From Russia and Finland we are only familiar with "hard brands" made by the blow of a hammer but in this particular make of Uleaburg goods we have the Swedish custom introduced of stencilling the device upon the deal ends with red paint. Generally speaking, these deviations from the accepted custom of the established trade are the result of ignorance, and are only committed by new makers, who are immediately put straight on these points by the importers. In illustration of this fact, an instance might be noticed where a Wyborg (Viborg) firm stencilled their initials R. S. upon one of their shipments. The importer, who was unprepared for any brand upon these goods, naturally protested against this innovation upon a settled custom. Where goods are shipped from a port that has long adopted the custom of branding, brands are naturally looked for, but when brands are attempted to be used on goods from a port not accustomed to use marks or devices, the step is immediately protested against. Thus, we have old customs preserved over extensive districts, the origin of which is lost in the vista of departed years.

Russian and Finland goods are principally of first and second qualities, designated by the shippers "prima" and "secunda." They were formerly all of best quality, but as they deteriorated they were separated into two qualities. During the last few years a commoner quality—"thirds"—has been introduced, but their sale is not easily effected against the common goods from the nearer ports of Sweden. With thirds Petersburgh deals we are familiar, with "waney" edges and battens nearly half round on one side. The Finland thirds are generally square edged, but are faulty deals thrown out from the other qualities. Finland can boast of a hard, strong, and close-grown quality of timber, but from its slow growth it is apt to be shaked, loose or blackhearted. This may explain the reason of their common goods being square-edged, as they are generally cut from the centre of the largest timbers. Hand-made deals are often shipped from these ports as common goods. The fact of their rude manufacture places them in this scale of quality, although they may be cut from the best and soundest timbers. These common goods are rarely branded where brands are used for the superior qualities. This is also the case where shippers are in the habit of exporting best and seconds goods unbranded. This custom, although it may appear strange upon the surface, creates no confusion, as the best are easily detected from the common quality, and the seconds are marked with a red stroke across the ends. In other cases where brands are used, the same impression may be marked on each class of goods, as A L, a red mark on the sides I or II denoting the qualities. In contradistinction to this custom we have some shippers who consider they make thirty, forty, or fifty per cent. of seconds goods in proportion to best, and will sign their shipping contracts accordingly, leaving the importer to select the qualities when he gets them to hand; in this case we have our merchants' devices upon the sides in red chalk, as



Other shippers (as instance "Peter Belaire," of Petersburg, who brands his best deals P. B., and his seconds P. B. 2) will set at rest the question of quality. These brands do not, in all cases, represent the initials of the makers, especially when they do not ship the goods themselves. The celebrated Gromoff Petersburg deals bear the brand of C. & Co., from the fact that they are shipped by the firm of Clarke and Co.

From the ports of Archangel and Onega, in the White Sea, we get a valuable class of timber. Seconds goods are rarely shipped, as they are able to supply such a large proportion of best quality. Shippers' brands, as W. S. C., &c., are used as in the Baltic ports, but we have this peculiarity—they may come to hand branded with figures, thus: 2, 3, 4, and even 5 and 6. These have no bearing upon the quality, but is said to denote the number of the yard in which the goods were stored previous to shipping. It will thus be seen that brands are somewhat perplexing on both Russian (proper) and Finland goods. It is a safe rule where red letters or devices are absent, and they are branded with the blow of a hammer, to set them down under this head; but where they are common goods, and bear no brand, like many of the Swedish shipments, they may generally be detected by the colour of the sap, which is not so blue as in the Swedish goods. With Swedish goods we are introduced to widely-different customs, and the principle of branding bears but distant relationship. Branding with the hammer is unknown. Here we have the settled custom of stencilling the letters upon the ends with red paint; and we have a leading department in the manufacture of common goods All the shippers make best goods, which, with few exceptions, are much inferior to the Russian shipments, and were it not from the fact of the low price of these common goods, which can only be purchased by taking a proportion of best goods, we should see very few best quality Swedish deals in our markets.

As previously observed with Russian goods, we are familiar with first, second, and third quality goods; here we have the first and second mixed together, and marked with the same brand. These "mixed" deals, as they are called by the shippers, are always sold by the English merchants as best Swedish goods: were it not so the best and seconds goods would have to be selected; this would cause some inconvenience, as they would both carry the same brand. For purposes of trade, they are all called best. It naturally follows that the shippers' thirds are called seconds, and so on with the fourth and fifth qualities, which are called thirds and fourths. The term "mixed," so common with the brokers and shippers, is never heard with the merchant and the consumer. Bearing this custom in mind, we will wade through a few of the leading brands, with the terms used by the brokers, and figured on the foreign specifications attached to them. We have thus:—Gefle stocks—E K B, mixed; E X B, thirds; E X X B, fourths. C Crown, B, mixed; C X B, thirds; C X X B, fourths; C V B, fifths. K H B, mixed; H A B, thirds; the fourths unmarked or unbranded. S K B, mixed; D O M, thirds; D M, fourths. Sundswall goods—M X, mixed; N X, thirds; O X, fourths. Holmsund goods (Dixons)—D. B. and Co., mixed; D D D, thirds; fourths unbranded. Malmo goods—F H K mixed; K X T, thirds; fourths unbranded. Soderhamn, from which the best class of Swedish goods are shipped, we have G. G. and Co., mixed; G G G, thirds; and fourths unbranded; B S S C (Bjornaborg Saw Mill Company), mixed; B C, thirds; and fourths unbranded. Stockholm—(Franke's)—J. Crown F, mixed; J E F, thirds; J E F O, fourths. As these qualities are transmuted in the hands of the merchants, we should recognize them in the timber yards, as E K B, best; E X B, seconds; E X X B, thirds, &c., &c. As fifths goods are rarely shipped, it will explain the reason of fourths goods being rarely seen in the timber yards, and, as seen by the above instances, that fourths goods are very often unmarked, we have the explanation to so many thirds quality Swedish goods bearing no brands. This alteration in the qualities causes some confusion, as so many of the shipments have letters or devices repeated three times for the thirds quality. We have two illustrations in the brands given above, viz., D D D and G G G. One accustomed to brands would naturally infer that those were thirds quality goods, whereas the timber merchant will inform you they are seconds. On the other hand, instances may be noted where the alteration of the qualities is favourable to the brands. This is the case with several of the Gottenburg shipments. An illustration is furnished by a Gefle stock—K A B, mixed; N A S, thirds; * * *, fourths, which, altered by the merchants, would stand thus:—K A B, best; N A S, seconds; * * *, thirds. In some instances, Gottenburg and other Swedish deals are branded on the sides or edges. This implies they have been sawn in the interior of the country, and have been sent down to the ports for shipment with chopped ends. Before being shipped the ends would be squared, and the brands, if applied in the ordinary way, would be destroyed. Where this is the case they are generally small insignificant letters, just sufficient for the maker to be able to recognize his goods in the finished state. Generally speaking, the principle of branding Swedish goods is objectionable. Where buyers are called upon to judge the qualities from inspecting the ends of the deals, their judgment is contorted by these glaring letters, and, as they are marked on both ends, there is no relief. Where Russian goods would be impressed with a crown from the blow of a hammer, Swedish goods might bear the full complement of letters, C R O W N, occupying the whole section of the deal. This is particularly the case with Norway goods, and, as they are principally 3 by 7 and 2½ by 7 in section, the difficulty is multiplied.

Hewn timbers are generally branded with the hammer at the ends. With Memel shipments the qualities are marked in the centre with a scribe, thus: I — I I for best and seconds; in like manner they will bear the initals of the shipper. Dantzic timber can always be detected from Memel by having a multiplicity of marks in the centre of the timber, thus: (X, I I I P D); as these are mostly private marks they are difficult to explain. The Custom House scribes can be readily understood, as XXIII for 23ft., &c., &c.*

THE SCIENCE AND ART DEPARTMENT.

WE understand that Mr. Buckmaster is at present engaged in making a tour in various manufacturing districts in England, in order to explain the principles upon which the Science and Art Department of the Privy Council are prepared to give aid to classes for the improvement of artizans in technical education. The following is a syllabus of the subjects in which instruction is to be given. 1. Mechanical and Geometrical Drawing—Introductory Lessons—Drawing and shading of simple figures, to give facility and accuracy in the use of the instruments. Plane—Use of the straight line and circle in drawing most of the forms given to materials used in the arts of construction, and in "setting out" work before being shaped by hand and tool; also setting out on the ground, as practised by builders and others, a few of the curves more frequently used, such as the ellipse (or oval), the curves of the teeth of wheels, cams, screws, &c. Solid—The meaning and use of the terms plans, elevations, and sections, with their application in drawing, machinery, masonry, shipbuilding, carpentry, &c. The above is all required of candidates for 3rd, 4th, or 5th class certificates. Having perfected themselves in the above, students will receive instructions in that kind of drawing required in their particular trade. Those students who aspire to earn a medal, or first or second class certificates, will be instructed in the higher branches of solid geometry; for example, the drawing of the curved surface of the screw propeller, of the surface of a ship, &c.; the development or unfolding of curved surfaces (of great practical use to boiler makers, shipbuilders, coppersmiths, and others); the intersections of curved surfaces, forming groins, vaults, skew arches, culverts, &c., determining the exact shape of each stone, and the manner of cutting it; isometric projection, or complete representation of a solid by means of one "view" only; and, finally, perspective, considered not as an art, but as a science. 2.—Theoretical and Practical Mechanics:—Introductory—Arithmetic, mensuration, weight of materials, strength of materials, expansion of metals by heat, expansion of metals by strain. Theoretical.—The general principle of the conservation of energy, as applied to the composition and resolution of forces, centre of gravity, the mechanical powers, friction, the laws of motion, falling bodies, centrifugal force, pressure of liquids, &c. Practical.—Wheelwork, shafting, &c., as applied to cranes, lathes, and other machines; block and tackle; the strains on roofs and girders; the stability of retaining walls and arches; the expansion of steam, and the steam engine; the fly-wheel; loss of work arising from friction; and the displacement of ships. N.B.—The practical part will be made to bear as much as possible on the different trades of the pupils who come forward; and at the same time will be in harmony with the drawing class.—Text book for junior students, Tate's "Exercises on Mechanics," price 2s. For students desirous of obtaining a first class certificate, the text book will be Professor Rankine's "Applied Mechanics."

* To be continued.

PHOTOGRAPHS OF THE REMAINS OF THE SEVEN CHURCHES OF ASIA AND THE ADJACENT SITES OF INTEREST.

"YOU see, Sir, we have to suit the various tastes of our customers." Such is the sort of answer every shopman is ready to give to any one who may express surprise at the diversity of ugliness, and the meaninglessness which are everywhere visible in our modern arts and manufactures. That the art of photography is no exception to this slavish subserviency becomes more evident every day. What we call "taste" must be pandered to, regardless of the quality of it. In all the multiform ramifications of its corruption, as well as in its strivings after better things, there are always plenty of "respectable" tradesmen and "clever artists" ready to keep it going. It matters little what the demand may be, it is sure to be supplied. Art has, in fact, given up its government. A teacher and a ruler no longer, it has become a mere tool to work out the foolishness of the hour, to minister to a vulgar passion, or please some weak sentimentalism. "The fifty original photographs" of the remains of the seven churches of Asia, now on view at the Arundel Society's rooms, 24, Old Bond-street, will no doubt meet with purchasers, not because the photographs are good in themselves, for this they are not; not because the scenery is beautiful or grand, for it is neither one nor the other; and not because the ruins of the seven cities are important contributions to the archæology of the East, for, with one or two exceptions, they are nothing but confused heaps of earth and rubbish. The only reason for the publication of such a series must be sought in Clapham or amongst the followers of Dr. Cumming. To those people whose highest pleasure is to revel in the Apocalyptic Vision, whose weakly sentiment and feeble imagination dwell upon mystic numbers, seven-headed beasts, and scarlet dresses, these photographs will afford, of course, food for much talk, and serve as a new sensation. To every one else they are worthless. Had the photographs themselves been better, one or two would have been slightly interesting to the archæologist: thus, the view of Philadelphia, showing arched fragments of old church; the theatre at Hierapolis (36), and the view of the old church at Pergamos (47), were fit subjects for the photographer's art. As represented, however, in this collection, we can make but little of them even with the help of a magnifying glass. Nos. 31 and 32, showing the temple of Venus Aphrodisias, are perhaps the best photographs, and certainly this temple forms the most interesting ruin. No. 4, Tomb of S. Polycarp, shows a long black blot near the centre of the subject which we suppose is intended for a tree; but whatever it may be called, it is an insult to the art of photography to exhibit such an utter and inexcusable failure. It would have been scarcely worth while to have said thus much but for the way in which this series of photographs have been introduced to public notice. The prospectus looks full of promise. The price is decidedly high—sixteen guineas the set; any sixteen for six guineas, and single copies for half-a-guinea. Then the series is announced as "complete," the photographs are styled "original," and the subjects, we are told, have been "never taken before." Lastly, Mr. Svoboda, who has produced the work, comes before us as "artist of the R.A. of Venice," and these mystic letters alone, whether in reference to Venice or to London, are quite enough to settle the doubts of most people.

Altogether, we do not hesitate to say that the work, viewed either as a specimen of photography or as merely illustrative of the remains of the seven churches, is decidedly disappointing, and whatever Philadelphia and Pergamos may possess in the way of archæology yet remain to be illustrated.

PORTION OF FRONT, NO. 40, STRAND.

ONE of the subjects illustrated by us this week is a portion of the front of No. 40, Strand, recently completed from the designs of Mr. John Barnett, architect. The building itself is five storeys in height, and has some considerable pretensions, as modern street architecture, to be favourably noticed. The two lower storeys form but one feature, and consist of five arches carried by light iron columns. The principal floor, immediately above these, and of which our illustration forms a part, has one large central opening, and two smaller side windows. The style may be termed Renaissance, with a mixture of Elizabethan feeling in the details. To this mixture of styles we have no fault to find, for the general effect is broad and bold, but the fault, if fault there is, consists in a too perceptible straining after originality, and the general effect is somewhat sacrificed. The two upper floor windows are segmental headed, and in stone, but do not call for particular notice. The building, as a whole, shows traces of careful study, and a commendable desire to improve our street architecture.

HISTORY OF A BRIDGE.

NO doubt many of our readers have looked with admiration at the Victoria bridge, which crosses the Thames at Battersea. At a recent meeting of the Institution of Civil Engineers, Mr. W. Wilson read a paper on this bridge. He said that it crossed the River Thames about 150 yards to the eastward of the Chelsea Suspension Bridge, at a point where the width of the waterway between the embankment walls was 740ft. It consisted of four segmental wrought-iron arches, each having a span of 175ft. at the springing, with a rise of 17ft. 6in., and a clear headway of 22ft. above Trinity high-water level. At the northern end there was a land opening of 70ft. span crossing the Grosvenor-road, and on the southern shore there was a corresponding opening of 65ft. span, crossing the wharves of the Brighton Railway Company.

In the first place, the gravel was dredged out of the bed of the river, down to the clay substratum, for a breadth of 100ft., and extending across the entire width of the water. Cofferdams, constructed of two rows of whole timbers, waled and strutted in the usual manner, were then driven 4ft. below the level of the intended foundation. When the enclosed area was cleared of water, the clay was excavated to a depth of 40ft. below Trinity high-water level. The space to be occupied by the foundations was next surrounded by permanent sheet piles driven to a depth of 8ft. below the lowest foundation level. Within this sheeting a bed of cement concrete, 4ft. in thickness, was formed, and on that the masonry of the piers was commenced, the concrete being afterwards carried up to the top of the sheet piles round the entire circumference of the piers. From the footings up to the level of 4ft. below low-water, the piers were built entirely of brickwork in lias mortar; thence to high-water level they were faced with rock-faced Portland roach stone, with one through course half way up. The core or backing was composed of pavior bricks, set in lias mortar, and the cutwaters, caps, springers, and other masonry above high water were of tool-dressed Bramley Fall stone. The width of the piers at the springing line was 12ft. 4in., and from the extrados of the arch to the level of the cornice the width was 10ft.

The superstructure of each of the four principal openings consisted of six wrought-iron arched girders, springing from cast-iron bed plates fixed to the masonry. Horizontal girders, resting on the piers and on the abutments, and riveted to the arch near the crown, formed the longitudinal bearers for the roadway. The spandrils, or intermediate spaces between the arched ribs and the horizontal girders, were filled in with a wrought-iron framework radiating from the arch; and between the horizontal bearers cross girders, for carrying the roadway, were fixed at distances averaging about 3ft. apart.

A detailed description was then given of the ironwork of one of the principal spans, that of the others being precisely similar; from this it appeared that all the six ribs, of which each arch was composed, were alike in construction, but varied in sectional area; they were I-shaped, the top and bottom tables and the central web being composed of flat plates, connected together longitudinally by angle irons, and vertically by T-iron stiffening pieces. The two middle ribs, which might each have to carry half the load on one line of rails, had each a sectional area of 80in.; the ribs intermediate between these and the outer ribs had each a sectional area of 71·2in., while the sectional area of each of the face ribs was 53·4in. The horizontal girders were continuous over the entire length of the four principal openings, and in the centre of each pier a stiff expansion joint was provided, for the purpose of equalizing the strains under different temperatures. The joints were made and the bolts screwed up at a mean temperature of 60 deg.; and the girders, which rested on bed-plates on each side of the open joint, were perfectly free to expand or contract, the continuity of strain being always preserved by the elasticity of circular vulcanized india-rubber washers, two such washers being provided to each bolt.

A segmental cast-iron shoe was bolted to the end of each rib, and rested in a corresponding concave bearer, working loose in a cast-iron frame fixed to the masonry, and provided with wrought-steel keys and cotters, for adjusting the arched rib in position. By this arrangement the whole compressive strain was distributed over the entire sectional area of the arch, whatever the state of the temperature. Each pair of ribs and horizontal bearers were connected together, so as to form, as it were, the two into one box-girder. In addition, there was a complete system of vertical and transverse bracing and strutting to both the girders and the spandril filling.

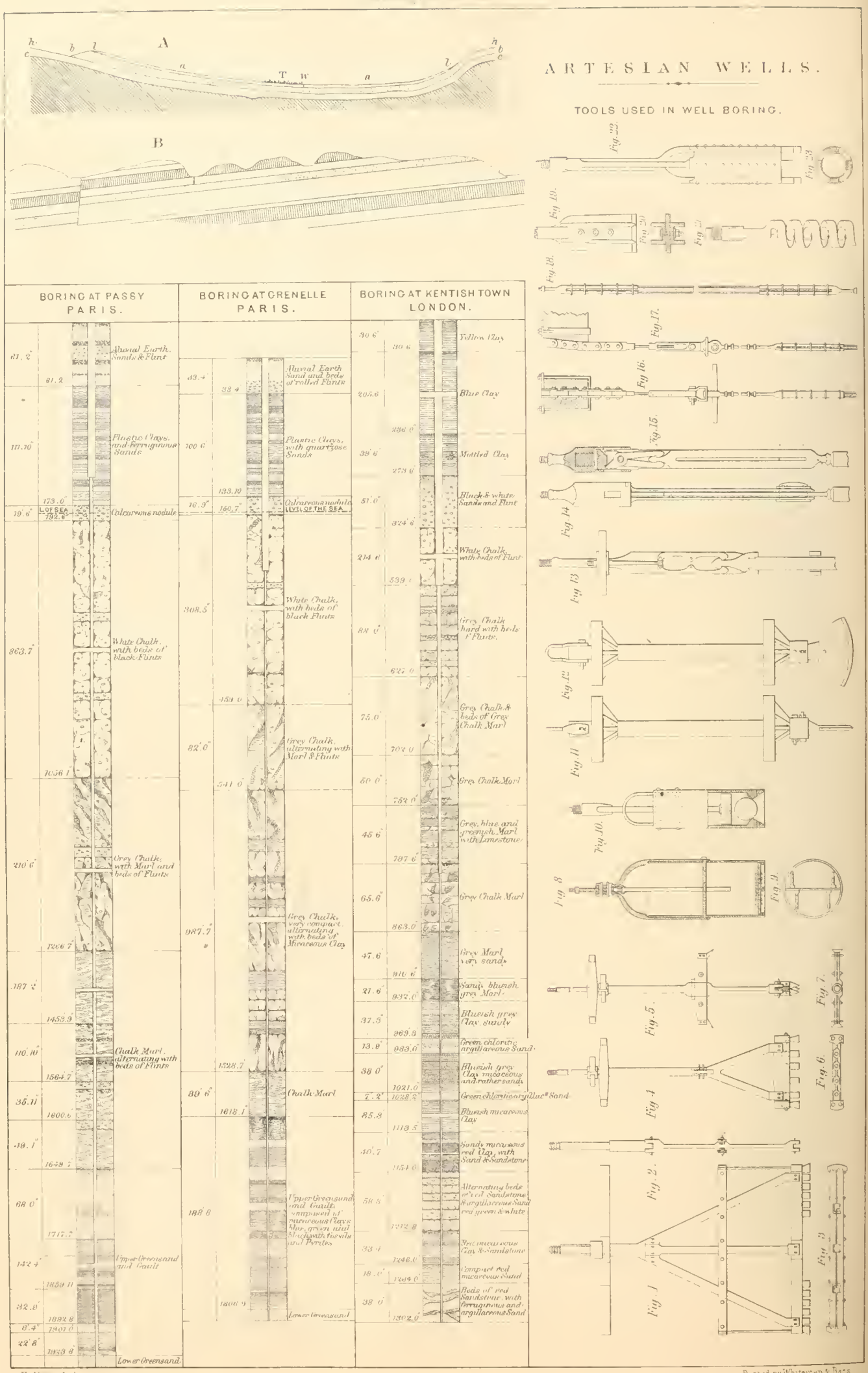
The total cost of the bridge, including the land arches and abutments, was about £84,000. The superficial area of the roadway, between the parapets, being 31,690ft., the cost per square foot was £2 13s.; while the total length being 930ft., the cost per lineal foot was £45 3s. Only twelve months were occupied in the erection of this important structure.

The works were designed by Mr. Fowler (President Inst. C E), and were carried out under his supervision by the author. Mr. John Kelk, M.P. (Assoc. Inst. C.E), was the contractor, and the iron work was sublet to Messrs. Bray and Waddington; the wrought iron work was supplied by the Monkbridge Iron Company, and the cross girders and angle iron by the Butterley Company.

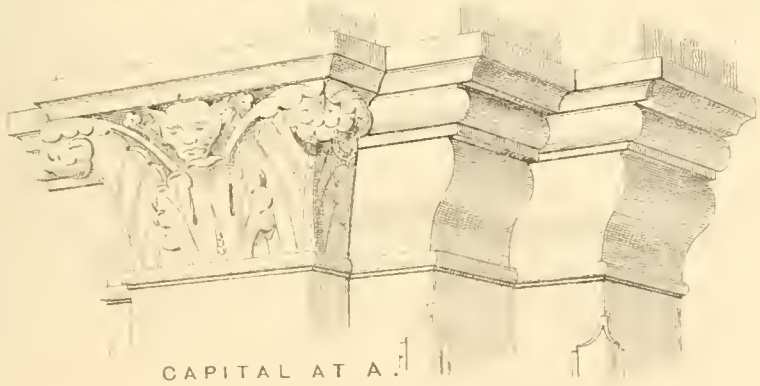
WATER PIPES.

IT is well known that water pipes burst during frosty weather by water freezing within them. The best way, therefore, to prevent their bursting is not to allow water to remain in them during cold weather. There are various means by which this can be effected. A correspondent advises householders to send for a plumber at once, that he may fix a valve at the bottom of the cistern, over the outlet pipe, with a small wire cord attached, and conveyed through a tube fixed in the cistern to the most convenient place below, so that the water becoming frozen the action of the valve is not impeded; the danger then is at an end. For three-quarters of the year the valve will not be required, but when the frost sets in, and especially at night, let the valve drop, and the water in the cistern will not be allowed to enter the pipes. The lowest tap being opened, the pipes will soon become empty, and, therefore, quite safe; water may at any time be obtained by a slight pull at the end of the cord, and securing it to a small hook fixed in the wall. A few shillings outlay before the next frost will insure a house from damage that would cost many pounds to repair, besides the inconvenience caused to its inhabitants.

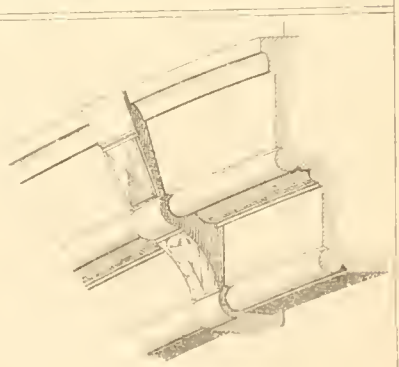
Another correspondent says:—My method is to insert a common stop-cock in the pipe which brings the water down to our rooms and kitchens, at its nearest possible point to its outrun from the bottom of the water reservoir above. This point will be commonly found at the top of the wall of an upper water-closet, over which the reservoir is commonly placed; but the water-closet supplies of water come down other separate and distinct pipes of their own, which, being only momentarily flushed as required, do not remain permanently charged with water, and, therefore, do not require any looking after. In the topmost main stem, then, of the pipe—which, like an inverted tree, shooting downwards from its root in the reservoir above, enters the house, and, in its descent to the kitchens, sends out its branches to taps in various rooms (in some of which the mischief always occurs)—a stop-cock can be inserted with little trouble, and its future use is an equally simple matter, causing no trouble at all worth counting against the mischief which it will assuredly prevent.


A
B
ARTESIAN WELLS.
TOOLS USED IN WELL BORING.
BORING AT PASSY PARIS.
BORING AT GRENELLE PARIS.
BORING AT KENTISH TOWN LONDON.
Alluvial Earth, Sands & Flint
Plastic Clays, and ferruginous Sands
Calcareous nodule
White Chalk, with beds of black Flints
Grey Chalk, with Marl and beds of Flints
Chalk Marl, alternating with beds of Flints
Upper Greensand and Gault
Lower Greensand
LEVEL OF THE SEA
Alluvial Earth Sand and beds of rolled Flints
Plastic Clays, with quartzose Sands
Calcareous nodule
White Chalk, with beds of black Flints
Grey Chalk, alternating with Marl & Flints
Grey Chalk, very compact, alternating with beds of Marneous Clay
Chalk Marl
Upper Greensand and Gault, composed of marneous Clays blue, green and black with Fossils and Pyrites
Lower Greensand
Yellow Clay
Blue Clay
Mottled Clay
Black & white Sand and Flint
White Chalk, with beds of Flint
Grey Chalk hard with beds of Flints
Grey Chalk & beds of Grey Chalk Marl
Grey Chalk Marl
Grey, blue and greenish Marl with Limestone
Grey Chalk Marl
Grey Marl very sandy
Sandy bluish grey Marl
Bluish grey Clay, sandy
Green chloritic argillaceous Sand
Bluish grey Clay marneous and rather sandy
Green chloritic argillaceous Sand
Bluish marneous Clay
Sandy marneous red Clay, with Sand & Sandstone
Alternating beds of red Sandstone, argillaceous Sand red green & white
Red marneous Clay & Sandstone
Compact red marneous Sand
Beds of red Sandstone, with ferruginous and argillaceous Sand
Fig. 1
Fig. 2
Fig. 3
Fig. 4
Fig. 5
Fig. 6
Fig. 7
Fig. 8
Fig. 9
Fig. 10
Fig. 11
Fig. 12
Fig. 13
Fig. 14
Fig. 15
Fig. 16
Fig. 17
Fig. 18
Fig. 19
Fig. 20
Fig. 21
Fig. 22
Fig. 23
H. Al... Lith.
Printed by Whitemore & Bass

PORTION OF FRONT TO Nº 40 STRAND.



CAPITAL AT A.



VOUSSOIR AT B.

H. STONE DELT

The Art Student.

INDUSTRIAL ARTS—PARIS EXHIBITION.*

THE cabinet in oak, exhibited by Fourdinors, is of a very superior character as to artistic merit, part of the design being carved in delicate low relief, while the little detached figures standing on brackets are delightful specimens of the wood carver's skill. The ornamental foliage employed would bear comparison with the most refined prototypes of the fifteenth and sixteenth centuries. Altogether, this is of its kind one of the most perfect objects—combining art with manufacture—that the Exhibition contains; and, if it may not be classed with examples of fine art proper, it certainly takes the highest rank in the decorative arts. It is well to show how excellent art may be in connection with industry, and how far the artizan is able to carry his work in the present day, as compared with the past, but its costliness must always prevent it being of frequent occurrence.

The ebony cabinet, by H. Lemoine, decorated with plaques of enamel, ornamented with tinted figures and portraits of Michael Angelo and Raphael, on a deep blue ground, is a work of much beauty and repose. G. Nisson, of Paris, exhibits an oak cabinet with panels of light coloured sandstone, on which is ornamented foliage prettily carved in relief; and although the effect is agreeable, the fact of the panels being of the material they are produces an unpleasant sensation, and leaves a feeling of regret that a more appropriate substance has not been employed. The object may serve as an example to indicate how far artizans sometimes mistake their way in the choice of a material to receive their work.

The introduction of plaques of Wedgewood ware into furniture and cabinet work, has only been done with success in a few instances, from a want of a better distribution of that material, the medallions telling too much as spots, resulting in that lack of unity which could have been obtained by a better repetition of the same colours throughout the work.

Belgium is not well represented, and does not send anything of consequence in industrial art. In good cabinet work it is deficient, and the ceramic arts, glass, pressed leather work, paper hangings, textile fabrics, including lace, of which there is a large assortment, are all of a third rate order.

The objects sent by George Gatti, of Rome, in ebony, inlaid with ivory are quite the best of their kind, and a small cabinet and table top wrought in these substances, the latter being varied by the insertion of small polished stones, have been produced with more taste and skill than we usually find in applications of this nature.

Florence and Milan also send furniture in ebony, and ivory inlay, very interesting, but with the exception of a large cabinet, having well designed ornamental detail, little in advance of the display made on occasions of the like kind; in short, several of the towns of Italy appear to be working only in imitation of what that country has done centuries ago, without the addition of any new element whatever.

Signor C. Salvatorri has some very nicely carved picture and looking-glass frames, as also a little cabinet in oak, in imitation of the work of the fifteenth century, as near to perfection as possible, both as to design and execution.

The furniture of Italy, with applications of inlaid stones and marble, is not nearly so good as the same speciality exhibited by Russia.

Denmark exhibits furniture and other matters of a very meritorious character, and the inlaid work on some of the cabinets and tables is exquisite.

Much of the cabinet work of Austria is very good, and the carving and inlaid work is often well applied.

The furniture sent by Russia is somewhat peculiar, and that portion the materials of which consist of ebony, ormolu, and different coloured stones and pastes (the last in wonderful imitation of natural flowers and fruit, is very remarkable), the main fault in the metal work being too light and in unbroken lines, as also employed in too large a quantity. A round table in black marble, decorated with small groups of flowers, tied together in garlands, with blue ribbons of lapis lazuli, is beautiful in colour. I may refer in this place to the magnificent mosaic in the Russian Court, which is, indeed, a surprise, whether we regard it from a pictorial point of view, or from the skill employed in the manufacture of the mosaics of which the picture is composed; and if this fine work is in reality the legitimate production of Russia itself, unassisted by foreign aid, from the original design to the manufacture of the material in which the picture is wrought, we may not only reasonably expect some great achievements in this direction, but we may also infer that there is in this country the elements of an excellent school of fine art.

The numerous objects in cabinet work and domestic furniture, exhibited by different firms of England, are very direct evidence that this class of art manufacture is receiving the best possible consideration, both as to construction and the appropriate application of the decorative arts; and I have no doubt that the new life that has been infused into this species of industrial art, will in the course of time culminate in the highest perfection.

A very dignified and well designed cabinet in ebony is exhibited by Gallow and Son, of London, inlaid with two small panels or plaques in imitation of Limoges enamels; also, another in light wood and inlays of different colour, very ingeniously applied. From certain peculiarities in these objects I had suspected that foreign help had been resorted to, but I was gratified to find that such was not the case in any degree. Redounding as this great success does to the honour of the manufacturer, notwithstanding that his interest is immediately connected therewith, and proclaiming, as it does, so loudly for the innate aptitude of the English designer and art workman, which was at one time a question of doubt, in some quarters all this marvellous change in ideas since 1851 points directly and unmistakably to the elaborate machinery, however imperfect it may have been in some respects, that has been set in motion, and which has been the means of producing so large a share in these results.

Furniture, both in ebony and ebonized, appears to be much employed at the present time as a medium by which the combined talent of the artist and artizan may be embodied. The effect in itself is sombre, but when relieved by a well-chosen wall paper, picture frames, and carpets, together with appropriate draperies, a richness is obtained that could not possibly be gained by any other means, and it is like the darkest markings of a picture, which serve not only to break up the deep shadows and monotony which might prevail, but from the value it gives to colour, the general effect of the whole is greatly enhanced.

In the cabinet of the material above mentioned, sent by George Trollope and Son, are some points of much interest; there is distributed about the work a number of medallions of painters in grisaille, and tinted slightly, but intelligently painted in oil on a black ground, in the manner of the Limoges enamels, with a judicious interspersing of gold lines and devices, and this pleasing adjunct, when executed by a ready and skilful artist, might often perform a part in the enrichment of the panels of furniture, giving it a life and purpose which it otherwise would not possess.

The firm of Jackson and Graham is represented chiefly by a cabinet composed of ebony and ivory, and compared with the advance lately made by other manufactures of England, it is felt that they do not maintain their position.

Wright and Mansfield have a large cabinet in satin wood, ornamented with medallions in Wedgwood wares, and becomingly inlaid with coloured marquetry. This is an elegant piece of furniture; at the same time its absence of great costliness will probably ensure a frequent demand for work of this description. The problem of supplying objects for domestic and ordinary use in tasteful simplicity to a much greater extent than is customary has yet to be solved.

The best examples of paper hangings are exhibited by the English, and the shortcomings of the French in this class of decorative art is difficult to explain; many of the designs shown by Wollams and Co. are excellent, and those of Dr. Dresser are especially good.

The carpets sent by the English are, for the most part, in good taste, and the conditions necessary to be observed are at length understood by the best manufacturers. The French, as well as other continental nations, do not bear a favourable comparison with those of our own country, which no doubt arises from the demand for carpets being much smaller on the continent than in England.

Our schools of art have done more in respect of flat decoration in its various forms of application than in any other branch of industrial art, and for which it is easy to account. Surface design having been readily understood and much practised in art schools, has had the opportunity of becoming constantly utilized, by the selections made from the exhibitions of students' works after the annual examinations.

The perfection to which the bronzists of France have now carried this speciality, and the magnificence with which they in many cases have invested their work, has not only placed them on the very highest pinnacle of the industrial arts, but they rank among the most excellent of those by which the formative arts generally are represented, whether they relate to works wrought either in iron, wood, stone, marbles, zinc, or bronze. The variety of the metal and a loys employed, the peculiar enrichment of the surface, all tend to the conclusion that every resource that could in any way enhance the beauty of their work has had careful consideration, until at length they may be said to revel in the facilities they possess, bringing into existence objects redundant with beauty and contrivance, destined for the dwellings of small pretensions, as well as for the mansions of the wealthy and the palaces of kings.

The grand display made by Barbidieu, all things considered, may be classed as the first in the Exhibition, and the tasteful application of enamelling to the smaller objects is much to be commended, and although the *status* of this exhibit is so entirely satisfactory, there are others of a less imposing nature which indicate very great knowledge of the technicalities of the art, and the fine things of De Lafontaine and Miroy, Frères, with the castings in zinc by Boy, are evidences of the skill to which I refer.

It is most interesting to examine the wonderful examples of iron casting brought together, whether we regard the ponderous things wrought by France, or the delicate productions of Prussia. At the same time, it is humiliating to acknowledge that beyond all doubt this country is found deplorably wanting, and that while our neighbours have been working we have manifested that unconcern which will tell against us in a very damaging manner a little further on.

As to the smaller works from Prussia, in which so much artistic excellence is developed, it is not too much to predict that the time will very soon arrive when the examples set by that country, and the eloquent discoveries now unfolded, are destined to be the means of producing a new era in this material, not only in objects of ordinary use, but in those of luxury also, the approach to which could only be made in oxidized silver at a cost beyond the means of all but the wealthy.

The gold and silversmith work has not made much advance, if any, in the hands of the French since 1862. There is assuredly a great display as to quantity, and the specimens are also noticeable in some instances for size. In much that is shown here, the greatest amount of glitter that could be attained seems to have been the motive regulating their work, and the valuable element of repose has for the most part been either forgotten or repudiated altogether. Of course, the exquisite objects for church purposes are not included in these remarks where the introduction of enamelling and precious stones has been so aptly made, and the delightful examples by Poussielque, of Paris, and those of Armand and Callait, of Lyons, are almost beyond praise.

In the English portion, Elkington, and Hunt and Roskell, are at the head, and the specimens in oxidized silver exhibited by the former are of consummate excellence, and, perhaps, the best in the whole Exhibition, the full resources of the metal having been duly appreciated; and as to the delicate application of *repousse* work, it has been carried to the utmost perfection. Doubtless, the best examples exhibited have been produced by foreigners, or under foreign supervision; and although many of these beautiful things may not have been actually designed by M. Vecht, still his influence is indicated in a most marked manner, and certainly will be felt as long as the manufactory which produced them is in existence; in their truly ornamental and refined character, as exponents of what may be achieved in this material, they will remain as the accomplished efforts and guides in this speciality for ever.

The application of enamelling to some of the beautiful examples exhibited by Messrs. Elkington has been made with much taste, and the quiet and discreet treatment is greatly superior to those of

* Concluded from page 888.

any other nation represented; not only is the spirit of the most perfect period of the Renaissance carried out, but the best features of the decorative arts of the present day have been resorted to with complete success.

The beautiful art of enamelling appears now to have thoroughly taken root in France again, as may be seen by the numerous applications to so many objects of manufacture; and the rapidity with which it has been developed during the last few years is truly surprising, more especially when we consider the chemical difficulties necessary to be overcome, and not only has that phase of it been revived, for which the country was formerly so famous a few centuries ago, but the problem has been solved to a great extent with reference to the early enamelling of eastern nations—so much so, that its application to numerous objects appears to have been made with the greatest ease, and there can be little doubt that the era is drawing nigh when matters of this nature, beautiful and true in everything that relates to artistic excellence, will constitute to a large extent, and at a small cost, the ornamental trinkets of our dwellings.

M. Lepec, of Paris, stands at the head of the discoveries made in this direction, and none but those who understand the process can realize the difficulties in the thousands of experiments and failures that that gentleman must have passed through before arriving at the wonderful achievements here displayed in the translucent enamels alone.

Other individuals also stand prominently forward here as fellow workers in the revival of enamelling on metals, and the production of Robellard, in imitation of those of the notorious Limoges period, are excellent. Also specimens by Le Cost, in the manner of those of the Byzantine epoch, the spirit of which has been well translated, and they have the advantage of being the most inexpensive in the Exhibition. There is also a choice exhibit of objects in imitation of the Limoges enamels by Charles Dohn, of Paris, which consists mainly of figure subjects.

The small case of enamels imitating the old examples by Rhudolphi, is very successful, as also are the objects of *repousse* work in silver which he exhibits.

Emile Phillippe, of Paris, exhibits some small things in metal work nicely designed, some in *repousse* work, and others engraved, and inlaid with different coloured enamels. The tasteful objects in silver and blue enamel, intended as personal ornaments, by Marshall, of Edinburgh, are worthy of great praise, being not only a new feature in this department, but they are entirely satisfactory as to their ornamental characters, and the mode in which the devices have been applied. The new life relative to art, which has manifested itself in innumerable forms in so many countries at the present time, is now beginning to take effect in the domestic but more particularly the ornamental glass now in use. It has certainly been amongst the last of the various kinds of manufacture that have been tardy in receiving new ideas and breaking through the trammels of the past, and no doubt the difficulties which had to be combated in working so peculiar a material as glass have been amongst the principal reasons why it has to a certain extent remained up to a recent period so stationary.

In almost every other kind of industry, good and instructive examples of earlier periods could be resorted to for information, but to find objects worthy of emulation in glass in this country has been difficult, for until the establishment of the Museum in connection with Science and Art Department very little reference could be made to examples furnishing that instruction necessary to the improvement of the forms which glass is capable of receiving. In France such has not been the case to the same extent, but notwithstanding this fact the manufacturers have not benefited by the treasures of their museum so much as might have been expected.

It is true that the coloured glass of France is quite as good as that of England, and perhaps in some cases better, but this country stands preeminent in the purity and crystalline quality of its flint glass. It is indeed very remarkable that such should be the fact, as the French manufacturers must be well acquainted with the ingredients necessary to compound a pure and colourless substance, as nearly every producer in England finds no difficulty in its manufacture, and in the presence of so many phases of advancement in France, and in the midst of the best chemists in the world, as respects the manufacture of vitreous colours for porcelain and the like, their want of perception in the present instance is hardly to be explained.

Flint glass is capable of much greater refinement in ornamentation by cutting than it has yet received, and when it is considered how rude are the materials used, for the most part, in the process of cutting the glass, we are rather disposed to wonder that so much success has been achieved, than to remark on its shortcomings. Like many other objects of merchandize, a large and ready supply has been found to be the most profitable for the manufacturers, and so long as this demand continues to be made irrespective of excellence, the means necessary to be employed to produce objects in glass, showing all the resources of which so beautiful a material is capable, will remain in abeyance. We do occasionally see small specimens wrought by the means to which I refer, namely, with a lathe similar to that used by the engraver on glass, as shown by one object only in the exhibit of Labouchere, where the two methods, that of the cutter and engraver, have been combined, but even this example bears little relation to what might be done, if taken up as a matter of fine art, as well as for ordinary merchandize.

Very strange and extravagant kinds of decoration for glass are employed for the sole purpose of producing novelty of effect, unlearned to the last degree, and, in most of them, the primary considerations which ought to have been observed in the cutting of flint glass, the enhancement of its brilliancy by an intelligent arrangement of facets, has been completely overlooked.

As I have already said, the purity of the British glass stands the first of all in the Exhibition, and as it really approaches the brilliancy and colourless quality of the diamond, it cannot be expected to go further in this respect, and while the cut portion does not show much progress since the English Exhibition of 1862, the forms are becoming more simple, and appear to be regulated by increased artistic knowledge and manipulation. The purposes for which glass are employed seem to be on the increase daily, and in the anxiety to turn the material to the best marketable account it often occurs that singular misapplications of it are made.

Some of the examples exhibited by several of this manufacture are very remarkable, but more especially those by Messrs. Phillips and Co., of London, which are the most unique of their kind in the Exhibition, nearly all the resources of the art workman having been brought into action, and with much success has he tried to realize the elegance of the forms of the Venetian period. Of course, they are larger, the ordinary frontil having been used, to the entire exclusion of the lamp, which was so much in practice by the old Venetian glass workers. The endeavour has been to get whatever beauty could be gained from the material itself by breaking up the surface while the substance was in a state of semi-fusion, almost to the total absence of cutting, and the chandelier exhibited is of wonderful workmanship as regards these qualities, showing how far the material may be made subservient to use and beauty in the hands of the well-trained artizan.

All the English firms exhibit engravings on glass, much of which is very tastefully applied, and, in some instances, very elaborate and costly examples occur, as seen by the specimen exhibited by Messrs. Phillips and Co. At the same time, it must not be forgotten that this, as well as all the other examples of the greatest excellence, are from the hands of foreigners, and so much have the engravers of England catered (perhaps of necessity) to the cheap and most marketable kind of engraving, that I am afraid the art is on the decline in this country. Fifteen years ago, engravers on glass were not easily found, but they most assuredly possessed greater skill than we are in the habit of seeing in the present day, which is explained by the circumstance of the demand being tenfold greater now than it was then, and which has resulted in a larger measure of apprentices to the profession from the most uncultivated grades of society.

M. Baccart, of Paris, exhibits quite the best glass in the French department, both flint and coloured, and many of the forms for various purposes are well designed, while the cutting has been applied with considerable judgment.

The ingenuity displayed in the etched portion, which forms so large a part of this exhibit, is most commendable, suggesting, as it does, so wide and legitimate a resource for the ornamentation of glass, and the simple application of the design to the surface by printing in the manner resorted to for earthenware will so much facilitate the process as to bring the objects within the means of the ordinary consumer. The placing of one coat or layer of glass upon another, thinly and evenly—a process found often so perplexing to accomplish—has been done with perfect success; but, on the whole, I am not impressed with a very marked advance in the French display of glass since 1862.

The Bohemian glass exhibits the usual features by which it is generally characterized; most of the colours and tints of the same are very beautiful; and staining from deep red down to pale lemon colour, with the customary treatment as to coating, are in abundance. Very many of the objects are cut and then subjected to the process of enamelling, gilding, and engraving, a species of decoration more resorted to for the glass of this country than any other.

In some examples the beauty of the forms are enhanced by the introduction of gilding, but in many the purity of the glass itself has been lost by an ill-judged covering of gold and enamel colour.

Parts of Germany send some tasteful drinking glasses, jugs, and ornaments for the cabinet, of common green glass, in the manner of the old Dutch and German examples, excellent both as to form and colour, and it is very interesting to see such an inexpensive material turned to so satisfactory an account. The restoration is perfect, save that in some instances the surface is too much covered with enamel colour.

Some of the specimens of Austrian glass are excellent, and the union of flint glass with metal work in the construction of candelabra and gaseliers has a very pleasant effect.

The Italian glass, viewed as a complete restoration of the past periods of that manufacture, may be considered the most excellent, and surely the most artistic, exhibited, and really constitutes a distinct speciality in the working of glass: the rapidity, too, with which it has been developed, together with its manifest superiority, distinguishes it most emphatically as being amongst the greatest achievements in the industrial arts of the time.

In the specimens sent by Dr. Salviatti, he gives you fac-similes of the early Venetian period, and all the secrets of the glassmaker of that time have been for the most part entirely restored to light by the assiduity of that gentleman; the old forms have been so clearly imitated, and the peculiarities so skilfully copied, that when the objects shall have been exposed to the action of gases or acids, or the accumulation of dust and dirt, or buried for a time in damp earth, and the surface blemished with scratches and smears usually incidental to age, it will be great affectation on the part of any individual to pass an unrestrained opinion on them, as to whether they are the production of ancient or modern times.

The manufacture of mosaics in imitation of those of the old period has been attended with every success. The easy access to examples which are so plentiful in Venice has very likely facilitated the restoration. The appliances of Dr. Salviatti are very efficient, and which I have recently had the pleasure of examining in Venice; and although the enquiry at first was a matter of scientific and artistic research, it will in time really become a source of great profit.

In the Sevres porcelain and enamel department, a brilliant display is made, as was anticipated, and the performances are so closely connected with fine art proper, that one almost regards them with the interest that would attach itself to a gallery of well-selected pictures.

In all the preceding exhibitions of works from this manufactory, the most superior productions were brought together, and the merits of the present collection are equally distinguished, combining at once the discoveries of the chemist, the assistance of some of the best painters of France, and the efforts of the intelligent and cultivated artizan.

In the manifold application of decoration to porcelain, the discoveries as to the peculiar processes for the same, and the fertility of resources, are surprising, and the perfect ability, regardless of cost and labour, with which this has been accomplished is greatly to be commended.

In every branch of the work, the ornamentist appears to have been quite master of his undertaking: if the human figure is attempted, we find it executed with consummate skill; if flowers or foliage are the theme, then they are done with that ease which only the educated ornamentist,

with a complete knowledge of nature, could accomplish, whether painted in colours or monochrome, or raised in their beautiful white enamel on tinted grounds, at which the French porcelain painters are such adepts; and their perception of colour, in these matters, is so perfect that the effect has been calculated with the utmost certainty. The fine decorated character of the various objects in blue and white enamel on metal, both small and large, in imitation of those of Limoges, plainly shows how thoroughly the difficulties of the material have been overcome.

Some of the exhibits intended as imitations of majolica and the ceramic arts of Italy of the sixteenth century are excellent, and the bodies of which they are composed, as well as the colours and glazes, have the nearest resemblance to the early period.

These qualities, apart from the decoration employed, indicate very distinctly how far the attempts in England are removed from what might be achieved in copying this species of art manufacture. One of the choicest collections is that by T. H. Deck, and, although frequently not in direct imitation of the old majolica ware, having peculiarities quite its own, the general effect of each piece as a whole is very pleasing, requiring much artistic skill in its production. Persian ware has been very cleverly copied, and the likeness it bears to it in design, &c., is a matter of surprise, the thinness of the glaze being the main distinguishing difference.

L Labasse, of Limoges, exhibits some good examples of white earthenware and porcelain, the whole of the pieces being well designed, and the bodies are of the utmost purity.

The imitation of Palissy ware, by Pul, is very good; and that by Barbizet is in near resemblance to the specimens of the old period.

Many other countries of the Continent have exhibited numerous objects of this class, but perhaps not of that character to warrant a notice here. In English pottery, the show made by Minton and Company, of Stoke, is large; but I have an impression that the standard of the works is not so high as it formerly was: the great distinguishing difference in them, compared with those of France, arises, in my opinion, from the imperfect knowledge displayed by the ornamentist. A large amount of time has been spent on many of the pieces with a view to give them excellence; at the same time the want of intelligence in the labour is very palpable, and true artistic knowledge is painfully lacking in numerous instances.

In almost every case the drawing of the human figure is very inferior, and when it approaches even mediocrity, it seems to be the result of timid and unlearned cautiousness, so that, on comparing these examples with those of France, on which I have just remarked, one cannot fail to discover at once a marked difference in all that relates to artistic education and knowledge.

Sometimes the decoration has been executed on panels, vases, &c., in imitation of the facile method of the well-disciplined continental artizan, and the ignorance here displayed is very deplorable, as it is quite evident that the style thus attempted has only been accomplished by considerable labour, ending of course in affectation, elaborate lameness, and emptiness.

These qualities, for which the firm is so celebrated, such as the forms of the object, the colours, and glazes, &c., are still conspicuous, but not in advance of anything exhibited in 1862.

The collection sent by Copeland, of Stoke, exhibits most of the defects of the firm just noticed, without so many excellencies in its favour. A large porcelain vase, decorated with flowers, is well painted, but the application requires fitness as to the size of the ornamentation, and the arrangement, which fault marks so many of the floral treatments on the objects of porcelain of this country. As to the Parian ware, &c., although the show is somewhat interesting, we are always unpleasantly impressed when looking at it, as this species of manufacture appears to compete with the works of the sculptor, and the difficulties attending its production operate in placing it with relation to fine art very far below a common cast in every respect, apart from the material of which it is made.

A portion of the exhibit of Wedgwood, of Etruria, is very unsatisfactory, as that firm appears to have been making attempts at imitating a class of manufacture that it by no means understands, and it is felt to be regretted all the more, as their beautiful speciality in jasper ware maintains its usual excellence.

Some very perfect bodies in earthenware are exhibited by the several manufacturers of North Staffordshire, and the experiments that have been made of late years to purify the ingredients with which they are made has terminated so successfully that it is often with difficulty that one can distinguish them from porcelain; in fact, were the material not determined by its opacity it would hardly be discoverable by any other means.

The decoration of these objects, intended mainly for domestic purposes, is becoming better adapted, quieter, and more in accordance with the rules of good taste; still the display made by most of the exhibitors in respect of forms and ornamentation, when measured by the highest standard, and by what might be, and no doubt, what will be done in the end, causes us to feel that many years of cultivation and research will have to come and go before that desired era shall have arrived.

Gothic art, as it is understood in England, is not appreciated to a great extent in France, and the building which has been erected for the better exhibition of works of this character is nearly filled with very inferior exhibitions, whether in relation to objects executed either in metal, stone, or wood. In some cases the exhibit is absurd as to the want of real knowledge on the subject of mediæval art, and altogether the interior more resembles a puppet show for children rather than an intention to display taste in this particular phase of industrial art. Exception to the above remarks may be made in the screen by Rudolphi, which appears to be a restoration of those of the early period of productions of this class.

The show made in stained glass is large; and, although good examples are exhibited from England, as well as from the Continent, nothing is felt to supersede the efforts made on former occasions.

I ought not to omit reference to the choice exhibit of objects for church purposes by Helbronvier, of Regent-street, London, the designs employed, as well as the colour of the materials used, being as near perfection as possible.

I may now just refer to those countries whose art products exhibited are not mentioned in the foregoing notes; and chief among them is Austria, both for the variety and excellence of its manufactures, and this is all the more surprising when we take into consideration that the recent troubles through which it has passed must have been a serious impediment to the preparation of objects representing the arts of peace.

The decorative artist appears to have been largely imbued with the true spirit of ornamentation, which is evident in the many objects brought together, such as porcelain, glass, metal, and leatherwork; also in enamelling and works in mosaics, with numerous other artistic applications. And it appears probable that this country will be amongst the first in the restoration of the industrial arts of the present era.

In the India department we have the usual effect of richness in the variety of the objects massed together, such as wood carving and inlaid furniture, coloured marbles, textile fabrics, engraved crystal, damascened metals, precious stones, porcelain, elaborately worked lace, &c., most of which examples are of great beauty, embodying the unerring instinct of the people who have wrought them; and although there may, perhaps, be nothing here more than we could have anticipated from our former acquaintance with the ornamental expression of that country, not much novelty resulting from the capricious change of fashion, still it is, as it were, everlastingly pointing, unchanged to the only right path that may be trodden by the European ornamentist.

A rich display is made of objects from China and Japan, and without particularizing any of them, it may be truly said that the instinct which these nations evince for colour and distribution of pattern over a given surface is as near perfection as possible, and I am of opinion that for the cultivation of this faculty in our own schools of art we cannot do so well as to bring the English student more into connection with examples from these countries; the tender and subtle feeling as to colours, as well as the perception of the full and the gorgeous, are not to be found in an equal degree in any other quarter of the globe.

It is feared that European influence will have a deteriorating effect on the natural aptitude of this people, for we cannot suppose that the intercourse which is becoming greater yearly can fail to produce a change; and, however desirable that change may be in the general course of civilization, it cannot be imagined that its effects will be equally salutary in those qualities which relate to the expression of individuality imparted to the decorative arts. The show made by Turkey is one of considerable interest, marked by the usual unmistakeable nationality, natural perception in the harmony of colour, and agreeable distribution of pattern on the part of the artist. Some of the inlaid work exhibited is exceedingly tasteful in design.

Tunis and Morocco send some curious examples of textile fabric and crockeryware, the application of colour having a tendency to gaudiness; and the arts of the countries appear quite stationary.

It would be interesting, and perhaps profitable, to inquire as fully as possible into the causes that have kept the decorative arts of certain Eastern nations in such a fixed condition during so many centuries, with that peculiar vitality which almost seems incidental to their very existence, while the history of the arts of other countries, spreading over a much shorter time, is one of repeated rise and fall, and is in truth a record of the divers forms of vicissitudes through which they have passed.

Conventional shapes of flowers and foliage appear to have been the constant theme above all other elements in their works, and which I think partly explains the reason of their prosperity, not only as to those steady and enduring features to which I have alluded, but in the happy character of the devices employed, and I am disposed to attribute one of the chief causes of the decline of the ornamental arts in other parts of the world to a discontinuance in the resort to natural types for information.

From the large amount of success that has attended the efforts made by the English Government in the cultivation of ornamental art in Great Britain during the last fourteen years, it is evident that we have been fortunate in the adoption of, at least, a part of those means necessary for the efficient training of students; those by which they have been able to collect materials from the field of nature as elements for future use, with the power to reproduce them at command, and regulate them according to the prescribed rules with which they have been associated, in the best examples of the most perfect art epochs of the past. When the fruits of this labour shall have been fully realized, and the public at large shall have become imbued with a desire for the beautiful, the culmination of another era will have arrived; but, as I have already said, it must not be forgotten that only a portion of this work can be performed during our lifetime, and that, in fact, the greatest part of it will have to be done by those who come after us, as, notwithstanding the advantages we now possess in the ample vestiges of other times, which remain to us, we can only lay the foundation stone on which, in the course of years, our successors may build the superstructure.

I have watched with the greatest interest the current of events relative to the industrial arts since the reorganization of the schools in 1852, and I feel I cannot omit recording my conviction as to the direct bearing of the present system of instruction through the Science and Art Department, not only on the ornamental arts of this country but on those of the Continent generally. Much has been, and no doubt will yet be said on the means by which the stimulus has been given, and whatever truth there may be in the statements, it certainly cannot be denied that the object intended has been for the most part accomplished, and the impetus that the French schools are receiving at the present moment is due to the successful growth of our own, and although there is every reason for satisfaction and hope for the future, it can only be on the conditions that the work of cultivation goes on; new activities must be set in motion, and help will be needed in endless directions, and unless we feel this to be the case our continental neighbours will so far outstrip us in the race, that it is impossible for us at this distance to count the consequences.

Most of the masters who now have the charge of schools, will have to look after their own education in the higher departments of art knowledge, or they can take but little part in supplying the demand that will be made upon them, as their present standard will be found quite insufficient to keep pace with the progressive requirements of art.

A comparatively new feature must also of necessity receive consideration—namely, the encouragement of the mediæval arts in every form of expression, and which I feel convinced will ultimately triumph over our past exertions, amongst

the remains of classical art. Of the facts that may hereafter be chronicled of the history of this country's progress, that page which will recount the efforts made to foster its industrial arts will not be the least interesting. The catalogue of events which linked the beautiful to the useful and the true, those pageants of a century like the one now passing before us, must always be held in grateful remembrances for the innocent and refined enjoyment they have blended with our existence. Generations to come will hardly be able to measure the worthy energies of the past, but a few names will ever stand forth representative of the agency by which these matters were brought into life and kept in motion; and when the wheat shall have been sifted from the chaff, when error shall have been forgotten in the cause of common good, and the balance of actions with intentions duly struck, then, and not till then, will their greatness of purpose be fully recognized, in the value of the labours they have left behind.

W. J. MUCKLEY,
Head Master of the Manchester School of Art.

ERRATUM.—For "the branch" read "this branch," in first sentence of third paragraph on second page in our last number.

RECENT IMPROVEMENTS IN PARIS.

THE annual report issued by Baron Haussmann, Prefect of the Seine, contains some interesting statistics concerning recent improvements in the French capital. For instance, it appears that during the year ending September 30 last 2,325 houses, comprising 14,287 separate apartments, were pulled down in the twenty *arrondissements*, while, during the same period, 3,809 houses, consisting of 23,753 apartments, were erected; the increase was consequently 1,484 houses, affording accommodation for 9,466 families. The greater portion of the new constructions were in the outlying districts, included between the former exterior boulevard and the fortifications. In the more central quarters the aggregate number of constructions and demolitions was about balanced, though rather unequally distributed over the different *arrondissements*. One singular instance may be cited:—In the sixth *arrondissement* (Luxembourg), while there are nine more houses than in 1866, there are 106 less apartments. This fact forms the ground of the complaint so generally made, that in quarters hitherto occupied by the middle and working classes the small apartments within reach of the more modest incomes are being replaced by sumptuous residences, while their former inhabitants are driven to a greater distance from the centre. The 9,466 apartments constructed in excess of those which have disappeared, as stated above, consist of 3,471 rated at less than 250f. a year, on which no tax is paid; 4,857 at from 250f. to 1,500f., and only 1,138 above the last-mentioned sum. The report, moreover, shows that in the entire department of the Seine, which, in addition to the twenty *arrondissements* of Paris, includes those of St. Denis and Sceaux, the number of houses built during the last fifteen years has been 86,944, and of those demolished 21,641.

A new system of paving footpaths, says a Paris correspondent, has been tried on the Boulevard de la Chapelle, behind the Hospital Lariboisière, with admirable effect, of iron frames measuring 3ft. square, into which, by means of holes bored in the frame, are encased blocks of poplar, forming a capital pavement, the wood of the poplar having been selected instead of oak. The latter, from its non absorbing qualities, was found objectionable. The system, originated in America, presents a pleasing effect to the eye, and appears to succeed. On each side of the footpaths are small conduits, by which rainwater is at once drained off into the side sewer.

TECHNICAL EDUCATION.

THE first of a series of conferences on this subject, under the auspices of the Working Men's Club and Institute Union, took place at the offices of the Society on Thursday week. It is proposed to enquire into the state of the existing literature of, and to receive suggestions from, each trade in turn with a view to the compilation of standard trade manuals. A paper was read by Mr. Paterson, a cabinet-maker, and one of the assistant-secretaries, on the existing technical literature in the cabinet-makers' trade. As far as he knew, there were but two works on the subject in England worth anything, "Blackie's Cabinet-maker's Guide," and "Morell's Cabinet-maker," both very expensive works. The French were much better off, and also derived a large amount of instruction from the presence among them of German workmen, who, according to the custom of their country, were obliged to travel over the Continent for a certain time to gather information before settling in business. The French cabinet-makers excelled in ornamentation and elegance; in substantial work they were far behind the English. Some of the materials and tools, too, which they used were never seen in an English cabinet-maker's shop. A very beautiful feature of the art, as practised in examples shown at the Paris Exhibition, and one which he should gladly see introduced into this country, was the ornamentation of panels, &c., by electrotypers of antique medallions and other works of art. He then proceeded to throw out a few hints with regard to the compilation of the proposed manuals. The very important question of shrinkage in different kinds of wood should be fully entered into, and the laws of shrinkage plainly set down. Results of experiments on the qualities and strength of different woods would, too, be very useful. Methods of construction would form a most important part; and chapters on decoration, colour, varnishes, glues, &c., might be added with great advantage. The chairman, Mr. Hodgson Pratt, suggested that the meeting should be adjourned to the second Thursday in January, when a larger attendance of persons directly interested should be sought, and the subject further proceeded with.

PHOTOGRAPHY ON PORCELAIN.

A NEW and very curious method of transporting photographs on ceramic surfaces has just been patented by M. Grune, of Paris. From an account of this process which appears in the French papers, we gather that the first operation consists in obtaining by the usual methods a negative on glass of the subjects to be reproduced. This done, the negative is coated with a fusible glass by the heat of a common cupelling furnace, and the image is thus rendered unassailable by any substance which glass can resist. The second operation consists in getting positives from the negative thus prepared. This is done by collodionizing the image side in a dark room with iodized collodion, sensitizing it in a nitrate of silver bath, then putting it into a printing-frame with the uncoated side exposed to the light, while the coated side is protected from the action of light by a black surface not in contact with it. In this state, the printing-frame is exposed to light for two or three minutes; then taken again into the dark room, where the collodionizing plate is immersed in a revealing bath of sulphate of iron and sulphuric acid, then well washed and fixed in hyposulphite of soda. The image now appears in reduced silver; before the collodionized surface is quite dry, a sharp point of needle is run all along the borders, the plate is then immersed in water containing 5 per cent. of glycerine, and the film of collodion will soon be seen floating on the liquid. The negative is then washed, wiped, and dried, and put by until again required. The film, which may be kept indefinitely in the glycerinized water without spoiling, is taken out when wanted, and its silver surface changed to gold by chloride of gold, or to the appearance of steel by chloride of platinum, &c., after which it is dipped into a solution of metallic salts, which, by the action of fire, will yield certain colours according to the operator's wish. The film is now carefully laid on the porcelain or glass to be adorned; it will stick by means of diluted glycerine and a soft brush. It is then coated with a vitreous flux, and becomes permanently fixed in the furnace.

NOTICES OF PUBLICATIONS.

"Atchley's New Builders' Price Book for 1868." London: Atchley and Co., 106, Great Russell-street.

THIS book contains a list of the present prices of building materials and labour, and of the building trades. It is full of valuable information. It is edited by P. Thompson. There is a very good chapter, which may be regarded as a supplement to the book, entitled "Practical Remarks on the Union of True Construction with Good Taste," by Mr. Fred. Rogers. These remarks are on brickwork, stonework, woodwork, slates and tiles, leadwork, zinc, ironwork, plaster, glass, painting, and staining. As a sample of Mr. Rogers' remarks, listen to some of them on stonework:—

First, to choose your stone. The best weather stone being given to a mason, unless he beds it so as to lie in the building in the same direction as in the quarry, the frost will split it, and the rain and the wind will soon destroy it; and, in spite of so much having been said and written on the subject, either from carelessness or a desire to save material, they are frequently wrongly bedded. Ignorance I can hardly admit as an excuse, as I have generally found that most masons can, if they wish it, readily detect the right bed. The rule which I have always found effectual has been this—In oolitic stones the shells, even when examined by the naked eye, are lying in the quarry on their broadest sides. Sand and limestones give their beds by the streaks of the strata.

In returning angles in masonry, it is not often that you see mouldings mitered on the exterior angle, but on the interior angle this is frequently done, and with most disastrous results, because the slightest movement in the wall causes a dislocation of the most neatly fitted mitre, and, at the same time, the bond which ought to exist between the two walls or faces is destroyed. All returns ought always to be in the solid, where there is any moulding; and in plain work, such as ashlaring, at least one in three stones ought to be solid in the angle.

Jointing tracery stones ought always to be very carefully considered,—the joints not only being radii from the point turning each circle, but each stone ought to be considered as an arch stone—perforated, if you will, but a series of arches so distributed that the weight is equally borne by the mullions and jambs. Each joint may be dowelled; but if the tracery is properly jointed, they will require dowelling no more than any other series of arches. The stones of the mullions ought always to be very strongly dowelled together, and the stones ought not to be of too great a height.

In carrying stones across wide openings, where no height can be obtained for an arch, much trouble and expense is frequently incurred in obtaining them of great scantling, when much smaller pieces, joggle-jointed, would have served much better. I remember seeing an opening thus treated at Fountains Abbey, 16ft. 3in. wide, and containing no less than twenty-one stones, and as perfect to-day as when it was first built, six hundred years ago.

When stone copings are used to a gable of steep pitch, it is very important that not only should the foot or base stone of the gable be of a good size, but also bond stones should be worked into the gable, at least every 4ft. apart. The neglect of these precautions often causes the whole of the coping to slip; the foot stone being insufficient in size, and the whole weight of the coping being thrown upon it, it either tips up or breaks across diagonally, and causes a never-ending eyesore; besides which, the coping joints being loosened, the walling is disturbed; in this movement, the cement fillet is cracked, and the water gets into either the centre of the wall or the exterior of the building.

Great care should be taken in bedding marble, granite, or other shafts, if of harder material than the rest of the piers or jambs; the one being compressible, and also built of many joints, and the other being comparatively incompressible, and having few joints, the hard shaft will be liable to take more than its fair share of weight, and in that case may split, flush in the beds, or thrust outwards. If not absolutely necessary for the construction, they should not be fixed until the rest of the work has taken its bearing, and should also be set on a strip of lead.

Very few of our marbles keep their polish after long exposure to the outside air. Devon marble certainly does not; and it remains to be proved that the Derbyshire serpentine will stand for many years. Scotch and some Irish granites only will keep their polished face after exposure to a few of our winters; and I do not know that the limit of their durability has yet been found—certainly, long after the rest of the building has perished.

When polished granite has been used in conjunction with dressed stonework, I cannot think that the effect is satisfactory, and am afraid that the blacker and more sombre the stonework becomes (as in some of the Pall Mall clubs), the greater will the effect become visible of a sort of skeleton gradually being eaten away, the tougher morsels being left for another period, when old Time's tooth is a little sharper.

"The Purification and Utilization of Sewage." By BALDWIN LATHAM. London: E. and F. N. Spon.

THIS is a valuable and compact contribution to

the sewage controversy. Mr. Latham is an authority on this question, and he writes from practical experience. Having superintended the production of large sewage works he has encountered the practical difficultiss with which an engineer has to cope; he is, also, in a position to speak on the value of sewage matter. The pamphlet contains a plan of the irrigation fields at South Norwood, and a plan of the irrigation fields at Beddington.

The value of sewage may be estimated from the following authorities, as stated by Mr. Latham:—Professor Way estimates the value of the sewage of Rugby at from 1d. to 1½d. per ton; but he considers the constituents of London sewage are not worth 1½d. per ton. Professor Voelcker estimates the intrinsic value of one ton of sewage at 2d., but that this theoretical value of 2d. per ton is practically greatly reduced, and in some instances would be altogether lost. Mr. Lawes estimates the value of the sewage of Rugby at 1¼d. per ton. Sir C. Fox estimates the value of sewage at 1¾d. per ton. W. Hope, Esq., estimates the commercial value of the sewage of London at 1d. per ton; he also computes the annual value at 6s. per head of the population. J. J. Mechi, Esq., gave it in evidence before the Select Committee on the Sewage of Towns that he estimated the annual value of sewage at 16s. per head of the population, upon the assumption that the value of the sewage was equal to one-tenth the value of the food consumed, which value he set down at from £7 to £8 per head of the population. Mr. Ellis estimates that the value of a ton of sewage is 2d. as compared with the guano at £11 per ton, on the principle that 1,250 tons of sewage contains as much fertilizing matter as a ton of guano. Mr. Morton, in his interesting and valuable paper on sewage read before the Society of Arts, calculated that in applying sewage in the meadows of Edinburgh, not more than ¾d. per ton is realized. If London sewage was utilized at the same rate, it would give an annual return of 6s. 3d. per head of the population.

The commissioners appointed to inquire into the distribution and utilization of sewage have calculated that at Croydon, after deducting £4 per acre as the estimated value of the land, that in the cultivation of rye grass ¾d. to 1d. is realized, and in the cultivation of meadow grasses ½d. to ¾d. per ton is realized. The value of sewage has generally been estimated by the amount of fertilizing matter present in it; and this value has been asserted by various persons to lie between 1d. and upwards of 2d. per ton.

Building Intelligence.

CHURCHES AND CHAPELS.

On the 18th inst. the Bishop of Ripon consecrated a new church at Thornton Watlass, Yorkshire. The style is Early English of the thirteenth century. The materials used is sandstone, with dressings of Ancaster stone. The length is 91ft., breadth 33ft., and height 33ft. Mr. G. F. Jones, of York, was the architect.

The corner stone of a new Presbyterian church was laid on Thursday week at St. Helens, Liverpool. The building will comprise nave and aisles, and will seat about 550 persons, at a cost of £2,680. Messrs. Corson and Aitken, of Manchester, were the architects; and Mr. G. Harris, of St. Helens, was the builder.

A new church, dedicated to St. James, is about to be commenced at Bartonsham, Hereford. It will be built of native stone, with freestone dressings, and will seat 600 persons. The designs have been prepared by Mr. T. Nicholson, the diocesan architect.

Upwards of £900 has been subscribed towards a fund now being raised for the restoration of Longtown parish church, and for introducing an obituary window to the memory of the late Sir James Graham.

The municipal council of Paris has decreed the restoration of the ancient tower of Jean Sans Peur, the great Duke of Burgundy. The tower, like that of St. Jacques, Rue de Rivoli, is to be surrounded by a square. This decree of the council, rejoices Messieurs les Antiquaire, is much depressed by the progress of King Haussmann's improvements.

The parish church of Oving, Bucks, was reopened on Friday, the 13th, after extensive restorations under the direction of Mr. Street. The chancel has been entirely rebuilt, but with every old feature reproduced, at the cost of the rector.

The second meeting of the Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels for the present session, was held on Monday last week at the society's house, No. 7, Whitehall, S.W., when there were present the Right Hon. the Earl of Romney (in the chair), Rev. Walter Field, Messrs. John Boodle, Jesse Cowburn, J. F. France, A. J. C. Laurie, and William Rivington, Rev. George Ainslie, M.A., Secretary, and Rev. C. B. Reid, M.A., Assistant Secretary. Grants of money, amounting to £680, were made in aid of the following objects:—Rebuilding the churches of St. Catherine, Gloucester; Hailey-cum-Crawley, near Witney; Handforth, near Stoke-on-Trent; Jeffreystone, near Pembroke; Llanfagan, near Carnarvon; and Ryhope, near Sunderland. Enlarging or otherwise increasing the accommodation in the churches at Berden, near Bishop Stortford; Englefield Green, near Egham; Mayfield, near Hurst-green; St. Hilda's, Middlesborough, York; Ripley, near Woking, Surrey; South Hayling, near Havant, Hants; and Sutton-in-Ashfield, near Mansfield, Notts. The grants formerly made towards building the church at Babbicombe, near Torquay; rebuilding the church at Molygrove, near Cardigan, and towards reseating and restoring the churches at Gresford, near Wrexham; Chatham St. John, and Lydden, near Dover, were under very urgent circumstances severally increased. The society likewise accepted the trusts of money as a repair fund for the church at Baldhere, Cornwall; St. Luke's, Lyncombe, Somerset, and an additional sum for St. Ann's, Bucks Mills, Devon.

BUILDINGS.

The newly-erected Standard Theatre, Shoreditch, has been opened. The entire length of the building is 167ft. by 90ft. wide. The ceiling is a low pitched dome 70ft. in diameter and 10ft. in depth, and the audience portion partakes of the well-known horse-shoe form, whilst the height from the pit floor to the centre of the dome is 84ft. The house is lighted from the roof by a combination of sunlight and chandelier. For the purpose of egress, during a panic, a wide flight of stone steps leads from each tier of boxes and from the gallery into the street direct, without coming down the ordinary way through the interior of the theatre. There are four tiers of seats, and ninety-two private boxes. The materials used have been principally bricks, stone, and iron, wood having been practically eschewed as far as possible in what may be termed the vital parts of the building.

WATER SUPPLY AND SANITARY MATTERS.

The Conservators of the Thames report that they have given the requisite thirteen months' notice for the removal of all sewers above Staines which emptied themselves into the river or into any tributary stream within three miles of the river, and at a later period in the current year they gave like notices with regard to drains below that town. Tunbridge Wells is now under sequestration, issued against it by Mr. Julian Goldsmid, M.P., who complains that the Improvement Commissioners of the town had polluted a stream running through his estate at Somerhill.

TO CORRESPONDENTS.

TO OUR READERS.—We shall feel obliged to any of our readers who will favour us with brief notes of works contemplated or in progress in the provinces.

Letters relating to advertisements and the ordinary business of the Paper should be addressed to the EDITOR, 21, TAVISTOCK STREET, COVENT GARDEN, W.C.

Advertisements for the current week must reach the office before 5 o'clock p.m. on Thursday.

NOTICE.—The BUILDING NEWS inserts advertisements for "SITUATIONS WANTED," &c., at ONE SHILLING for the first Twenty-four Words.

RECEIVED.—W. J. M.—R. G. T.—W. H. L.—A. J. B.—J. R.—T. J. S.—B. and C.—J. H.—W. H. B.—W. W.—J. C.—J. R.—W. J. M.—W. R.—A. J. V.

W. G. (Belfast).—Your questions on Irish granite are inserted in Intercommunication.

J. A. S.—Three storeys, of course.

W. D. (Reading).—Your question was answered about three months since. Question 588, Intercommunication.

W. T. B.—The Hugon gas engine will answer your purpose. A lady almost can use it in her drawing-room to work her sewing machine.

W. H. W.—Saws and springs are hardened in various compositions of oil, suet, wax, and other ingredients. Steel plates are hardened occasionally by allowing water to fall on them when hot.

A YOUNG BEGINNER.—We cannot undertake to recommend the best work on any subject.

Correspondence.

GEOMETRICAL KEY TO THE PROBLEM OF THE CIRCLE.

TO THE EDITOR OF THE "BUILDING NEWS."

SIR,—Please insert the following observations on Mr. Guillaume's diagram in the BUILDING NEWS of December 6:—First, let the diameter of a circle be 7, then the chord of 60 deg. will be 3·5.

The chord of 90 deg. = 4·949747468, &c.
The chord of 120 deg. = 6·062177827, &c.

Then 3·5 : 7 :: 11·011925295
2

Circumference 22·023850590 ÷ 7

Quotient = 3·14626437
3·14159265 truth.

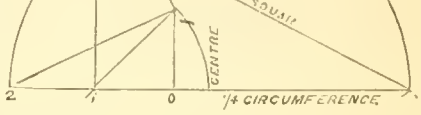
To his method of squaring 00467172 error.

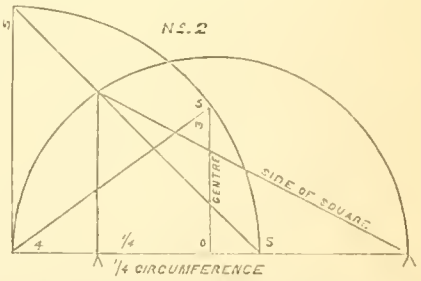
The circle is very erroneous; see the result of the various proportions below, also of the two diagrams drawn. No. 1 is derived from the difference between the radius and the chord of the quadrant; No. 2 from the sides of the right angled triangle formed by 3, 4, 5. These need no instruction.

Diameter and circumference of a circle.

		Difference and error.
Truth	1 : 3·14159265, &c.	
7 : 22 =	3·14285714, &c.	·00126449
113 : 355 =	3·14159292, &c.	·00000027
No. 1 =	3·14213562, &c.	·00054297
No. 2 =	3·14194109, &c.	·00034844
Mr. G. =	3·14626437, &c.	·00467172

dia.
No. 1 7, circumference 21·994949368, &c.
No. 2 8, circumference 25·13552872, &c.





Being so little complicated, by observing the figures they will be easily comprehended, and coming so near truth they ought to be stereotyped. No. 2 is perhaps the nearest that can be obtained by a single operation, though 113 : 355 is much nearer truth, yet it is an approximation from 7 : 22; thus $7\frac{1}{15} = 113$, and $22\frac{3}{16} = 355$. The next step in approximating towards truth would be $113\frac{1}{4697\frac{1}{7}}$: $355\frac{3}{4697\frac{1}{7}}$, which would give a quotient true to 12 decimal places, notwithstanding "E. L. G.'s" condemning censure on my scheme given in the "BUILDING NEWS," of the 27th of September, which, if Mr. Guillaume chooses, I will show how to work.—I am, Sir, &c.,

JAMES BUTLER.

Tower Lodge, 123, Sandymount, Strand, Dec. 16.

CONCRETE HOUSES.

SIR,—In reply to Mr. Tall's letter, in which he states that I wish to mislead the public respecting my system of concrete building, I beg to say that I will undertake to build on the same method, as I stated in my letter of December 13—whether it be one house, or one hundred, or any other kind of wall construction, for £5 or £6 per rod, if gravel and water be handy on the spot, or even less. I require no apparatus to construct my walls with whatever. Compare the cost of skilled labour to an apparatus, and would it pay to purchase an apparatus to build one house, when I build mine without one. I could build feet where an apparatus would only turn out inches, and could make the blocks here at Northfleet, and send them to any part of England, if gravel was not obtainable. Respecting my mould, I merely lay pieces of quartering on a level piece of ground to make my blocks, placing pieces in between each piece of quartering to the size the blocks may be required, and by this simple method you can make

any quantity you like, or, in other words cover a field, if you have sufficient quartering to do so. Mr. Tall states that he can make hollow walls much easier than can be done by my system, by inserting cores or prints, which I deny. I require no cores for my work, which is just as simple in principle as brick on edge hollow walls. If any of your readers think of building on my principle, I shall be happy to give them any particulars they may require.—I am, Sir, &c., W. MAY, Jun.

Northfleet.

[We can insert no more correspondence on this subject, except as advertisements.]

Intercommunication.

QUESTIONS.

[696.]—WAGES.—Will you, or any of your readers, inform me what difference, if any, in the price of building materials generally and wages between London and Dublin.—J. BLAKELEY, Guilsboro', Dec. 12.

[697.]—IRISH GRANITE.—Is it a fact that the large blocks of granite from quarries in the Co. Down, Ireland, used at the Albert Memorial, London, are delivered in London as Mull granite? Is it a fact that from the peculiar nature of this Irish granite hand specimens are procured from the above, and learnedly described as Mull granite before students' classes in some of your colleges?—HORNBLENDE.

[698.]—ICEHOUSES.—I should feel obliged by any brother subscriber giving me a few hints how to build an ice-house.—W. W.

[699.]—HOT-AIR ENGINES.—Can any of your readers give me any information as to hot-air engines, their relative power to steam engines, &c., and name and address of the manufacturers?—S. R. T.

[700.]—ASPHALTE PAVEMENT.—In the BUILDING NEWS a fortnight ago there appeared a short article on "Bitumen as Paving," and describing how very popular it had become as a paving and road material in Paris. I should be glad to know the mode adopted in laying the asphalte in any of the places mentioned in your article.—C. B. O.

[701.]—DESTROYING COLOUR ON PLANS.—Can any one inform me how or by what acid I can destroy burnt sienna and sepia, or any other colours on drawing paper. I find I can take out Prussian blue effectually without injuring the surface in the slightest, by potash, and carmine by a solution of chloride of lime. Purple of these colours may be destroyed by applying nitrate of potash and afterwards a solution of chloride of lime. Immediately on the colours being destroyed by the acid, remove it with clean water and blotting paper. The acids ought to be kept in glass stoppered bottles.—GIVE AND TAKE.

REPLIES.

[694.]—ETCHING VARNISH.—I beg to inform "A Londoner" that the hard varnish used by Callot, and commonly called the Florence varnish, is prepared thus:—Take four ounces of fat oil, very clear, and made of good linseed oil, like that used by painters; heat it in a clean pot of glazed earthenware, and afterwards put to it four ounces of mastick well powdered, and stir the mixture briskly till the whole be well melted. Then pass the mass through a piece of fine linen into a glass bottle with a long neck, that can be stopped very securely. The varnish is then ready for use.—E. E.

[695.]—DEAD DIPPING.—This process may be described in a few words. The brasswork, after the final stamping with its adhering black scale from the annealing oven, is placed in dilute nitric acid and left in it until the scale may be easily detached; it is then taken out and washed with water. Again it is plunged in dilute acid somewhat stronger than before, until the surface is covered with minute bubbles, after which it is washed in a solution of argol and dried in hot beech or boxwood sawdust. It is well rubbed until it is quite dry, and then burnished and lacquered.—T. M.

LEGAL INTELLIGENCE.

NONSUIT THROUGH NON-PRODUCTION OF A LETTER.—NUNN *v.* TASKER.—BEFORE THE COUNTY COURT, BROMLEY.—The plaintiff, a builder, claimed £38 0s. 8d. for work done to a house at Page Heath. £18 0s. 8d. had been paid into court, thus reducing the claim to £20. The plaintiff stated that he sold the house, to which the work had been done, to the defendant for £1,400, and that the terms of the contract, and also a reference to the work to be done, were mentioned in a letter written by the defendant to the plaintiff. The defendant contended that a letter having passed between the parties at the commencement of the transactions, in which the stipulations as to the state in which the property should be left by the plaintiff were fully stated, that letter should be produced. As the plaintiff had not the letter with him, a nonsuit was entered, and Mr. Gibson applied for immediate costs from the money that had been paid into court, as he had reason to believe that the plaintiff was on the eve of bankruptcy—a suggestion, however, which the plaintiff most indignantly denied. After considerable discussion, the judge declined to grant the application.

Our Office Table.

The monthly meetings of the Royal Archæological Institute of Great Britain and Ireland will be held at their rooms in New Burlington-street, on the following Fridays in 1868:—February 7, March 6, April 3, May 1, June 5, and July 3. The annual general meeting will be held at Lancaster, but the day is not yet fixed.

A portion of the objects obtained from Paris, either by loan or by purchase, will be exhibited at the South Kensington Museum during the Christmas holidays. Among the loans may be specified the extraordinary crystals lent by His Majesty the Emperor of Austria, and the goldsmiths' work of the fourth century, lent by the Roumanian Government. Among the purchases are the cabinet by Fourdinois, which was the *capo d'opera* of furniture; the beautiful spinette made at Milan in 1577, and Castellani's collection of peasant jewelry.

It has been calculated that the number of matches consumed in France is about six per head per day; it is eight in England, and nine in Belgium. Taking the French average as a basis, the number of matches consumed all over Europe in a day is about 2,000 millions, representing upwards of 600lb. of wood. The kinds of wood chiefly employed in manufacturing them—viz., aspen and poplar, are sold by the cubic metre (35 cubic feet); allowing for waste, this quantity does not weigh more than 500lb., so that in Europe alone the number of cubic metres of wood thus burned amounts to 400,000, being equivalent to 14 millions of cubic feet English measure. To this quantity should be added that of the stearine matches, commonly called vestas, the consumption of which has of late increased very considerably. The weight varies between 3,200 and 4,000 per lb. in France. The quantity of phosphorus used in the manufacture of matches is about 420,000lb., exclusive of chlorate of potash, sulphur, minium, sulphuret of antimony, gum, and glue. There are in Austria manufactories employing 5,000 hands, and the aggregate value of matches produced is 250,000,000f. The invention of friction matches only dates from 1832. In 1834, chlorate of potash was partially replaced by minium and peroxide of manganese, and phosphorus by sulphuret of antimony. In 1837, chlorate of potash was completely abandoned for bi-oxide of lead, and then for the nitrate of that metal, and also by nitrate of potash. In France, chlorate of potash continued to be in use till 1847; at present it is only used for vestas. It is a very dangerous substance, since it will explode by mere friction in the mortar.

The prizes and certificates awarded to students in the Southampton School of Art were distributed in the hall of the Hartley Institution, on Thursday week, by the Mayor (Alderman Stebbing). The report which was read stated that the total number of scholars under instruction during the past year was 1,150. The number, however, had seriously diminished since the last report; the school having now passed into the hands of the Corporation, it was hoped things would improve.

Commenting on the recent cases of death through actual starvation that have occurred in the metropolis, a correspondent thinks that many hundreds of poor men now out of work on the river side might be employed mixing a cheap fuel which might be burnt in lieu of coal, and be the means of saving life. Half river mud and half coal dust, we are told, makes a better fuel than ordinary coal, much more durable, and can be made for 8s. a ton: Coal dust and black river mud, well mixed in equal parts, and made into egg-shaped balls about twice the size of a man's fist, and built up in a fire-place with the pointed ends up and down to allow the air to pass through the mass. The writer made some the year before last at a coal yard by the river side, and burnt it in the open air within half an hour of its being mixed. A fuel committee for various districts now suffering privation might at a very trifling cost supply cheerful fires, and supposing half that cost to be borne by subscription, the poor might obtain five tons of fuel where they now get one.

According to the last mail the leading topic of interest at Natal was the confirmation of the discovery of large beds of excellent coal in that colony. The Government was being urged to assist in utilizing the discovery.

Jerusalem is soon to be lighted with gas, and a railway to the Holy City is projected.

It appears from a Parliamentary return recently published that the current annual expenses connected with the National Gallery amount to an annual sum of £15,894, of which the director receives £1,000 and the keeper and secretary £750. The establishment at Trafalgar-square costs £1,523, of which £327 is paid to the curators, and £786—or more than double—to police. A sum of £621 is spent at South Kensington, £2 000 is allowed for travelling expenses, agency business, &c., and £10,000 for the purchase of pictures. In 1865, the visitors to the National Gallery numbered 694,354; to South Kensington, 692,900; and to the National Portrait Gallery, 16,642. Last year the numbers were respectively 775,901; 756,075; and 24,666.

Great changes, says the "Journal of the Society of Arts," are impending over the South Kensington Museum. The iron portion of the building, which gave to the structure the name of "The Brompton Boilers," is about to be removed, and again set up on a site, already designated, at Bethnal-green, there to form an auxiliary Museum of Science and Art for the East of London. The sum of £5,000 was voted last session by Parliament "on account" of a total estimate of £20,000 to defray the cost of this auxiliary museum for East London. The new permanent buildings at Kensington, on account of which the grant of £32,500 was made last session, continue in steady progress. The decorations of the portions already erected possess novelties as striking as the courts hitherto opened to the public. Various artists were invited to give their assistance in carrying out the ornamentation of the lecture theatre and the buildings connected therewith. The decorations of the refreshment rooms, commenced by the late Mr. Godfrey Sykes, have been, since his death, entrusted to his pupils, Messrs. Gamble and Townroe, to whom are also delegated the ornamentation of the corridors and the lecture theatre. The firm of Morris, Marshall, and Co., known for revivals of ancient processes, and for efforts to bring art into novel relations to domestic uses, has been occupied in the adorning of the dining-room. Mr. Poynter, the young artist, who became conspicuous in the last Royal Academy by his large picture, "The Israelites in Egypt," has also been engaged upon these new buildings. Other of the mural decorations are from the designs of Mr. Moody; and Mr. W. B. Scott, a poet as well as an artist, has given drawings for the staircases leading to the lecture theatre.

The first silver medal of the Royal Academy for architectural drawing has been awarded to Mr. H. Sancton Wood.

The town of Dundee is about to carry out a very considerable public improvement. The Council will shortly apply to Parliament for powers to enclose a portion of the Solum of the Frith of Tay by the construction of a sea wall, extending westward from near to the point of the Gray Pier to Buckingham Point at the Magdalen Green. A public esplanade, and also a street 50ft. wide, will be formed to connect these points. In consideration of the land they are to receive, the Caledonian Railway Company are to contribute £13,000 to the expense of the new improvements; the North British Railway Company will contribute £13,000; the trustees of the Dundee Harbour are to contribute £13,000, in consideration of the improvement of their works; and the balance of the costs is to be paid by the Town Council from the public funds.

Mr. G. F. Watts has been elected a full member of the Royal Academy.

The sum granted by Government for public works and buildings in 1867-68, amounted to £942,535, being a decrease of £30,552, as compared with the preceding year. The largest single item granted was £125,326 for Royal works and pleasure gardens, the smallest was £1,670 for the British Embassy Houses at Paris and Madrid.

MEETINGS FOR THE WEEK.

TUES.—Royal Institution.—Professor Tyndall on "Heat and Cold" (Juvenile Lectures), 3.

THURS.—Royal Institution.—Professor Tyndall on "Heat and Cold" (Juvenile Lectures), 3.

SAT.—Royal Institution.—Professor Tyndall on "Heat and Cold" (Juvenile Lectures), 3.

Patents for Inventions

CONNECTED WITH THE BUILDING TRADE.

1107. C. CROCKFORD. IMPROVEMENTS IN OBTAINING USEFUL PRODUCTS FROM CERTAIN MATERIALS PRODUCED IN THE PROCESS OF GALVANIZING OR COATING IRON WITH ZINC. Dated April 13, 1867.

The first part of this invention consists in a method of treating the material known as "Bath" or "flux" skimmings The second part of the invention consists in a method of refining the hard spelter known as dross spelter, collected from the bottom of the baths of zinc, and produced in the process of galvanizing or coating iron with zinc. We cannot here devote space to the details of this invention *Patent completed.*

1185. J. SMALLEY AND S. BRIDGE. IMPROVEMENTS IN APPARATUS FOR MIXING PAINT, PUTTY, AND OTHER LIKE SUBSTANCES. Dated April 23, 1867.

This invention consists of apparatus for mixing or incorporating dry and liquid and other substances into a plastic or semifluid state, and is particularly suitable for preparing paint, putty, and other articles ordinarily sold by colourmen. Within a vessel or container of any suitable size and form, and made of metal or other material, the inventors cause two sets of arms or vanes to rotate in opposite directions. The manner of effecting the rotation of the said arms or vanes is readily accomplished by bevel wheels. One set of the vanes or arms is fixed on a central spindle, and the other on a hollow tube surrounding the said spindle. On the said spindle, and also on the said tube, there is a bevel wheel; one driving wheel geared with the wheels just mentioned, on being made to rotate, causes the respective sets of arms or vanes to revolve in opposite directions. *Patent abandoned.*

1226. W. COOKE AND T. WRIGHTSON. IMPROVEMENTS IN HOISTS SUITABLE FOR RAISING AND LOWERING WEIGHTS. Dated April 27, 1867.

The patentees claim the arranging hoists suitable for raising and lowering weights with a trunk containing water or liquid, and having within it an air barrel or bell, such barrel or bell having the liquid displaced from it or admitted into in it to cause it to rise or fall, and being connected by ropes or chains passing around pulleys with weights to be raised or lowered. They also claim the arranging valves in connection with the air barrel or bell, so that as soon as the said barrel or bell commences to move, either up or down in the trunk, the passage of air into or from it is arrested automatically, so as to render it impossible for the load to attain a dangerous speed. They also claim the contracting the water-way between the trunk and the barrel or bell, so as to check the rise or the descent of the said barrel or bell, and bring it quietly to rest. They also claim the application of a reservoir of air under pressure to supply air to the barrel or bell to displace the liquid therefrom. They also claim the combining a sheave or sheaves with the barrel or bell in such manner that the weight may be raised or lowered a distance exceeding that passed over by the barrel or bell. *Patent completed*

1218. W. COCHRAN. AN IMPROVED LEVEL. (Partly a communication.) Dated April 27, 1867.

This improved level consists of an apparatus in which the surface line of a liquid enclosed within a hollow disc of glass, or partly of glass, indicates upon a graduated circle or scale the angle of inclination of any surface upon which the apparatus is placed. *Patent abandoned.*

1200. D. BIRKETT. IMPROVEMENTS IN THE CONSTRUCTION OF FIRE PROOF FLOORS. Dated April 20, 1867.

This invention consists in bedding the entire depth of the joists in concrete or other incombustible material, without filling the entire space between the joists, by fastening to the sides and between the joists horseshoe or other shaped tiles of fire clay, by which the incombustible material in which the joists are bedded is maintained in its position against the sides of the joists. Iron of the requisite form may be used for the fire clay tiles. *Patent abandoned.*

1270. J. BROWN. IMPROVEMENTS IN THE CONSTRUCTION OF FIREPROOF AND OTHER CEILINGS AND FLOORS. Dated May 1, 1867.

This invention consists, essentially, in filling the spaces between the joists with "plaster of Paris," or other similar material. To hold the cement of plaster of Paris the joists may taper wider on their lower sides than their upper; or fillets may be fixed on the sides of the joists. *Patent abandoned.*

1316. T. R CRAMPTON. IMPROVEMENTS IN MACHINERY FOR PREPARING CLAY, AND FOR MAKING BRICKS, TILES, AND SIMILAR ARTICLES. Dated May 4, 1867.

The patentee claims the arranging apparatus to prepare clay for moulding into bricks, tiles, and other similar articles, by cutting the untempered clay into their slices by means of cutting wires or blades moving rapidly and continuously, as described. He also claims the arranging apparatus to form the untempered clay roughly into a stream and to slice such stream, by means of a rapidly revolving drum with cutting wires upon it. He also claims the arrangement of machinery described for moulding clay, such arrangement consisting of three rollers and a die or moulding orifice, so placed that the clay after passing between the upper and the central roller may descend on to the lower roller, and be carried between it and the central roller to the forming die or orifice. He also claims the so arranging the machinery that, by a cutting wire a length may be cut off from the stream of clay issuing from the forming die or orifice, and slid along a table until it is brought opposite to a frame of cutting wires which are passed through the length of clay while it remains stationary, the single wire and the frame of wires being connected together so as to move simultaneously. He also claims the cutting bricks, tiles, or blocks from a moving stream of clay by means of a cutting wire or wires actuated by a steam cylinder, the valves of which are governed by the flow of the clay. *Patent completed.*

Trade News.

TENDERS.

BRIGHTON.—For the erection of the Court House. Mr. T. C. Sorby, architect:—

Patching and Son	£6,245
Higgs	5,978
Nixon and Son	5,976
Patman and Fotheringham	5,869
Bull and Sons	5,956
Lynn and Sons	5,955
Ford and Sons	5,720
Lathey Brothers	5,635
Cheesman and Co.	5,600
Chappell (accepted)	5,395

CHELTENHAM.—For female training college. Mr. J. T. Darby, architect:—

Broom and Son (accepted)	£4,474

CITY.—For rebuilding back premises, 24, St. Mary-axe. Mr. H. H. Collins, architect:—

Sanders	£454
Newmann and Mann	446
A. Cohen	375
D. Sale	330

VENTNOR.—For main sewerage. Contract No. 5 and No. 6. Mr. John G. Livesay, C.E., engineer. Quantities supplied by Mr. Augustus F. Livesay:—

	Contract No. 5.	Contract No. 6.
Phillips	£538 9 0	£318 5 0
Wainwright	510 0 0	390 0 0
Moses & Walldor	500 0 0	370 0 0
Moxon	485 0 0	235 0 9
Frayne (accepted)	478 9 0	294 10 9
Beavis and Son	470 0 0	360 0 0
Pharoah	450 0 0	300 0 0

WALSALL.—For the erection of court room, &c. Mr. T. C. Sorby, architect:—

Burkitt	£4,100
Neale and Sons	3,844
Rowley	3,830
Highway (accepted)	3,410

BATH STONE OF BEST QUALITY.

RANDELL and SAUNDERS, Quarrymen and Stone Merchants, Bath. List of Prices at the Quarries and Depots; also Cost for Transit to any part of the United Kingdom, furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

BANKRUPTS.

TO SURRENDER IN BASINGHALL-STREET.

William Brooks, Clarendon-road, Notting-hill, builder, January 13, at 11—Levi Butler, Boscombe, Christchurch, builder, January 27, at 11—Edward Clarke, Judd-street, plumber, January 16, at 1—William Hey, Rockingham-street, Newington-causeway, architect, January 7, at 12—James Miller, Cambridge, plumber, January 22, at 12—John Sinclair Mulley, Southsea, civil engineer, January 7, at 11—John James Lovegrove, Isleworth, decorator, January 1, at 12—T. Rigby, Palmerston-road, Wandsworth, blacksmith, January 22, at 2.

TO SURRENDER IN THE COUNTRY.

Thomas Allcock, Sandiacre, brickmaker, January 16, at 12—Michael Gladwell, Rougham, plumber, January 8, at 11—William Hutchinson, Salford, engineer, January 10, at 11—Thomas Mowbray, Everton, contractor, January 6, at 11—Richard Watts, Penygloddfa, Montgomeryshire, carpenter, January 7, at 11—William Williams, Dowlais, contractor, January 4, at 2—Henry Hanson, Pentrich, Derbyshire, stonemason, December 26 George Manby Nichols, Leeds, bricklayer, January 9—B. Palmer, Southwold, Suffolk, carpenter, January 4—William Pilkington, Blackburn, painter, January 2—T. Richards, Old Basford, Nottingham, bricklayer, February 5—Charles Edward Smith, Liverpool, sculptor, January 8—Robert Smith, Blackburn, plumber, January 2.

NOTICES OF SITTINGS FOR LAST EXAMINATION.

January 30, G. O. Lane, Pall Mall, civil engineer—January 30, F. Hamilton, Golden-lane, engineer—January 31, G. Green, Greenwich, builder—January 15, W. Cook, Gateshead, builder—February 13, L. Vincent, Thornford, carpenter—February 13, H. Evans, Pembroke Dock, mason February 6, C. J. Braine, Franklin-street, Bromley, painter—January 15, E. B. Reynolds, Stanley street, Chelsea, builder—January 17, J. W Reed, Hornsey-rise, architect.

PARTNERSHIPS DISSOLVED.

Clinton and Wightman, Aldershot, decorators—Ambrose and Keetch, Hornsey-road, carpenters—Rennie and Marshall, Rotherhithe, engineers—Head, Ashby, and Co., South Stockton, ironfounders—Graham and Atley, Wilsden, Yorkshire, joiners—T. Capon and D. W. Young, Canal-road, Kingsland, cement manufacturers—J. W. Scott and T. T. Laverick, Sunderland, builders.

DECLARATIONS OF DIVIDEND.

T. J. Gilson, Hounslow, ironmonger, first div. of 3s. 6d—J. Credland, Norwich, glass merchant, first div. of 2s. 5½d.

LATEST PRICES OF MATERIALS USED IN CONSTRUCTION.

METALS.

IRON:—					
Welsh Bars in London	per ton	6 7 6	6 10 0	3	
Nail Rod	do	7 10 0	7 15 0	2½	
Hoops	do	8 10 0	9 0 0		
Sheets, Single	do	9 15 0	10 0 0		
Staffordshire Bars	do	7 10 0	7 15 0		
Bars, in Wales	do	6 12 0	6 0 0	3	
Rails	do	5 10 0	6 0 0	net	
Foundry Pigs, at Glasg. No 1	do	2 15 0	3 3 6	2½	
Swedish Bars	do	10 5 0	10 10 0	net	
STEEL:—					
Swedish Keg, hammered	per ton	15 0 0	15 10 0	2	
Swedish Faggot	do	10 10 0	12 10 0	2	
COPPER:—					
Sheet & Sheathing, & Bolts	per ton	80 0 0	82 0 0		
Hammered Bottoms	do	92 0 0	0 0 0		
Flat Bottoms, not Hammered	do	85 0 0	0 0 0		
Cake and Tough Ingot	do	71 0 0	72 0 0		
Best Selected	do	79 0 0	80 0 0		
Australian	do	83 0 0	84 0 0		
Y. L. Metal Sheathing & Rods	per lb	0 0 7	0 0 0		
ZINC:—					
English Sheet	per ton	26 10 0	27 0 0	2	
Devaux's V. M. Roofing Zinc	do	26 10 0	0 0 0		

* And 5 per cent. discount if laid upon the new system

TIN:—					
English Block	per ton	93 0 0	96 0 0	2½	
do Bar	do	93 0 0	97 0 0		
do Refined	do	97 0 0	99 0 0		
Banca	do	94 0 0	95 0 0	net	
Straits	do	90 0 0	0 0 0		
LEAD:—					
Pig, English	per ton	21 10 0	0 0 0	2½	
,, Spanish Soft	do	19 0 0	0 0 0		
Shot, Patent	do	22 10 0	0 0 0		
Sheet	do	20 10 0	0 0 0		
White	do	27 0 0	30 0 0	6	
SPELTER:—					
On the Spot	per ton	21 0 0	21 2 6	net	
QUICKSILVER	per btl	6 17 0	0 0 0		

REGULUS OF ANTIMONY

French	per ton	28 0 0	0 0 0

TIMBER, duty 1s per load, drawback, 1s.

Teak	load	£9 0	£10 10	Archangel, yellow	£11 10	£13 0
Quebec, red pine		3 0	4 10	St. Petersburg, yel.	10 10	11 0
,, yellow pine		2 15	4 0	Finland	8 0	9 0
St. John N.B. yellow		0 0	0 0	Memel	0 0	0 0
Quebec Oak, white		5 5	5 10	Gothenburg, yellow	8 10	10 10
,, birch		3 10	4 10	,, white	8 0	9 0
,, elm		5 10	6 0	Gefle, yellow	9 0	11 0
Dantzic oak		5 10	6 0	Soderham	9 0	10 10
,, fir		2 0	3 0	Christiania, per C., 12 ft. by 3 by 9 in.		
Memel fir		2 0	3 10	yellow	16 0	22 0
Riga		3 0	3 5	Deck Plank, Dantzic, per 40 ft. 3 in.	0 18	1 4
Swedish		2 0	2 5	TUNICK STONE per ton	6 0	8 0
Masts, Quebec red pine		6 0	7 0	OILS, &c.		
,, yellow pine		5 0	8 0	Seal, pale	per tun 40 10	41 0
Lathwood, Dantzic, fm		4 10	5 0	Sperm body	110 0	112 0
,, St. Petersburg		6 10	7 10	Cod	36 0	36 10
Deals, pr C., 12 ft. by 3 by 9 in., duty 2s per load, drawback 2s.				Whale, Sth. Sea, pale	39 10	0 0
Quebec, white spruce		13 0	19 0	Olive, Gallipoli	67 10	68 0
St. John, white spruce		13 10	16 10	Cocoanut, Cochin, ton	56 0	67 0
Yellow pine, per reduced C.				Palm, fine	40 10	41 0
Canada, 1st quality.		17 0	18 10	Linseed	34 10	35 0
2nd do.		11 10	12 10	Rapeseed, Eng. pale	34 0	38 10
				Cottonseed	33 0	39 10

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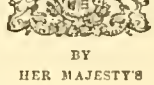

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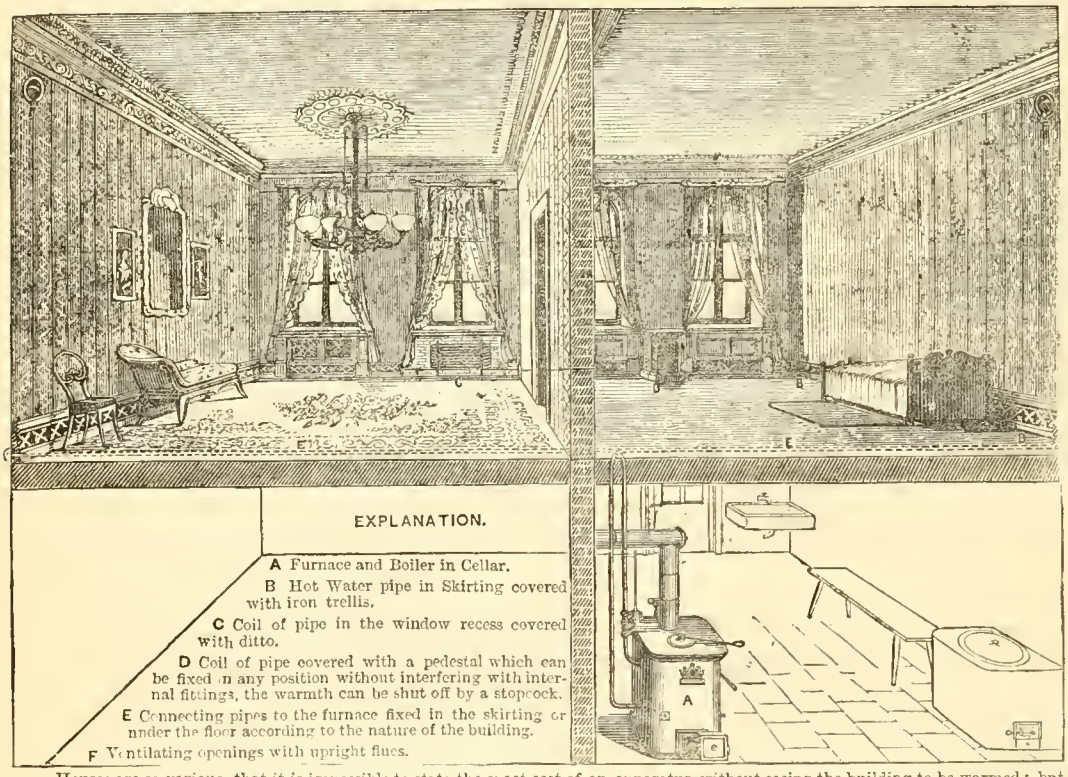

The Advantages of this Mode of Warming are the following:—

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2. A healthy and agreeable summer-like temperature, and good ventilation, without draft, can be maintained equally throughout an entire house; or, if required, the heat can be regulated in each room separately by stop-cocks; sleeping-rooms being entirely shut off in this manner during the night, and warmed in the morning by merely turning a handle.

3. Great economy in fuel.

4. Saving of trouble to the servants, only one fire having to be lighted, which requires very little attention; no fuel being consumed in the rooms, the consequent dirt and dust are avoided, and there are no grates to be cleaned.

5. Smoky chimneys, and the very great inconvenience and dirt caused by sweeping them are entirely obviated.

Houses are so various, that it is impossible to state the exact cost of an apparatus, without seeing the building to be warmed; but the average cost of heating a house of ten rooms (exclusive of kitchen offices) on this plan, having a cubical content of 20,000 feet, would be about £80, or £4 per 1,000 cubic feet warmed. This price includes supplying the cast-iron trellis-work to cover the pipes, and the arrangement for regulating the warmth in the different rooms; but as no stoves, mantelpieces, or chimney-breasts are required, at least half of this amount would be saved, besides much space being gained in every apartment. For churches, the cost would vary from 10s. to 25s. per 1,000 cubic feet warmed, including the necessary cast-iron trellis-work. For factories, about £2 per 1,000 cubic feet. The cost of the fuel required to warm a house must necessarily depend upon the thickness of the walls, the amount of the glass surface, and the manner in which it is built; but we have found, from a very large experience, that the cost of heating a well-built house, containing about 20,000 cubic feet, is £5 10s. for the entire winter, or about a half-penny per day per 1,000 cubic feet; all rooms and passages being warmed to an agreeable temperature.

An Apparatus, illustrating every point of construction, is on exhibition at our Office, in the Farringdon-road (near to the Metropolitan Station), where the public are respectfully invited to call and examine it, and a private house entirely heated upon this plan, without open fires, can be shown during the winter, on personal application at the Office, where any further information can be obtained. Exact estimates will be given for any plans sent to our Office, or on application being made for a personal inspection, and we guarantee the successful operation of every apparatus which we erect.

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